Test Systems
P-12XL

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Table of Contents

Copyright....2
Warranty....3
Export Control....7
Colophon....8
Table of Contents....9
List of Tables....15
List of Figures....19

Chapter 1, Introduction 31

1.1 The Objective of this Manual....32
1.1.1 Chapter Descriptions....32
1.2 Notices....33
1.2.1 Documentation Numbers Defined....33
1.2.2 Software Versions....33
1.2.3 Graphic Images....33
1.2.4 Procedure Times....33
1.3 Typographical Conventions....34
1.3.1 Text Formatting....34
1.3.2 Numeric Subscripts....34
1.3.3 Hazard Key Words Used in the Manual....34
1.4 Contacting Tokyo Electron....35
1.4.1 Sales and Service Offices Worldwide....35
1.4.2 Ordering Documentation and Reporting Documentation Problems....39

Chapter 2, Hazard Control 41

2.1 Types of Hot Work....42
2.2 Performing Lockout and Tagout on the Prober....43
2.3 Releasing Lockout and Tagout on the Prober....46

Chapter 3, Creating a Basic Setup File 49

3.1 Creating Wafer Files (Methodology)....50

3.1.1 Series Input....50

3.1.2 Continuous Inputting and Testing of Data....50

3.1.3 Revising and Inputting Data....51

3.2 Inputting Data to Create a Wafer File....52

3.3 Inputting Probe Card Parameters....59

3.4 Inputting Probe Tip Positions....65

3.5 Performing Probe Card Alignment....82

3.6 Preparing to Input Wafer Alignment Data....84

3.7 Transferring a Wafer....86

3.8 Selecting a Method for Inputting Wafer Alignment Data....88

3.9 Using the Wafer Setup Option....90

3.10 Inputting Wafer Edge Positions (Manual)....91

3.11 Inputting Macro Street Intersections (Manual)....93

3.12 Inputting the Micro Street Intersection and Target Pattern Positions (Manual)95

3.13 Wafer Edge Detection (Semiautomatic)....99

3.14 Inputting the Macro Street Intersection (Semiautomatic)....100

3.15 Inputting the Micro Street Intersection and Target Pattern Positions (Semiautomatic)....102

3.16 Inputting the Reference Pad and Registered Pads....106

3.17 Verifying Wafer Alignment....111

3.18 Performing a Contact Check....112

3.19 Configuring Contact Check Parameters....113

3.20 Performing a Contact Check....116

3.21 Implementing PTPA Position Corrections and Offsets....118

3.22 Inputting the Reference Die Position....126

3.23 Loading Control Maps....128

3.24 Designating the Probe Area....129

3.25 Designating the Skip Area....135

3.26 Checking and Disabling the Skip Area....138

3.27 Completing the Setup File Process....141

Chapter 4, Wafer Parameters 143

4.1 Wafer Parameters: Overview....144
4.2 Accessing Wafer Parameters....145
4.3 Basic Wafer Parameters....146
4.4 Consecutive Fail Parameters....148
4.5 Overdrive Parameters....150
4.6 Control Map Parameters....151
4.7 Multi-Testing Parameters....152
4.8 Location Setting Method....153
4.9 Gross Parameters....160
4.10 Specific Flat Orientation Parameters....161
4.11 Probe Mark Inspection Parameters....162
4.12 Select Probe Area Parameters....169
4.13 Select Skip Area Parameters....171
4.14 Polish Needle Parameters....172
4.15 Reference Die Parameter....178
4.16 Sample Testing Parameters....179
4.17 When the Sample Testing Mode is Set to Test....182
4.18 When the Sample Testing Mode is Set to Skip....183
4.19 Sample Testing with Multi-cards....184
4.20 Pad Coordinate Parameters....185
4.21 Checking Pad Positions....187
4.22 Probe Card Inspection Parameters....188
4.23 PTPA....191
4.24 Stage Control Parameter....194
4.25 Bump Alignment Parameter....195
4.26 Hot Chuck Parameters....196
4.27 Contact Correction at High Temp Parameters....197

Chapter 5, Operation Parameters 201

5.1 Operation Parameters: Overview....202
5.2 Accessing Operation Parameters....203
5.3 Alignment Operation Parameters....204
5.4 Die Stop Parameters....206

5.5 Unload Stop....208
5.6 BIN Input Operations Parameters....210
5.7 Machine Number Parameter....213
5.8 Buzzer Parameters....214
5.9 Card/Wafer Blow Operation Parameters....215
5.10 Indexing Units Parameter....217
5.11 Loader Transfer Parameters....218
5.12 Unload Flat Position Parameters....220
5.13 Cassette Type Parameter....222
5.14 Enable Loader Operations Parameter....223
5.15 Measurement (Test) Menu Parameters....224
5.16 Probe Alignment Parameters....226
5.17 Contact Count Calculation Parameters....229
5.18 Z Axis Parameters....230
5.19 Sample Wafer Parameters....231
5.20 Consecutive Fail Parameters....232
5.21 Stage Movement Limit Parameter....233
5.22 FDI Command Parameter....234
5.23 Map File Parameters....235
5.24 Lamp Control Parameter....236
5.25 Printer Parameters....237
5.26 GPIB Parameters....240
5.27 Hot Chuck On/Off Parameters....242
5.28 Hot & Cold Operating Conditions Parameters....244
5.29 TEMP Control Operating Conditions Parameters....246

Chapter 6, Creating an Advanced Setup File 249

6.1 Designating and Training Probe Mark Inspection (PMI) Pads....250
6.2 Designating Inspection Pads....251
6.3 Inputting Inspection Parameters....259
6.4 Specifying the Inspection Range and Training Batch Pads....261
6.5 Training Individual Pads....264
6.6 Inputting the Probe Mark Inspection Area....266
6.7 Checking/Disabling the PMI Area....269
6.8 Modifying Operation Parameters....273

6.9 Creating a New Wafer File from Existing Data Files.....275
6.10 Editing Existing Wafer File Data.....279
6.11 Editing Basic Parameters in Existing Files.....281
6.12 Editing Specific Wafer Parameters.....283
6.13 Editing Registered Setup Wafer Data File Parameters.....285
6.14 Editing Probe Card Data File Parameters.....289
6.15 Editing Probe Card Data Pin Registration.....291
6.16 Managing Lot Parameters.....293
6.17 Re-inputting Wafer Alignment Data.....297
6.18 Changing Contact Check Parameters.....301
6.19 Performing a Contact Check.....305
6.20 Correcting the PTPA Position and the XY Offsets.....310

Chapter 7, Software Utilities 319

7.1 Measuring Die Sizes and Distances on a Wafer.....320
7.2 Checking Contact Points on the Inspection Pad.....323
7.3 Checking Valid Die Rates.....326
7.4 Checking the Reference and Registered Probes.....329
7.5 Measuring Contact Position Displacement.....331
7.6 Testing Probe Mark Inspection (PMI).....335
7.7 Retraining PMI During Contact Check.....337
7.8 Testing Probe Card Inspection (PCI).....342
7.9 Copying the Wafer Files.....345
7.10 Deleting Files.....347
7.11 Searching Data Files.....350
7.12 Formatting a Floppy Disk.....352
7.13 Saving Wafer Files to Floppy Disk.....354
7.14 Deleting Wafer Files from a Floppy Disk.....356
7.15 Loading Wafer Files from a Floppy Disk.....358
7.16 Loading Control Maps.....360
7.17 Loading BIN Data from Floppy Disks.....362
7.18 Loading Pad Coordinate Data.....364
7.19 Loading Transfer Condition Data.....366
7.20 Loading Signal Tower Lighting Conditions.....368
7.21 Saving Signal Tower Lighting Conditions.....370

7.22 Saving Operation Parameters and Lot Parameters....372
7.23 Loading Operating Parameters and Lot Parameters....374
7.24 Inputting and Restoring Default Operation and Lot Parameters....376
7.25 Setting the Running Diagnostic Parameters....378
7.26 Accessing Log Data....380
7.27 Checking Operational Log Data During an Error....381
7.28 Checking, Saving, and Deleting Logs from the Diagnostics Menus....382
7.29 Saving Log Data to a Floppy Disk....383
7.30 Performing FOUP Indexer Registration....386
7.31 Inputting and Changing Passwords and Protecting Parameters....398
7.32 Masking and Protecting Parameters....400

Chapter 8, Machine Setup 405

8.1 MMI Setup Menu....406
8.2 Set Date/Time Menu....408
8.3 Hardware Setting (Yes/No) Menu....409
8.4 Hardware Settings (Multiple) Menu....412
8.5 GPIB Communication Parameters....414
8.6 SACC Setup Menu....420
8.7 Testing Control Menu....422
8.8 TTL Communications Parameters....425
8.9 TTL Interface Parameters Menu....427
8.10 BIN Data Group Input Menu....431
8.11 Group Color Selection Menu....434

Appendix A, Software Hierarchy 435

A.1 Software Hierarchy....436

Glossary....441

Index....447

Revision History....451

List of Tables

Tokyo Electron Sales and Service Offices Worldwide....35
Basic Wafer Parameters....146
Consecutive Fail Parameters....148
Overdrive Parameters....150
Control Map Parameters....151
Multi-Testing Parameters....152
Multi-Testing Parameters....154
Multi-Testing Parameters....155
Multi-Testing Parameters....157
Multi-Testing Parameters....158
Gross Parameters....160
Specific Flat Orientation Parameters....161
Probe Mark Inspection Parameters (Page 1/5)....162
Probe Mark Inspection Parameters (Page 2/5)....163
Probe Mark Inspection Parameters (Page 3/5)....165
Probe Mark Inspection Parameters (Page 4/5)....167
Probe Mark Inspection parameters (5/5)....168
Select Probe Area Parameters....169
Select Skip Area Parameters....171
Polish Needle Parameters....172
Polish Needle Parameters (Page 2/4)....174
Polish Needle Parameters (Page 3/4)....175
Polish Needle Parameters (4/4)....176
Reference Die Parameter....178
Sample Testing Parameters (Page 1/2)....179
Sample Testing Parameters (Page 2/2)....180
Pad Coordinate Parameters....185
Pad Position Classes....187
Probe Card Inspection Parameters....188
Probe Card Inspection Parameters....191
Stage Control Parameter....194
Bump Alignment Parameter....195

Hot Chuck Parameters....196
Contact Correction at High Temp Operation Parameters....197
Contact Correction at High Temp Operation Parameter....199
Alignment Parameters....204
Die Stop Parameters....207
Unload Stop Parameters....208
BIN Input Operations Parameters....210
Machine Number Operation Parameter....213
Buzzer Parameters....214
Card/Wafer Blow Parameters....215
Indexing Unit Operation Parameters....217
Loader Transfer Conditions Parameters....218
Unload Flat Position Parameters....220
Cassette Type Operation Parameter....222
Enable Loader Operations Parameter....223
Measurement (Test) Menu Operation Parameter....224
Probe Alignment Operation Parameter....226
Probe Alignment Operation Parameter....228
Contact Count Calculations Parameters....229
Z Down Amount Operation Parameters....230
Sample Wafer Operation Parameter....231
Consecutive Fail Parameters....232
Stage Movement Limit Operation Parameter....233
FDI Operation Parameter....234
Map File Operation Parameters....235
Lamp Control Operation Parameter....236
Printer Operation Parameters....237
GPIB Operation Parameters....240
Hot Chuck Fixed Auto Off Parameters....242
Hot & Cold Operating Conditions Parameters....244
TEMP Control Operating Conditions Parameters....246
Inspection Parameters....259
Probe Alignment Operation Parameter....286
Probe Alignment Operation Parameter....287
Basic Parameters (Light Setting when Setting Up Wafer)....288

Lot Parameter Descriptions.....294
Inspection Parameters.....339
Running Diagnostic Parameter Settings.....379
Running Diagnostic Parameter Settings (After Running Test (Aging)).....379
Cassette Input Parameters.....391
FOUP Input Parameters.....392
FOUP Input Parameters.....393
FOUP Input Parameters.....393
FOUP Input Parameters.....394
FOUP Input Parameters.....394
Acceleration/Deceleration Codes Table.....394
FOUP Input Parameters.....395
Raise Loader Z Parameters.....396
Raise Loader Z Parameters.....397
MMI Setup Menu Parameters.....406
Set Date/Time Menu Parameters.....408
Hardware Setting (Yes/No) Menu Parameters.....409
Hardware Settings (Multiple) Menu Parameters.....412
GPIB Communication Menu (1/4) Parameters.....414
GPIB Communication Menu (2/4) Parameters.....416
GPIB Communication Menu (3/4) Parameters.....417
GPIB Communication Menu (4/4) Parameters.....418
SACC Setup Menu Parameters.....420
Testing Control Menu Parameters.....422
Testing Control Menu Parameters.....423
Tester I/F Data Set Menu Parameters.....428
Tester I/F Data Set (2) Parameters.....429
Tester I/F Data Set (2) Parameters.....430

List of Figures

Power Supply Switch....44
Lockout Device Handle (Single Port)....44
Lockout Device Handle (Wide Loader)....45
Lockout Device Handle (Single Port)....46
Lockout Device Handle (Wide Loader)....47
Power Supply Switch....47
Initial Selections Menu....48
Example of Series Input....50
Example of Continuous Inputting and Testing....51
Example of Revising and Inputting Data....51
Setup Menu....52
Wafer Name Keyboard....53
Setup Menu....53
Wafer Parameters Setup Menu....54
Flat Orientation Designation....54
Alignment Axis....55
Wafer Parameters Setup Menu....56
Wafer Parameters Item Selection Menu....57
Parameters Setting Menu....57
Wafer File Setup Probe Menu....60
W PC Macro View....61
W PC Micro View....61
M PC 2 Macro View....61
M PC 2 Micro View....62
Needle Information Menu....62
Probe Base....63
Stage Control Menu....66
Stage Control Menu....67
Stage Control Menu....68
Symmetrical Distribution of Probe Tips (Incorrect)....68
Asymmetrical Distribution of Probe Tips....68
Stage Control Menu....69

Stage Control Menu.....69
Macro Input Position.....70
First Micro Pin Initial Position.....70
First Micro Pin in Macro View.....71
Second Micro Pin Initial Position.....71
Third Micro Pin in Macro View.....71
Fourth Micro Pin Initial Position.....72
Fourth Micro Pin in Macro View.....72
Stage Control Menu.....73
Stage Control Menu.....73
Stage Control Menu.....74
Stage Control Menu.....75
Setup Menu.....75
Stage Control Menu.....76
Visual Field Probe Setup Menu.....76
Recommended Second Pattern Probe Positions.....77
Stage Control Menu.....78
Setup Menu.....78
Stage Control Menu.....79
Stage Control Menu.....79
Reference Pin Setting Example - Correct Positions.....80
Reference Pin Setting Example - Incorrect Positions.....80
Stage Control Menu.....80
Stage Control Menu.....81
Setup Menu.....81
Wafer File Setup Probe Menu.....82
Probe Alignment Results Menu.....83
Wafer Alignment Process.....85
Wafer Transfer Setup Menu.....86
Wafer Alignment Selection Menu.....88
Wafer Setup Option Menu.....90
Stage Control Menu.....91
Stage Control Menu.....92
Stage Control Menu.....93
Stage Control Menu.....95

Stage Control Menu....96
Stage Control Menu....96
Stage Control Menu....97
Stage Control Menu....97
Stage Control Menu....100
Stage Control Menu....102
Stage Control Menu....103
Stage Control Menu....103
Stage Control Menu....104
Stage Control Menu....104
Stage Control Menu....106
Stage Control Menu....108
Registered Pad Centering Correction Menu....109
Inspection Parameters Menu....109
Registered Pad Centering Menu....110
Align Wafer Setup Menu....111
Alignment Results Display Menu....111
Block Diagram of a Contact Check....112
Wafer File Check Contact Menu....113
Contact Down Position Menu....116
Check Registered Pad Menu....116
Stage Control Menu....117
Camera Menu....119
Contact Position Offset Selection Menu....119
Stage Control Menu....120
XY PTPA Offset Display Menu....120
Camera Menu....121
Contact Position Offset Selection Menu....121
Stage Control Menu....122
XY Theta PTPA Correction Offset Amount Display Menu....122
Camera Menu....123
Contact Position Offset Selection Menu....123
Stage Control Menu....124
XY Offset Display Menu....124
Z Position Setting Menu....125

Reference Die Input Menu (Wafer Map)....127
Select Probe Area Menu....130
Probe Area Setting Menu (Wafer Map)....130
Probe Area Setting....131
Probe Area Check/Change Menu (Wafer Map)....132
Probe Area Check/Change Menu (Wafer Map)....133
Probe Area Check/Change Menu (Wafer Map)....133
Probe Area Transfer Menu (Wafer Map)....134
Probe Area Transfer Menu (Wafer Map)....134
Select Skip Area Menu (Wafer Map)....136
Skip Area Setting Menu (Wafer Map)....136
Skip Area Setting Menu (Wafer Map)....137
Select Skip Area Menu....139
Check/Disable Skip Areas Menu (Wafer Map)....139
Skip Area Check/Disable Menu (Wafer Map)....140
Skip Area Check/Change Menu (Wafer Map)....140
Setup Menu....141
End Setup Menu....142
Basic Wafer Parameters Menu....146
Consecutive Fail Menu....148
Overdrive Parameters Menu....150
Control Map Parameters Menu....151
Multi-Testing Parameters Menu....152
Multi-Location Setting Menu (2)....153
Multi-Location Setting Menu (3)....153
Multi-Location Patterns....154
Multi-Location Setting Menu (4)....155
Multi-Location Patterns (4)....156
Multi-Location Setting Menu (8)....157
Multi-Location Setting Menu (Free)....158
Gross Parameters Menu....160
Specific Flat Orientation Menu....161
Probe Mark Inspection Menu (1 of 5)....162
Probe Mark Inspection Setting Menu (2 of 5)....163
Probe Mark Inspection Parameters (Page 3/5)....165

Probe Mark Inspection Menu (4 of 5)....167
Probe Mark Inspection Menu (5 of 5)....168
Select Probe Area Parameters Menu....169
Select Skip Die Area Menu....171
Polish Needle Menu (1 of 4)....172
Polish Needle Menu (2 of 4)....174
Polish Needle Menu (3 of 4)....175
Polish Needle Menu (4 of 4)....176
Reference Die Setting Menu....178
Sample Testing Menu (1 of 2)....179
Sample Testing Menu (2 of 2)....180
Test Die Designation....182
Selecting Skip Die....183
Sample Testing with Multi-Cards....184
Pad Coordinates Parameters Menu....185
Pad Data Menu....187
Probe Card Inspection Menu....188
PTPA Menu....191
Stage Control Parameter Menu....194
Bump Alignment Parameter Menu....195
Hot Chuck Parameters Menu....196
Contact Correction at High Temperature Measurement Menu....197
Contact Correction at High Temp Menu (2 of 2)....198
Alignment Parameters Menu....204
First Die Stop Menu....206
Last Die Stop Menu....206
Z Stop Position Menu....206
BIN Input Menu....210
Conversion Method Using Binary....211
Conversion Method Using Parity....212
Machine Number Parameter Menu....213
Card/Wafer Blow Parameter Menu....215
Indexing Units Parameter Menu....217
Loader Transfer Conditions Menu....218
Unload Flat Position Menu....220

Cassette Type Parameter Menu....222
Enable Loader Operation Menu....223
Measurement Menu....224
Standard Testing Menu....224
Real Time Wafer Map Menu....225
Probe Alignment Parameters Menu....226
Probe Alignment Menu (2 of 2)....227
Contact Count Calculations Menu....229
Z Down Amount Menu....230
Sample Wafer Menu....231
Cons. Fail Initial Menu....232
Stage Movement Limit Menu....233
FDI Command Menu....234
Map File Parameters Menu....235
Printer Parameters Menu....237
GPIB Menu....240
Hot Chuck Auto Off Menu....242
Hot & Cold Operating Cond. Menu....244
TEMP Control Operating Conditions Menu....246
Wafer Parameters Item Selection Menu....252
Probe Mark Inspection Menu (1/5)....252
Stage Control Menu....253
Stage Control Menu....254
Stage Control Menu....254
Stage Control Menu....254
Stage Control Menu....256
Inspection Pad Input Selection Menu....256
Pad Position Designation Menu....257
Training Menu....258
Inspection Parameters Menu....259
Training Menu....262
Training Menu....262
Crosshairs Movement Menu....264
Reference Die Input Menu (Wafer Map)....267
PMI Area Select Menu (Wafer Map)....267

PMI Area Setting Menu (Wafer Map)....268
PMI Area Select Menu (Wafer Map)....268
Reference Die Input Menu (Wafer Map)....270
PMI Area Select Menu....270
PMI Area Check/Disable Menu (Wafer Map)....271
PMI Area Check/Disable Menu (Wafer Map)....271
PMI Area Check/Disable Menu (Wafer Map)....272
PMI Area Select Menu....272
Operation Parameters Item Selection Menu....273
Parameter Setting Menu (Unload Stop Menu shown)....274
Operation Parameter Item Selection Menu....274
Change Setup Wafer Data Menu....275
File Input Menu....276
Data File Selection Menu....276
File Input Menu....277
File Input Menu....277
File Load/Save Menu....278
Change Setup Wafer Data Menu....279
Wafer Input Menu....280
File List Menu....280
Basic Parameters Menu....281
Change Setup Wafer Data Menu....283
Wafer Parameter Menu....284
Wafer Parameters Item Selection Menu....284
Change Setup Wafer Data Menu....285
Wafer Input Menu....286
Basic Parameters Menu....286
Wafer Setup Option Menu....287
Light Setup Menu....288
Change Setup Wafer Data Menu....289
Probe Card Input Menu....290
Probe Card Parameter Menu....290
Change Setup Wafer Data Menu....291
Probe Card Input Menu....292
Stage Control Menu....292

Lot Parameters Menu..293
Additional Wafer Menu..295
Manual ID Menu..296
Change Setup Wafer Data Menu...297
Wafer Input Menu..298
Wafer Transfer Menu..298
Wafer Transfer Menu..299
Stage Control Menu..300
Change Setup Wafer Data Menu...301
Check Contact Menu...302
Contact Data Menu...302
Detail Parameters Menu...303
Change Setup Wafer Data Menu...305
Contact Check Menu...305
File List Menu..306
Wafer Transfer Menu..306
Wafer Transfer Menu..307
Wafer Transfer Menu..308
Wafer Transfer Menu..308
Contact Down Position Menu..310
Message Menu...311
Stage Control Menu 311
Z Position Setting Menu..312
Camera Menu...313
Contact Position Offset Selection Menu...313
Stage Control Menu...314
XY Offset Display Menu..314
Camera Menu...315
Contact Position Offset Selection Menu...315
Stage Control Menu...315
XYθ Offset Amount Display Menu...316
Camera Menu...316
Contact Position Offset Selection Menu...317
Stage Control Menu...317
XY Offset Display Menu..317

Contact Check Menu....320
Camera Menu....321
Camera Menu....321
Testing Results Menu....322
Contact Check Menu....323
Camera Menu....324
Message Menu....324
Multi-Channel No. Input Menu....325
Contact Check Menu....326
Contact Down Position Menu....327
Contact Down Position Menu....327
Contact Check Menu....329
Camera Menu....330
Stage Control Menu....330
Contact Check Menu....331
Camera Menu....332
Camera Menu....332
Stage Control Menu....333
Stage Control Menu....333
Testing Results Menu....334
Contact Check Menu....335
Contact Down Position Menu....336
PMI Judgment Results Menu....336
Contact Check Menu....337
Camera Menu....338
Training Menu....338
Inspection Parameters Setting Menu....338
Training Menu....340
Training Menu....340
Crosshairs Movement Menu....341
Contact Check Menu....342
Contact Down Position Menu....343
PCI Judgment Results Menu....343
Stage Control Menu....344
File Input Menu....345

Wafer File List Menu....346
File List Menu....346
File Input Menu....347
File List Menu....348
File Input Menu....349
File List Menu....349
File Input Menu....350
Wafer File List Menu....351
File List Menu....351
Copy Wafer Data Menu....352
Inserting a Floppy Disk....353
Format Floppy Disk Menu....353
Inserting a Floppy Disk....354
Save File Selection Menu....355
Inserting a Floppy Disk....356
Wafer Save Menu....357
Safe File Selection Menu....357
Inserting a Floppy Disk....358
Load Wafer Data Item Selection Menu....359
Inserting a Floppy Disk....360
File Load Menu....361
Inserting a Floppy Disk....362
File Load/Save Menu....363
Inserting a Floppy Disk....364
File Load Menu....365
Inserting a Floppy Disk....366
File Load/Save Menu....367
Inserting a Floppy Disk....368
File Load/Save Menu....369
Inserting a Floppy Disk....370
File Load/Save Menu....371
Inserting a Floppy Drive....372
Operation Parameters Item Selection Menu....373
Inserting a Floppy Drive....374
Operation Parameters Item Selection Menu....375

Item Selection Menu....376
Item Selection Menu....377
Aging Parameters Menu....378
Error Processing Functions Menu....381
Error Log Menu....381
Log Functions Menu....382
Inserting a Floppy Disk....383
Error Log Menu....384
Cassette Input Menu....387
Cassette Input Parameters Menu....387
Raise Indexer Z Menu....388
Cassette Input Parameter Menu....389
Insert Position Offset Menu....389
Cassette Input Parameters Menu....390
Cassette Input Parameters Menu....391
Slot 1 Positions Setting Value....392
Map Ending Point Setting Value....392
Map Ending Point Setting Value....393
Pitch Setting Value....393
Center Shift-Amount Setting Value....394
Slot 1 Access Position Offset Amount....395
Raise Loader Z Menu....396
Insert Position Offset Menu....397
Inserting a Floppy Disk....402
MMI Setup Menu....406
Set Date/Time Menu....408
Hardware Settings (Yes/No) Menu....409
GPIB Parameters Menu (1 of 4)....414
GPIB Parameters Menu (2 of 4)....416
GPIB Parameters Menu (3 of 4)....417
GPIB Parameters Menu (4 of 4)....418
SACC Setting Menu....420
Testing Control Menu (1/2)....422
Testing Control Menu (2/2)....423
TTL Parameters -- Tester Interface Logics Menu....425

Signal Level....425
TTL Parameters -- XY BIN Interface Logics Menu....426
Tester I/F Data Set (1) Menu....427
Tester I/F Data Set (2) Menu....429
BIN Data Group Input Menu....431
BIN Data Group Input -- Categories Corresponding to BIN Numbers Menu....432
BIN Data Input Menu....432
Group Color Selection Menu....434

CHAPTER 1

Introduction

This chapter contains an overview of this manual, reader notices, and typographical conventions. Additionally, the Introduction includes chapter summaries for each chapter in the **P-12XL Advanced Operations Manual** .

1.1 The Objective of this Manual 0404.1

This manual is for Test Systems P-12XL/XL+ prober operators who are responsible for the upkeep (spare parts replacement, inspection, and adjustments) of TEL's Fully Automatic Wafer Prober P-12XL/XL+ (called “prober” in this manual). This manual contains the necessary information for the basic operations of the prober.

1.1.1 Chapter Descriptions 0405.1

The following table includes descriptions for each of the chapters in this manual.

Chapter	Description
1	The **Introduction** , describes the organization and content of the operations manual and provides chapter summaries for each chapter in the manual.
2	Chapter 2, **Safety**, contains procedures for controlling certain hazards on the prober using the lockout and tagout procedures. It also contains descriptions of the levels of hot work that may be encountered while installing, operating or performing maintenance on the prober. For more information on hazards associated with the prober operations and maintenance, refer to the **P-12XL Safety Manual**.
3	Chapter 3, **Creating a Basic Setup File** , describes the basic steps involved in creating a setup file. These steps include entering wafer and probe card parameters, entering needle-tip positions, aligning the wafer to the probe card, and performing a contact check.
4	Chapter 4, **Wafer Parameters** , describes and defines the P-12XL wafer parameter settings. It provides the steps to navigate to the appropriate wafer parameter menu, make any necessary changes, and save the new settings. The menu screen and available settings of each wafer parameter are presented in tabular form.
5	Chapter 5, **Operation Parameters** , describes and defines the P-12XL operation parameter settings. It provides the steps to navigate to the appropriate operation parameter menu, make any necessary changes, and save the new settings. The menu screen and available settings of each operation parameter are presented in tabular form.
6	Chapter 6, **Creating an Advanced Setup File** , describes the advanced features that are involved in creating a setup file, including entering probe mark inspection, and probe and skip area parameters.
7	Chapter 7, **Software Utilities** , describes the software utilities available for data file manipulation and backups, error and assist recovery, and utilities available while probing is paused.
8	Chapter 8, **Machine Setup** , describes the procedures required to set up the prober including setting up the man-to-machine interface (MMI) and other aspects of the machine.

1.2 Notices 0003.1

1.2.1 Documentation Numbers Defined 0004.1

There are two document numbers on the cover of this manual. Note that an (N) follows one number, and a (C) follows the other. The number preceding the (N) refers to the normal bond paper documentation number. The number preceding the (C) refers to the clean room paper documentation number.

1.2.2 Software Versions 0005.2

There may be some differences in the prober's specifications because of the continual effort to improve the design and software of the prober. This manual corresponds to system software revision Rzz00-R014.05.

There are menu buttons that appear on the touch screen but are not supported by the current system software. Menu buttons that are not supported by the software will not function. These buttons will be supported in future software versions.

1.2.3 Graphic Images 0006.1

The pictures and drawings in the manual may not depict all stickers. Refer to the descriptions of the hazard label locations, for drawings that accurately depict safety sticker locations. The photographs in the manual are meant to be representative, and stickers may be in different locations on your prober.

The screen captures in the manual do not always depict what appears on the touch screen. Some menus appear on top of other menus. In this manual only the top level menu is shown in the graphic.

1.2.4 Procedure Times 0007.1

The times that are shown in each procedure are representative. The published times are based on the following conditions:

- Required tools, parts, and personnel are readily available.
- Personnel are trained in the appropriate TEA P-12XL class.
- The times do not take local fab policies into account.
- Procedures are completed as written, without omission or revision. Times shown do not account for the time required to complete associated corrective actions referenced in a separate procedure.

Therefore, when the procedure is performed at the local fab site, the actual time to complete the task may be different than shown.

1.3 Typographical Conventions 0008.1

1.3.1 Text Formatting 0009.2

Typographical conventions used in this manual include text formatting for: HARDWARE SWITCHES, SOFTWARE BUTTONS, *screen names*, `screen output`, **important points** , `user input`, and glossary terms.

1.3.2 Numeric Subscripts 0010.2

Each procedure and section title is followed by a subscripted number. The four digits (0010 for this section) before the period make up a unique control number. The number following the period is the revision number for the section or procedure.

1.3.3 Hazard Key Words Used in the Manual 0011.1

Key words for safety warnings are used in this manual and in warning labels posted on the equipment.

Signal words are words that indicate to equipment users and individuals who work near the equipment the magnitude of dangers in the equipment. There are three types of signal words depending on the level of danger.

⚠ DANGER

Danger labels indicate an imminently hazardous situation, that if not avoided, WILL result in death or serious injury. Danger key word panels use white text on a red background as shown.

⚠ WARNING

Warning labels indicate a potentially hazardous situation, that if not avoided, COULD result in death or serious injury. Warning key word panels use white text on an orange background as shown.

There are two types of caution panels, one for personnel, and one for equipment.

⚠ CAUTION

Personnel caution labels indicate a potentially hazardous situation, that if not avoided, MAY result in minor or moderate injury to personnel. Personnel caution key word panels use black text on a yellow background, including the safety alert symbol (an exclamation point inside a triangle) as shown.

CAUTION

Equipment caution labels indicate a potentially hazardous situation, that if not avoided, MAY result in property damage to equipment or product. Equipment caution key word panels use black text on a yellow background. This panel does not include the triangle.

1.4 Contacting Tokyo Electron 1701.2

Contact Tokyo Electron at 1-800-TOKYO50 (1-800-865-9650) for troubleshooting assistance, parts ordering, service requests, or any other reason 24 hours a day, 7 days a week.

To contact Tokyo Electron worldwide sales and service offices directly, locate information in English at **http://www.tel.com/eng/about/locations/locations.htm** or in Japanese at **http://www.tel.com/jpn/about/locations/japan.htm**.

Tokyo Electron has an additional English website at **http://www.telcustomer.com** to provide online services to customers in the United States.

1.4.1 Sales and Service Offices Worldwide 0012.1

In case of emergency, contact our sales and service offices for assistance. Refer to the contact information in the following list.

Tokyo Electron Sales and Service Offices Worldwide

	Address	Telephone Number	Fax Number
TOKYO ELECTRON AMERICA, INC.			
Austin Office (Head Office)	2400 Grove Boulevard, Austin, Texas 78741 U.S.A.	512-424-1000	512-424-1001
Albuquerque Office	5931 Jefferson N.E. Suite B, Albuquerque, New Mexico 87109 U.S.A.	505-449-1100	505-449-1101
Boise Office	9050 W. Barnes Drive, Boise, Idaho 83709 U.S.A.	208-672-6000	208-672-6001
Burlington Office	27 River Road B, Essex Junction, Vermont 05452 U.S.A.	802-288-7100	802-288-7101
Colorado Springs Office	5061 N. 30 Street, Colorado Springs, Colorado 80919 U.S.A.	719-278-1506	719-278-1501
Dallas Office	1651 N. Collins Blvd., Suite 150, Richardson, Texas 75080 U.S.A.	972-705-9234	972-705-9987
Eugene Office	1710 Willow Creek Circle, Suite 100, Eugene, Oregon, 97402 U.S.A.	541-345-6200	541-345-2482
Fishkill Office	20 Corporate Park Drive, Suite A Hopewell Junction, New York 12533 U.S.A.	845-231-0000	845-897-9548
Los Angeles Office	23440 Hawthorne Blvd., Suite 260, Torrance, California 90505 U.S.A.	310-378-7663	310-378-1320

	Address	Telephone Number	Fax Number
Manassas Office	10318 Battleview Parkway, Manassas, Virginia 20109 U.S.A.	703-392-1800	703-392-1801
Marlborough Office	5 Mount Royal Ave., Marlborough, Massachusetts 01752 U. S.A.	508-460-2100	508-460-7923
Orlando Office	8427 S. Park Circle, Suite 140, Orlando, Florida 32819 U.S.A.	407-355-3400	407-226-1431
Phoenix Office	2120 West Guadalupe Road, Gilbert, Arizona 85233 U.S.A.	480-539-2000	480-539-2001
Portland Maine Office	5 Foden Road, M/S 03-02 South Portland, ME 04106 U.S.A.	207-541-8530	207-541-4611
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Santa Clara Office	2953 Bunker Hill Lane, Suite 300, Santa Clara, California 95054 U.S.A.	408-566-4300	408-566-4301
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	2500 Montopolis Drive, Austin, Texas 78741-6404 U.S.A.	512-486-4000	512-486-4001
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Boston Plant	123 Brimbal Avenue, Beverly, Massachusetts 01915 U.S.A.	978-921-0031	978-524-7099
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Austin Office	2400 Grove Blvd., Austin, Texas 78741 U.S.A.	512-424-1000	512-424-1001
Dallas Office	1651 N. Collins Blvd., Suite 150, Richardson, Texas 75080 U.S.A.	972-705-9234	972-705-9987

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SUPERCRITICAL SYSTEMS, INC.			
	2120 West Guadalupe Road, Gilbert, Arizona 85233-2805 U.S.A.	480-507-8100	480-507-3103
TIMBRE TECHNOLOGIES, INC.			
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TOKYO ELECTRON EUROPE LIMITED			
Crawley Office (Head Office)	Premiere House, Betts Way, London Road, Crawley West Sussex RH10 2GB, England	1293-655800	1293-655888
European Distribution Centre	Unit 4, Faraday Centre, Faraday Road, Crawley West Sussex RH10 2PX, England U.K.	1293-655980	1293-655999
Livingston Office	Unit 1, Alderstone Business Park, MacMillan Road, Livingston EH54 7DF, Scotland U.K.	1506-420044	1506-420055
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Catania Office	c/o Big Sicilia, Box HT3, Zona Industrial Pantano D'Arci, Contrade Torre Allegra, 95030 Catania, Italy	95-7357384	95-523232
TOKYO ELECTRON DEUTSCHLAND GmbH			
Munich Office (Head Office)	Carl-Zeiss-Ring 5, 85737, Ismaning, Germany	89-96278-0	89-96278-111
Alsdorf Office	Joseph-von, Fraunhofer-Strasse 3d, 52477 Alsdorf, Germany	2404-906-715/716	2404-906-714
Dresden Office	Moritzburger Weg 67, Haus D, 01109 Dresden, Germany	351-885920	351-8859288
TOKYO ELECTRON NEDERLAND B.V.			
	Kerkenbos 10-15, Unit C, 6546 BB Nijmegen, The Netherlands	243-726-630	243-726-640
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	Collinstown Industrial Park, Leixlip, Co. Kildare, Ireland	1-606-7923	1-606-8944
TOKYO ELECTRON ISRAEL LIMITED			
Kiryat Gat Office	Habarzel St., Gat 2000 Industrial Zone, Kiryat Gat, Israel	972-8-681-0860	972-8-6810862
Migdal HaEmec Office	2nd Floor, Galai Building, Mada St., Ramat Gabriel Industrial Area, Migdal HaEmek, Israel	4-6040350	4-6440505
TOKYO ELECTRON FRANCE S.A.R.L.			
Grenoble Office (Head Office)	Batiment Alicante 1, Chemin de la Dhuy, 38240 Meylan, France	4-7604-1244	4-7604-1243
Paris Office	c/o, ALTIS, 224 Bd John KENNEDY, 91105 Corbeil Essonnes Cedex France	1-6090-9944	1-6495-4673
Rousset Office	ST Microelectronics Zone Industrielle de Rousset 13106 ROUSSET cedex France	4-4253-4012	4-4253-2288
TOKYO ELECTRON KOREA LIMITED			

	Address	Telephone Number	Fax Number
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Cheongju Office	5Fl, In-Hwa Bldg., 1827 Pongmyoung-dong Cheongju-city, Chungbuk 361-300 Korea	31-260-5240	43-276-8561
Cheonan Office	129 Block 10 Lot, Seongjeong-Dong, Cheonan-City, Chungchongnam-Do, Korea	31-260-5194/5195/5196	31-260-5197
Gumi Office	456-10 Songjeong-dong, Gumi-city, Kyong Sang Buk-do, 730-010 Korea	31-260-5261	31-260-5260
Icheon Office	4Fl, Hyundai Park Bldg., 687-2, Ami-ri, Pubal-up Icheon-city, Kyonggi-do 467-860 Korea	31-260-5270	31-637-4180
Kiheung Office	348-6 Banwol-ri, Taean-up, Hwasung-gun Kyonggi-do, 445-970 Korea	31-260-5280	31-260-5284
Pucheon Office	3Fl, Yuspo Sports Center 169-115 Yakdae-dong Wonmi-ku Pucheon-city, Kyonggi-do 420-140 Korea	31-260-5259	32-675-2788
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TOKYO ELECTRON (SHANGHAI) LIMITED			
Head Office	30Fl, No. 28 Xinjinquao Road, Puding 201206, China	21-5032-8833	21-5032-8877

1.4.2 Ordering Documentation and Reporting Documentation Problems 1702.1

Order documentation by contacting your local sales and service office or by calling 1-800-TOKYO50 (1-800-865-9650). The document number of a manual is also the part number. Please refer to this number when ordering new documentation.

Tokyo Electron America has made every effort to ensure that this manual is accurate. However, because the equipment is constantly revised and improved, you may find that information is missing. If necessary information is missing or there is information that your company wants to see added, please mail or fax your proposed changes on the Document Change Request form located at the end of this manual.

We appreciate all feedback you give us. Your feedback helps us keep our manuals accurate and up-to-date.

CHAPTER 2

Hazard Control

This chapter contains procedures for controlling certain hazards on the prober using the lockout and tagout procedures. It also contains descriptions of the levels of hot work that may be encountered while installing, operating or performing maintenance on the prober. For more information on hazards associated with the prober operations and maintenance, refer to the **P-12XL Safety Manual**.

2.1 Types of Hot Work 1301.1

SEMI has defined four Hot Work Levels to indicate the type and severity of electrical hazards that are present to personnel while working on a particular piece of equipment. Be sure to read and understand these types before performing any procedure that could expose you to electrical hazards. The following list provides a description of each Hot Work Level:

- Type 1
  Equipment is fully de-energized (electrically cold). This includes all uninterrupted power supplies.
- Type 2
  Equipment is energized. Live circuits are covered or insulated. Work is performed at a remote location to preclude accidental shock.
- Type 3
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Potential exposures are less than 30 VRMS, 42.2 volts peak, 240 volt-amps, and 20 Joules. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.
- Type 4
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Voltage potentials are higher than 30 VRMS, 42.2 volts peak, 240 volt-amps, 20 Joules, or radio frequency (rf) energy is present. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.

2.2 Performing Lockout and Tagout on the Prober 0040.2

Introduction

Purpose:

To perform lockout and tagout on the prober.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	Safety goggles Padlocks and keys for lockout/tagout locks, lockout tags
Parts or Consumables:	None

1 Inform all necessary personnel that the prober will be locked out. Stop any testing that is in process and unload all wafers.

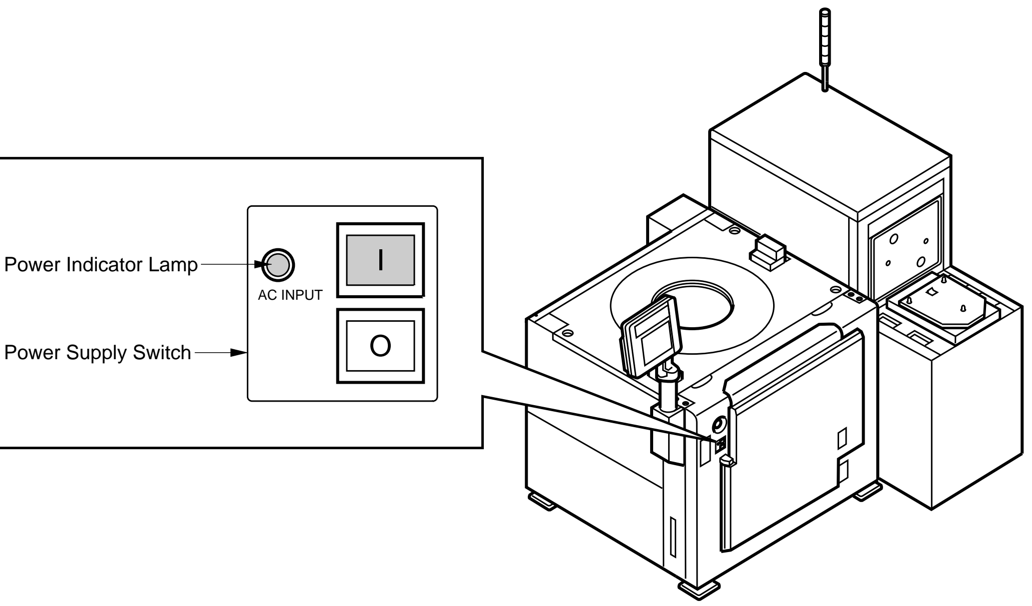
2 Navigate to the `Main Menu` on the touch screen.

3 Press SHUTDOWN on the *Main Menu*. A check menu is displayed asking, `Do you want to shutdown?`.

4 Press YES. The prober stops accessing the hard disk and floppy disk drives, then a message menu is displayed stating, Restart the system.

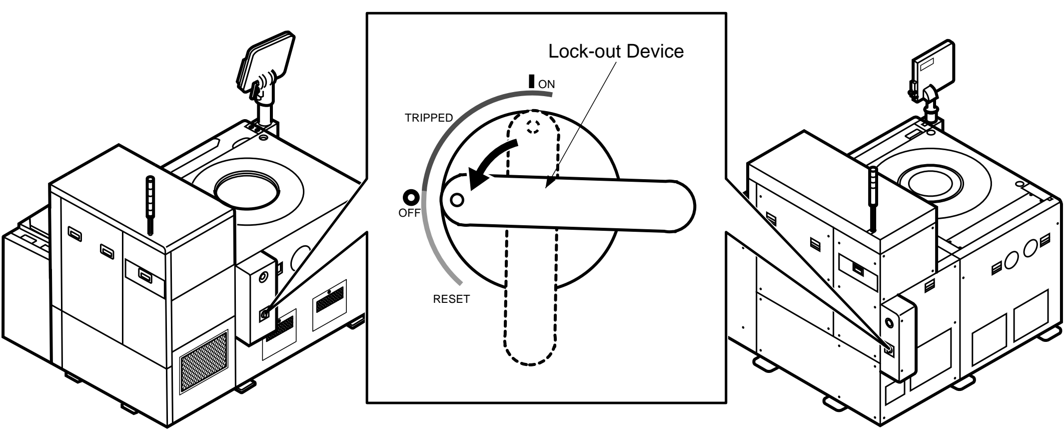
5 Check that the restart message is displayed, then press the power supply switch [O] on the front of the prober to turn off the power supply to the prober.

Power Supply Switch



6 Turn the lockable energy isolation device on the back of the prober to OFF. The supply of power to the prober is stopped.

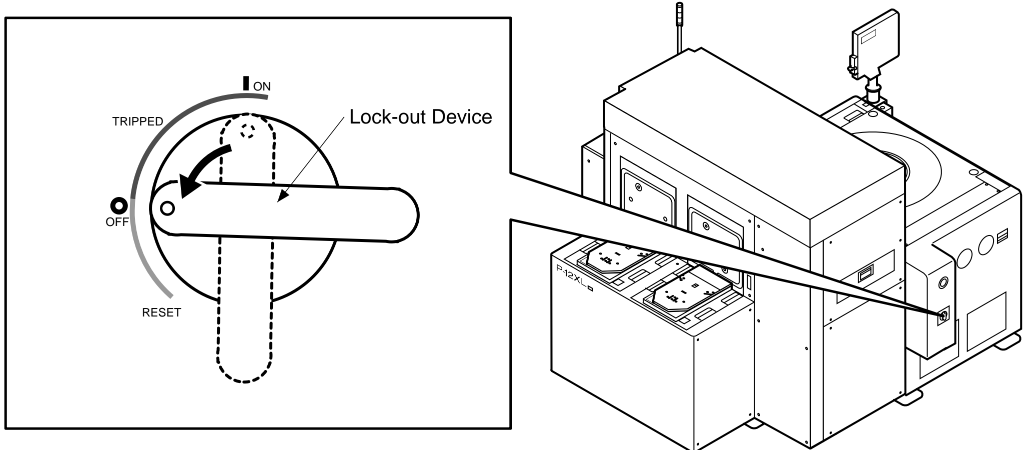
Lockout Device Handle (Single Port)



Single Port Loader Specification

Wide Loader Specification

▼ **Lockout Device Handle (Wide Loader)**



7 Secure the position of the lockable energy isolation device with a padlock and place a lockout tag on the padlock. The tag should include notes or warnings that are required by test floor procedures.

8 Check that the power supply will not turn on even if the [I] switch on the front switch panel of the prober is pressed.

9 Inform others that you are performing maintenance work and that the prober cannot be used.

2.3 Releasing Lockout and Tagout on the Prober 0043.1

Introduction

Purpose:

To release a system from the locked out state.

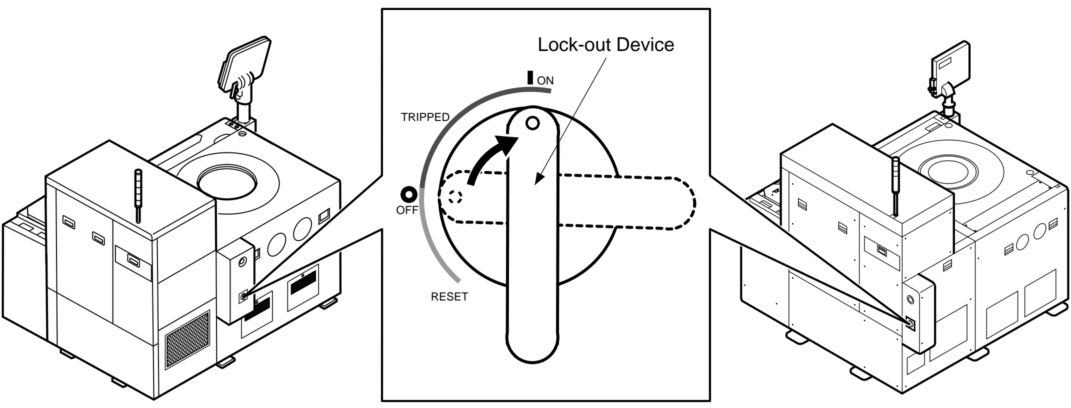
Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	Safety Glasses/Goggles Keys for lockout/tagout locks, lockout tags
Parts or Consumables:	None

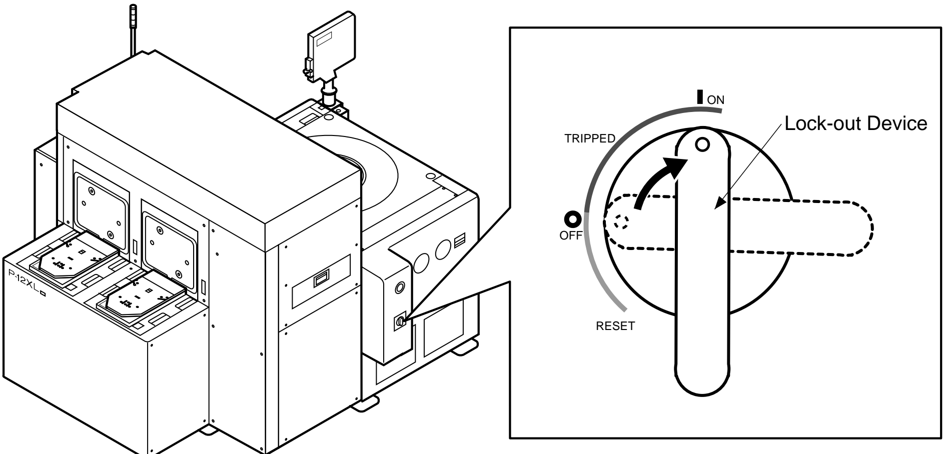
1 After finishing maintenance work, replace any covers, close all access doors, close and secure the head plate, and check around the immediate area of the tool for any safety hazards. After checking that the area is safe and that all personnel are clear of the prober, remove the padlock and lockout tag on the lockout handle. Inform local maintenance personnel to remove their locks and lockout tags.

2 Turn the lockable energy isolation device to ON to establish AC input to the power supply of the prober.

Lockout Device Handle (Single Port)



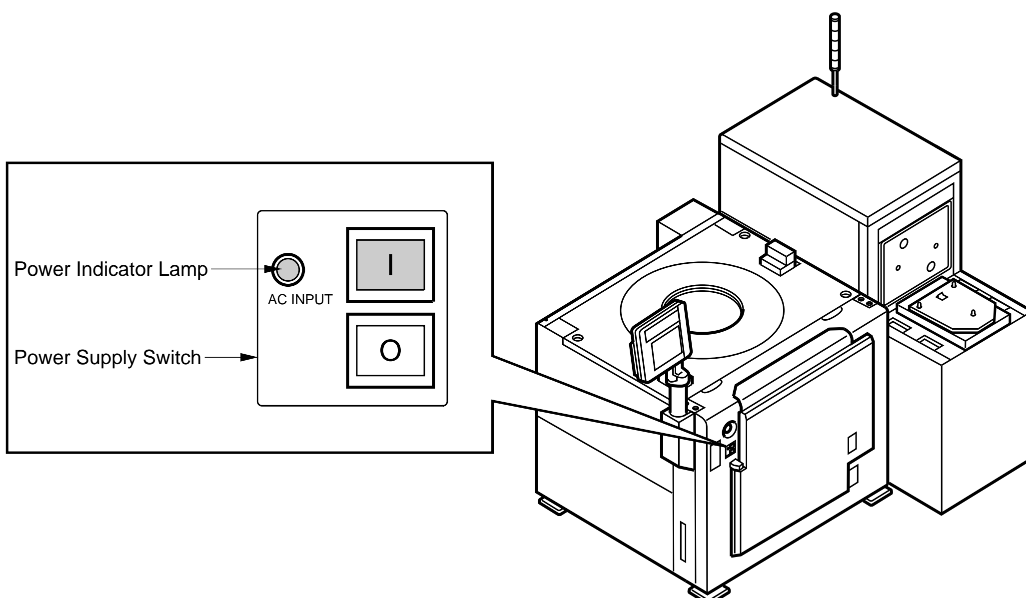
Lockout Device Handle (Wide Loader)



3 Press the power supply switch [I] on the front panel to turn ON the prober.

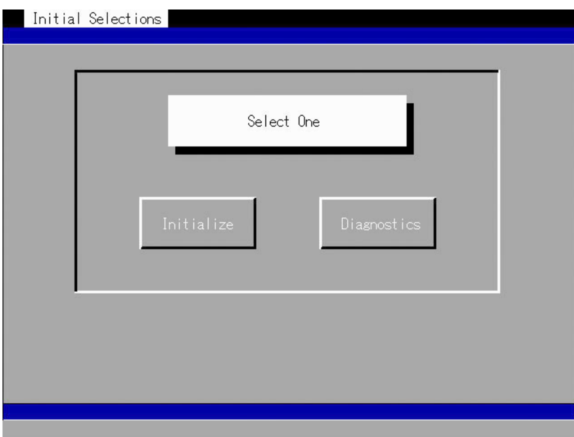
> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

Power Supply Switch



4 When the prober has completed the boot-up process, press INITIALIZE on the *Initial Selections Menu*. The stage and loader are initialized and the *Main Menu* is displayed.

Initial Selections Menu



5 Inform others that you have completed your maintenance work and that the prober can be used.

CHAPTER 3

Creating a Basic Setup File

This chapter describes the basic steps involved in creating a setup file. The basic steps include inputting wafer and probe card parameters, inputting probe-tip positions, aligning the wafer to the probe card, and performing a contact check. Each section describes the purpose of the associated procedures and provides the menu paths to the appropriate screens for performing them.

3.1 Creating Wafer Files (Methodology) 0406.1

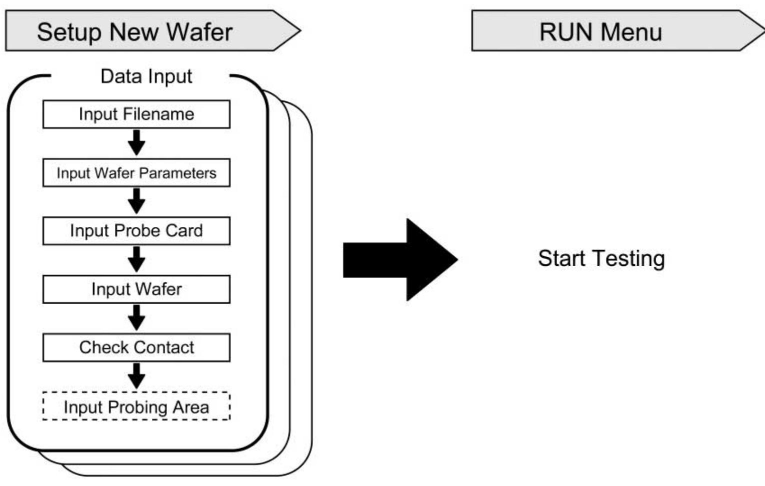
When creating wafer files, the following three methods that can be used:

- 3.1.1 Series Input (see page 50)
- 3.1.2 Continuous Inputting and Testing of Data (see page 50)
- 3.1.3 Revising and Inputting Data (see page 51)

3.1.1 Series Input 0407.1

Series Input, the most common method used when creating new wafer files, allows the operator to input all of the necessary data at once. Testing of the new wafer file is performed at later time.

Example of Series Input

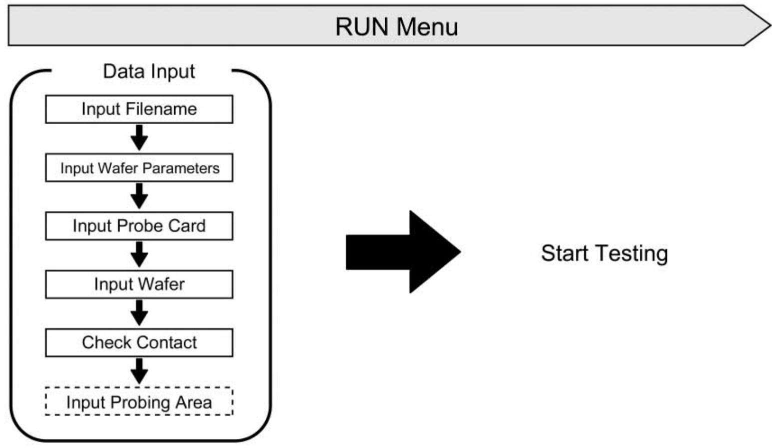


The steps that are in dashed lines are optional.

3.1.2 Continuous Inputting and Testing of Data 0408.1

This method for creating wafer files allows the operator to continuously input all the necessary data. Upon completion of the continuous inputting, testing begins immediately.

Example of Continuous Inputting and Testing

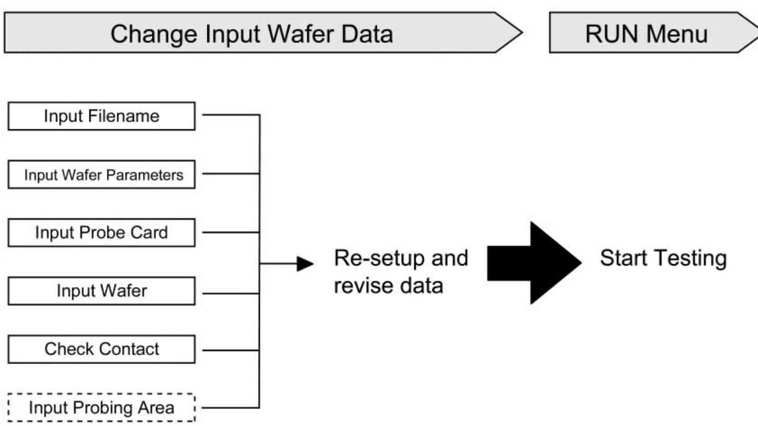


NOTE **The steps that are in dashed lines are optional.**

3.1.3 Revising and Inputting Data 0409.1

Revising and inputting data to create wafer files allows an operator to select an existing file, modify some of the existing data, input new data, and then save the file either under the old name or by creating a new one. This method is used when the parameters for different tests are similar; therefore, reusing those similar characteristics and adding new ones aids the file creation process.

Example of Revising and Inputting Data



NOTE **The steps that are in dashed lines are optional.**

3.2 Inputting Data to Create a Wafer File 0411.1

Introduction

Purpose:

To input the filename and basic wafer parameters necessary for creating a wafer file.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A FOUP of wafers or a single wafer, and a probe card.

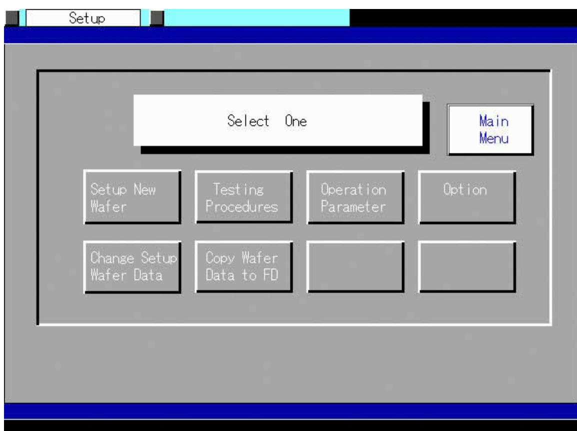
NOTE **Make sure that the probe card needed to create the wafer file has already been loaded into the prober. If the probe card is not loaded, abort the wafer file under construction and load the card.**

Make sure that either a FOUP is present, or a single wafer has been placed onto the unload table. If a FOUP of wafers or a single wafer is not present, the wafer file under construction will have to be aborted and the FOUP or single wafer loaded.

Inputting Wafer Filenames

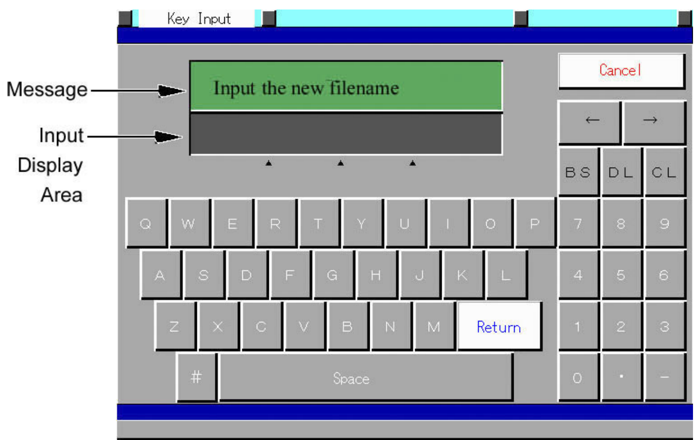
1 Press SETUP on the *Main Menu*. The *Setup Menu* is displayed.

Setup Menu



2 Press SETUP NEW WAFER on the *Setup Menu*. A keyboard with the message is displayed stating `Input the Wafer Name`.

Wafer Name Keyboard



3 Input a filename containing a maximum of 20 characters, and press RETURN.

> **NOTE** **If the filename you input matches that of an existing file, a check menu is displayed stating `The same name exists. Do you want to overwrite?` To overwrite the existing file, press** YES**; press** NO **to return to the keyboard to input a different filename.**

4 A second keyboard is displayed. Input any comments containing a maximum of 60 characters. Press RETURN. The *Wafer Parameters Setup Menu* is displayed.

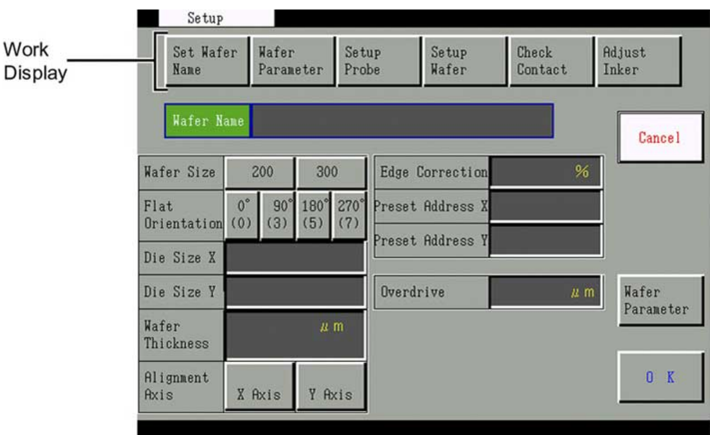
5 Verify that the wafer filename you input in step 3 is displayed for `Wafer Name`.

Setup Menu

Inputting Basic Wafer Parameters

6 Check that the *Wafer Parameters Setup Menu* has the `Wafer Parameter` box selected.

Wafer Parameters Setup Menu



7 Select the proper wafer size. Press 200 for `Wafer Size` if the wafer size to be tested is 200 mm and 300 for 300 mm wafers.

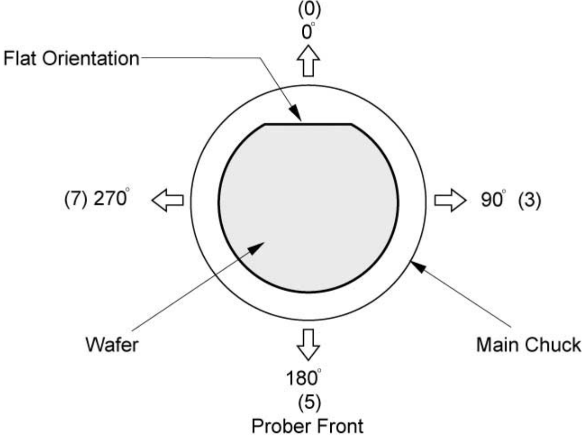
CAUTION **Property Damage Hazard**
When loading a control map created on an external PC, select the same wafer size that is contained within the control map. Using a different wafer size will cause errors when you begin testing.

Only 200 and 300 mm wafers can be tested on the P-12XL.

8 Select the proper flat direction. Refer to the graphic below for an illustration of the wafer flat orientation.

CAUTION **Property Damage Hazard**
When loading a control map created on an external PC, select the same flat direction that is contained within the control map. Using a different flat direction will cause errors when you begin testing.

Flat Orientation Designation



9 Use the following steps to input the die size.

9.1 Press the value display area adjacent to `Die Size X`. A numeric keypad is displayed.

9.2 Input the die size in the X direction and press OK.

9.3 Press the value display area adjacent to `Die Size Y` on the *Wafer Parameters Setup Menu*. A numeric keypad is displayed.

9.4 Input the die size in the Y direction and press OK.

NOTE **When loading a control map created on an external PC, input the same die size that is contained within the control map. Using a different die size will cause errors once testing is started.**

10 Use the following steps to input the wafer thickness.

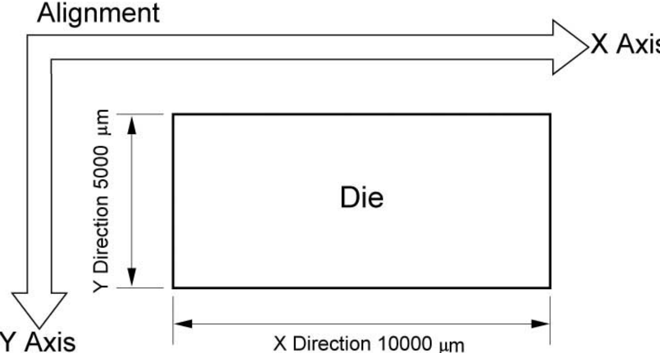
10.1 Press the value display area adjacent to **Wafer Thickness** . A numeric keypad is displayed.

10.2 Input a wafer thickness value other than 0 and press OK.

NOTE **It is not necessary to input a precise value for the wafer thickness. The value you input is used as a reference value for focusing the chuck camera when aligning the wafer. The correct value is calculated automatically after aligning the wafer.**

11 Press X Axis or Y Axis for `Alignment Axis`. The alignment axis is the axis perpendicular to the axis containing the largest die size value.

Alignment Axis



In the graphic shown above, the die size in the X direction is 10,000 µm; the die size in the Y direction is 5,000 µm. Since the die is largest in the X axis, select Y Axis, which is perpendicular to the X axis, as the alignment axis.

Inputting Additional Wafer Parameters

NOTE **Perform the following procedure to input the `Edge Correction`, `Preset Address`, and `Overdrive` settings.**

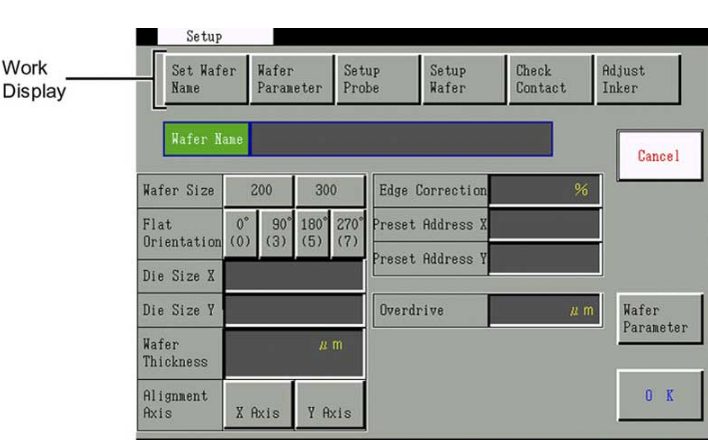
The `Edge Correction` setting determines the percentage of a complete die that must be present for a die to be tested. Any die that is not at least 90% intact will not be tested.

The `Preset Address` setting labels the coordinates of the reference die and is used as the basis for assigning coordinates to all of the die on the wafer.

The `Overdrive` setting determines the additional amount to raise the chuck in the Z axis during testing. This additional rise is applied at the point where the probes make contact with the die pad.

12 Press the value display area adjacent to `Edge Correction` on the *Wafer Parameters Setup Menu*. A numeric keypad is displayed.

Wafer Parameters Setup Menu



13 Input the edge correction percentage and press OK. To input an edge correction percentage to test only whole die, input 100% and press OK.

14 Use the following steps to input the preset address.

> **CAUTION** **Property Damage Hazard**
>
> **If a control map created on an external PC is loaded onto the prober, the preset address coordinates set on the control map will be used instead of the ones input on the *Wafer Parameters Setup Menu*.**

14.1 Press the value display area adjacent to `Preset Address X` on the *Wafer Parameters Setup Menu*. A numeric keypad is displayed.

14.2 Input the X coordinate and press OK.

14.3 Press the value display area adjacent to `Preset Address Y` on the *Wafer Parameters Setup Menu*. A numeric keypad is displayed.

14.4 Input the Y coordinate and press OK.

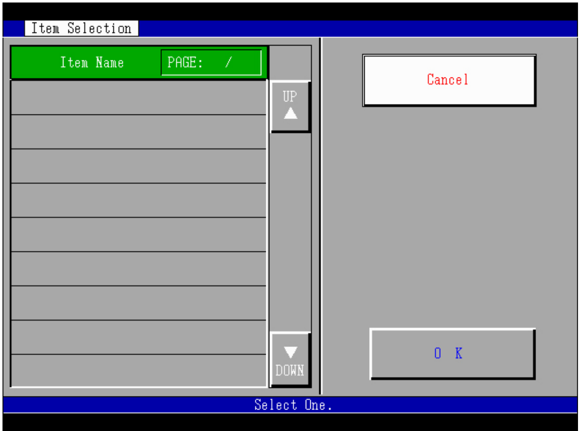
15 Use the following steps to input the overdrive amount.

15.1 Press the value display area adjacent to `Overdrive` on the *Wafer Parameters Setup Menu*. A numeric keypad is displayed.

15.2 Use the numeric keypad to input the overdrive amount and press OK.

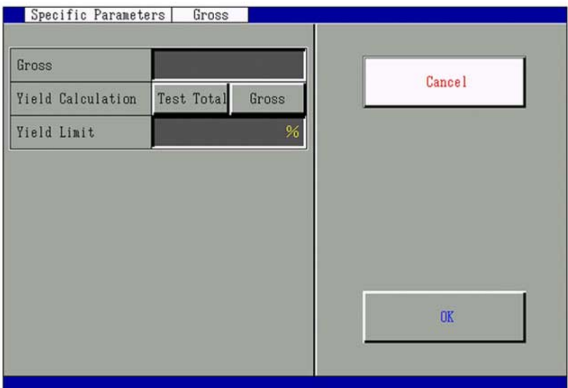
16 After setting all of the parameters on the *Wafer Parameters Setup Menu* parameters, additional wafer parameters may also be set. Press WAFER PARAMETERS; the *Wafer Parameters Item Selection Menu* is displayed.

Wafer Parameters Item Selection Menu



17 Press an item to display the *Parameter Settings Menu* for that item. You do not need to select the basic parameters, which were set in the previous subprocedure. Press the scroll buttons to change the items displayed on the men.

Parameters Setting Menu



18 Set the parameters for each of the items. Refer to **Chapter 4, Wafer Parameters (see page 143)** for the details of each parameter. You can input the values using the numeric keypad that is displayed when you press each display area.

19 After setting the parameter, press OK. A check menu is displayed with the message `Do you want to change the value settings?`

20 Press YES on the check menu. The parameters are saved and the *Wafer Parameters Item Selection Menu* is displayed.

21 Press OK on the *Wafer Parameters Item Selection Menu.* The wafer parameters are entered, and the *Wafer Parameters Setup Menu* displays the information to be used to set up the probe card.

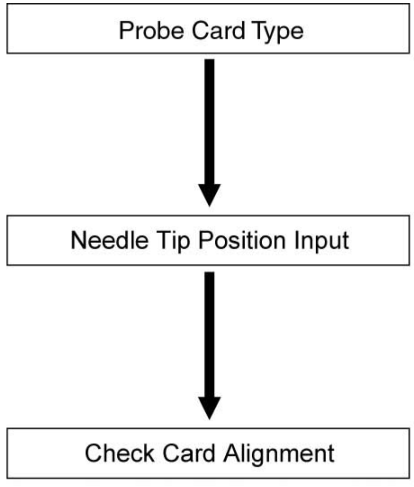
NOTE **You can access the menu containing basic and advanced wafer parameters through the *Wafer Parameters Item Selection Menu*.** **Chapter 4, Wafer Parameters (see page 143)** **explains the contents and how to set each wafer parameter menu individually.** **Chapter 6, Creating an Advanced Setup File (see page 249)** **explains the advanced wafer parameter menus and how to set them.**

3.3 Inputting Probe Card Parameters 0413.1

Introduction

Purpose:

The following figure illustrates the general steps to input probe card data. First the probe card type must be designated. This will determine the method used for registering pin addresses. Depending upon the type of PC chosen, the probe channel number and probe information must be input before pin registration is performed. The standard registration method involves designating a reference pin and three other input pins in both macro and micro camera views. These pin positions must be noted for use in selecting the corresponding pads in the wafer alignment process of the setup. After teaching the probe card pin positions, the alignment should be verified using Align Card and reviewing the alignment results.



This sets the alignment algorithm for the probe card to be used in testing.

Input the Needle tip positions (Total of 4 places).

Perform Probe Card Alignment using the input Probe data to check that Alignment is possible.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

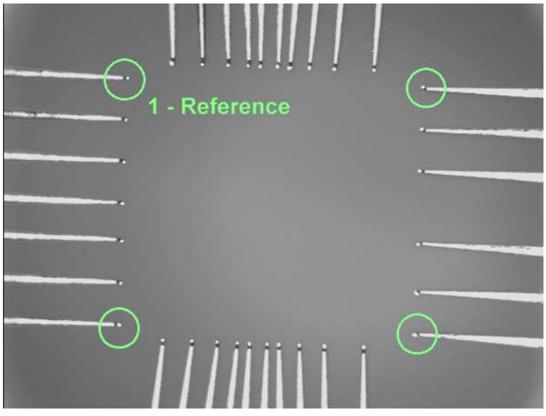
1 Check that the *Setup Menu* is displaying `Setup Probe`.

Wafer File Setup Probe Menu

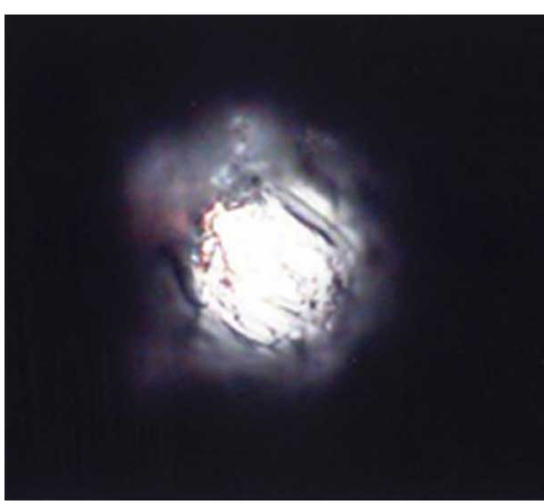
2 Press the value display area adjacent to `Probe Type`. Refer to the table below for description of each probe card option.

Probe Card Type	Description
W PC	**Tungsten Wire Probe Card.** Cantilever and Cobra probe card with a probe tip diameter of 15 to 180 mm (5 to 180 µm with Small Tip Recognition option). The recognition process uses macro mode pattern matching, probe tip detection (detecting the bright probe tip on a dark background), and micro shape recognition (detects the bright circle on the dark background). Refer to **Transportable Set Up (TSU) Probe Card Specifications Manual (Document Number 3297–410043–21)** for further information.
VT PC	**Tokyo Electron Vertical Probe Card** . The recognition process uses macro pattern matching and micro shape recognition (detects the bright circle on the dark background).
M PC 1	**Tokyo Electron Membrane Probe Card Mode 1** . The recognition process uses macro and micro pattern matching.
M PC 2	**Membrane Probe Card Mode 2** (outside manufacturer). The recognition process uses macro and micro pattern matching.
T MPC	**Target Mark Probe Card** . The recognition process uses macro and micro pattern matching.
V PC 1	**Vertical Probe Card Mode 1** (outside manufacturer). The recognition process uses macro pattern matching and micro shape recognition (detects the bright circle on the dark background).
V PC 2	**Vertical Probe Card Mode 2** (outside manufacturer). The recognition process uses macro pattern matching and micro shape recognition (detects the bright circle on the dark background). Refer to **Vertical Needle Detection Software Specifications Manual (Document Number 3297–4X0136–21)** (for P(A)xx00–R012.13 and later) for further information.
P PC	**Pyramid Probe Card Mode** (outside manufacturer). The recognition process uses macro and micro pattern matching. Refer to **Probe Alignment for FFI Card Specifications Manual (Document Number 3297–420096–21)** for further information.

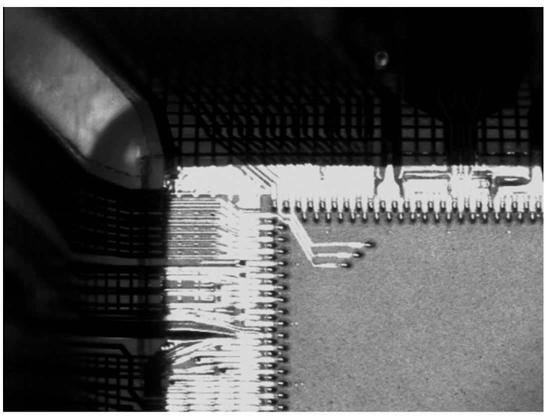
▼ **W PC Macro View**



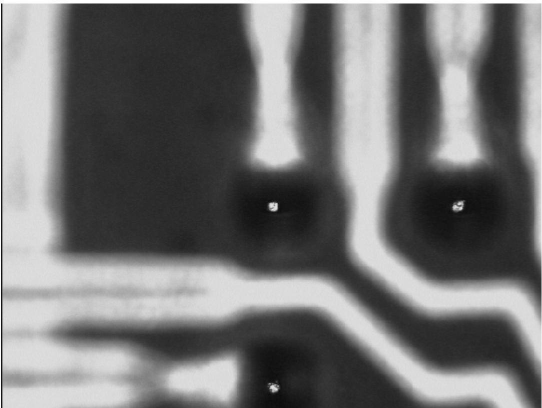
▼ **W PC Micro View**



▼ **M PC 2 Macro View**



M PC 2 Micro View



3 The probe channel number is the multichannel number of the probe card where the reference probe is positioned. The procedure for inputting the reference pins is described in **3.4 Inputting Probe Tip Positions (see page 65)**. Use the following steps to input the probe channel number:

3.1 Press the value display area adjacent to `Probe Channel No`. A numeric keypad is displayed.

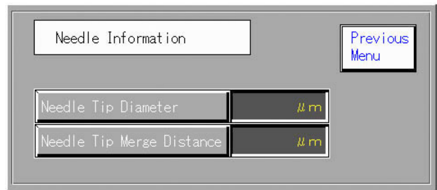
3.2 Input the channel number and press OK. The channel number will differ depending upon probe card specifications.

- If the probe card has a single DUT (Device Under Test) or channel, input 1.
- If the probe card has multiple DUTs or channels, input the channel number where the reference pin is located.

NOTE **When creating a wafer file for the first time, the Variation Tolerance for Pin Gap, the Card Z Variation Tolerance, and Card Pin Size Variation Tolerance are all preset and cannot be changed. To change these settings, complete the setup before returning to the file.**

4 Press NEEDLE INFORMATION. The *Needle Information Menu* is displayed.

Needle Information Menu



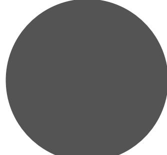
NOTE **These settings are most effective when used with shape recognition based alignment (W PC, VT PC, V PC1 or V PC2 type probe cards).**

5 Use the following steps to input the probe-tip diameter.

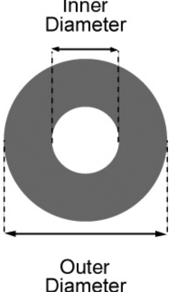
5.1 Press the value display adjacent to **Needle Tip Diameter** . A numeric keypad is displayed.

5.2 Input the outside diameter of the probe tip (the black circle) for the probe tip diameter and press OK. Do not input a value based on the probe base. Be sure to use the probe tip.

▾ **Probe Base**



NOTE **When using a V PC2 type probe card, the probe tip is seen as a white circle (probe tip) positioned in a back circle (probe base).**



5.3 The value is input as the probe-tip diameter for probes on this probe card and the *Needle Information Menu* is displayed.

NOTE **An assist occurs if the sizes recorded during probe alignment exceed the probe-tip diameter value.**

6 If a split probe tip exists, input the **Needle Tip Merge Distance** . This value represents the maximum allowable split that can exist for the prober to consider the tip to be one tip and not two separate tips. Use the following steps to input the probe-tip merge value:

6.1 Press the value display area adjacent to **Needle Tip Merge** . A numeric keypad is displayed.

6.2 Input the value on the numeric keypad and press OK.

6.3 The value is input as the tolerance value for card pin size, and the *Needle Information Menu* is displayed.

7 Input the `Variation Tolerance Value for Pin Gap`. This value represents the tolerance range the prober has in determining the distance between the probes (reference pin and three registered pins) during alignment. When the probe positions are input, the distances between the probes are automatically recorded. An assist/error occurs if the distances recorded during alignment exceed the range allowed by the tolerance value. Use the following steps to input the tolerance value for pin gap:

7.1 Press the value display area adjacent to `Variation Tolerance Value for Pin Gap`. A numeric keypad is displayed.

7.2 Input the variation tolerance value on the numeric keypad and press OK. The value is input as the tolerance value for pin gap and the *Setup Menu* is displayed.

8 Input the `Card Z Variation Tolerance`. This value represents the tolerance range for the average height of the probes (reference pin and three registered pins) at the time of alignment. An

assist occurs if the average height exceeds the tolerance range during alignment. Use the following steps to input the card Z tolerance value:

8.1 Press the value display area next to `Card Z Variation Tolerance`. A numeric keypad is displayed.

8.2 Input the tolerance value on the numeric keypad and press OK. The value is input as the tolerance value for card Z and the *Setup Menu* is displayed.

9 Input the `Card Pin Size Variation Tolerance`. This value represents the tolerance range for the different sized probes (reference pin and three registered pins) at the time of alignment. When the probes are input, the probe sizes are automatically recorded. An assist/error occurs if the sizes recorded exceed the tolerance range at probe alignment. Use the following steps to input the card-pin size tolerance value:

9.1 Press the value display area adjacent to `Card Pin Size Variation Tolerance`. A numeric keypad is displayed.

9.2 Input the tolerance value on the numeric keypad and press OK. The value is input as the tolerance value for card pin size and the *Setup Menu* is displayed.

NOTE **Do not input a value for the X, Y, and θ PTPA correction. The offset amounts for X, Y, and θ are automatically set by performing a contact check, which occurs later in the file creation process.**

10 The probe-card parameters are input. Continue the file creation process by inputting the probe-tip positions described in **3.4 Inputting Probe Tip Positions (see page 65)**.

3.4 Inputting Probe Tip Positions 0414.1

Introduction

Purpose:

To input the reference pin and three registered pin positions. Additional pins can be selected using the PTPA parameters.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Overview:

Probe-tip position addresses must be registered in order that the probe card be aligned to the wafer pads for correct contact. Probe tip positions must be registered in both macro and micro view. The registered pin addresses are then used to calculate the pin-to-pad positioning for contact. Depending upon the type of probe card selected, different methods of inputting registered addresses are required. This procedure describes how to input the probe-tip position using the one of the following methods:

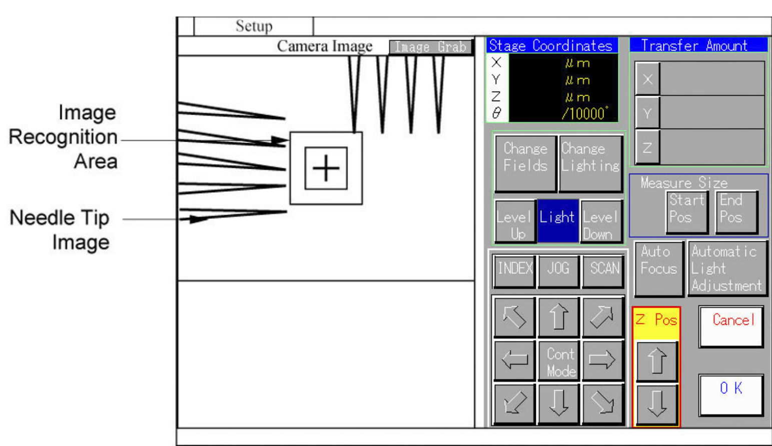
- **Standard Method (see page 66)**: This method is used when the probe card types are `VTPC`, `M PC1`, `M PC2`, `V PC1`, or `W PC`and the `Macro Recognition` setting on the *Probe Alignment Operation Parameter Menu* is set to IMAGE DETECTION.
- **Vertical Probe Card Method (see page 67)**: This alignment method is meant to be used with a **V PC2** type probe card.
- **Multi-Pin Method (see page 70)**
- **Target Mark Method (see page 72)**: This alignment method is used when the probe type is **Probe Card with Target Mark (TMPC)** .
- **Candidate Point Method (see page 75)**: This method is used when the recognition of the input probe positions is not possible. To use this method of inputting probes, only with `W PC` must be set to CANDIDATE DETECTION on the *Probe Alignment Parameter Menu*. This alignment method detects the positions of the probes from several candidate probes (maximum of 7). These candidate probes have similar patterns.
- **Detection Method (see page 79)**: This method is used when a W PC type probe card is set, and the `Macro Recognition`menu item on the *Probe Alignment Operation Parameter Menu* is set to NEEDLE TIP DETECTION. The probe tip detection method calculates the pin positions you input by extracting the probe tip coordinates and then comparing them to the probe tip distribution. This method is recommended when probe cards that have different images will be used on the same wafer file.

Standard Method

1 If the probe card has a single row of probes, press TEACH CARD on the *Setup Menu*.

The chuck camera moves to the probe card center and the *Stage Control Menu* is displayed. The chuck camera (macro) displays the image of the probe tips.

Stage Control Menu



2 Use the arrow control buttons on the touch screen to position the crosshairs on the probe tip that will be used as the reference pin. When choosing a reference pin, it is best to choose a corner pin or one that is isolated. This will simplify locating the pin in micro view, and assist the prober in aligning the probe card.

NOTE **If the probe tip is not displayed, use the control buttons to move the stage until the probes are displayed.**

3 Once the reference pin tip is on the crosshairs, use the Z position control buttons to adjust the focus.

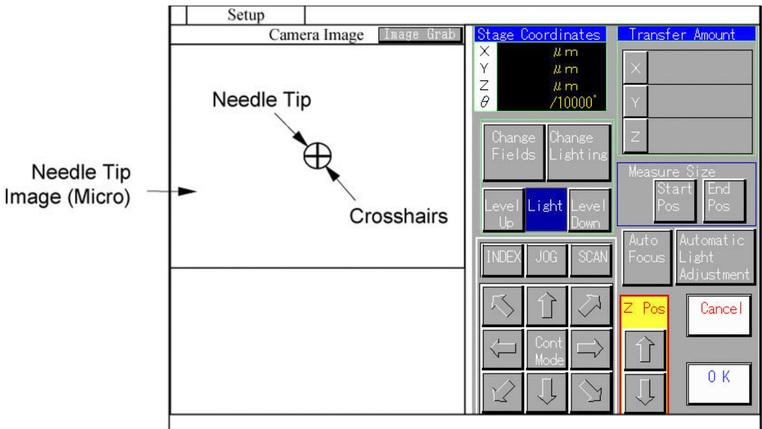
NOTE **Press** AUTO FOCUS **to automatically focus the pin. If focusing is not possible, press the up arrow or down arrow on Z Pos to focus. Press** AUTOMATIC LIGHT ADJUSTMENT **to automatically adjust the lighting amount.**

4 Press OK. The probe-tip position is input as the reference pin.

5 Repeat steps 2 through 4 to input a maximum of three registered pin positions. The menus will refer to the probes that were input as the reference pin, registered pin 2, registered pin 3, and registered

pin 4. After inputting registered pin 4 (the fourth position), the chuck camera changes to the micro view. The chuck camera (micro) displays an image of the reference pin tip.

Stage Control Menu



6 Use the control buttons to position the crosshairs over the probe tip. Press OK. The probe tip position is input, and the prober automatically displays the next probe tip image (registered pin 2).

> **CAUTION** **Property Damage Hazard**
> **If the display of pins 2 through 4 (positions 2 through 4) is notably out of focus while the reference pin is in focus, check how the probe card is attached. It might be slightly slanted.**

7 Repeat step 6 to input the positions of all four probe tips (reference pin, registered pin 2, registered pin 3, registered pin 4). After inputting all four probe tip positions, press OK on the *Stage Control Menu*. The *Setup Menu* is displayed.

> **CAUTION** **Property Damage Hazard**
> **Do not forget the position of the reference pin (the first probe input). You will need to remember it when inputting the reference pad position because the reference pad and reference pin positions must be aligned.**

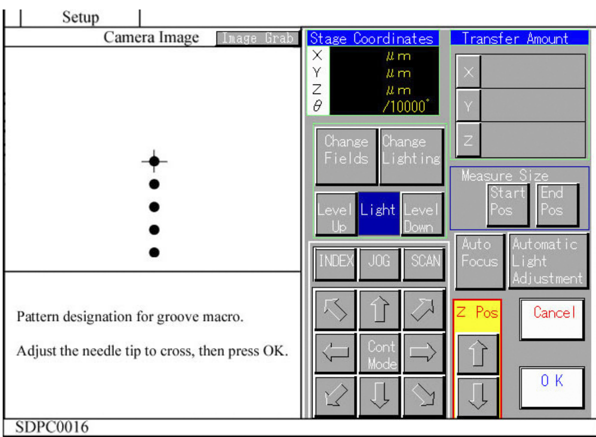
Vertical Probe Card Method

> **NOTE** **This alignment method applies to vertical probe cards where the black probe tips are positioned on a white background when viewed in the macro field.**

1 If the probe card has a single row of probes, press TEACH CARD on the *Setup Menu*.

The chuck camera moves to the probe card center and the *Stage Control Menu* is displayed. The chuck camera (macro) displays the image of the probe tips.

Stage Control Menu

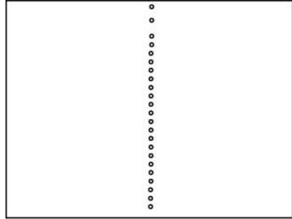


If the probe tip is not displayed, use the control buttons to move the stage until the probes are displayed.

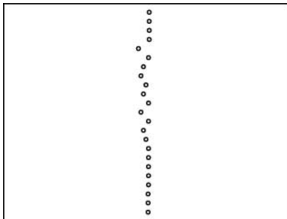
2 Adjust the quantity of light and the Z height to minimize the background non-uniformity and to keep enough distance between the probes and the background.

3 Use the arrow control buttons to position the crosshairs onto the reference pin. When choosing a reference pin, it is best to choose a corner pin or one that is isolated from the other pins.

Symmetrical Distribution of Probe Tips (Incorrect)



Asymmetrical Distribution of Probe Tips

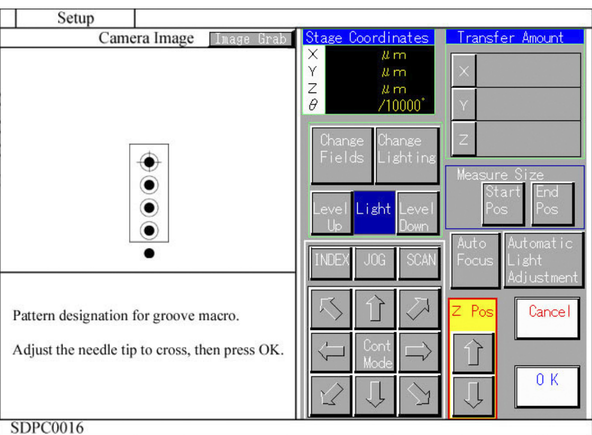


NOTE **For the reference pin and registered pin 2, select a unique area where the probe tips are distributed in an asymmetrical pattern around the center cross.**

NOTE **Alignment shift may occur when an area with a symmetrical pattern is selected.**

4 Press OK to display the recognized probe group area and a confirmation menu. Press YES to set the current position as the probe group area, or press NO to reset the probe group area.

Stage Control Menu



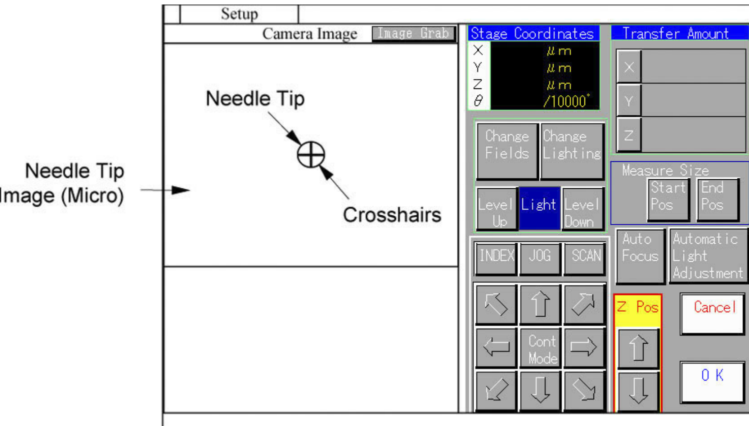
5 Repeat steps 2 and 3 to input registered pins 2 through 4. After inputting the pins in the macro view, the chuck camera switches to micro view and displays an image of the probe tip.

6 Input the probe base position. Adjust the Z height so that the substrate roughness can be seen, and then press OK.

> **CAUTION** **Property Damage Hazard**
>
> **When focusing on the probe base, adjust the height so that the substrate roughness can be seen. Take care not to interfere with the probe card, chuck top, or the wafer when focusing on the probe base**

7 After inputting the probe base position, input the probe tip position. Lower the camera from the base position, and display the probe tip image on the *Stage Control Menu*. Position the crosshairs onto the probe tip, which is displayed as luminous and white. Press OK.

Stage Control Menu



8 Repeat step 6 for registered pins 2 through 4. Once all pin positions are input, press OKon the *Stage Control Menu*. The *Setup Menu* is displayed.

NOTE **In V PC2 alignment, the position where the card is attached is assumed to vary by a maximum of 1 mm in the X and Y directions, and 500 µm in the Z direction.**

Multi-Pin Method

1 Press MULTIPIN TEACHING on the *Setup Menu*. To input multi pins in the macro view using a method similar to the **Standard Method** described earlier, position the crosshairs onto each of the four probe tips to be input and press OK.

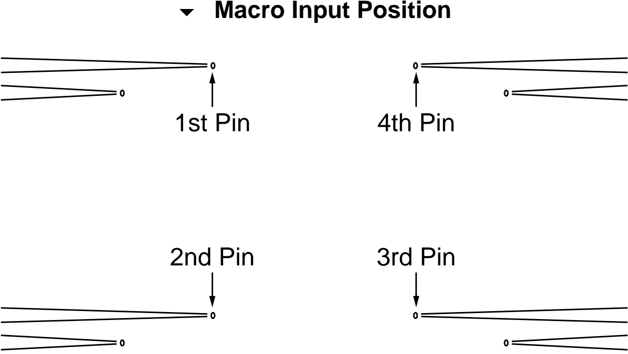
2 After inputting the fourth pin, the prober returns to the first pin in macro view. Position the crosshairs onto the pin that will be used as the first micro pin and press OK. The prober will then switch to micro view and search for the selected probe tip. After inputting the first micro pin, the prober switches to the macro view again and moves to the second pin position. Repeat the preceding instructions to input the second through fourth pins

This process allows for the rough focusing of the micro pin in the macro view. This allows you to easily input the parameters for the macro and micro pins.

3 Here is an example of how to input pins using MULTIPIN TEACHING.

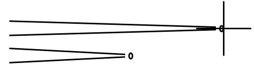
3.1 Input the four macro pins.

Macro Input Position



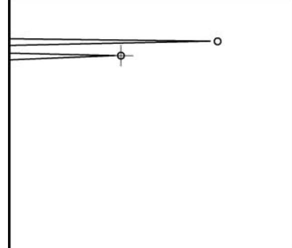
3.2 After inputting the four macro pins, input the four micro pins. To input the first micro pin, the prober moves the crosshairs to the first macro pin and displays the image in macro view.

First Micro Pin Initial Position



3.3 Move the crosshairs onto the pin that will be used as the first micro pin, and press OK.

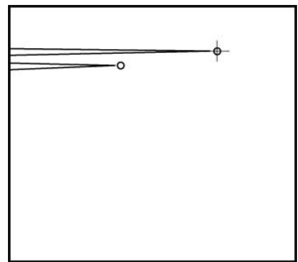
First Micro Pin in Macro View



3.4 The prober will switch to the micro view and search for the selected probe tip. After the prober finds the probe tip, confirm that the right tip was detected by pressing OK once the micro probe tip image is displayed. The prober registers the first micro probe tip, and moves to the second micro pin.

3.5 The prober moves the crosshairs to the second macro pin and displays the image in macro view.

Second Micro Pin Initial Position



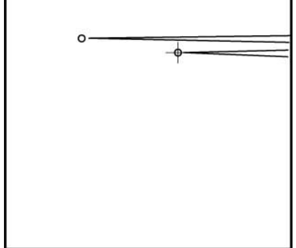
3.6 Move the crosshairs onto the pin that will be used as the second micro pin, and press OK.

3.7 The prober will switch to the micro view and search for the selected probe tip. After the prober finds the probe tip, confirm that the right tip was detected by pressing OK once the micro probe tip image is displayed. The prober registers the second micro probe tip, and moves to the third micro pin.

3.8 The prober moves the crosshairs to the third macro pin and displays the image in macro view.

3.9 Move the crosshairs onto the pin that will be used as the third micro pin, and press OK.

Third Micro Pin in Macro View

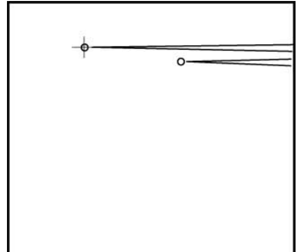


3.10 The prober will switch to the micro view and search for the selected probe tip. After the prober finds the probe tip, confirm that the right tip was detected by pressing OK once the

micro probe tip image is displayed. The prober registers the third micro probe tip, and moves to the fourth micro pin.

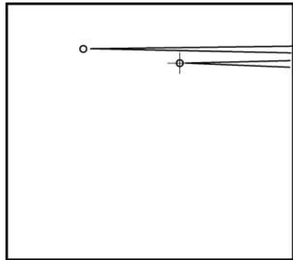
3.11 The prober moves the crosshairs to the fourth macro pin and displays the image in macro view.

Fourth Micro Pin Initial Position



3.12 Move the crosshairs onto the pin that will be used as the fourth micro pin, and press OK.

Fourth Micro Pin in Macro View



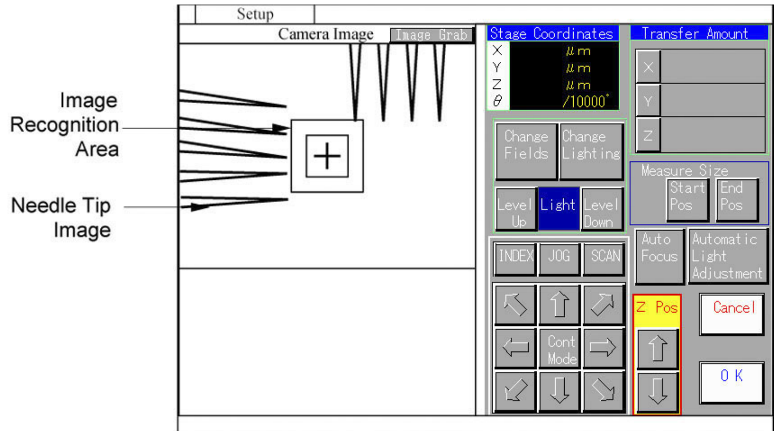
3.13 The prober will switch to the micro view and search for the selected probe tip. After the prober finds the probe tip, you need to confirm that the right tip was detected by pressing OK once the micro probe tip image is displayed. The prober registers the fourth micro probe tip, and completes the process.

Target Mark Method

1 If the probe card has a single row of probes, press TEACH CARD on the *Setup Menu*.

The chuck camera moves to the probe card center and the *Stage Control Menu* is displayed. The chuck camera (macro) displays the image of the probe tips.

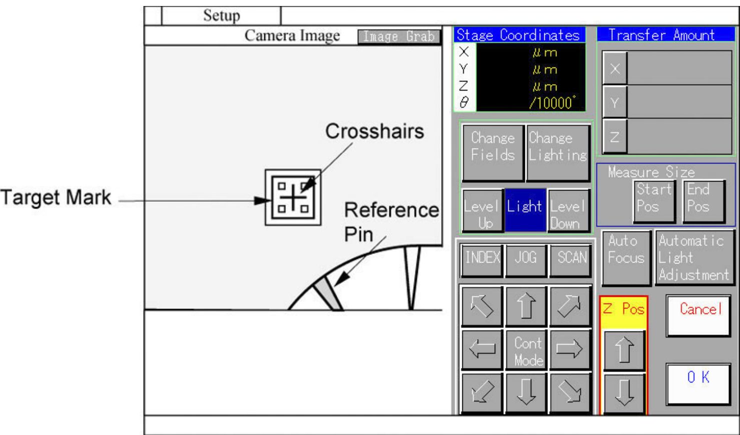
Stage Control Menu



If the probe tips are not displayed, use the control buttons to move the stage until the probes are displayed.

2 Use the arrow control buttons to position the crosshairs on the target mark center closest to the probe that will be used as the reference pin. When choosing a reference pin, it is best to choose a corner pin or one that is isolated. This will simplify locating the pins in micro view, and assist the prober in aligning the probe card.

Stage Control Menu



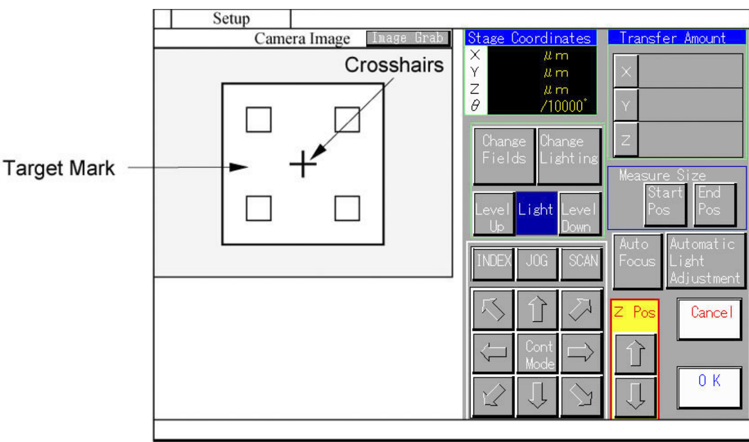
3 Once the target mark center is on the crosshairs, use the Z position control buttons to adjust the focus.

NOTE **Press** Auto Focus **to focus the pin automatically. If focusing is not possible, press the up arrow or the down arrow on Z Pos to focus on the pins. Press** Automatic Light Adjustment **to automatically adjust the level of light.**

4 Press OK. The reference-pin target mark is input as the reference pin.

5 Repeat steps 2 through 4 to input the target marks for the three registered pin positions. After inputting probe pin number 4 target mark (the fourth position), the chuck camera changes to the micro view. The chuck camera (micro) displays an image of the reference pin target mark.

Stage Control Menu



6 Use the control buttons to position the target mark center under the crosshairs. Repeat steps 2 through 4 if the target mark center is not positioned on the crosshairs or is out of focus. Once the target mark is in the proper position, press OK. The target mark position is input, and the prober automatically displays the next target mark image (registered pin 2 target mark).

CAUTION **Property Damage Hazard**

If the target mark image is notably out of focus while the reference pin is in focus, check how the probe card is attached. It might be slightly slanted.

7 Repeat step 6 to input the target mark positions for all four probe tips (reference pin, registered pin 2, registered pin 3, registered pin 4). After inputting all four probe-tip target mark positions, the image of the reference pin target mark is displayed.

8 Press CHANGE FIELDS to switch to the macro camera mode.

9 Use the control buttons to position the crosshairs on the probe tip that will be input.

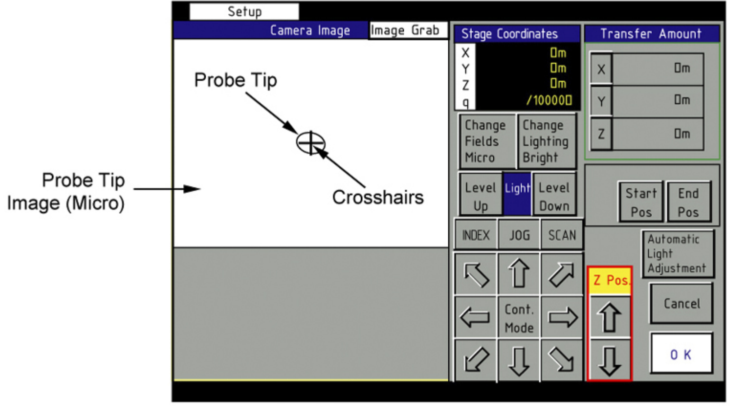
10 Press CHANGE FIELDS to switch to the micro camera mode.

11 Use the control buttons to position the crosshairs on the probe tip that will be used as the reference pin. Press OK. The reference pin probe-tip position is input, and the prober automatically displays the next probe tip image (registered pin 2).

CAUTION **Property Damage Hazard**

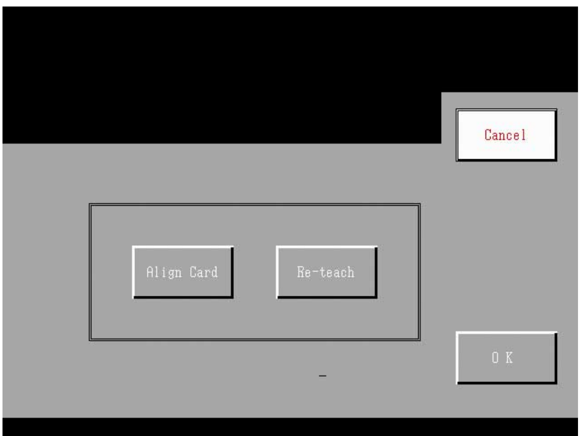
Do not forget the position of the reference pin (the first probe input). You will need to remember it when inputting the reference pad position because the reference pad and reference pin positions must align with each other.

Stage Control Menu



12 Repeat step 11 to input the positions of all four probe tips (reference pin, registered pin 2, registered pin 3, registered pin 4). After inputting all four probe tip positions, press OK on the *Stage Control Menu*. The *Setup Menu* is displayed.

Setup Menu



Candidate Point Method

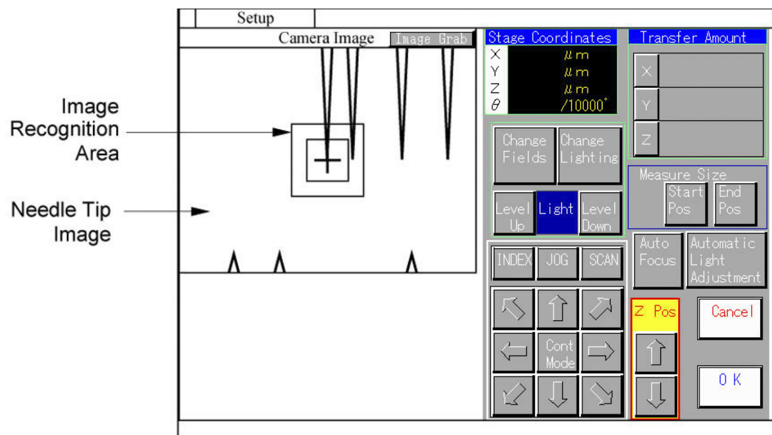
NOTE **This procedure assumes that a probe card has already been loaded into the prober, and that W PC (Tungsten probe card) has been input as the type of probe card. If a probe card is not loaded, the setup process must be canceled and a probe card loaded. Use the following steps to input the reference pin and three registered pin positions:**

1 If the probe card has a single row of probes, press TEACH CARD on the *Setup Menu*.

If the probe tips differ in macro and micro view, press MULTIPIN TEACHING.

The chuck camera moves to the probe card center and the *Stage Control Menu* is displayed. The chuck camera (macro) displays the image of the probe tips.

Stage Control Menu



2 Use the arrow control buttons to position the crosshairs on the probe tip that will be used as the reference pin. When choosing a reference pin, it is best to choose a corner pin or one that is isolated. This will simplify locating the probes in micro view, and assist the prober in aligning the probe card.

CAUTION **Property Damage Hazard**

If an image is not displayed, use the XY stage control arrows under the pin position where an image is displayed. Use the Z buttons only after locating the pin image.

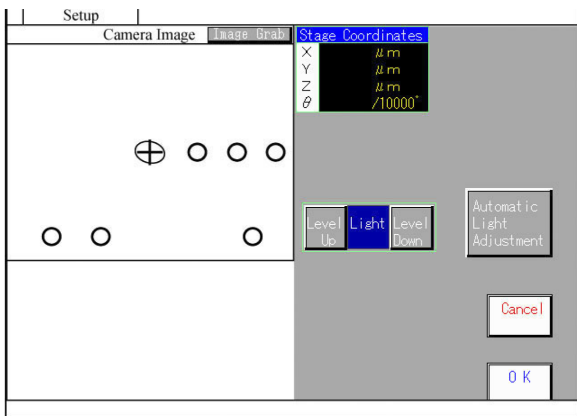
3 Once the reference pin tip is on the crosshairs, use the Z position control buttons to adjust the focus.

NOTE **Press** AUTO FOCUS **to automatically focus the pin. If focusing is not possible, press the up or down arrow buttons for Z Pos to focus. Press** AUTOMATIC LIGHT ADJUSTMENT **to automatically adjust the lighting amount.**

4 Press OK. The probe-tip position is input as the reference pin.

The prober searches for a candidate probe based on the reference pin pattern. During the search the lighting switches automatically, going from dark to bright or bright to dark, and the probe tip is displayed on the *Visual Field Probe Setup Menu*.

Visual Field Probe Setup Menu



5 To adjust the lighting further, press LEVEL UP or LEVEL DOWN on the *Visual Field Probe Setup Menu*. Make sure that only the probe tip is showing.

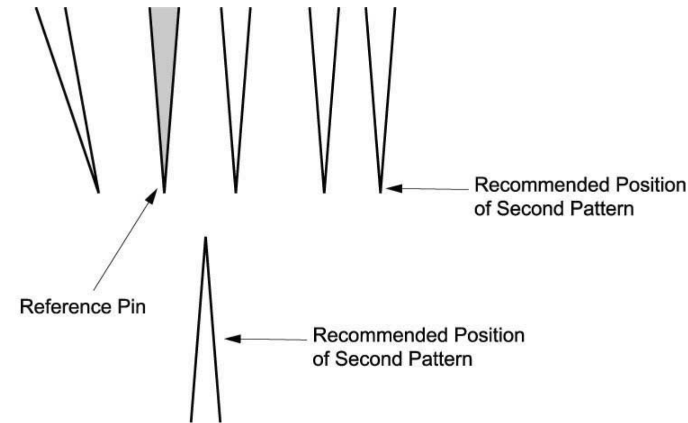
6 Press OK. A check menu asking you to set a second reference pin pattern is displayed.

7 Input a second pattern if necessary to eliminate reference pin mis-recognition. Make sure to input a second pattern if a probe with a similar pattern is located in the vicinity of the reference pin.

- To input a second reference pin pattern, press YES on the check menu. A *Stage Control Menu* is displayed. Go to step 8.
- To decline inputting a second reference pin pattern, press NO on the check menu. Go to step 10.

8 Use the arrow control buttons to position the crosshairs on the probe tip that contains the second reference pin pattern.

Recommended Second Pattern Probe Positions



NOTE **Select a probe that has a shaft approach angle that is similar to the pins selected for alignment, as well as whose physical relationship with the reference pin position is unique.**

9 Press OK on the *Stage Control Menu*. The second reference pin pattern is input.

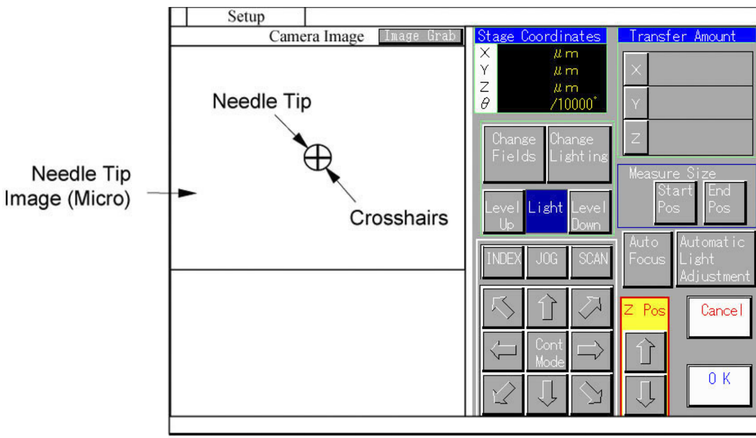
10 Use the control buttons to position the crosshairs on the probe tip that will be used as registered pin 2.

NOTE **For reference pins 2 through 4, select a probe whose shaft approach angle is the same as the reference pin.**

11 Press OK. The position of registered pin 2 is input in the macro view.

12 Repeat steps 10 and 11 to input the positions for registered pins 3 and 4. After inputting registered pin 4 (the fourth position), the chuck camera changes to the micro view. The chuck camera (micro) displays an image of the reference pin tip.

Stage Control Menu



13 Use the control buttons to position the crosshairs over the probe tip. Press OK. The probe tip position is input, and the prober automatically displays the next probe tip image (probe pin number 2).

14 Repeat step 13 to input the positions for the other three probe tips (registered pin 2, registered pin 3, registered pin 4). After inputting all four probe tip positions, press OK on the *Stage Control Menu*. The *Setup Menu* is displayed.

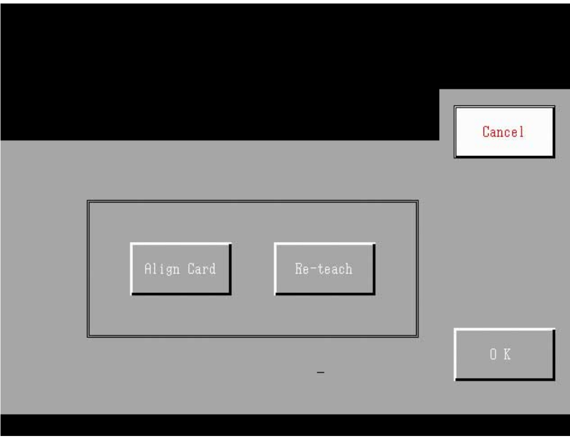
CAUTION **Property Damage Hazard**

If the display of pins 2 through 4 (positions 2 through 4) is notably out of focus while the reference pin is in focus, check how the probe card is attached. It might be slightly slanted.

CAUTION **Property Damage Hazard**

Do not forget the position of the reference pin (the first probe input). You will need to remember it when inputting the reference pad position because the reference pad and reference pin positions must align with each other.

Setup Menu



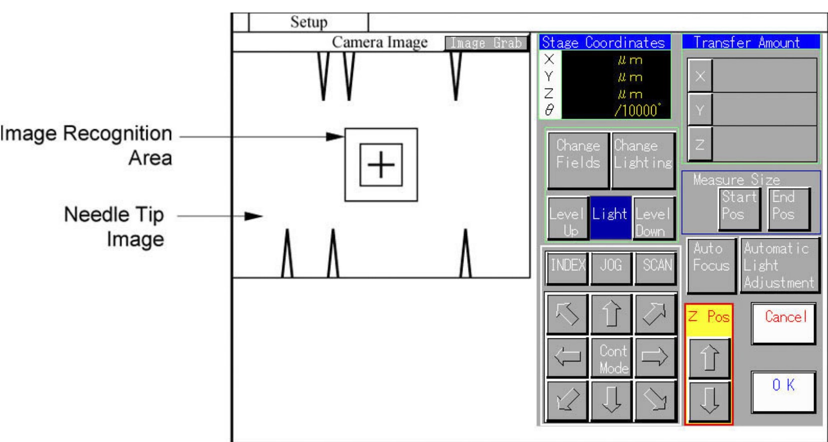
Detection Method

1 If the probe card has a single row of probes, press TEACH CARD on the *Setup Menu*.

If the probe tips differ in macro and micro view, press MULTIPIN TEACHING.

The chuck camera moves to the probe card center and the *Stage Control Menu* is displayed. The chuck camera (macro) displays the image of the probe tips.

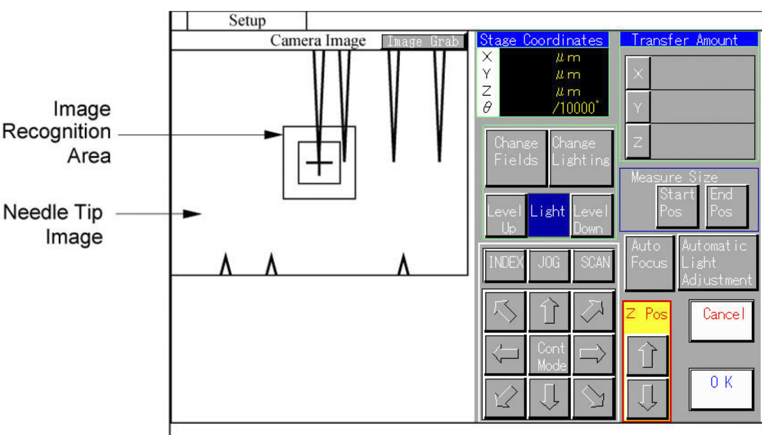
Stage Control Menu



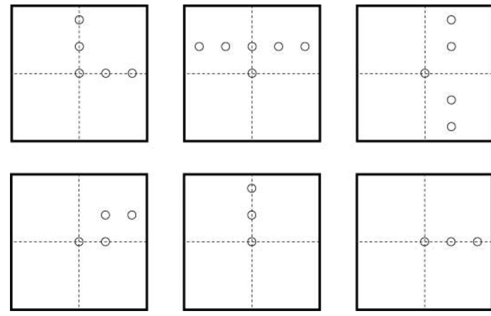
2 Use the control buttons to position the crosshairs on the probe tip that will be used as the reference pin. When choosing a reference pin, it is best to choose a corner pin or one that is isolated by at least 1 mm from any other pin. This will simplify locating the probes in micro view, and assist the prober in aligning the probe card.

> **CAUTION** **Property Damage Hazard**
> **If an image is not displayed, use the XY stage control arrows under the pin position where an image is displayed. Use the Z buttons only after locating the pin image.**

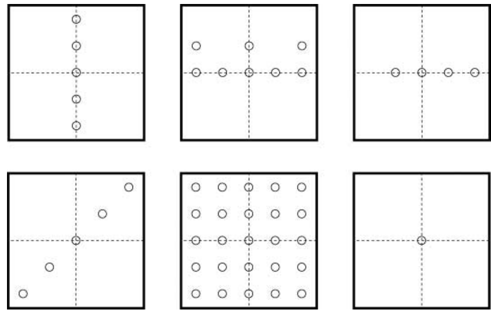
Stage Control Menu



Reference Pin Setting Example - Correct Positions



Reference Pin Setting Example - Incorrect Positions

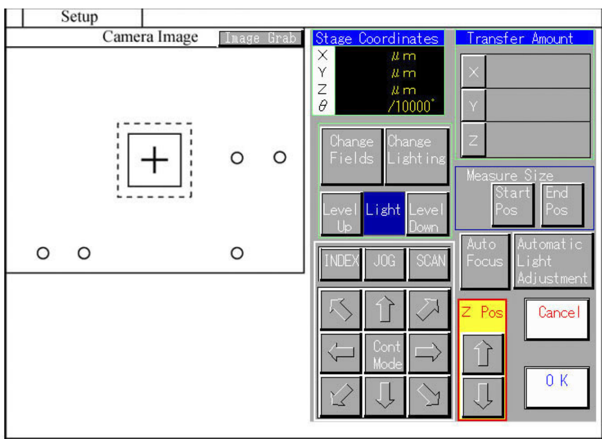


3 Once the reference pin tip is on the crosshairs, use the Z position arrow control buttons to adjust the focus.

NOTE **Press** AUTO FOCUS **to focus the pin automatically. If focusing is not possible, press the up or down arrow on Z Pos to focus. Press** AUTOMATIC LIGHT ADJUSTMENT **to automatically adjust the lighting amount.**

4 Set `Change Lighting` to BRIGHT and press OK. To prevent a false recognition of other parts of the probe card instead of the probe tip, it is recommended that you perform this procedure using the BRIGHT setting.

Stage Control Menu



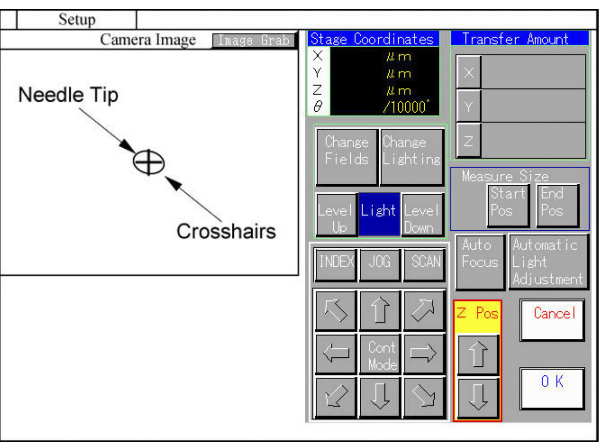
Unlike the target mark or candidate point method, in the detection method the prober performs focusing or confirmation of the probe tip in the micro field after OK is pressed to accurately

incorporate the probe tip coordinate. While the prober is incorporating the probe tip coordinate, a **WAIT** message is displayed in red below the menu.

5 Repeat steps 2 through 4 to input the four probe tip positions (reference pin, registered pin 2, registered pin 3, registered pin 4). After all the pins are input, the chuck camera switches to the micro view and displays the reference pin probe tip.

> **CAUTION** **Property Damage Hazard**
> **If the probe tip image is notably out of focus while the reference pin is in focus, check how the probe card is attached. It might be slanted.**

Stage Control Menu

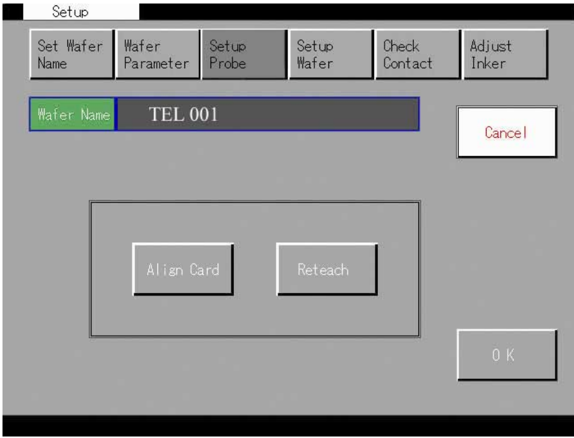


6 Use the control buttons to position the crosshairs over the probe tip.

7 Press OK. The probe-tip position is input and the prober automatically displays the next probe tip (registered pin 2).

8 Repeat steps 6 and 7 to input the other three probe tips (registered pin 2, registered pin 3, and registered pin 4). After inputting the fourth probe tip position, press OK. The *Setup Menu* is displayed.

Setup Menu



3.5 Performing Probe Card Alignment 0415.1

Introduction

Purpose:

To perform probe card alignment.

Required Resources:

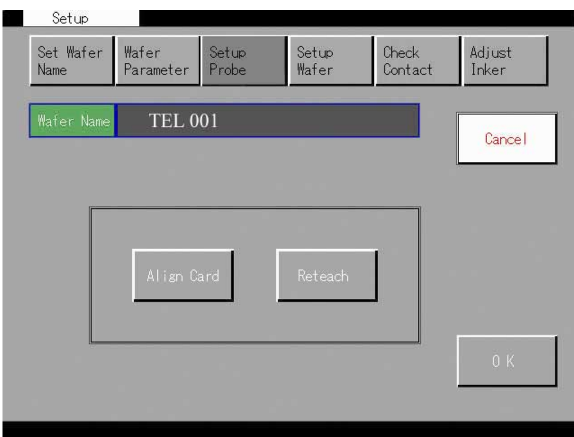
Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Overview:

Perform probe card alignment to check the probe card data usability. The prober must be able to locate and focus on the probe tips. If an alignment error occurs, the probe card data must be re-input.

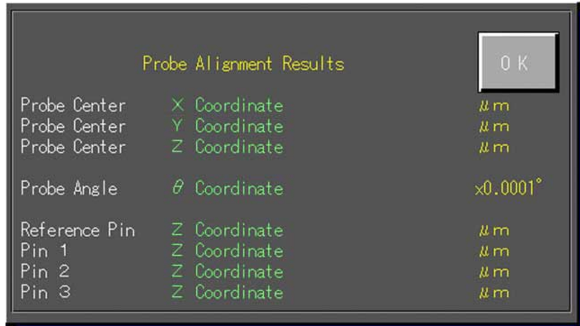
1. The *Setup Menu* is displayed. Check that SETUP PROBE is highlighted.
2. Press ALIGN CARD on the *Setup Menu*.

Wafer File Setup Probe Menu



Probe card alignment is performed and the *Probe Alignment Results Menu* is displayed.

Probe Alignment Results Menu



3 After checking the alignment results, press OK. The *Setup Menu* is displayed.

4 If an alignment error occurs, press RETEACH on the *Setup Menu* and re-input the probe tip positions.

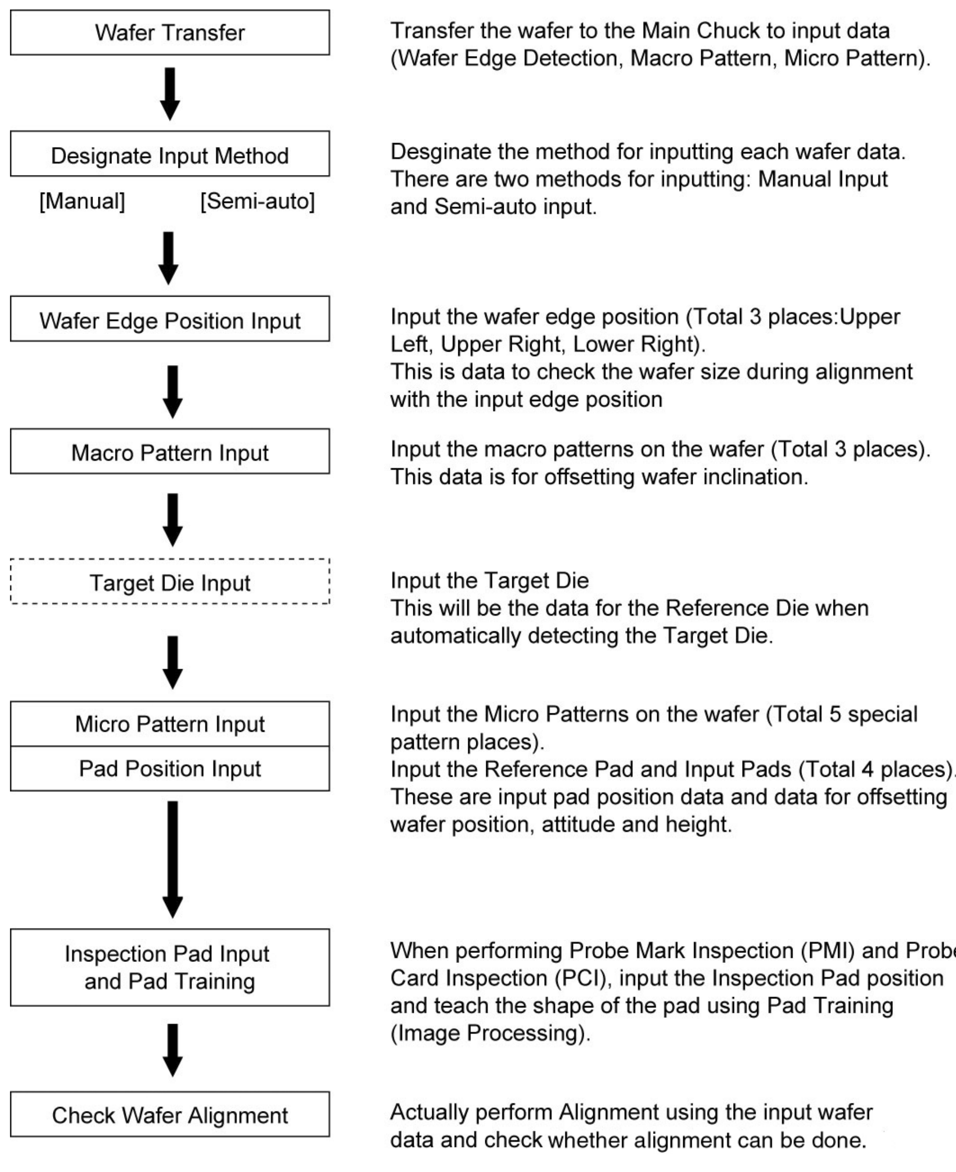
5 If the probe card is aligned correctly, press OK on the *Setup Menu*. The `Setup Wafer` section of the *Setup Menu* is displayed.

3.6 Preparing to Input Wafer Alignment Data 0416.1

Before any wafer alignment data can be input, a wafer must be transferred to the chuck top. Once a wafer is on the chuck, wafer alignment can begin. The graphic on the next page presents an example of the process for inputting wafer alignment data. Optional steps are italicized. The main components in the wafer alignment process are as follows:

- Wafer Transfer
- Select Data Entry Method
- Input Wafer Edge Position
- Input Macro Pattern Intersection Targets
- Input Target Die (option)
- Input Micro Patterns for Intersection Target and Micro-Alignment Target
- Input Pad Positions for Alignment Choose either to:
    - Select Pad Position for PMI/PCI, or
    - Pad Training
- Check Wafer Alignment

Wafer Alignment Process



3.7 Transferring a Wafer 0417.1

Introduction

Purpose:

To transfer a wafer to the chuck top using either the FOUP or the wafer table.

To input the data necessary to align the wafer, the wafer must be on the chuck top. If a wafer is already on the chuck, do not perform this procedure.

Required Resources:

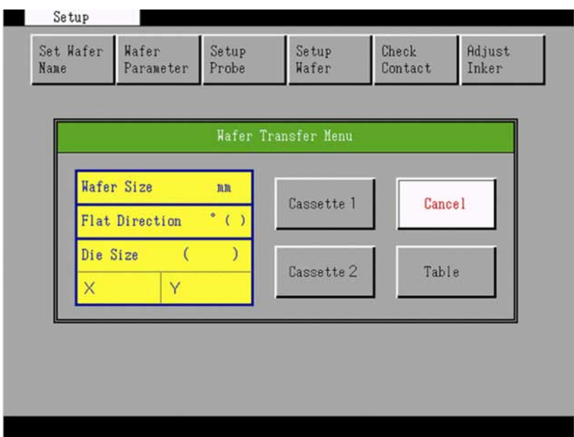
Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Overview:

NOTE **This procedure assumes that a FOUP is present on the load port, or that a single wafer has been placed onto the wafer table. If a FOUP is not loaded, the setup process must be cancelled; return to the *Main Menu* to load a FOUP.**

1 The *Wafer Transfer Setup Menu* is displayed. Check that **Setup Wafer** is highlighted on the *Wafer Transfer Setup Menu*.

Wafer Transfer Setup Menu



2 Use one of the following methods to transfer the wafer to the chuck top.

- **To transfer a wafer from the FOUP** : Press CASSETTE 1 or CASSETTE 2. A numeric keypad is displayed. Input the slot number of the wafer to be transferred, and press OK. A message menu is displayed stating `Transferring Wafer.` The wafer is transferred to the chuck top, and the *Wafer Transfer Setup Menu* is displayed.

- **To transfer a wafer from the wafer table** : Press TABLE. A message menu is displayed stating `Transferring Wafer.` The wafer is transferred to the chuck top and the *Wafer Transfer Setup Menu* is displayed.

3.8 Selecting a Method for Inputting Wafer Alignment Data 0418.2

Introduction

Purpose:

To select a method for inputting wafer alignment data.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

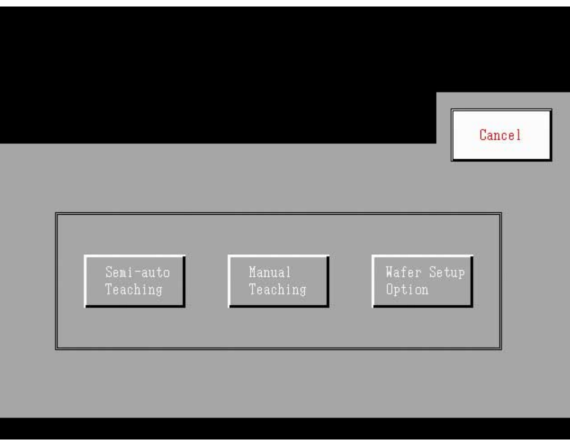
Overview:

After the wafer is transferred is the main chuck, the prober prompts the user to designate the method for inputting wafer data.

NOTE **The following procedure begins from the point at which** **3.7 Transferring a Wafer (see page 86)** **was completed.**

1 The *Wafer Alignment Selection Menu* is displayed.

Wafer Alignment Selection Menu



2 Select the method for inputting setup file data.

- WAFER SETUP OPTION: Used for target sense when wafer pattern has little image structure or contrast. Go to **3.9 Using the Wafer Setup Option (see page 90)** and setup the wafer setup options.

- MANUAL TEACHING: Requires the operator to input all necessary data; the prober will not automatically calculate any of the alignment point data for the setup file to reduce input steps required. Begin with **3.10 Inputting Wafer Edge Positions (Manual) (see page 91)**, then perform the manual teaching procedures that follow.
- SEMIAUTOMATIC TEACHING: Allows the prober to calculate part of the necessary data for the setup file. Begin with **3.13 Wafer Edge Detection (Semiautomatic) (see page 99)**, then perform the semiautomatic teaching procedures that follow.

3.9 Using the Wafer Setup Option 0420.1

Introduction

Purpose:

To select an existing wafer file and change its setup wafer data file parameters using the *Change Setup Wafer Data Menu*. Wafer file data is changed only after loading a probe card and a FOUP of wafers into the prober and transferring a wafer to the chuck top. When changing the probe card data, make sure to re-input the probe tip positions and the probe parameters after changing all other data.

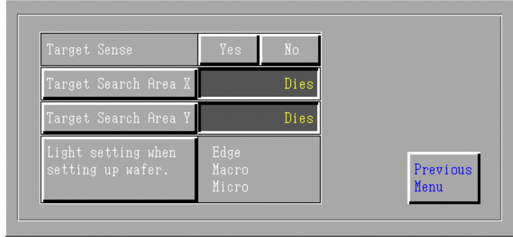
The target sense feature allows the prober to sense a target, and then use that target as an additional pattern for wafer alignment.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Press WAFER SETUP OPTION on the *Wafer Alignment Selection Menu*. The *Wafer Setup Option Menu* is displayed.

Wafer Setup Option Menu



2 Confirm that `Target Sense` is set to YES or NO.

YES: Use the `Target Sense` feature to create the current wafer file.

NO: Do not use the `Target Sense` feature to create the current wafer file.

3.10 Inputting Wafer Edge Positions (Manual) 0422.1

Introduction

Purpose:

To input the wafer edge position using MANUAL TEACHING.

To input the wafer edge position, three different positions on the wafer's edge must be input: upper left, upper right, and lower right. This procedure describes how to input the wafer edge positions in manual mode.

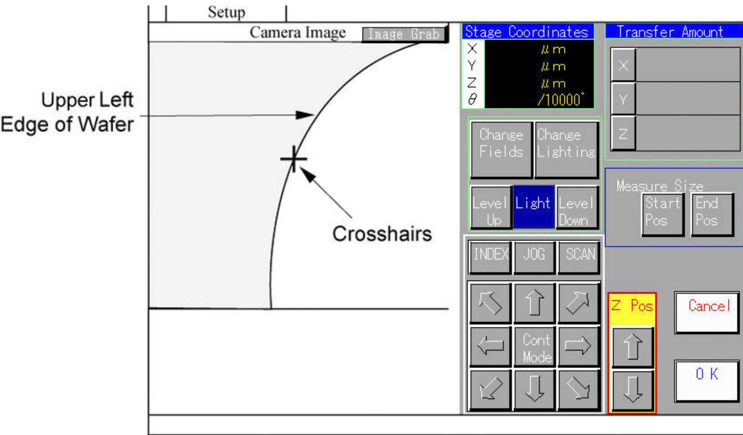
Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Press MANUAL TEACHING on the *Wafer Setup Menu*. Upper/lower camera matching is performed, and a stage control menu displaying the wafer upper left edge position will be displayed.

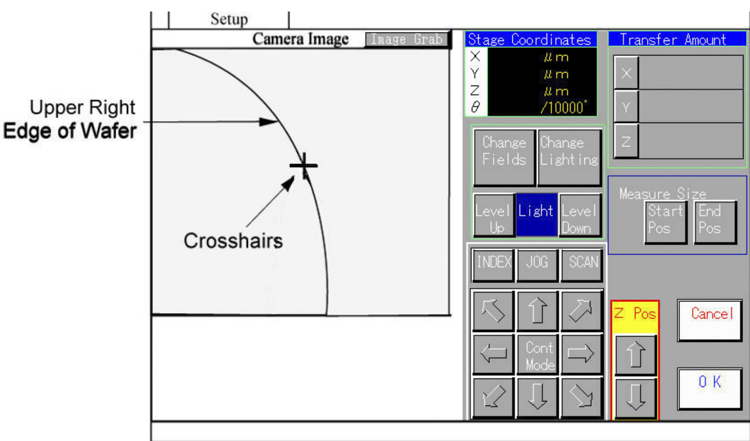
2 Check that the upper left edge of the wafer is positioned on the crosshairs on the *Stage Control Menu*. If the edge is not positioned on the crosshairs, use the stage arrow control buttons to position the crosshairs on the contrast line of the wafer edge.

Stage Control Menu



3 Press OK. The upper left edge position is input as surface map (1), and an image of the upper right edge of the wafer is displayed.

Stage Control Menu



4 Check that the upper right edge of the wafer is positioned on the crosshairs. If the edge is not positioned on the crosshairs, use the stage arrow control buttons to position the crosshairs on the contrast line of the wafer edge.

5 Press OK. The upper right edge position is input as surface map (2), and an image of the lower right edge of the wafer is displayed.

6 Check that the lower right edge of the wafer is positioned on the crosshairs. If the edge is not positioned on the crosshairs, use the stage arrow control buttons to position the crosshairs on the contrast line of the wafer edge.

7 Press OK. The lower right edge position is input as surface map (3), and the wafer center is displayed.

NOTE **When the edge position cannot be input because of the position of the second orientation flat, move the stage using the stage control buttons to a position where the crosshairs fall onto the second flat arc. However, do not move the stage more than ±40° from the wafer center.**

3.11 Inputting Macro Street Intersections (Manual) 0423.1

Introduction

Purpose:

To input macro street intersections manually for coarse theta alignment.

The patterns on the wafer are used as aids in wafer alignment. Two types of patterns are input: a macro pattern and a micro pattern. A street intersection is usually used for the macro pattern.

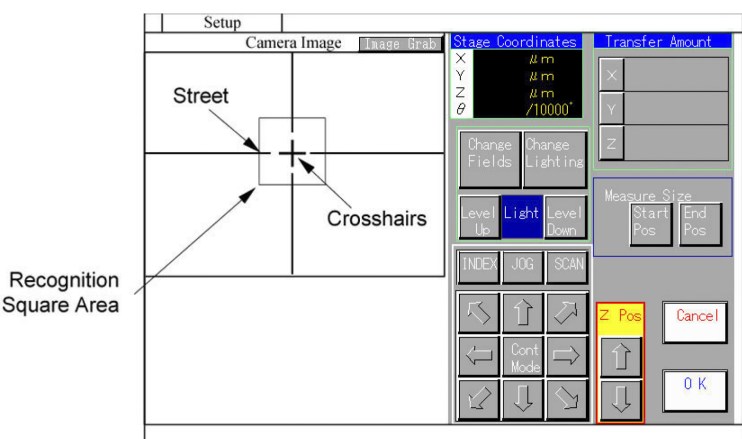
Perform the following procedure to input macro street intersection positions for coarse theta alignment. These position must be designated for proper theta alignment to occur.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 A street intersection near the center of the wafer is displayed on the *Stage Control Menu*. Check that it is positioned on the crosshairs. If the street intersection is not positioned on the crosshairs, use the stage arrow control buttons to position the intersection on the crosshairs.

Stage Control Menu



2 Press OK. The street intersection is input as macro pattern (1). The chuck moves 2 to 3 die in the positive direction alignment axis to the macro pattern (2) position.

NOTE **If you must re-input the macro pattern data, the prober will compare the new street intersection with the one previously input. If the distance between these two intersections is more than a quarter of a die size, a check menu will be displayed. Press CONTINUE on the check menu to use the newly input street intersection. Press CANCEL to cancel the changes.**

3 A new position near the second intersection is displayed on the *Stage Control Menu*. Check that it is positioned on the crosshairs. If it is not positioned on the crosshairs, use the stage arrow control buttons to position the street intersection at the identical position as the macro pattern (1) on the crosshairs.

4 Press OK. The street intersection is input as macro pattern (2). The chuck moves to the macro pattern (3) position.

5 A new street intersection is displayed on the *Stage Control Menu*. Check that it is positioned on the crosshairs. If it is not positioned on the crosshairs, use the stage arrow control buttons to position the street intersection on the crosshairs.

6 Press OK. The street intersection is input as macro pattern (3). The camera alignment system will focus to the street intersection position and adjust theta alignment as calculated. The bridge camera switches to micro mode, and the center of the wafer is displayed.

3.12 Inputting the Micro Street Intersection and Target Pattern Positions (Manual) 0424.1

Introduction

Purpose:

To manually input the target sense pattern positions, micro street intersection, and micro pattern positions. The center of the micro street intersection is set as the origin position for the wafer map.

Micro alignment required that the exact street intersection be designated and a unique repeatable image structure be designated at five calculated die positions on the wafer surface.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

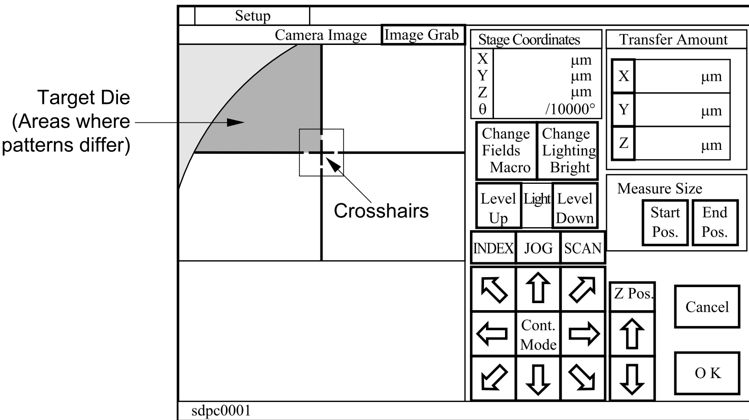
Inputting Target Sense Pattern Position

1 If you set `Target Sense` to YES on the *Wafer Setup Option Menu*, then a *Stage Control Menu* is displayed allowing you to input the target sense pattern.

- If you are using target sense, continue to the next step.
- If you are not using target sense, press OK. The bridge camera switches to the micro view and the center of the wafer is displayed. After inputting the macro pattern, input micro pattern. Then go to **Inputting Micro Street Intersections (see page 96)**.

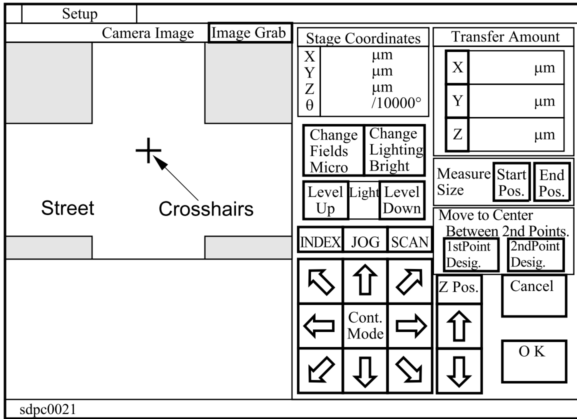
2 Use the control buttons to position the crosshairs over the edge of a die whose pattern differs from the test die.

Stage Control Menu



3 Press OK to input the target sense pattern. The bridge camera switches to micro and the center of the wafer is displayed.

Stage Control Menu



NOTE **It is possible to input the target sense pattern in the micro view. To input the pattern in the micro view, press** CHANGE FIELDS **to switch the bridge camera to the micro view and then input the pattern.**

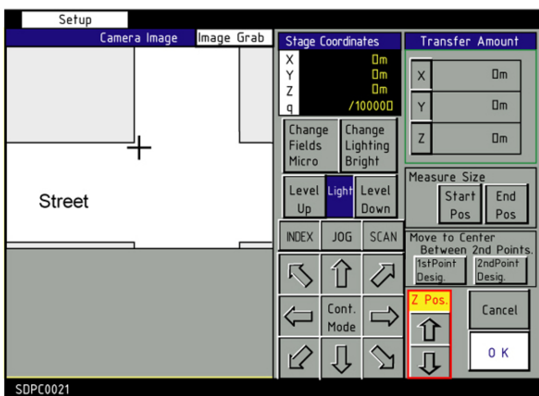
Inputting Micro Street Intersections

4 A stage control menu shows the street intersection in the micro view. Press LEVEL UP or LEVEL DOWN on the *Stage Control Menu* to adjust the lighting amount. Use the control buttons to adjust the `Z Pos` height to focus the image.

5 Use the following steps to set the origin position for the wafer map.

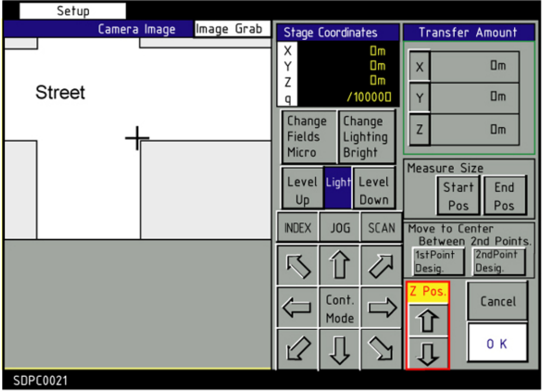
5.1 Position the crosshairs on the upper left corner of the street intersection and press 1ST POINT DESIG.

Stage Control Menu



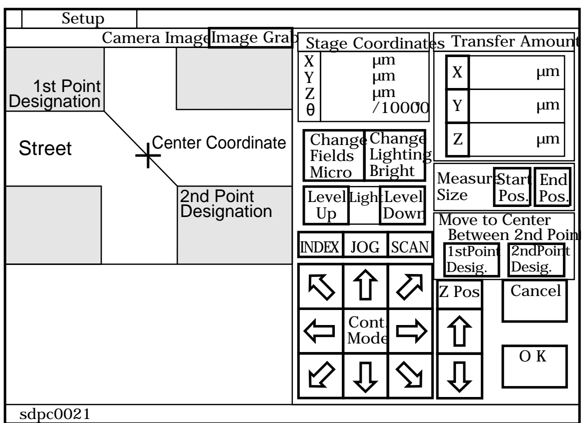
5.2 Position the crosshairs on the lower right corner of the street intersection.

▾ **Stage Control Menu**



5.3 Press 2ND POINT DESIG. The crosshairs will be automatically positioned in the calculated center position of the intersection.

▾ **Stage Control Menu**



NOTE **Some wafers may have a mark on the center of the intersection; however, this mark may not match the position calculated by the prober. If this situation occurs, use the calculated position.**

5.4 Press OK. The exact micro intersection point is set, and the wafer map origin position is input.

Inputting Micro Target Pattern Position

6 Set the X and Y transfer amounts between 1 and 5 µm.

7 Use the stage arrow control buttons to position the crosshairs on the corner of a pattern. Avoid probe pads since they can cause a repeatability problem if some have probe marks and others do not. If there are no distinct images, position the crosshairs on the intersecting points of the circuitry near the street. Choose a target that is coplanar in the Z axis to the pads.

8 Press OK. The camera implements a focus evaluation sequence and checks the different light levels. If the image recognition is successful, the image pattern and address position is registered in memory. The prober will automatically move to the next die location.

9 Check that the crosshairs are positioned on the same part of the pattern edge that was used in micro pattern (1). If the two positions are different, use the control buttons to position the crosshairs on the correct part of the pattern.

NOTE **Make sure to stay within half a die of movement in the X axis.**

10 Press OK. The camera implements a focus evaluation sequence and checks the different light levels. If the image recognition is successful, the image pattern and address position is registered in memory. The prober will automatically move to the next die location.

11 Check that the crosshairs are positioned on the same part of the pattern edge that was used in micro pattern (1). If the two positions are different, use the control buttons to position the crosshairs on the correct part of the pattern.

NOTE **Make sure to stay within half a die of movement in the Y axis.**

12 Press OK. The camera implements a focus evaluation sequence and checks the different light levels. If the image recognition is successful, the image pattern and address position is registered in memory. The prober will automatically move to the next die location.

13 Check that the crosshairs are positioned on the same part of the pattern edge that was used in micro pattern (1). If the two positions are different, use the control buttons to position the crosshairs on the correct part of the pattern.

NOTE **Make sure to stay within half a die of movement in the X axis.**

14 Press OK. The camera implements a focus evaluation sequence and checks the different light levels. If the image recognition is successful, the image pattern and address position is registered in memory. The prober will automatically move to the next die location.

15 Check that the crosshairs are positioned on the same part of the pattern edge that was used in micro pattern (1). If the two positions are different, use the control buttons to position the crosshairs on the correct part of the pattern.

NOTE **Make sure to stay within half a die of movement in the X axis.**

16 Press OK. After all the micro patterns have been input, a message menu is displayed stating `Designate 2nd Micro Pattern.` For the purposes of this procedure, select No. Go to 3.16 Inputting the Reference Pad and Registered Pads (see page 106) and input the reference and standard input alignment pads.

NOTE **The steps to input a second micro pattern are the same as the steps for inputting the first micro pattern; however, the micro pattern only needs to be input once. Inputting a second micro pattern can prevent mis-recognition of the original micro pattern, but it is not necessary to complete a setup file. If you input a second micro pattern, be sure to use a different pattern from the first.**

3.13 Wafer Edge Detection (Semiautomatic) 0426.1

Introduction

Purpose:

The semiautomatic method of inputting wafer edge positions and the macro pattern allows you to teach the prober while specifying few positions. The prober will attempt to locate other positions automatically, but will generate an assist and require you to input more positions manually if the semiautomatic setup fails.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Press SEMI-AUTO TEACHING on the *Setup Menu*. The prober uses the upper left, upper right, and lower right edge positions to input the surface map. After inputting the three positions, the prober displays the wafer center. If the prober is unable to calculate the position of the wafer edge, an assist message is generated.

2 Use the control buttons to position the crosshairs on the wafer edge and press OK. The prober will use the newly input edge position to calculate the other edge positions.

NOTE If the edge position cannot be input because of the position of the second orientation flat, use the control buttons to move the stage to a position where the crosshairs fall onto the second flat arc. Do not move the stage more than 40° from the wafer center.

3.14 Inputting the Macro Street Intersection (Semiautomatic) 0427.1

Introduction

Purpose:

To input macro street intersection positions for coarse theta alignment. The patterns on the wafer are used to aid wafer alignment. Two types of patterns are input: a macro pattern and a micro pattern. A street intersection is usually used for the macro pattern.

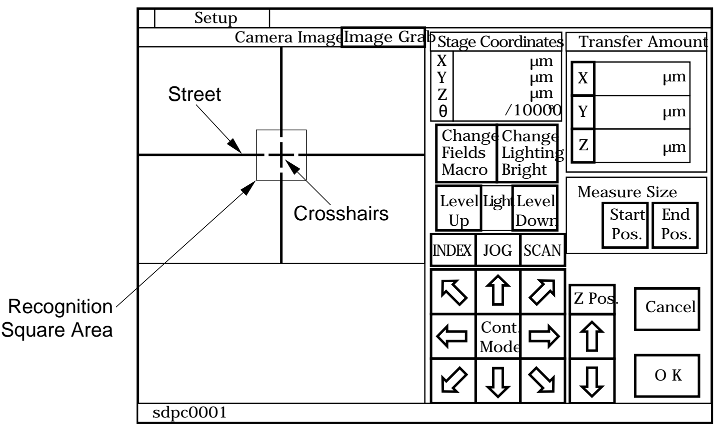
The semiautomatic method of inputting wafer edge positions and the macro pattern allows you to teach the prober by specifying just one wafer edge position and one macro pattern location. The prober will attempt to locate other positions automatically, but will generate an assist and require you to input more positions manually if the semiautomatic setup fails to locate and recognize alignment positions.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 After the wafer edge positions have been input, a street intersection near the center of the wafer is displayed on the *Stage Control Menu*. Use the control buttons to position the crosshairs in the closest intersection in the macro view.

Stage Control Menu



2 Press OK. The street intersection is input as macro pattern (1). The stage moves in the alignment axis a few die steps to automatically locate and input the macro pattern (2) and (3) positions. The image data collected is used to correct the coarse theta alignment positioning. The stage then drives the

wafer to the last calculated row/column and repeats the image processing for final course theta adjustment.

NOTE **If the prober cannot locate the street intersections for macro pattern 2 and macro pattern 3, an assist is generated. Use the control buttons to position the street intersection on the crosshairs and press** OK**. The prober will use the newly input street intersection to calculate the other macro pattern positions.**

NOTE **If you must re-input the macro pattern data, the prober will compare the new street intersection with the one previously input. If the distance between these two intersections is more than a quarter of a die size, a check menu will be displayed. Press** CONTINUE **on the check menu to use the newly input street intersection. Press** ABORT **to cancel the changes.**

3 The bridge camera switches to micro mode, and the center of the wafer is displayed.

After the macro pattern street intersection has been input, the micro pattern street intersection must be input.

3.15 Inputting the Micro Street Intersection and Target Pattern Positions (Semiautomatic) 0428.1

Introduction

Purpose:

To input the target sense pattern positions, the micro street intersection, and the macro pattern positions. The center of the street intersection is set as the origin position for the wafer map.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

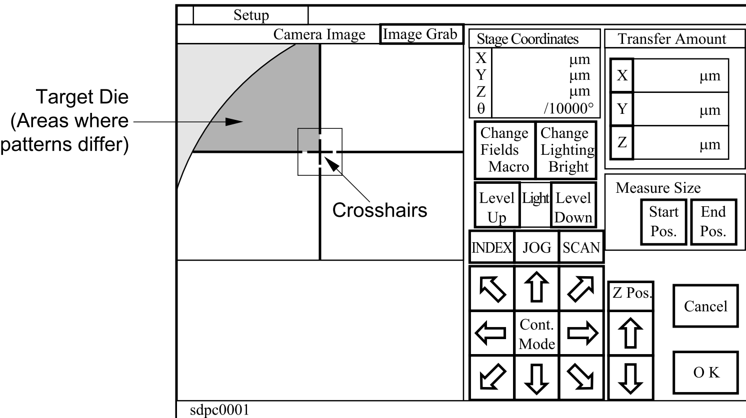
Inputting the Target Sense Pattern Position

1 If you set `Target Sense` to YES on the *Wafer Setup Option Menu*, then the *Stage Control Menu* is displayed to allow you to set the target sense pattern.

- If you are using target sense, continue to the next step.
- If you are not using target sense, press OK. The bridge camera switches to the micro view and the center of the wafer is displayed. After inputting the macro pattern, input the micro pattern. Then go to **Inputting Micro Street Intersections (see page 103)**.

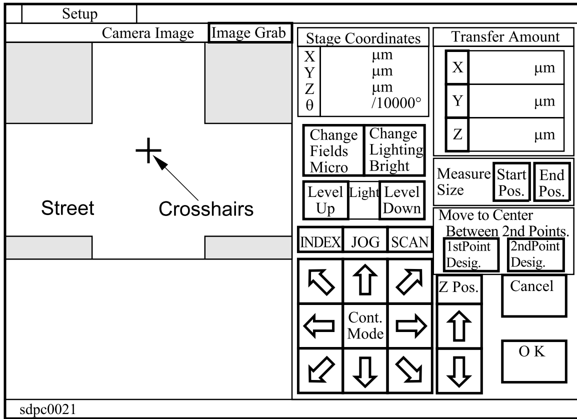
2 Use the control buttons to position the crosshairs over the edge of a die whose pattern differs from the test die.

Stage Control Menu



3 Press OK to input the target sense pattern. The bridge camera switches to micro view and the center of the wafer is displayed.

Stage Control Menu



NOTE **It is possible to input a target sense pattern in the micro view. To input the pattern in micro view, press** CHANGE FIELDS **to change the bridge camera to micro and then input the pattern.**

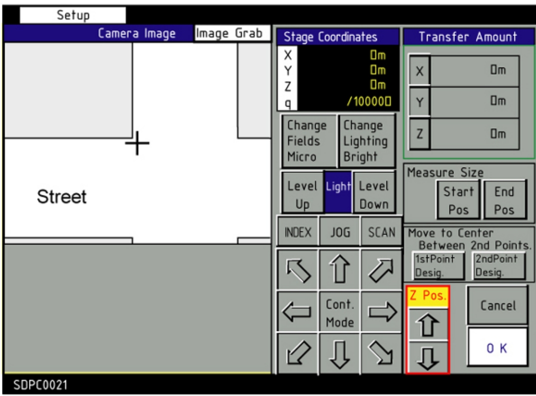
Inputting Micro Street Intersections

4 The *Stage Control Menu* shows the street intersection in the micro mode. Press LEVEL UP or LEVEL DOWN on the *Stage Control Menu* to adjust the lighting amount. Use the control buttons to adjust the `Z Pos` height to focus the image.

5 Use the following steps to set the origin position for the wafer map.

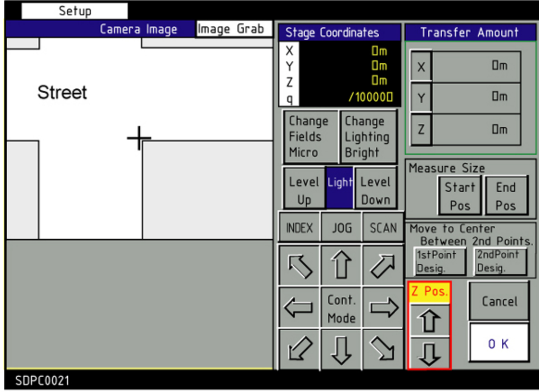
5.1 Position the crosshairs on the upper left corner of the street intersection and press 1ST POINT DESIG.

Stage Control Menu



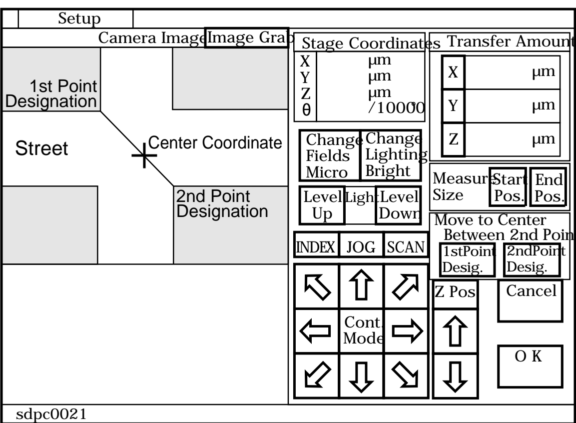
5.2 Position the crosshairs on the lower right corner of the street intersection.

▼ **Stage Control Menu**



5.3 Press 2ND POINT DESIG. The crosshairs will be automatically positioned in the calculated center position of the intersection.

▼ **Stage Control Menu**



NOTE **Some wafers may have a mark on the center of the intersection. This mark may not match the position calculated by the prober. If this situation occurs, use the calculated position.**

5.4 Press OK. The exact micro intersection point is set, and the wafer map origin position is input.

Inputting Micro Target Pattern Position

NOTE **Use the following steps to semiautomatically input the corner of a pattern that is unique and repeatable, has straight edges, and displays a high contrast level.**

6 Set the X and Y transfer amounts between 1 and 5 µm.

7 Use the control buttons to position the crosshairs on the corner of a pattern. Avoid probe pads since they can cause a repeatability problem if some have probe marks and others do not. If there are no clear corners, position the crosshairs on the intersecting points of the circuitry near the street. Choose a target that is co-planar in the Z axis to the pads.

8 Press OK. The camera implements a focus evaluation sequence and checks the different light levels. Micro pattern (1) is input. The prober will automatically input micro pattern (2) through (5), based on the first micro pattern.

NOTE **If the prober cannot input the micro pattern, an assist will be generated. Use the control buttons to position the crosshairs on the street intersection and press OK. The prober return to semiautomatic mode to input the other micro patterns.**

9 After all five micro patterns have been input, a message menu is displayed stating `Designate 2nd Micro Pattern` For the purposes of this procedure, select NO. Go to **3.16 Inputting the Reference Pad and Registered Pads (see page 106)** to input the reference and standard input alignment pads.

NOTE **The steps to input a second micro pattern are the same as the steps for inputting the first micro pattern; however, the micro pattern only needs to be input once. Inputting a second micro pattern can prevent mis-recognition of the original micro pattern, but it is not necessary to complete a setup file. If you input a second pattern, be sure it is a different pattern from the first.**

3.16 Inputting the Reference Pad and Registered Pads 0430.1

Introduction

Purpose:

To input the reference and registered pads.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Standard Method

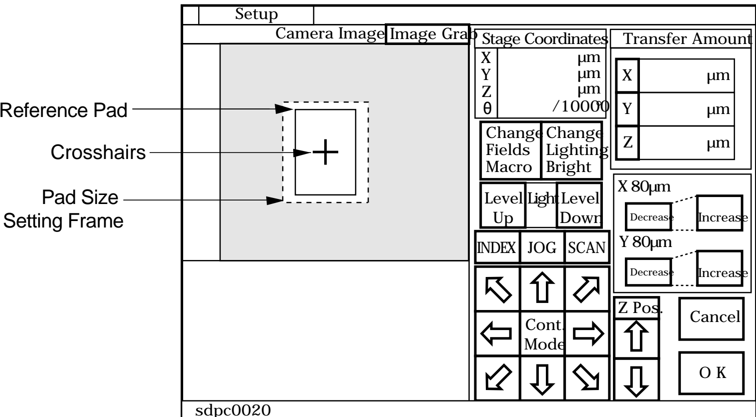
NOTE **If `Pad Center Position Offset` is set to YES in the Alignment Operation Parameter, refer to** **Inputting Pad Center Offsets (see page 108)** **for information on how to input a pad center offset.**

1 Select the SCAN mode and drive the stage to a reference pad that matches the reference pin position input when you performed **3.4 Inputting Probe Tip Positions (see page 65)**.

2 Select the JOG mode and center the crosshairs on the center of the pad. A pad size setting frame is displayed.

3 Change the size of the pad size-setting frame to fit around the edge of the pad by pressing INCREASE or DECREASE for the `XY Direction`. Adjust the center position of the crosshairs and frame using the X/Y axis stage arrow control buttons.

Stage Control Menu



4 Press OK to input the **reference pad** . The stage then moves to the area where the first registered pad will be located (corresponding to registered pin number 2).

5 Center the crosshairs on the pad center. Adjust, if necessary, the size of the pad size-setting frame to fit around the edge of the pad and the X/Y centering of the crosshairs.

6 Press OK to input the first **registered pad** . The stage moves to the area where the second registered pad will be located (corresponding to registered pin number 3).

7 Center the crosshairs on the pad center. Adjust, if necessary, the pad size-setting frame to fit around the edge of the pad and the X/Y centering of the crosshairs.

8 Press OK. The second **registered pad** is input, and the stage moves to the area where the third registered pad will be located (corresponding to registered pin number 4).

9 Center the crosshairs on the pad center. Adjust, if necessary, the size of the pad size-setting frame to fit around the edge of the pad and the centering of the crosshairs in the X/Y direction.

10 Press OK. The third **registered pad** is input. After inputting the reference pad and three registered pad positions, the *Inspection Pad Input Menu* is displayed.

11 For the purposes of this procedure, press DON'T INPUT. Inspection functions will be discussed in **Chapter 6, Creating an Advanced Setup File (see page 249)**.

12 When all four pad positions have been registered for the micro pattern, the *Setup Menu* is displayed. The setup file creation process is continued in **3.17 Verifying Wafer Alignment (see page 111)**.

Bump Pad Method

NOTE **The steps for inputting the wafer map origin position and the micro pattern are the same. The difference occurs in inputting the reference and registered pad positions. The probe card should be set to VT PC (vertical probe card) in order to successfully set up bump pads.**

NOTE **If `Pad Center Position Offset` is set to YES in the Alignment Operation Parameter, refer to Inputting Pad Center Offsets (see page 108) for information on how to input a pad center offset.**

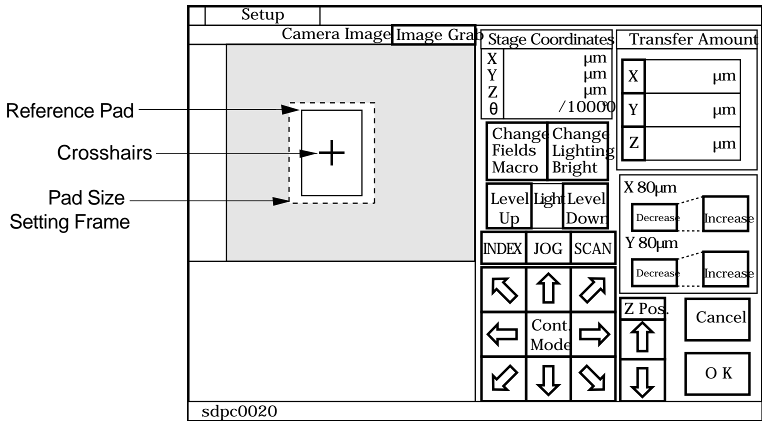
13 Use the following steps to input the reference pad position:

13.1 Select the SCAN mode and drive the stage to a reference pad that matches the reference pin position input when you performed **3.4 Inputting Probe Tip Positions (see page 65)**.

13.2 Switch to JOG mode and center the crosshairs on the pad center. A pad size-setting frame is also displayed.

13.3 If the height of the bump pads differs from the die and pad surfaces, use the **Z Pos** arrows to focus the pad surface. This will ensure that the prober can accurately judge the pad Z height.

▾ **Stage Control Menu**



13.4 Change the size of the pad size-setting frame to fit around the edge of the pad by pressing INCREASE or DECREASE for the XY direction.

14 Press OK on the *Stage Control Menu*. A check menu is displayed with the message `Do you want to Input as the Bump Pad?` This message is only shown when the Z position is altered by more than 8 μm to focus the pad surface. To input the bump pad as the reference pad, press YES. To not input the bump pad, press NO.

The stage then moves to the area where the first registered pad will be located (corresponding to registered pin number 2).

15 Center the crosshairs on the pad center and focus the image using the Z control arrows. Adjust, if necessary, the size of the pad size-setting frame to fit around the edge of the pad.

16 Press OK to input the first registered pad; the stage then moves to the area where the second registered pad will be located (corresponding to registered pin number 3).

17 Center the crosshairs on the pad center and focus the image using the Z control arrows. Adjust, if necessary, the pad size-setting frame to fit around the edge of the pad.

18 Press OK. The second registered pad is input, and the stage moves to the area where the third registered pad will be located (corresponding to registered pin number 4).

19 Center the crosshairs on the pad center and focus the image using the Z control arrows. Adjust, if necessary, the size of the pad size-setting frame to fit around the edge of the pad.

20 Press OK. The third registered pad is input. After inputting the reference pad and three registered pad positions, a message menu is displayed stating `Execute Inspection Pad Designation?` or the purposes of this procedure, press DON'T INPUT. Inspection functions will be discussed in **Chapter 6, Creating an Advanced Setup File (see page 249)**.

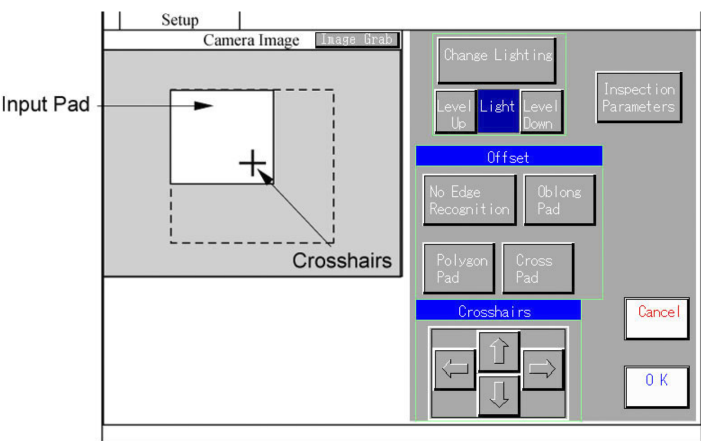
The setup file creation process is continued in **3.17 Verifying Wafer Alignment (see page 111)**.

Inputting Pad Center Offsets

NOTE **Pad center position offsets automatically center the pad when inputting pad positions. The program does not calculate X, Y, Z, and θ offsets at this point.**

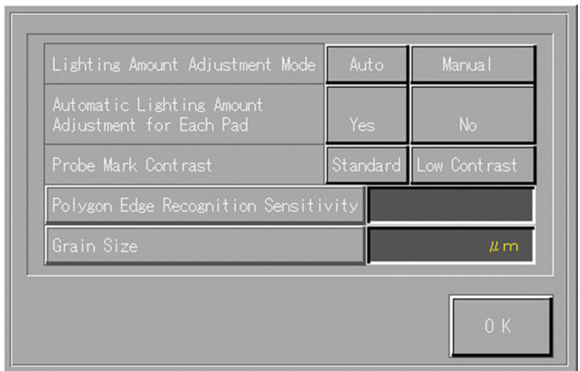
21 After inputting the reference pad and three registered pad positions, the reference pad is displayed on the *Registered Pad Centering Correction Menu*.

Registered Pad Centering Correction Menu



22 Press INSPECTION PARAMETERS on the *Registered Pad Centering Correction Menu*. The *Inspection Parameters Menu* is displayed.

Inspection Parameters Menu



23 Set each parameter.

23.1 Select the adjustment mode for the amount of lighting.

To have the prober adjust the lighting automatically during training, press AUTO for `Lighting Amount Adjustment Mode`.

To manually adjust the lighting used during training, press MANUAL for `Lighting Amount Adjustment Mode`.

23.2 Select the lighting amount adjustment mode for each pad.

To have the prober adjust the lighting individually for each pad, press YES for `Automatic Lighting Amount Adjustment for Each Pad`.

To have the prober adjust the lighting at the beginning of training only, press NO for `Automatic Lighting Amount Adjustment for Each Pad`.

23.3 Select the contrast for the Probe Mark Inspection (PMI) pad and the probe mark.

Press STANDARD for `Probe Mark Contrast` if the probe mark is clearly visible.

Press LOW CONTRAST for `Probe Mark Contrast` if the probe mark is barely visible. The low contrast setting optimizes the prober to recognize probe marks that are difficult to distinguish.

23.4 Select the recognition sensitivity for polygon edges. Since recognition of glass edges is difficult when training polygon edges, set the range of recognition sensitivity from `-100` to `+100`. The recognition sensitivity setting will depend upon the image displayed. If the glass edge is faint, increase the sensitivity. If it is too grainy, decrease the sensitivity.

NOTE **`Polygon Edge Recognition Sensitivity` is an option only when training polygon pads.**

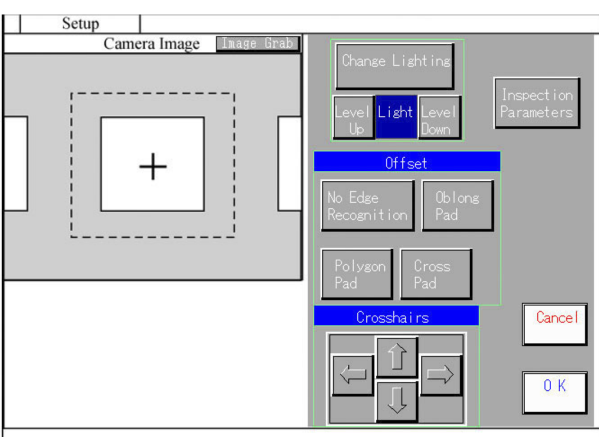
23.5 Select the grain size that will not be recognized (diameter 0 to 10 µm) by the prober. This setting prevents the prober from confusing grains as probe marks which could cause a mis-recognition error.

24 After setting each parameter, press OK on the *Inspection Parameters Menu*. The *Registered Pad Centering Menu* is displayed.

25 Use the control buttons to move the crosshairs so that they are not positioned above the probe mark, if the pad has one.

26 Press the OFFSET button that corresponds to the pad shape. For example, press OBLONG PAD for a square or rectangle-shaped pad. The XY stage is moved so that the pad center is under the crosshairs.

Registered Pad Centering Menu



27 Press OK after checking the pad center and crosshairs position. The offset amount is input, and a message menu is displayed stating `Execute Inspection Pad Designation?`

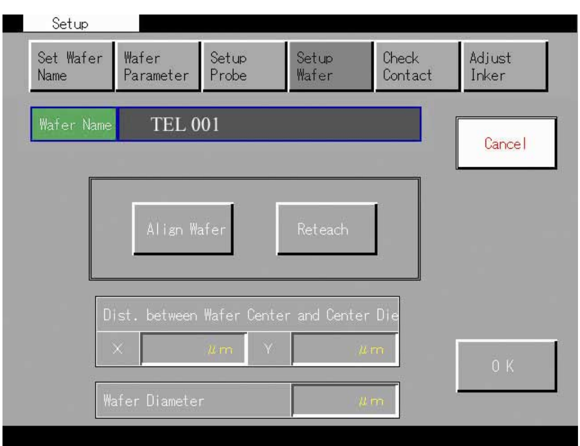
28 For the purposes of this procedure, press DON'T INPUT. Inspection functions will be discussed in **Chapter 6, Creating an Advanced Setup File (see page 249)**.

The setup file creation process is continued in **3.17 Verifying Wafer Alignment (see page 111)**.

3.17 Verifying Wafer Alignment 0432.1

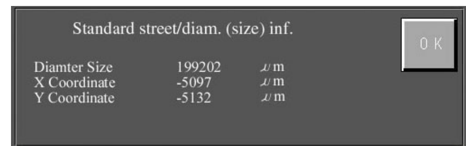
1 Press ALIGN WAFER on the *Setup Menu*.

Align Wafer Setup Menu



2 Wafer alignment is performed, and the alignment results are displayed.

Alignment Results Display Menu



3 After checking the results, press OK. The *Align Wafer Setup Menu* is displayed.

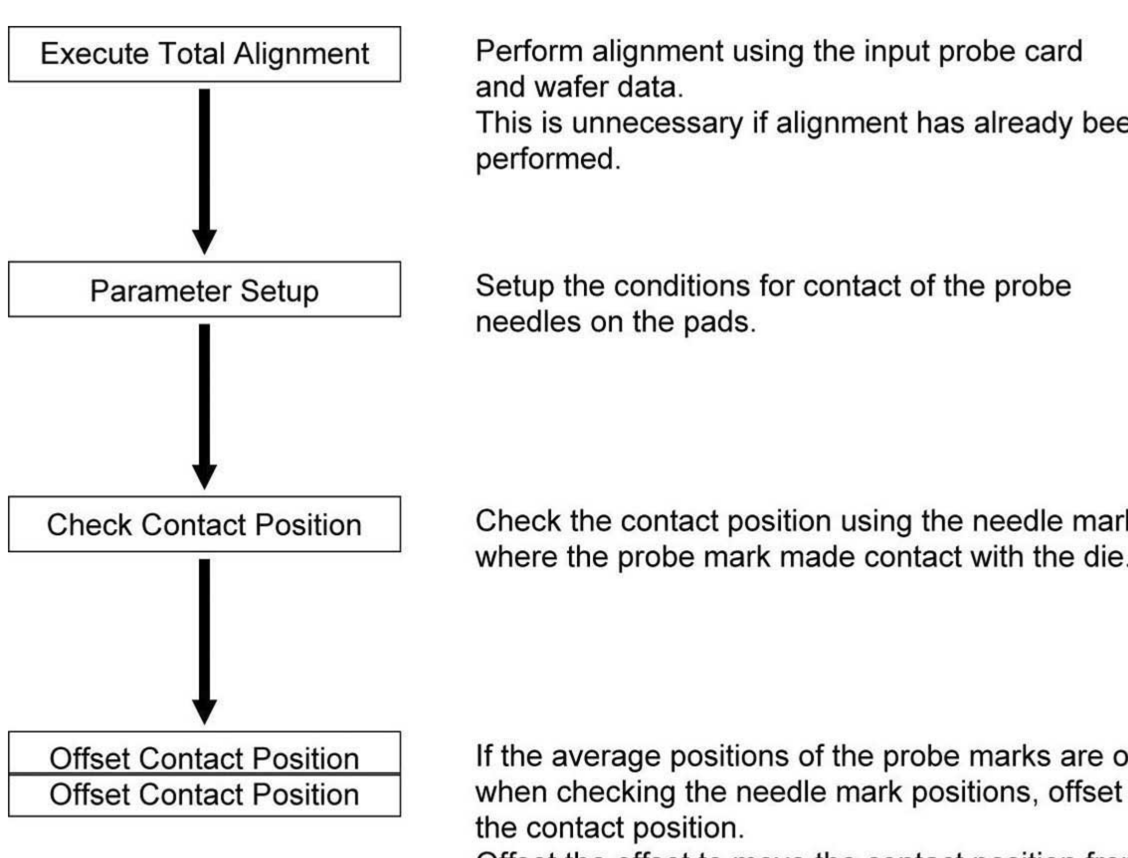
4 If an alignment error occurred, press RE-TEACH and re-input the wafer data.

5 Press OK on the *Align Wafer Setup Menu* to continue to the *Contact Check Setup Menu* and continue to setup the wafer file.

3.18 Performing a Contact Check 0433.1

Contact check parameters are set based on the data input for the probes and die during the setup process. The contact position is checked and offset before testing to ensure that all of the probes contact the correct die in the correct place. A block diagram of the contact check process follows.

Block Diagram of a Contact Check



3.19 Configuring Contact Check Parameters 0434.1

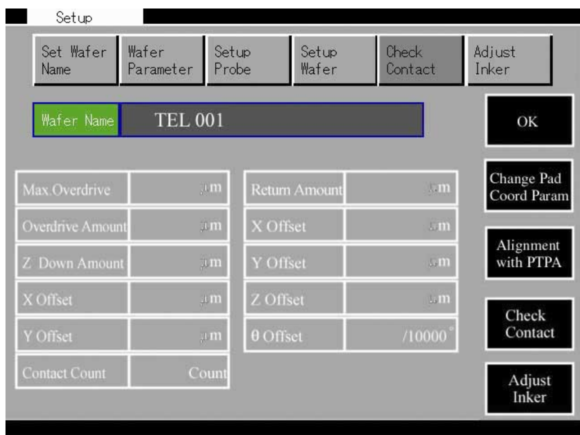
Introduction

Overview:

Specific contact settings include overdrive, Z down amount, contact count, and any shift of contact point position or X, Y, Z, Theta PTPA alignment correction offsets. This procedure describes how to set contact check parameters.

1 Check that `Check Contact` on the *Setup Menu* is highlighted.

Wafer File Check Contact Menu



2 Input all the settings. Refer to the table below for a description and explanation of each menu option.

Menu Option	Setting/Range	Description
`Max. Overdrive`	Up to 1000 µm	Sets the upper limit for the overdrive amount. If the overdrive amount is changed while testing, the prober will not use anything over the upper limit.
`Overdrive Amount`	(Overdrive Return - Z Down Amount) to Max. Overdrive µm	Sets the amount of overdrive applied when the probes make contact with the wafer. **NOTE** **Refer to 6.18 Changing Contact Check Parameters (see page 301) for instructions on changing the Overdrive Return.**
`Z Down Amount`	200 to 500 µm	Sets the amount the chuck will lower in the Z axis when positioning a die for testing.
`X Offset`	- (Die Size X ÷ 2) to (Die Size X ÷ 2) µm	Displays the offset amount in the X direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when the contact point is offset in the X direction; however, you can change the settings.

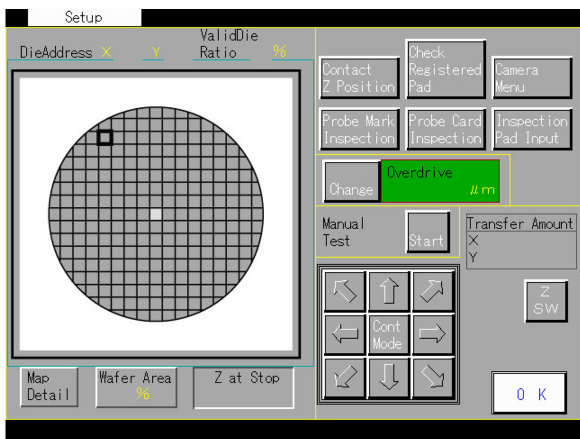
Menu Option	Setting/Range	Description
`Y Offset`	- (Die Size Y ÷ 2) to (Die Size Y ÷ 2) µm	Displays the offset amount in the Y direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when the contact point is offset in the Y direction; however, you can change the settings.
`Contact Count`	1 to 10 times	Sets the number of times the wafer contacts the probes. More than one contact may be necessary to ensure good contact between the wafer and the probes.
`Return Amount`	0 to Overdrive Amount µm	Sets the amount the Z axis will lower from the position where the pad contacts the probes.
`X Offset`	-10,000 to 10,000 µm	Displays the X offset amount when offsetting in the theta direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when offsetting in the theta direction during contact check; however, you can change the settings.
`Y Offset`	-10,000 to 10,000 µm	Displays the Y offset amount when offsetting in the theta direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when offsetting in the theta direction during contact check; however, you can change the settings.
`Z Offset`	-10,000 to 255 µm	Displays the X offset amount when offsetting in the theta direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when offsetting in the theta direction during contact check; however, you can change the settings. **NOTE** **Be sure to input a value that is smaller than the `Z Down Amount`-200 and whose absolute value is less than the `Max. Overdrive`. If the value is larger than the `Z Down Amount`-200, then the prober will stop testing and display the following message: M0087 Z PTPA Correction Reached the Z Down Amount. If the absolute value is larger than the `Max. Overdrive`, the prober will stop testing and display the following message: M0086 Z PTPA Correction reached the maximum overdrive value.**
`Theta Offset`	-50,000 to 50,000/ 10,000°	Displays the Theta offset amount when offsetting in the theta direction when the contact point (the contact position that does not include the overdrive amount determined by the prober) is displaced. The offset amount is automatically set when offsetting in the theta direction during contact check; however, you can change the settings.

NOTE **The** `X Offset`**,** `Y Offset`**,** `Z Offset` **and** `Theta Offset` **parameters are saved in the probe card file.**

3.20 Performing a Contact Check 0435.1

1 Press CHECK CONTACT on the *Contact Check Menu*. The prober performs a total alignment if an alignment has not been performed. The *Contact Down Position Menu* is displayed.

Contact Down Position Menu



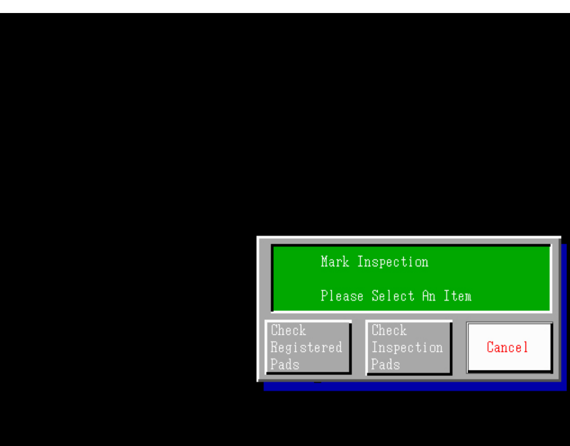
2 Use the control buttons to position the shaded square over the die on which to check the contact position.

3 Press Z SW. The probes make contact with the designated die.

4 Press Z SW again. The probes separate from the wafer surface.

5 Press CAMERA MENU; then press CHECK REGISTERED PAD. A message menu is displayed stating `Mark Inspection. Please Select An Item.`

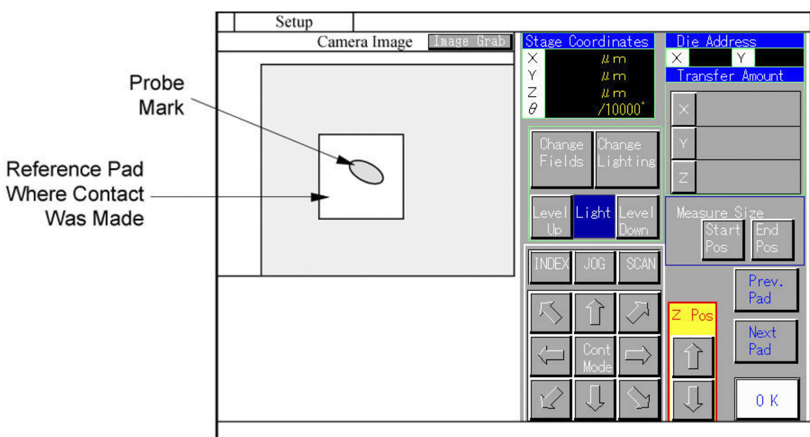
Check Registered Pad Menu



NOTE **If the wafer files contains the inspection pad addresses for PMI, PCI or PTPA, then a message menu is displayed stating, `Mark Inspection. Please Select an Item.` If the wafer file contains no inspection pad addresses for PMI, PCI, or PTPA, then the reference pad is displayed in the *Stage Control Menu*.**

6 Press the name of the pad to be checked (for example, CHECK REGISTERED PADS). The specified pad is displayed on the *Stage Control Menu*.

Stage Control Menu



NOTE **Two kinds of overdrive are displayed on the *Contact Down Menu*: Z1/Z2 mm. The first overdrive, Z1, is the actual Z up amount after the software compensation for probe load. The second overdrive, Z2, is the setting amount from the overdrive parameter.**

7 Check the probe mark position. Press NEXT PAD to view the next registered pad; the registered pads are displayed in order. When the probe mark is off the pad, the contact position may need to be adjusted using an offset. The next procedure, **3.21 Implementing PTPA Position Corrections and Offsets (see page 118)**, describes how to offset the contact position.

8 If there was no problem with the contact position, press OK. Press OK on the *Contact Down Position Menu* to complete the contact check. The *Check Contact Menu* is displayed.

3.21 Implementing PTPA Position Corrections and Offsets 0436.1

Introduction

Purpose:

To check, correct, and/or offset the contact position.

Adjusting the contact positions of the probe to pad alignments can be done using the PTPA Corrections and/or the Z and XY Contact Position Offsets. PTPA Correctional Offsets are intended to correct for contact alignment calculations. The Z and XY Contact Position Offsets are used to intentionally change the point of contact to a specified position.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A FOUP of wafers or single wafer and a probe card

NOTE **This procedure assumes that a FOUP of wafers is on the load port or a single wafer is on the wafer table. If a FOUP is not loaded, then the procedure cannot be completed.**

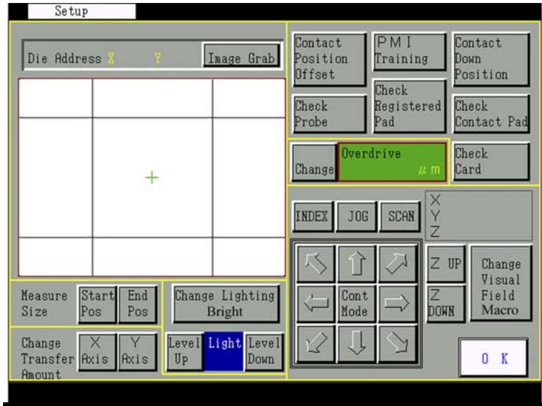
The procedure also assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, then the procedure cannot be completed.

Setting an XY PTPA Alignment Correction

NOTE **Use the XY PTPA correction offset if the probe marks are all out of position along the linear axis. Since XY controls the left/right motion of the main chuck, adjusting this direction can reposition the probes into the correct position.**

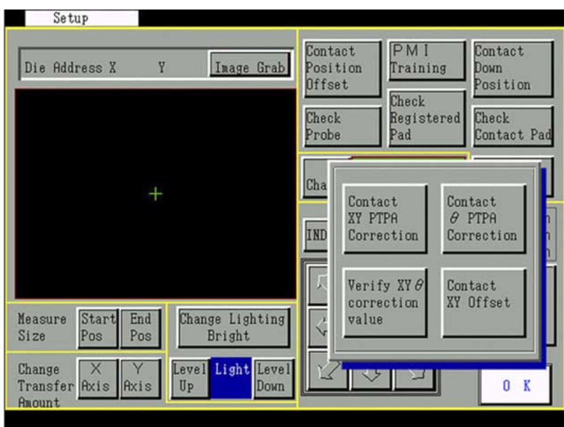
1 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



2 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

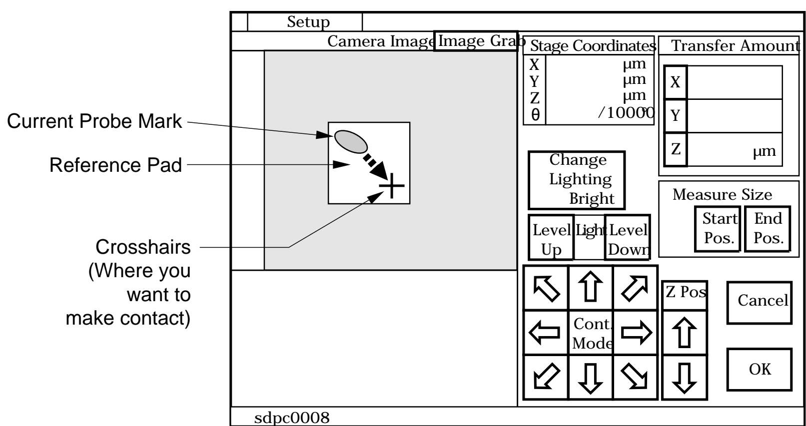
Contact Position Offset Selection Menu



3 Press CONTACT XY PTPA CORRECTION. The reference pad, designated by the wafer file parameters, is displayed on a *Stage Control Menu*.

4 Use the control buttons to move the contact position on the crosshairs.

Stage Control Menu



5 Press OK. A message menu is displayed asking **Teach preset amount?**

6 Press YES. The *XY PTPA Offset Display Menu* is displayed.

XY PTPA Offset Display Menu

7 Check the values displayed on the *XY PTPA Offset Display Menu*. The values displayed for the X and Y PTPA offset represent the amount, in microns, that the crosshairs on the *Stage Control Menu* were moved. After checking the displayed offset for each axis, press OK. The offset amounts are saved and the *Camera Menu* is displayed.

8 If you want to change the contact position XY PTPA offset again, press RESET.

9 After changing the offset, press OK. The *Setup Menu* is displayed.

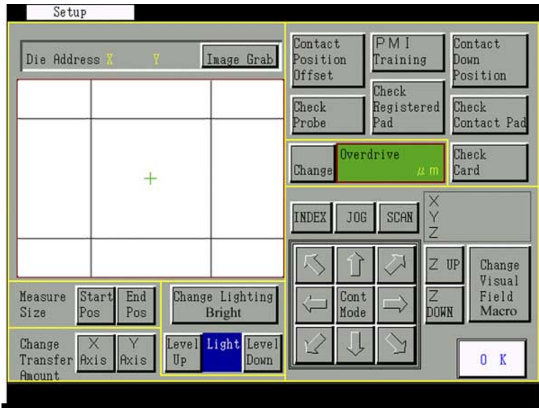
NOTE **The crosshair will turn to its original position if the offset transfer amount exceeds 100 µm. Make sure to select an offset position that is within 100 µm.**

Setting a Theta PTPA Alignment Correction

NOTE **The theta PTPA correction offset should be used if each probe mark position differs in rotational placement per pad along the theta axis. Imprecise alignment is the primary cause of this type of problem. Since theta controls the rotation of the chuck, adjusting this direction can help to further align the wafer and the probe card. If a theta offset does not fix the placement problem, the probe card itself should be inspected for flaws.**

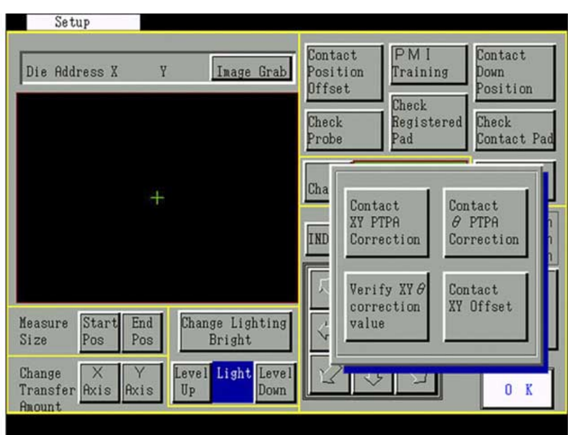
10 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



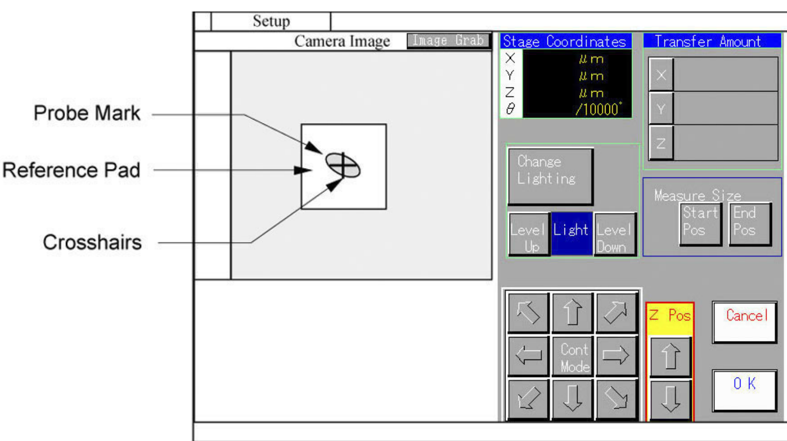
11 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

Contact Position Offset Selection Menu



12 Press CONTACT THETA PTPA CORRECTION. The reference pad, designated by the wafer file parameters, is displayed on the *Stage Control Menu*.

Stage Control Menu



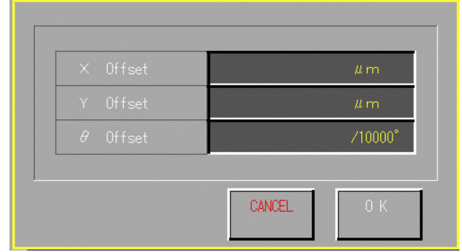
13 Use the control buttons to position the center of the probe mark on the crosshairs.

14 Press OK. Registered pad (2) is displayed.

15 Repeat Steps 13 and 14 to position the crosshairs on the center of the probe mark for the other registered pads.

16 After positioning all of the registered pads, press OK. The *XY Theta PTPA Correction Offset Amount Display Menu* is displayed. It shows the new position calculated by the prober.

XY Theta PTPA Correction Offset Amount Display Menu



17 After checking the offset amount for each direction, press OK. A check menu is displayed stating `The wafer will be aligned because theta was offset.` Press OK. The prober performs wafer alignment and displays the *Camera Menu*. The offset amount for the theta direction is saved to the offset amount parameter.

The XY theta correction amount can no longer be changed.

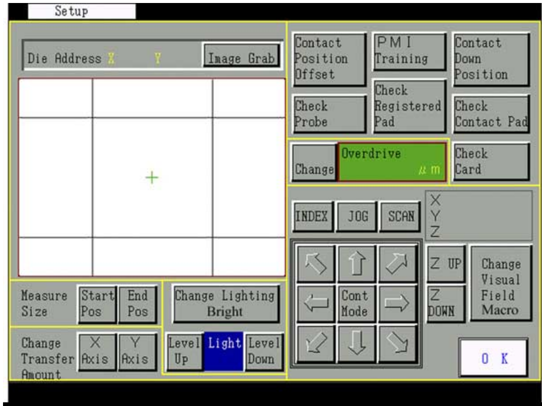
18 Press OK to end the contact check. The *Setup Menu* is displayed.

Setting an XY Offset

NOTE **The XY offset is an intentional shift in the XY axis contact position. This positioning is applied after alignment is performed, and is used to offset the calculated contact position to the desired position.**

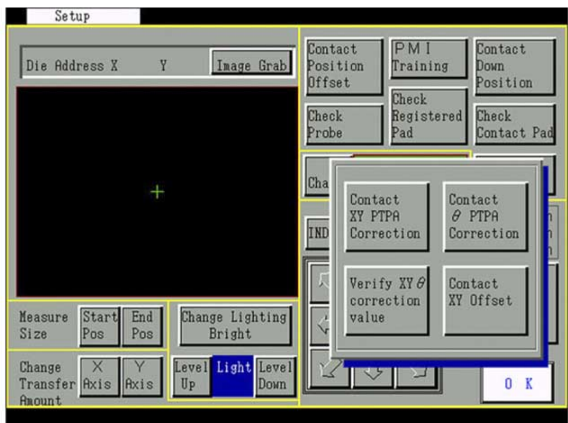
19 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

▼ **Camera Menu**



20 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

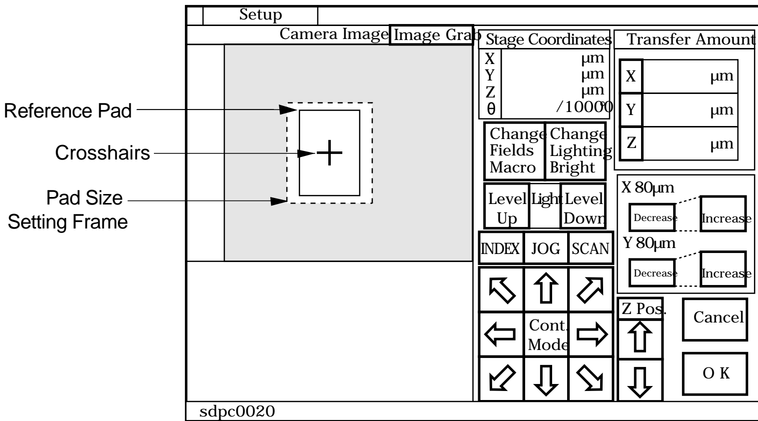
▼ **Contact Position Offset Selection Menu**



21 Press CONTACT XY OFFSET. The reference pad, designated by the wafer file parameters, is displayed on the *Stage Control Menu*.

22 Use the control buttons to position the crosshairs over the desired contact position.

Stage Control Menu



23 Press OK. A message menu is displayed asking `Teach preset amount?`

24 Press YES. The *XY Offset Display Menu* is displayed. The values displayed for the X and Y offset represent the amount, in microns, that the crosshairs on the *Stage Control Menu* were moved.

XY Offset Display Menu

25 After checking the displayed offset for each axis, press OK. The offset amounts are saved and a check menu is displayed.

26 If you want to change the contact position XY offset again, then press RESET. If you do not want to change the offset, then press YES on the check menu. The offset amounts are saved and the *Camera Menu* is displayed.

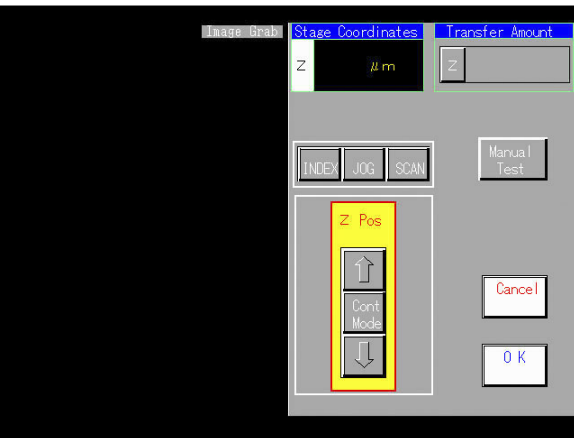
27 Press OK on the *Camera Menu*. The *Setup Menu* is displayed.

Setting a Z Contact Offset

NOTE **Use the Z direction offset if the probe mark was too heavy or too light. Since the Z controls the up/down motion of the chuck, adjusting this direction will cause the contact height to change. Since the amount of overdrive used to create the probe mark is unchanged, any change to the contact height will cause the mark to be heavier or lighter.**

28 Press CONTACT Z POSITION on the *Contact Down Position Menu*. The *Z Position Setting Menu* is displayed.

▾ **Z Position Setting Menu**



29 Use the up or down arrow buttons to change the height of the chuck while checking the Z coordinate.

> **CAUTION** **Property Damage Hazard**
> **When pressing the up arrow, set the indexing amount to** JOG**. If the indexing amount is too large, the probe card could be damaged by the impact of the die hitting the probes.**

30 If the Z coordinate is correct, (see **3.20 Performing a Contact Check (see page 116)** for instructions on how to perform a contact check), then press OK. A check menu is displayed asking **Teach Preset Amount?**

31 Press YES. The Z offset amount is saved in the wafer file parameters and the *Contact Down Position Menu* is displayed.

32 After changing the offset to complete the contact check, press OK. The *Setup Menu* is displayed.

3.22 Inputting the Reference Die Position 0438.1

Introduction

Purpose:

You can set a probe area (testing area) on the prober when `Probe Area Select` and `Skip Area Select` are set to USE in the Wafer Parameters. You can also set a PMI area and an IDI area on the prober when `Ink Dot Inspection` (IDI) and `Probe Mark Inspection` (PMI) are set to FREE INSPECTION AREA This procedure assumes that `Reference Die, Probe Area, and Skip Area`are set to YES in the Wafer Parameters. Also, `Control Map`must be off.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Overview:

Perform probe area selection while you watch the wafer map or the camera image displayed on the menu. When you adjust the die position displayed on the camera image, press SETUP CAMERA VIEW to display the *Camera Image Setting Menu*. Press CAMERA VIEW or WAFER MAP to view the wafer map or the camera image during reference die selection.

The wafer map also displays the die attributes through a color-coding system. Press DIE ATTRIBUTES to check the meaning of each color. For example, a test die is green and a PMI die has horizontal stripes. Input the reference die position before you input the probe, skip, PMI, or IDI areas.

Use the following steps to input the reference die position:

1 Use the following steps to change menus:

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

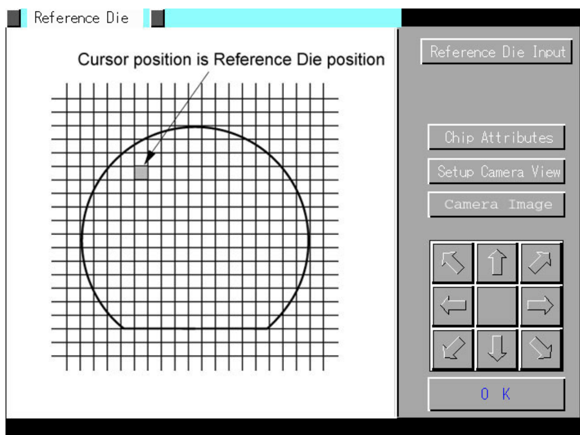
1.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.4 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection. Press OK.

1.5 Press WAFER MAP to view the *Reference Die Input Menu*.

2 Use the control buttons to position the cursor on the reference die.

Reference Die Input Menu (Wafer Map)



3 Press REFERENCE DIE INPUT. The reference die position is input, and a red “X” is displayed on the reference die.

NOTE **Press** REFERENCE DIE INPUT **to save the reference die position. If you press** OK **first, a message will be displayed stating,** `The reference die has not been set.`

4 Press OK. A message menu is displayed stating `Reference Die is registered.`

5 Press OK on the message menu. The *Select Probe Area Menu* is displayed.

3.23 Loading Control Maps 0440.1

Introduction

Purpose:

To load control maps to the prober hard disk drive.

Instead of selecting a reference die, probe area, skip area and PMI area, you can use a control map to manage these functions. This procedure can be performed only if the wafer parameters for a particular file have been set to USE for `Control Map` on the *Control Map Menu*. To verify or change these settings, follow the procedure described in **4.6 Control Map Parameters (see page 151)**.

If the wafer parameter for `Control Map` is set to DON'T USE on the *Control Map Menu*, then you do not need to load the control maps.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Insert a floppy disk containing the control maps into the prober floppy disk drive.

> **NOTE** **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press OK on the *Setup Menu*. A check menu is displayed, asking `End Setup?`

3 Press YES. The *Control Map Load Menu* is displayed.

> **NOTE** **Press BACK to return to the previous parameter.**

4 Press LOAD. The control map is loaded and input into the parameters file of the currently active wafer file. After loading is complete, the *Setup Menu* is displayed.

3.24 Designating the Probe Area 0441.1

Introduction

Purpose:

To input the probe area columns and rows.

It is possible to check and/or change the probe area after you have input it. The probe area cannot be set unless a reference die has been specified.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

A maximum of 200 rows in the Y direction can be input for the probe area.

Inputting the Probe Area

1 Use the following steps to access the *Reference Die Input Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

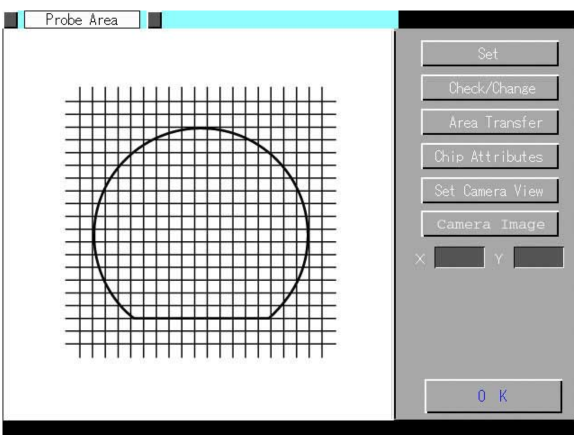
1.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.4 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection. Press OK.

1.5 Press WAFER MAP. The *Reference Die Input Menu* is displayed.

2 Verify that a red X, signifying that a reference die has been set, is present on the *Reference Die Input Menu*. Press OK on the *Reference Die Input Menu*. The *Select Probe Area Menu* is displayed.

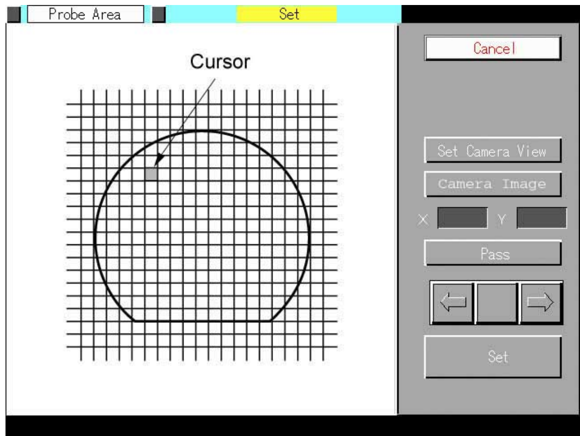
Select Probe Area Menu



3 Press SET on the *Select Probe Area Menu*.

4 The cursor moves to the upper left die position on the wafer and the *Probe Area Setting Menu* is displayed.

Probe Area Setting Menu (Wafer Map)



Set the probe area rows. Select a die on both the left and right edges of a row within the desired probe area; that row will then be set as part of the testing area. The left and right-edge die do not have to be on the left and right edges of the wafer; they can fall anywhere on the wafer. Continue to select left and right-edge die on each row until all your chosen rows are selected.

Use the following buttons to set the probe area:

- SET Selects the current die (cursor location) as part of the probe area.
- PASS Does not select the current die (cursor location) as part of the probe area.
- LEFT ARROW, RIGHT ARROW Moves the cursor in the X direction to select the left and right edges of the current probe area row.

5 Use the following steps to set the probe area.

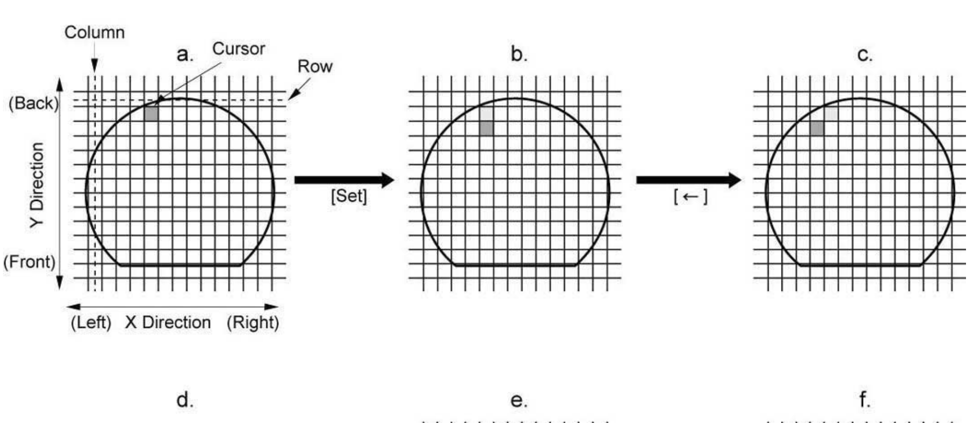
5.1 Select the die on the left edge of each row by pressing SET or PASS. Once a selection is made the cursor automatically moves down the left side of the wafer to the next die.

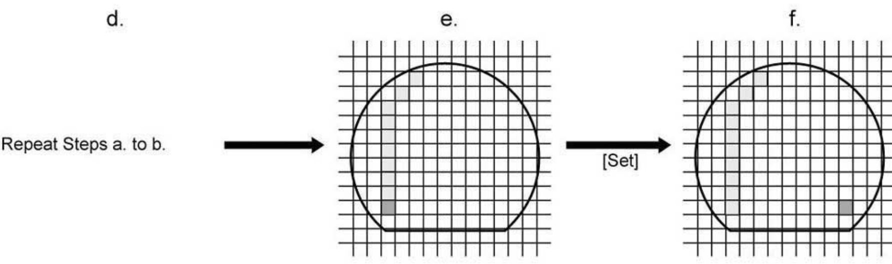
5.2 Set the probe area on the left side of the wafer. When you finish setting the left side of the probe area, the cursor automatically moves to the right side of the wafer.

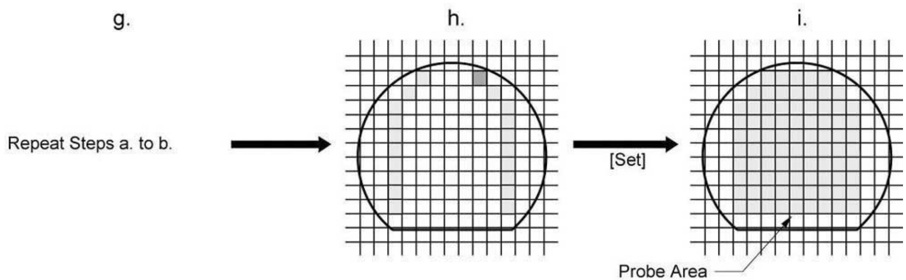
5.3 Select the right edge die for each row by pressing SET, or PASS, or by repositioning the cursor. When you finish setting the probe area, the *Select Probe Area Menu* is displayed.

6 If you do not want to check or change the probe area, press OK. A check menu is displayed stating `Input the Skip Area.` Press OK to input the probe area and to display the *Select Probe Area Menu*.

Probe Area Setting







Checking and Revising the Probe Area

7 Use the following steps to change menus:

7.1 Press SETUP on the *Main Menu*.

7.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

7.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

7.4 Press WAFER TRANSFER on the *Probe Area Menu*to transfer a wafer to the chuck top. For information on how to transfer a wafer to the chuck top, refer to **3.7 Transferring a Wafer (see page 86)**.

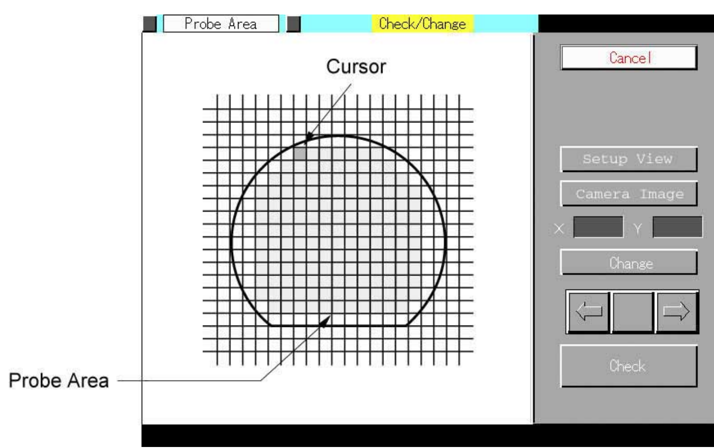
7.5 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection and press OK.

7.6 Press WAFER MAP to view the *Reference Die Input Menu*.

8 Verify that a red X, signifying that a reference die has been set, is present on the *Reference Die Input Menu*. Press OK on the *Reference Die Input Menu*. The *Select Probe Area Menu* is displayed.

9 Press CHECK/CHANGE on the *Select Probe Area Menu* to display the probe area. The cursor will move to the upper left die position of the probe area.

Probe Area Check/Change Menu (Wafer Map)

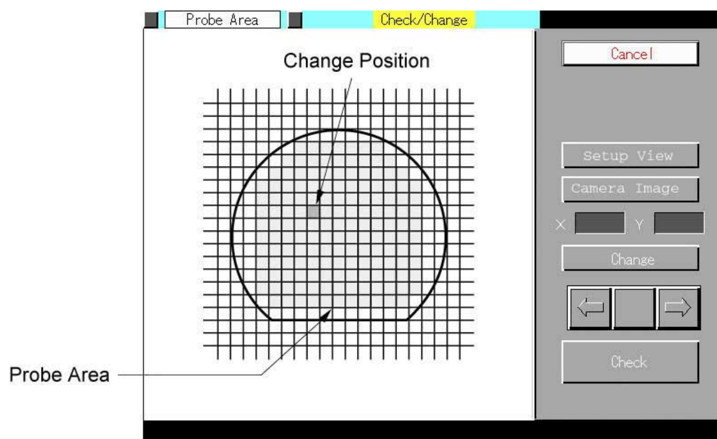


10 Check the probe area.

- If the probe area does not need to be changed, press CANCEL.
- If the probe area should be changed, press CHECK.

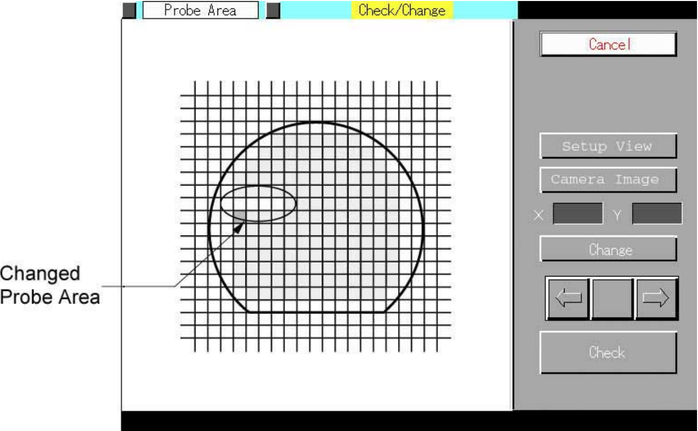
11 Use the arrow control buttons to position the cursor on a die on the edge of the probe area row to be changed. Press CHANGE.

Probe Area Check/Change Menu (Wafer Map)



12 Use the arrow control buttons to position the cursor on a die that is on the opposite edge of the probe area row that will be changed. Press CHANGE. The probe area is revised.

Probe Area Check/Change Menu (Wafer Map)



13 Repeat steps 11 and 12 to revise other probe area rows.

14 After completing all changes, press CANCEL. A check menu is displayed stating `Save the changed position?` Press YES. The probe area is updated and the *Select Probe Area Menu* is displayed.

Moving the Probe Area

15 Use the following steps to access the *Reference Die Input Menu*.

15.1 Press SETUP on the *Main Menu*.

15.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

15.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

15.4 Press WAFER TRANSFER on the *Probe Area Menu* to transfer a wafer to the main chuck.

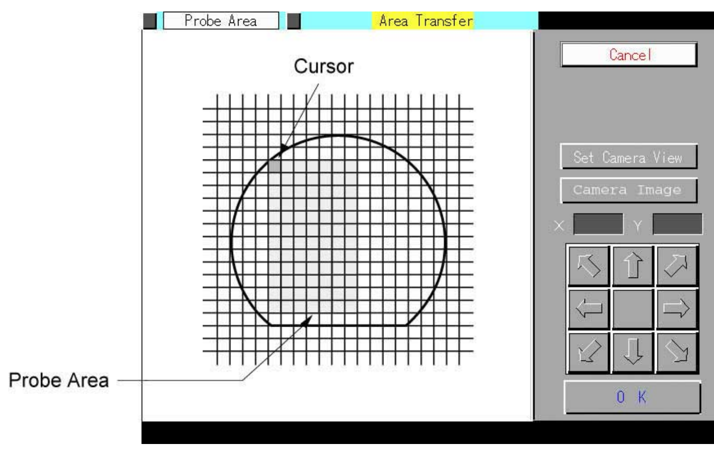
15.5 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection. Press OK.

15.6 Press WAFER MAP to view the *Reference Die Input Menu*.

16 Verify that a red X, signifying that a reference die has been set, is present on the *Reference Die Input Menu*. Press OK on the *Reference Die Input Menu*. The *Select Probe Area Menu* is displayed.

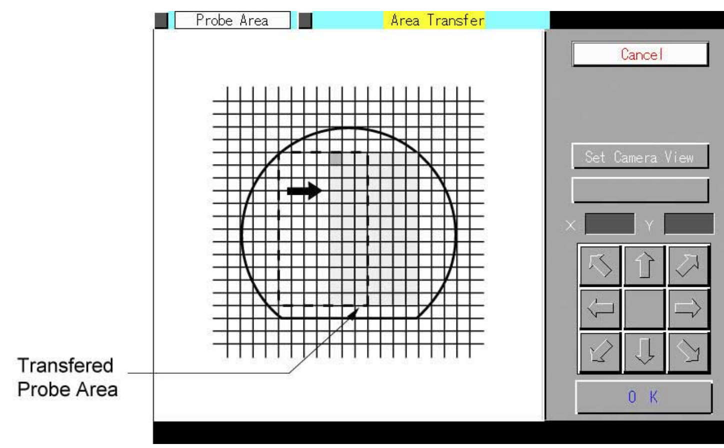
17 Press AREA TRANSFER on the *Select Probe Area Menu*. The *Probe Area Transfer Menu* is displayed, and the cursor moves to the upper left die position of the probe area.

Probe Area Transfer Menu (Wafer Map)



18 Use the arrow control buttons to transfer the probe area to the desired position.

Probe Area Transfer Menu (Wafer Map)



NOTE **The position of the upper left die is the basis for movement of the probe area.**

19 After transferring, press OK. The probe area is updated and the *Select Probe Area Menu* is displayed.

3.25 Designating the Skip Area 0442.1

Introduction

Purpose:

To designate the skip area.

You can input a maximum of 200 die for the skip area. Once the skip area is selected, you can check, disable, or delete it if it is no longer needed.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

You cannot set the skip area unless you have specified a reference die.

1 Use the following steps to access the *Reference Die Input Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.4 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection and press OK.

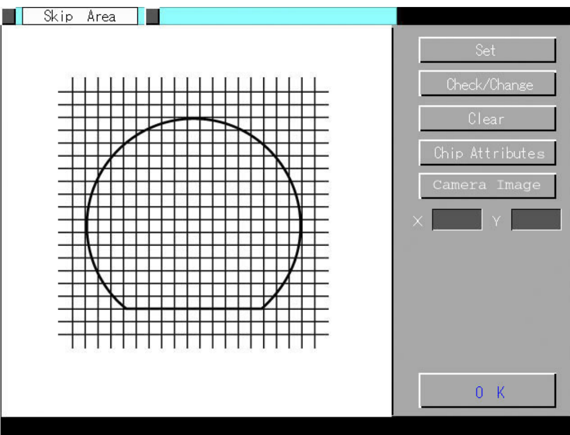
1.5 Press WAFER MAP to view the *Reference Die Input Menu*.

2 Verify that a red X, signifying that a reference die has been set, is present on the *Reference Die Input Menu*. Press OK on the *Reference Die Input Menu*. The *Select Probe Area Menu* is displayed.

3 Verify that a probe area has been set and is displayed on the *Select Probe Area Menu*.

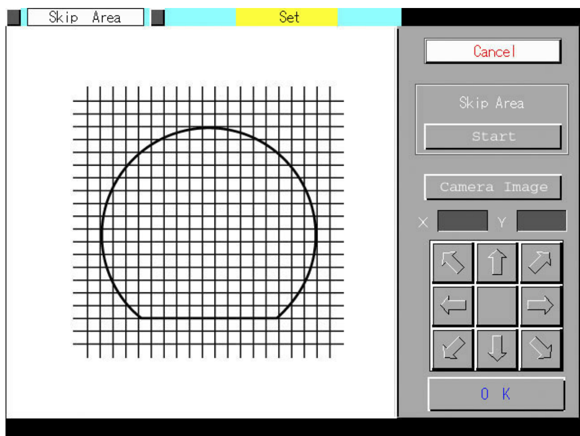
4 Press OK on the *Select Probe Area Menu*. The *Select Skip Area Menu* is displayed.

Select Skip Area Menu (Wafer Map)



5 Press SET. The *Skip Area Setting Menu* is displayed.

Skip Area Setting Menu (Wafer Map)



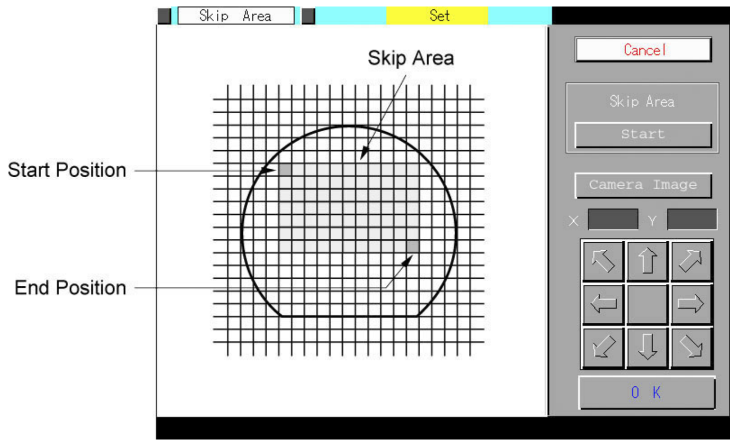
6 Use the arrow control buttons to position the cursor on the starting position of the skip area.

7 Press START POSITION. The skip area start position is input.

8 Use the arrow control buttons to position the cursor on the end position of the skip area.

9 Press END POSITION. The row and column from the start position to the end position is set as the skip area.

Skip Area Setting Menu (Wafer Map)



10 If you want to set more skip areas, repeat steps 6 through 9.

11 After setting the skip areas, press OK. The *Select Skip Area Menu* is displayed.

12 If you do not want to check, change, or delete the set skip areas, press OK. The skip area is input and the *Select PMI Area Menu* is displayed.

3.26 Checking and Disabling the Skip Area 0443.1

Introduction

Purpose:

Once you have selected the skip area, you can check, disable, or delete it if it is no longer needed.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Use the following steps to access the *Reference Die Input Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.4 Press WAFER TRANSFER on the *Probe Area Menu* to transfer a wafer to the chuck top.

1.5 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. The prober will attempt to locate a street intersection; if it cannot, use the control buttons to position the crosshairs on an intersection and press OK.

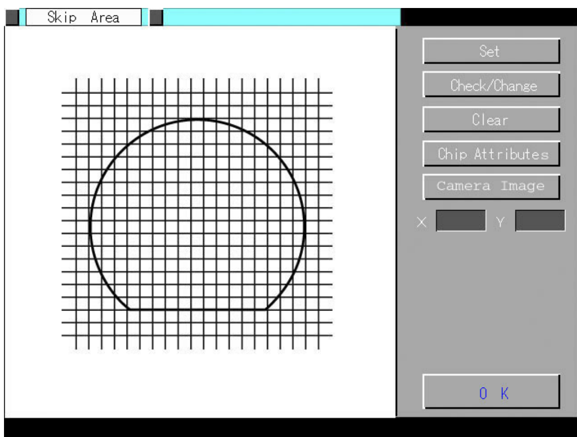
1.6 Press WAFER MAP to display the *Reference Die Input Menu*. The wafer map is displayed on this menu.

2 Verify that a red X, signifying that a reference die has been set, is present on the *Reference Die Input Menu*. Press OK to display the *Select Probe Area Menu*.

3 Verify that a probe area has been set and is displayed on the *Select Probe Area Menu*. Press OK on the *Select Probe Area Menu*. The *Select Skip Area Menu* is displayed.

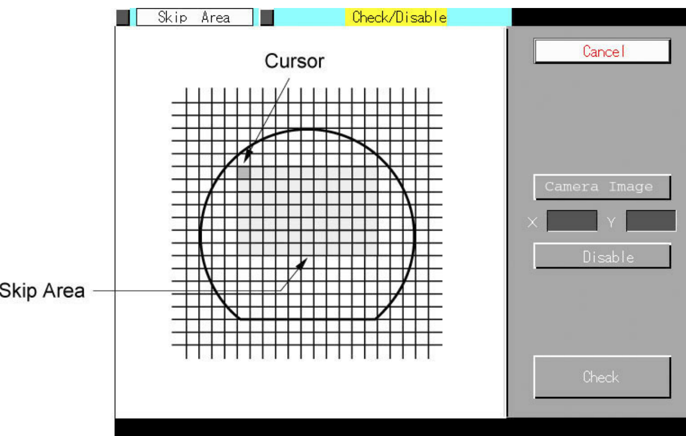
4 Press CHECK/CHANGE on the *Select Skip Area Menu*.

▼ **Select Skip Area Menu**



5 The *Check/Disable Skip Areas Menu* is displayed. The cursor moves to the first skip die position.

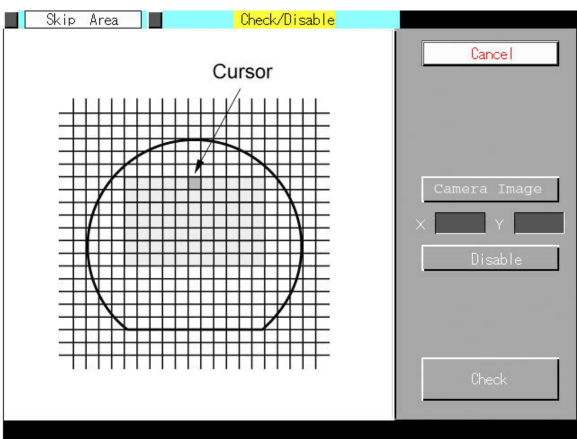
▼ **Check/Disable Skip Areas Menu (Wafer Map)**



6 Check the skip area. If you do not want to disable the skip area, press CANCEL.

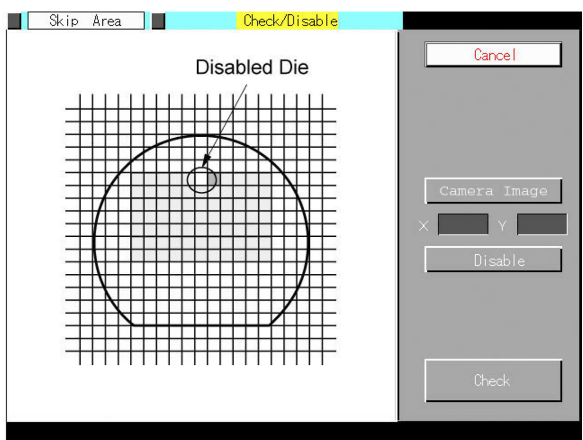
7 Press CHECK and move the cursor to the die that you want to disable. The cursor moves in one die increments within the skip area.

Skip Area Check/Disable Menu (Wafer Map)



8 Press DISABLE. The selected die is disabled as part of the skip area.

Skip Area Check/Change Menu (Wafer Map)



9 If you want to continue disabling other die, repeat steps 7 through 8.

10 After disabling, press CANCEL. A check menu stating `Save the changed position?` is displayed.

11 Press YES. The skip area is updated and the *Select Skip Area Menu* is displayed.

NOTE **To delete skip areas, press CLEAR on the *Select Skip Area Menu*. A check menu stating is displayed asking, `Is it okay to clear?` Press YES to delete the skip area.**

3.27 Completing the Setup File Process 0445.1

Introduction

Purpose:

To finish the setup file creation process.

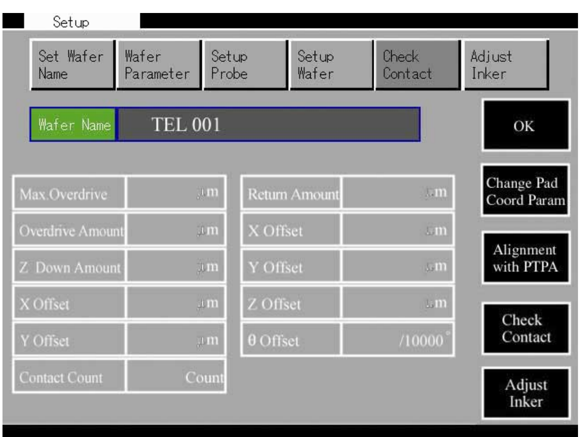
The setup file creation process must be finished correctly in order for the new setup file to be saved to the prober hard disk. Testing with the new wafer file can only be done after the setup file creation process is complete.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Check that the *Setup Menu* is displayed. The *Setup Menu* display differs after you have finished creating the setup file.

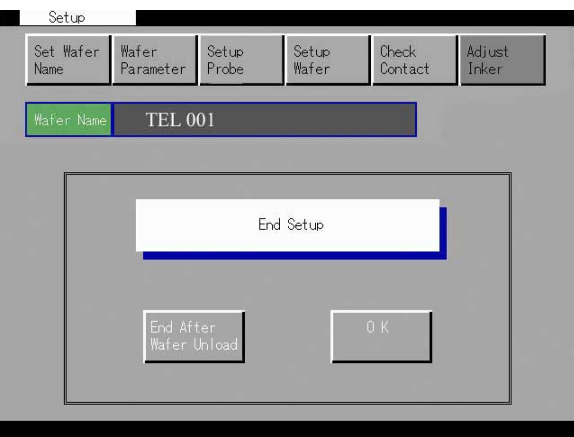
Setup Menu



2 Press OK. A check menu is displayed stating `Do you want to end setup?`

3 Press YES. The *End Setup Menu* is displayed.

End Setup Menu



NOTE **Press BACK to return to the previous parameter.**

4 Use one of the following methods to end the setup file creation process.

- To end immediately, press OK. The *Setup Menu* is displayed.
- To end after a wafer is unloaded, press END AFTER WAFER UNLOAD. A message menu is displayed stating `Transferring Wafer.` After the wafer is unloaded, the *Setup Menu* is displayed.

Wafer Parameters

This chapter lists, describes, and defines the wafer parameter settings. **4.2 Accessing Wafer Parameters (see page 145)** provides the steps to navigate to the appropriate wafer parameter menu, make any necessary changes, and save the new settings. The menu screen and available settings of each wafer parameter are presented the following topics.

4.1 Wafer Parameters: Overview 0446.1

Wafer parameters contain detailed information about the wafer, probe card, and optional units and how they function during testing. Wafer parameters are file specific. Each product file that is created will have its own set of wafer parameters. The wafer parameters are listed below:

CAUTION **Property Damage Hazard**

Only personnel who have been trained and have authorization should access and/or alter wafer parameters.

- 4.3 Basic Wafer Parameters (see page 146)
- 4.4 Consecutive Fail Parameters (see page 148)
- 4.5 Overdrive Parameters (see page 150)
- 4.6 Control Map Parameters (see page 151)
- 4.7 Multi-Testing Parameters (see page 152)
- 4.9 Gross Parameters (see page 160)
- 4.10 Specific Flat Orientation Parameters (see page 161)
- 4.11 Probe Mark Inspection Parameters (see page 162)
- 4.12 Select Probe Area Parameters (see page 169)
- 4.13 Select Skip Area Parameters (see page 171)
- 4.14 Polish Needle Parameters (see page 172)
- 4.15 Reference Die Parameter (see page 178)
- 4.16 Sample Testing Parameters (see page 179)
- 4.20 Pad Coordinate Parameters (see page 185)
- 4.22 Probe Card Inspection Parameters (see page 188)
- 4.24 Stage Control Parameter (see page 194)
- 4.25 Bump Alignment Parameter (see page 195)
- 4.26 Hot Chuck Parameters (see page 196)
- 4.27 Contact Correction at High Temp Parameters (see page 197)

4.2 Accessing Wafer Parameters 0448.1

1 Use the following steps to access the *Wafer Parameter Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press WAFER PARAMETER on the *Change Setup Wafer Data Menu*. The *Wafer Parameter Input Menu* is displayed.

1.4 Press FILENAME on the *Wafer Parameter Input Menu*.

1.5 Locate and press the filename that contains the wafer parameter to be changed. If necessary, use the UP and DOWN scroll arrows to locate the filename.

1.6 After selecting the filename, press OK.

1.7 Press PARAMETERS on the *Wafer Parameter Input Menu*.

1.8 Press the specific parameter button on the *Wafer Parameter Item Selection Menu*. If necessary, use the scroll bar UP and DOWN arrows to view the desired option. The appropriate *Wafer Parameter Menu* is displayed.

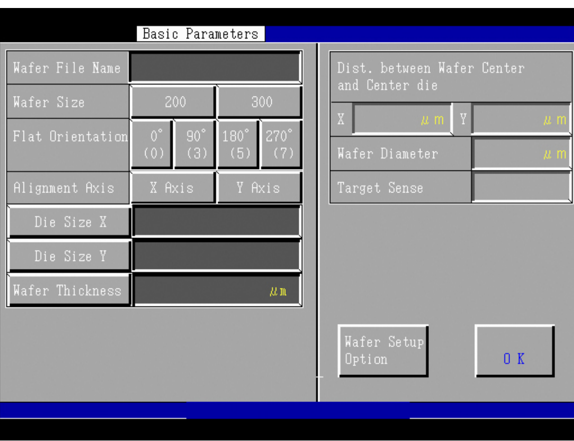
2 Set each parameter. Refer to the appropriate section below for a description and explanation of each menu option.

3 After confirming all of the settings, press OK. A check menu is displayed, asking `Is it OK to change the setting value?` Press YES. The settings are input and the *Wafer Parameter Item Selection Menu* is displayed.

4.3 Basic Wafer Parameters 0450.1

Pressing BASIC PARAMETER allows you to access and change the basic wafer parameter settings.

Basic Wafer Parameters Menu



Basic Wafer Parameters

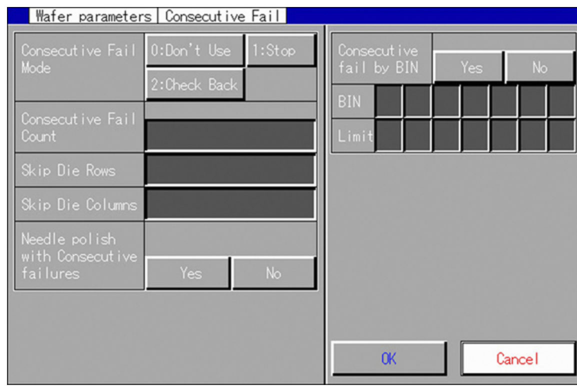
Parameter Name	Setting/Range	Contents
`Wafer Size`	200, 300	Displays the wafer size input as part of the control map or during creation of the wafer file.
`Flat Orientation`	0° (0), 90° (3), 180° (5), 270° (7)	Displays the direction of the wafer flat or notch orientation when it is loaded to the chuck top. This setting can be input as part of the control maps, or during creation of the wafer file. **Flat Orientation Designation** (0) 0° Flat Orientation (7) 270° 90° (3) Wafer Main Chuck 180° (5) Prober Front
`Die Size X`	300—80,000 µm	Displays the die size in the X direction. This value can be input as part of the control map or during creation of the wafer file. **NOTE** **For the Die Size X parameter, the guaranteed range for the alignment operation is 350-76000 µm.**

Parameter Name	Setting/Range	Contents
`Die Size Y`	300—80,000 µm	Displays the die size in the Y direction. This value can be input as part of the control map or during creation of the wafer file. **NOTE** **For the Die Size Y parameter, the guaranteed range for the alignment operation is 350-76000 µm.**
`Edge Correction`	1—100%	Sets the valid area size of the die to be tested. Input the valid die area percentage to be tested, with 100% indicating the whole die. Die outside the setting area are not tested.
`Preset Address X`	0—255	Assigns the X coordinate of the reference die. This value can be input as part of the control map or during creation of the wafer file.
`Preset Address Y`	0—255	Assigns the Y coordinate of the reference die. This value can be input as part of the control map or during creation of the wafer file.

4.4 Consecutive Fail Parameters 0451.1

Pressing CONSECUTIVE FAIL allows you to access and change the consecutive fail parameter settings. The **Consecutive Fail Mode** parameter is not applicable to GPIB measurement.

Consecutive Fail Menu



Consecutive Fail Parameters

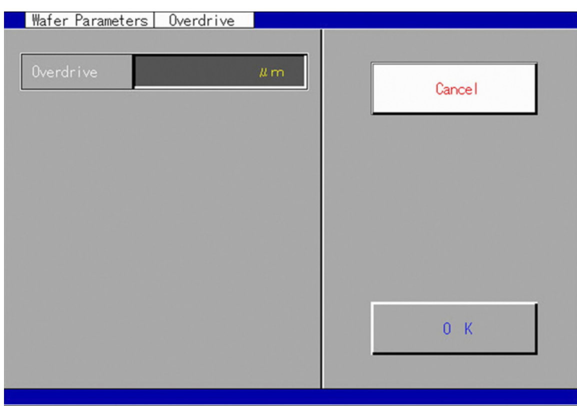
Parameter Name	Setting/Range	Contents
`Consecutive Fail Mode`	0: DON'T USE 1: STOP 2: CHECK BACK	Sets the prober's movement when there have been consecutive die failures (defects). When using multi-test, consecutive failures are counted for each channel. 0: DON'T USE: Consecutive fail mode is not active. 1: STOP: Stops testing when the consecutive fail count is exceeded. 2: CHECK BACK: If the consecutive fail count is exceeded, the prober will re-test the last known good die. If the re-tested pass die still passes, the prober will resume testing with the first untested die after the consecutive fails. If the die fails on its re-test when it had passed initially, testing stops and an assist message is displayed. **NOTE** **Consecutive Fail Mode must be set to either** 1: STOP **or** 2: CHECK BACK **for any of the other parameters on this menu to be valid.**
`Consecutive Fail Count`	1—999	Sets the number of consecutive fail dies before executing 1: STOP or 2: CHECK BACK. When using multi-test, separate counts are made for each channel.
`Skip Die Rows`	0— 9	Sets the die arrangement to be excluded from the consecutive fail count. Input the number of rows from the top and bottom of the probe area. When consecutive failures occur outside of this boundary, they will not be counted as consecutive fails. This setting optimizes the consecutive fail count for the higher fail rate expected at the edges of wafers.

Parameter Name	Setting/Range	Contents
Skip Die Columns	0— 9	Sets the die arrangement to be excluded from the consecutive fail count. Input the number of columns from the left and right sides of the probe area. When consecutive failures occur outside of this boundary, they will not be counted as consecutive fails. This setting optimizes the consecutive fail count for the higher fail rate expected at the edges of wafers.
Needle Polish with Consecutive Failures	YES, NO	This parameter is valid when Consecutive Fail Mode is set to 2: CHECK BACK, Polish Needle is set to YES, and Polish Mode on the *Polish Needle Parameter Menu*is set to POLISHER. Sets whether or not to execute cleaning when the testing results from Check Back differ from the previous time. YES: Executes probe polish. NO: Does not execute probe polish.
Consecutive Fail by BIN	YES, NO	This parameter is valid when Consecutive Fail Mode is set to 1: STOP or 2: CHECK BACK and when BIN input is set to YES. YES:Consecutive fail by BIN is valid. NO: Consecutive fail by BIN is invalid.
BIN	0—9, A—Z	This parameter is active when Consecutive Fail by BIN is set to YES. Sets the seven BIN types used for counting consecutive failures by BIN.
Limit	0—99	This parameter is active when Consecutive Fail by BIN is set to YES. Sets the count used to execute a 1: STOP or a 2: CHECK BACK for the consecutive failures for the upper row BIN.

4.5 Overdrive Parameters 0452.1

Pressing OVERDRIVE allows you to access and change the overdrive parameter settings.

Overdrive Parameters Menu



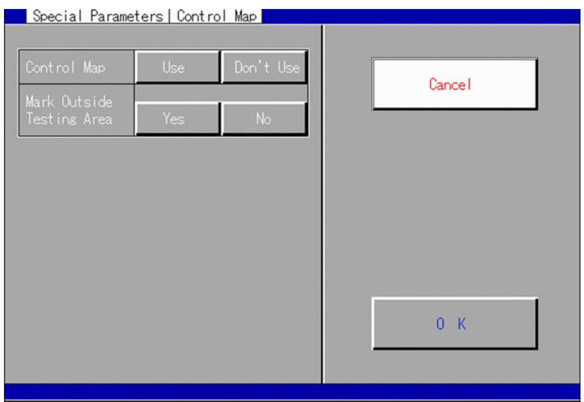
Overdrive Parameters

Parameter Name	Setting/Range	Contents
Overdrive	(Overdrive return - Z Down Amount) to maximum overdrive µm	Sets how much farther the prober will drive (overdrive amount) after the probe tip has made contact with the Probe Polish Pad (or the Probe Polish Wafer). Displays the overdrive that was input in the Check Contact Parameters. **NOTE** **To set the overdrive to ensure the probes will not contact the wafer during probing, decrease the overdrive amount.**

4.6 Control Map Parameters 0453.1

Pressing CONTROL MAP allows you to access and change the control map parameter settings.

Control Map Parameters Menu



Control Map Parameters

Parameter Name	Setting/Range	Contents
`Control Map`	USE, DON'T USE	Sets whether to use a control map created on a personal computer. USE: Uses control maps created on a personal computer. The control maps must be created on a personal computer and then loaded to the prober. DON'T USE: Does not use control maps created on a personal computer. **NOTE** **Control Map must be set to USE for the other menu items to be active.**
`Marking (Inking) Outside Testing Area`	YES, NO	Sets whether to put ink dots on the die outside the probe area (testing area) set in the control map. YES: Ink die outside the probe area. NO: Does not ink die outside the probe area. **NOTE** **The current system software, version Rzz00–R014.05, does not support this parameter.**

4.7 Multi-Testing Parameters 0454.1

Pressing MULTI TESTING allows you to set parameters if the probe card is a multi-card (a card capable of probing more than one die at a time).

Multi-Testing Parameters Menu

Multi-Testing Parameters

Parameter Name	Setting/Range	Contents
`Multi-Testing`	YES, NO	This parameter is active when a control map is used. Sets whether or not to use the multi-test set in the control map. YES: Multi-testing is executed. NO: Multi-testing is not executed.
`Multi-Testing Mode`	2, 3, 4, 8, FREE	Sets the number of channels/die on the multi-card.
`Optimum Probing Mode`	1, 2, 3, DUT1, STANDARD, FREE	The configuration of multi-cards sometimes causes one set of probes to be at or past the edge of the wafer, while another set of probes is testing an edge die. If some probes on a card make contact with the edge of a wafer but other probes on the same card do not make contact with anything, probes can become pinched, bent, or broken. This setting optimizes the probing mode to minimize the number of probes not making contact with the wafer when multi-testing. 1: Position the testing start position for each probe area row as the reference position. 2: Position so that the overhang left and right is averaged for each probe area row. STANDARD:Position all rows in the same way so that the overhang left and right is averaged for the largest probe area row. **NOTE** **The settings 3, DUT1, and FREE cannot be selected on the prober. They are displayed only if those settings were included in the control map.**
`Input CH`	1–64	Identifies the channel number of the die location; the die location includes the reference pin that was set during probe card input.

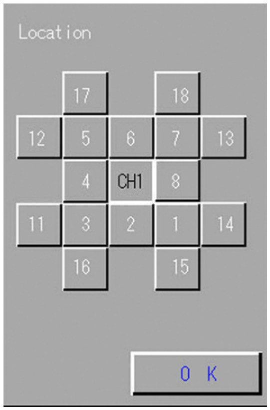
4.8 Location Setting Method 0455.1

Configuring for Multi-Testing Mode 2

Use the following steps to set the CH positions when `Multi-Testing Mode` is set to 2.

1 Press SET MULTI DETAILS on the *Multi-Testing Menu*. The *Multi-Location Setting Menu (2)* is displayed.

Multi-Location Setting Menu (2)



2 Select the CH2 position with CH1 in the center position.

3 Press OK. CH2 is saved.

Configuring for Multi-Testing Mode 3

Use the following steps to set the CH positions when `Multi-Testing Mode` is set to 3.

4 Press SET MULTI DETAILS on the *Multi-Testing Menu*. The *Multi-Location Setting Menu (3)* is displayed.

Multi-Location Setting Menu (3)

5 Set each parameter. Refer to the following table for a description and explanation of each menu option.

Multi-Testing Parameters

Parameter	Setting/Range	Contents
Location	X, Y	Indicates the multi-card location direction. Refer to the **Multi-Location Patterns** diagram below for further explanation. X: Horizontal direction. Y: Vertical direction.
X: CH1Pos.	LEFT, RIGHT	This parameter is valid when LOCATION is set to X. Indicates the horizontal direction for CH1. LEFT: Far left. RIGHT: Far right.
Y: CH1Pos.	UP, DOWN	This parameter is valid when LOCATION is set to Y. Indicates the vertical direction for CH1. UP: Top. DOWN: Bottom.

Multi-Location Patterns

Location:X

CH1	CH2	CH3

CH3	CH2	CH1

Location:Y

CH1	CH3
CH2	CH2
CH3	CH1

NOTE **The CH2 and CH3 positions are determined based on CH1.**

6 After confirming all of the settings, press OK on the *Multi-Location Setting Menu (3)*. The parameters are saved.

Configuring for Multi-Testing Mode 4

NOTE **Use the following steps to set the CH positions when `Multi-Testing Mode` is set to 4.**

7 Press SET MULTI DETAILS on the *Multi-Testing Menu*. The *Multi-Location Setting Menu (4)* is displayed.

Multi-Location Setting Menu (4)

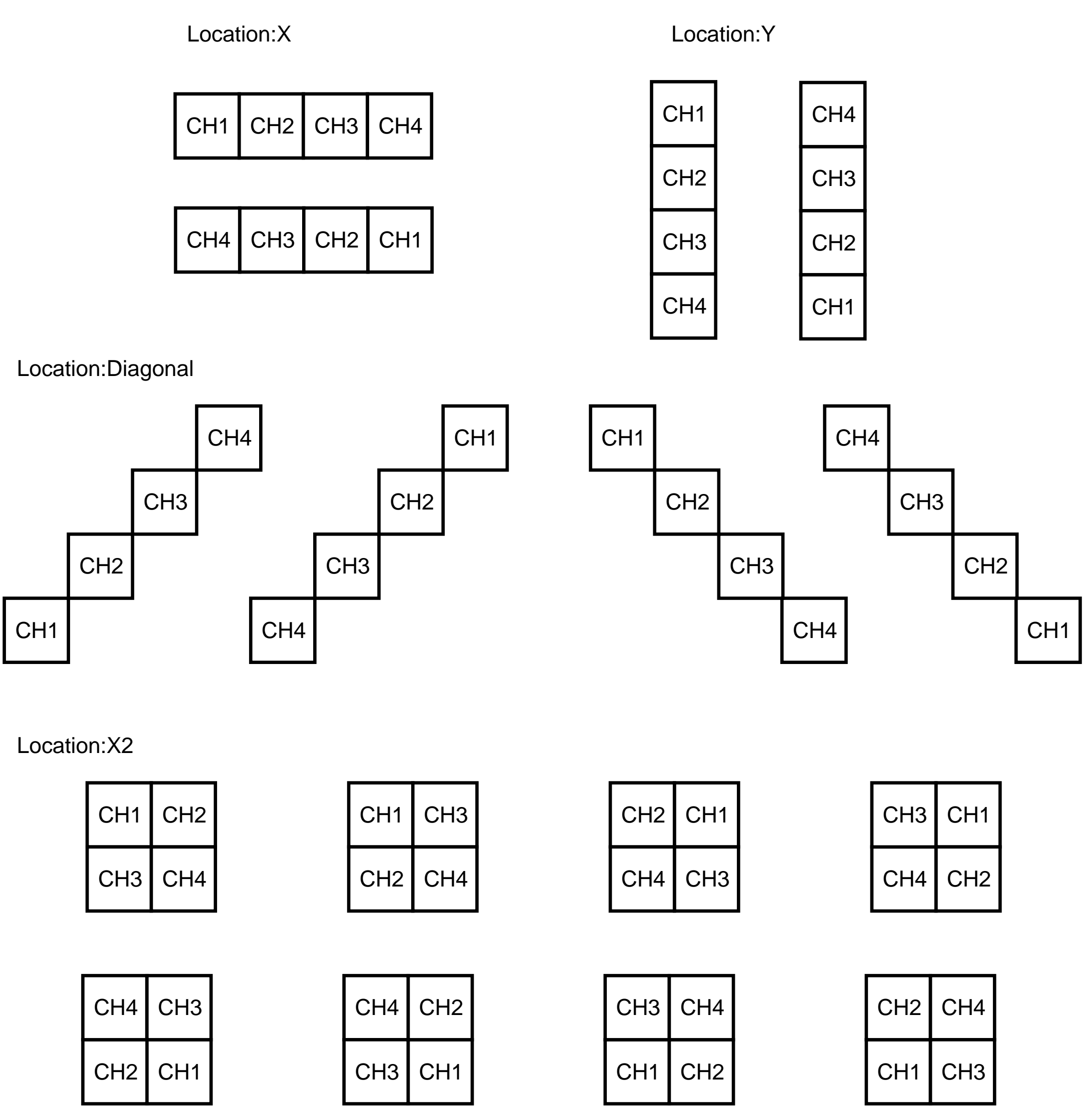
8 Set each parameter. Refer to the following table for a description and explanation of each menu option.

Multi-Testing Parameters

Parameter	Setting/Range	Contents
Location	X, Y, X2, DIAG	Indicates the multi-card location direction. Refer to the **Multi-Location Patterns (4)** diagram below for further explanation. X: Horizontal direction. Y: Vertical direction. X2: Square DIAG: Slanted
X: CH1Pos.	LEFT, RIGHT	This parameter is valid when LOCATION is set to X. Indicates the horizontal direction for CH1. LEFT: Far left. RIGHT: Far right.
Y: CH1Pos.	UP, DOWN	This parameter is valid when LOCATION is set to Y. Indicates the vertical direction for CH1. UP: Top. DOWN: Bottom.
X2/Diag CH1 Pos.	LEFT UP, RIGHT UP, LEFT DOWN, RIGHT DOWN	This parameter is valid when LOCATION is set to X2 or DIAG. LEFT UP: RIGHT UP: Square, upper right. LEFT DOWN: Slanted, lower left. RIGHT DOWN:

Parameter	Setting/Range	Contents
`2X2 CH Dir`	HORIZ, VERT.	This parameter is valid when LOCATION is set to X2. VERT.: Vertical position in relation to CH1. HORIZ: Horizontal position in relation to CH1. **NOTE** **Select the CH2 position when the location is square. Select the CH2 position with CH1 position as a reference.**

Multi-Location Patterns (4)



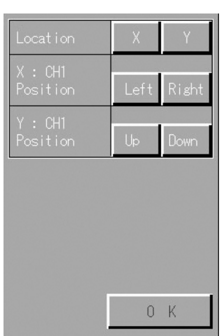
9 After confirming all of the settings, press OK on the *Multi-Location Setting Menu (4)*. The parameters are saved.

Configuring for Multi-Testing Mode 8

NOTE **Use the following steps to set the CH positions when `Multi-Testing Mode` is set to 8.**

10 Press SET MULTI DETAILS on the *Multi-Testing Menu*. The *Multi-Location Setting Menu (8)* is displayed.

Multi-Location Setting Menu (8)



11 Set each parameter. Refer to the following table for a description and explanation of each menu option.

Multi-Testing Parameters

Parameter	Setting/Range	Contents
`Location`	X, Y,	Indicates the multi-card location direction. X: Horizontal direction. Y: Vertical direction.
`X: CH1Position`	LEFT, RIGHT	This parameter is valid when LOCATION is set to X. Indicates the horizontal direction for CH1. LEFT: Far left. RIGHT: Far right.
`Y: CH1Position`	UP, DOWN	This parameter is valid when LOCATION is set to Y. Indicates the vertical direction for CH1. UP: Top. DOWN: Bottom. **NOTE** **CH2 — CH8 positions are determined based on CH1.**

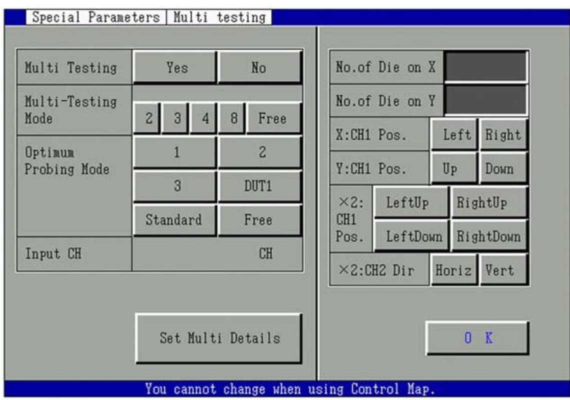
12 After confirming all of the settings, press OK on the *Multi-Location Setting Menu*. The parameters are saved.

Configuring for Multi-Testing Mode Free

NOTE **Use the following steps to set the CH positions when `Multi-Testing Mode` is set to FREE.**

13 Press SET MULTI DETAILS on the *Multi-Testing Menu*. The *Multi-Location Setting Menu (Free)* is displayed.

Multi-Location Setting Menu (Free)



14 Set each parameter. Refer to the following table for a description and explanation of each menu option.

Multi-Testing Parameters

Parameter	Setting/Range	Contents
`No. of Die on X`	1— 64	Indicates the number of die in the X direction. **NOTE** **The value of** NO. OF DIE ON X **must match the following formula:** **(No. of Die on X) x (No. of Die on Y) □ 64**
`No. of Die on Y`	1— 64	Indicates the number of die in the Y direction. **NOTE** **The value of** NO. OF DIE ON Y **must match the following formula:** **(No. of Die on X) x (No. of Die on Y) □ 64**
`X: CH1Pos.`	LEFT, RIGHT	This parameter is valid when NO. OF DIE ON X is set to 2 or more and NO. OF DIE ON Y is set to 1. Indicates the horizontal direction for CH1. LEFT: Far left. RIGHT: Far right.
`Y: CH1Pos.`	UP, DOWN	This parameter is valid when NO. OF DIE ON X is set to 1 and NO. OF DIE ON Y is set to 2 or more. Indicates the vertical direction for CH1. UP: Top. DOWN: Bottom.

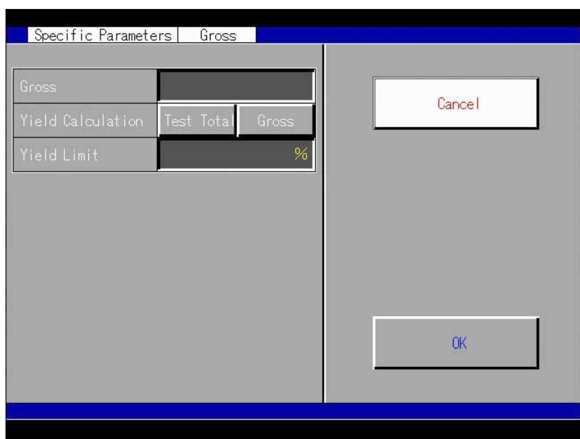
Parameter	Setting/Range	Contents
`X2: CH1 Pos.`	LEFT UP, RIGHT UP, LEFT DOWN, RIGHT DOWN	This parameter is valid when NO. OF DIE ON X and NO. OF DIE ON Y are set to 2 or more. Indicates the position for CH1. LEFT UP: Square, upper left. RIGHT UP: Square, upper right. LEFT DOWN: Square, lower left. RIGHT DOWN: Square, upper right.
`X2: CH2 Dir`	HORIZ, VERT.	This parameter is valid when NO. OF DIE ON X and NO. OF DIE ON Y are set to 2 or more. Indicate the CH2 position with CH1 position as a reference. VERT.: Vertical position in relation to CH1. HORIZ: Horizontal position in relation to CH1. **NOTE** **Select the CH2 position when the location is square. Select the CH2 position with CH1 position as a reference.**

15 After confirming all of the settings, press OK on the *Multi-Location Setting Menu (Free)*. The parameters are saved.

4.9 Gross Parameters 0456.1

Pressing GROSS allows you to access and change the gross parameter settings. Gross parameters set the parameters used to calculate the yield (pass rate) per wafer.

Gross Parameters Menu



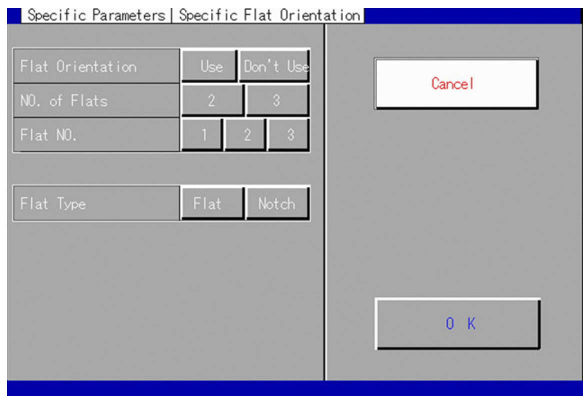
Gross Parameters

Parameter Name	Setting/Range	Contents
Gross	0—99,999	This parameter is active when Yield Calculation is set to GROSS, Check Yield on the *Post Marking Menu* is set to YES, and Bad Yieldon the *Printer Menu* is set to YES. Sets the number of dies on one wafer.
Yield Calculation	TEST TOTAL, GROSS	Sets the method for calculating the yield. The results of the yield calculation are displayed on the testing menu. TEST TOTAL: Calculates the yield for the entire number of tested dies. Formula: Yield = (Pass Die Total ÷ Total Number of Test Dies) X 100%. GROSS:Calculates the yield for the settings in Gross. Formula: Yield = (Pass Die Gross) x 100%.
Yield Limit	0—99%	Sets the lower limit value of the yield. At the end of each tested wafer, the prober compares the actual yield to the value of this setting. If the actual yield falls below the yield limit, and if the Bad Yield parameter is set to YES, then the prober prints BAD YIELD in the printed test results.

4.10 Specific Flat Orientation Parameters 0457.1

Pressing SPECIFIC FLAT ORIENTATION allows you to access and change the specific flat orientation parameter settings. This parameter is set when you test wafers that have multiple cut edges/flats.

Specific Flat Orientation Menu



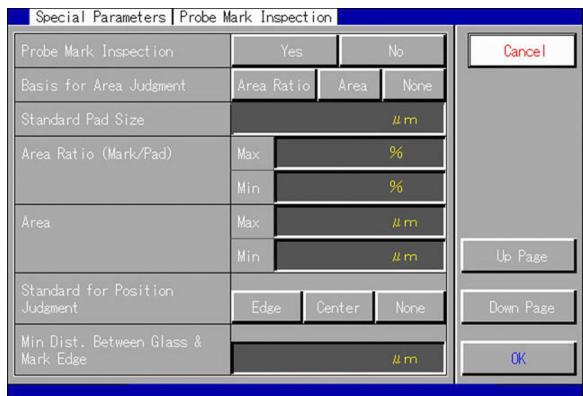
Specific Flat Orientation Parameters

Parameter Name	Setting/Range	Contents
`Flat Orientation`	USE, DON'T USE	Sets how to test wafers with multiple flat edges. USE:Test wafers with multiple cut edges. DON'T USE:Test wafers with only one cut edge. **NOTE** **Flat Orientation must be set to USE to activate the other menu items.**
`NO. of Flats`	2, 3	Sets the number of cut edges.
`Flat NO.`	1, 2, 3	Selects the flat to be used for determining wafer orientation. The longest flat position is number 1. Numbers 2 and 3 are determined by counting clockwise around the wafer from the number 1 flat.
`Flat Type`	FLAT, NOTCH	Sets the flat shape type. FLAT:When the flat shape type is a flat. NOTCH: When the flat shape type is a notch.

4.11 Probe Mark Inspection Parameters 0458.1

Pressing PROBE MARK INSPECTION allows you to access and change the probe mark inspection parameter settings.

Probe Mark Inspection Menu (1 of 5)



Probe Mark Inspection Parameters (Page 1/5)

Parameter Name	Setting/Range	Contents
Probe Mark Inspection	YES, NO	This option sets whether to perform Probe Mark Inspection (PMI). When PMI is performed, the judgment standards and contact condition during testing (probe mark size and position) are compared with the settings on this menu. If they are outside of the judgment standard, an assist/error occurs. YES: Perform PMI. NO: Do not perform PMI. **NOTE** **Probe Mark Inspection must be set to YES to activate the other menu items.**
Basis for Area Judgement	AREA RATIO, AREA, NONE	This option sets the method for judging the size of the probe mark. AREA RATIO:Judge by a ratio of the probe mark surface area to the bonding pad surface area of 100%. AREA: Judge by the surface area of the probe mark. NONE: Do not judge the size of the probe mark.
Standard Pad Size	0-200 µm (length of one side of the pad)	This parameter is active when Basis for Area Judgment is set to AREA RATIO. Sets the standard pad surface area to determine the surface area ratio. When set to 0 µm, surface-area ratio calculations are based on the actual pad surface area.
Area Ratio (Mark Pad)	0—100 %	This parameter is active when Basis for Area Judgmentis set to AREA RATIO. It sets the tolerance range for the probe mark surface area ratio in relation to the standard pad size. The set tolerance range is the basis for judgment of the probe mark size. Area ratio (%) = Probe Mark Surface Area/Pad Surface Area X 100. For example, if a probe mark should only occupy 25% of the bonding pad area, set the maximum percentage to 25 or 30%.

Parameter Name	Setting/Range	Contents
Area	0-9,999 µm	This parameter is active when Basis for Area Judgment is set to AREA RATIO. Sets the tolerance range for the probe mark area. The set tolerance range is the judgment criteria for the probe mark size. Multiply the acceptable length by the width of a probe mark, and then input that value as the maximum Area setting.
Standard for Position Judgement	EDGE, CENTER, NONE	Sets the method for judging the contact position. EDGE: Judge by the distance (up, down, left, right) from the edge of the PMI pad to the edge of the probe mark. CENTER: Judge by the distance from the center of the PMI pad to the center of the probe mark. NONE: Do not judge the contact position.
Min Dist. Between Glass & Mark Edge	0—999 µm	This parameter is active when Standard for Position Judgment is set to EDGE. Sets the minimum distance from the inner mot edge of the PMI pad to the edge of the probe mark. The minimum set distance is the judgement criteria for the contact position.

Probe Mark Inspection Setting Menu (2 of 5)

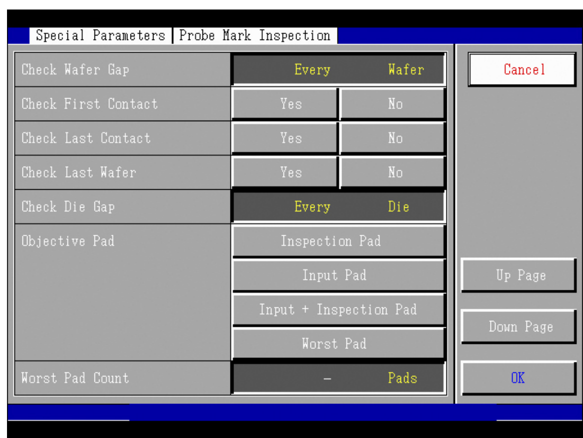
Probe Mark Inspection Parameters (Page 2/5)

Parameter Name	Setting/Range	Contents
Max Dist. Between Pad & Mark Centers	0—999 µm	This parameter is active when Standard for Position Judgment is set to CENTER. Sets the maximum length from the center of the PMI Pad to the center of the probe mark. The set maximum length is the judgement criteria for the contact position.

Parameter Name	Setting/Range	Contents
Area	CONTROL MAP, FREE INSPECTION AREA, FREE PROBE AREA, DISTANCE FROM WAFER EDGE	Selects the PMI area. CONTROL MAP: The PMI area set on the control map is used as the PMI area. FREE INSPECTION AREA:The PMI area is set manually on the prober. FREE PROBE AREA:The probe area set manually on the prober is used as the PMI area. DISTANCE FROM WAFER EDGE: The area from the wafer edge to the setting value is not part of the inspection area. **NOTE** **When `Control Map` is set to DON'T USE, you cannot use the inspection area set in the control map. When `Area` is set to FREE PROBE AREA, the `Wafer Parameter Probe Area` must be set to YES and a probe area must be input.**
Distance from Wafer Edge	0—99 mm	This parameter is active when `Area` is set to DISTANCE FROM WAFER EDGE. Limits the inspection area; the area from the wafer edge to the set value is the inspection area.
Inspection Edge Correction (E.C.)	1—100%	This parameter is active when `Area` is set to DISTANCE FROM WAFER EDGE. Sets the PMI valid die ratio; die on the edge of the inspection area (which fall below this ratio) will not be inspected. Input the PMI valid die surface area, with a complete die being 100%. The non-valid die ratio and die on the edge of the inspection area are not applicable for PMI.
Consecutive Fail Count Per Pad	1—100	This parameter is active when `Probe Mark Inspection` is set to YES. Sets the consecutive fail count needed to generate an assist/error when the PMI judgement results for the same position on each channel register a failure. When the fail count reaches this setting, an assist/error is generated according to the judgment time set by the probe mark judgement timing.

Parameter Name	Setting/Range	Contents
Consecutive Fail Count	1—100	This parameter is active when Probe Mark Inspection is set to YES. Sets the consecutive fail count to generate an assist/ error when the PMI judgement results register consecutive failures regardless of the channel and pad number. If the setting is 0, consecutive fail count will not be performed. An assist/error is generated regardless of the selection made for Needle Mark Judgement Timing when the consecutive fail count reaches this setting value. You can check the judgement results for all the failed pads. When the assist/error is cancelled, PMI restarts. **NOTE** **The contents of the assist/alarm vary depending on the Needle Mark Judgment Timing settings when Consecutive Fail Count Per Pad and Consecutive Fail Count occur simultaneously. When Needle Mark Judgment Timing is set to** BATCH AT END**, as assist/error for consecutive fail occurs. An assist/error for Consecutive Fail Count Per Pad occurs when there is no pad to continue PMI on when the assist/ error is cancelled. If there is a pad to continue PMI on, as assist/error for Consecutive Fail Count Per Pad occurs after PMI. When Needle Mark Judgment Timing is set to** EVERY PAD**, as assist/error occurs for Consecutive Fail Counts.**

Probe Mark Inspection Parameters (Page 3/5)



Probe Mark Inspection Parameters (Page 3/5)

Parameter Name	Setting/Range	Contents
Check Wafer Gap	EVERY 0-50 Wafer	Sets the number of wafers between PMI executions. However, if this parameter is set to 0, PMI is not executed based on the number of wafers tested. Setting Example: Setting Value = 5: PMI is executed for the 1st, 6th, 11th, etc., wafers.

Parameter Name	Setting/Range	Contents
`Check First Contact`	YES, NO	Sets whether to perform PMI when contact is made on the first tested die. YES: Perform PMI when contact is made on the first tested die. PMI will be performed on the first die tested regardless of whether it has been input as a PMI die. NO: Do not perform PMI when contact is made on the first tested die.
`Check Last Contact`	YES, NO	Sets whether to perform PMI when contact is made on the last tested die. YES: Perform PMI when contact is made on the last tested die. PMI will be performed on the last die tested regardless of whether it has been input as a PMI die. NO: Do not perform PMI when contact is made on the last tested die.
`Check Last Wafer`	YES, NO	Sets whether to perform PMI on the last wafer. YES: Perform PMI on the last wafer. NO: Do not perform PMI on the last wafer.
`Check Die Gap`	0–100 die	Set the frequency, or interval, of PMI inspections by die count. If `Check Die Gap` is set to 0, PMI is not executed. If `Check Die Gap` is set to 1, PMI is executed by the number of die tested when using probe area. PMI is executed by the number of die designated when using inspection area.
`Objective Pad`	INSPECTION PAD, INPUT PAD, INPUT + INSPECTION, WORST PADS	Sets what classification of bonding pad should be used for inspection. INSPECTION PAD: The pads trained during wafer alignment training will be used for inspection. INPUT PAD: The reference, probe pad 1, probe pad 2, and probe pad 3 will be used for inspection. INPUT + INSPECTION: The pads trained during wafer alignment training and the reference and input pads will be used for inspection. WORST PADS: The prober will look at all trained inspection pads and determine the worst ones. The prober will still judge all trained inspection pads, it will not determine the worst pads by the order they were trained. These worst pads used for inspection. **NOTE** **If you set Objective Pad to** WORST PADS**, although the first contact check is not executed, a contact check will be executed for each set number of pads. Applicable pads are registered pads and inspection pads.**
`Worst Pad Count`	0–99 pads	Sets how many worst pads the prober should consider. The prober will still judge all trained inspection pads, and then determine which ones are the worst up to this setting.

Probe Mark Inspection Menu (4 of 5)

Special Parameters | Probe Mark Inspection

Needle Mark Judgment Timing — Batch at End / Every Pad
Pad for Visual Check — Fail Pads / All Pads
Auto Focus — Every Die / All Pads / None
Min Recog Needle Mark Surface Area — µm
Sensitivity of Probe Mark
Print Out — Yes / No
Print Objective Pad — Fail Pads / All Pads
Print Items — All Items / Basis of Judgment
Print Judgment Results — Yes / No
Cancel
Up Page
Down Page
OK

Probe Mark Inspection Parameters (Page 4/5)

Parameter Name	Setting/Range	Contents
Needle Mark Judgement Timing	Batch At End, Every Pad	Sets the display method and timing for viewing a failed PMI inspection. Batch at End: Inspect each designated PMI die pad, then display an assist/error if one or more pads fail. Every Pad: Stop and display an error as soon as any PMI die pad fails.
Pad for Visual Check	Fail Pads, All Pads	Sets the type of PMI pad that can be visually checked on the *Judgement Results Menu* when results are not standard. Fail Pads: Allows visual checks on PMI pads that fail inspection. Only PMI pads that fail inspection are displayed on the *PMI Results Display Menu*. All Pads: Allows visual checks on all input PMI pads. All PMI pads, regardless of the judgment results, are displayed on the *PMI Results Display Menu*.
Auto Focus	Every Die, All Pads, None	Sets how often auto focus is performed during PMI. Every Die: Performs auto focus on every die inspected during PMI. All Pads: Performs auto focus on every pad on every die inspected during PMI. None: Do not perform auto focus after the initial focusing during PMI. **NOTE** **If the difference between the previous pad and the training focus point is 7µm or greater when performing PMI, the prober will automatically focus and recognize the pad. This process improves the recognition rate for glass edges.**
Min Recog Needle Mark Surface Area	0–9999µm	Sets the minimum area of the object that can be recognized as a probe mark. If the setting value is not met, the object is not recognized as a probe mark. Setting the minimum area can prevent the mis-recognition of grain on the pad as a probe mark. If the value is set to 0 µm ^{2}, a default value of 78.5 µm ^{2} is used as the minimum area.

Parameter Name	Setting/Range	Contents
Sensitivity of Probe Mark	–100–100	Sets the sensitivity for recognizing the probe mark. -100: Low sensitivity threshold. Use when pads are dirty or have a heavy grain. 0: Normal sensitivity . +100: High sensitivity. Use when probe marks are very light and PMI fails because no probe mark is found.
Print Out	YES, NO	Sets whether to print the PMI results. The printer must be connected to the prober and the option parameter Printer must be set to YES. YES:Print PMI results. NO: Do not print PMI results.
Print Objective Pad	FAIL PADS, ALL PADS	Sets the pad type that will be printed in the PMI results. FAIL PADS: Limits printing to PMI pads that fail inspection. ALL PADS: Prints all PMI pads.
Print Items	ALL ITEMS, BASIS OF JUDGMENT	This parameter is active when Print Out is set to YES. Sets the items to print out in the PMI results. ALL ITEMS: Prints all probe mark inspection result data. BASIS OF JUDGMENT: Limits printing to only the judgment result items that were specified in the Basis for Area Judgementparameter.
Print Judgement Results	YES, NO	This parameter is active when Print Out is set to YES. Sets whether to print the judgment results in the PMI results. YES: Print judgment results. Print Example: No mark/"JUDGE= NO MARK", Insufficient Area/ "JUDGE=UND DIM", Pass/"JUDGE=PASS". NO: Do not print judgment results.

Probe Mark Inspection Menu (5 of 5)

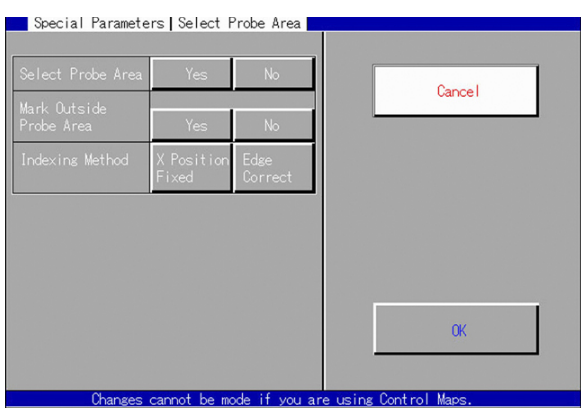
Probe Mark Inspection parameters (5/5)

Parameter Name	Setting/Range	Contents
Retry Count	0–2	Sets the number of times PMI is retried when PMI results fail. Auto focus is performed regardless of the setting in the auto focus parameter.

4.12 Select Probe Area Parameters 0459.1

Pressing PROBE AREA SELECT allows you to access and change the select probe area parameter settings. This method is an alternative to control maps and free probe area, and allows the operator to define the XY die arrangement.

Select Probe Area Parameters Menu



Select Probe Area Parameters

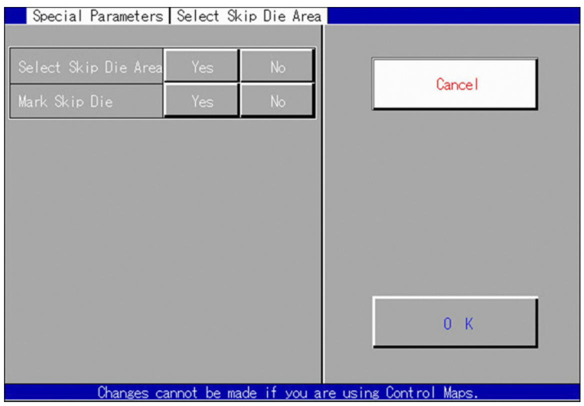
Parameter Name	Setting/Range	Contents
`Select Probe Area`	YES, NO	This parameter is active when `Control Map` on the *Control Map Menu*is set to DON'T USE. Sets whether to create a probe area (test area) for test wafers. YES: Create the probe area on the prober. A reference die must be input before the probe area can be input. NO: Do not create the probe area on the prober. Load a control map, created on a personal computer, to the prober. **NOTE** **`Select Probe Area` must be set to YES to activate the other menu items.**
`Marking (Inking Outside Probe Area)`	YES, NO	This parameter is active when `Select Probe Area` is set to YES. Sets whether to place inks dots on die outside of the specified probe area. YES: Ink die outside of the probe area. NO: Do not ink die outside of the probe area. **NOTE** **The current system software, version Rzz00–R014.05, does not support Marking (Inking Outside Probe Area) .**

Parameter Name	Setting/Range	Contents
`Indexing Method`	X POSITION FIXED, EDGE CORRECT	Sets the indexing method used when building a control map. X POSITION FIXED: The X position is fixed. The user can change it manually or leave it where the prober places it during the creation of a control map. EDGE CORRECT: The prober automatically places the X position on the first whole die.

4.13 Select Skip Area Parameters 0460.1

Pressing SKIP DIE AREA SELECT allows you to access and change select skip area parameter settings.

Select Skip Die Area Menu



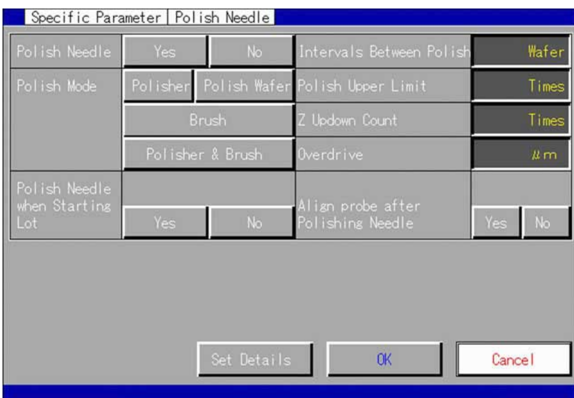
Select Skip Area Parameters

Parameter Name	Setting/Range	Contents
`Select Skip Die Area`	YES, NO	This parameter is active when `Control Map` on the *Control Map Menu* is set to DON'T USE. Sets whether to create various skip areas for test wafers. Skip areas can be single die or groups of die. These die will not be probed during testing. YES: Create the skip area on the prober. A reference die must be input before the skip area can be input. NO: Do not create the skip area on the prober. Instead, load a control map created on a personal computer.
`Mark (Ink) Skip Die`	YES, NO	This parameter is active when `Select Skip Die Area` is set to YES. Sets whether to place ink dots on die within the selected skip area. YES: Ink die within the skip area. NO: Do not ink die within the skip area. **NOTE** **The current system software, version Rzz00–R014.05, does not support Marking (Inking Outside Probe Area) .**

4.14 Polish Needle Parameters 0461.1

Pressing POLISH NEEDLE allows you to access and change the polish needle parameter settings. There are four pages of items; press SET DETAILS to access the other probe polish menus. When you have located the polish needle parameter you want to change, press the display area adjacent to the menu item. A numeric keypad is displayed, allowing new entries.

Polish Needle Menu (1 of 4)



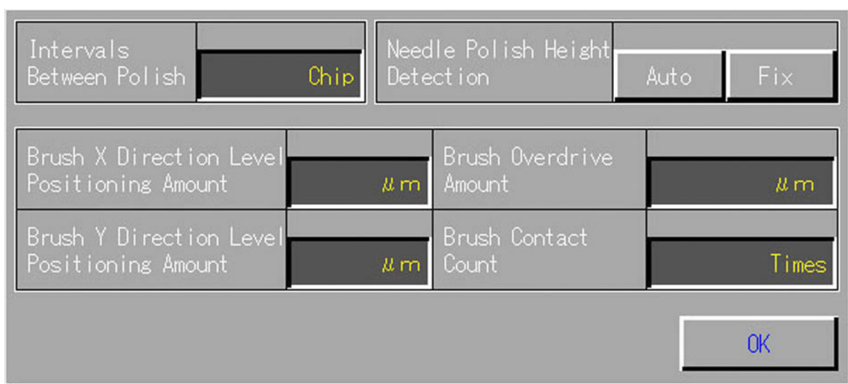
Polish Needle Parameters

Parameter Name	Setting/Range	Contents
`Polish Needle`	YES, NO	Sets whether to perform probe polish inspections. YES: Perform probe polish inspections. NO: Don't perform probe polish inspections. **NOTE** **`Polish Needle` must be set to YES to activate the other menu items.**

Parameter Name	Setting/Range	Contents
`Polish Mode`	POLISHER, POLISH WAFER, BRUSH, POLISHER & BRUSH	This parameter is active when `Polish Needle` is set to YES. Sets the method that will be used to clean the probe tip. POLISHER: Cleans the probe tips using the probe polish pad. POLISH WAFER:Cleans the probe tips using a polish wafer. BRUSH: Cleans the probe tips using the brush. POLISHER & BRUSH: Cleans the probe tips using the probe polish pad and the brush. NOTE **When cleaning the probe tip with the probe polish wafer, you will need to set and test the probe polish contact point. Refer to 3.4 Inputting Probe Tip Positions (see page 65) for information on setting the probe polish contact point.** NOTE **In the procedure 3.3 Inputting Probe Card Parameters (see page 59), if `Probe Card Type` is set to** MPC 1**,** MPC 2**, or** TMPC**, the normal probe polish operation cannot be performed.**
`Polish Needle when Starting Lot`	YES, NO	This parameter is active when `Polish Mode` is set to POLISH WAFER. Sets whether or not to perform probe polish before testing the first wafer of the lot. YES: Perform probe polish before testing the first wafer of the lot. NO: Do not perform probe polish before testing the first wafer of the lot.
`Intervals Between Polish`	0–99 Wafer	This parameter is active when `Polish Needle` is set to YES. Sets the probe polish cleaning cycle interval based upon the number of wafers tested. For example, if this parameter is set to 5, probe polish is performed on wafer 5,10, etc. If this parameter is set to 0, probe polish will not be performed based on the number of wafers tested.
`Polish Upper Limit`	0–9,999 Times	This parameter is active when `Polish Mode` is set to POLISHER, POLISH WAFER, or POLISHER & BRUSH. Sets the upper usage limit for the probe polish pad or the polish wafer. An alarm is generated when the upper limit is reached.
`Z Updown Count`	0–99 Times	This parameter is active when `Polish Mode` is set to POLISHER, POLISH WAFER, or POLISHER & BRUSH. Sets the number of times the probes touch the probe polish pad or the probe polish wafer.
`Overdrive`	0–200 µm	This parameter is active when `Polish Mode` is set to POLISHER, POLISH WAFER, or POLISHER & BRUSH. Sets the probe overdrive amount that is applied once the probes make contact with the probe polish pad or the polish wafer.

Parameter Name	Setting/Range	Contents
Align Probe after Polishing Needle	YES, NO	This parameter is active when Polish Needle is set to YES. Sets whether or not to align the probe card and the wafer (1 point) after probe polish. YES: Align the probe card and the wafer (1 point) after probe polish. NO: Do not align the probe card and the wafer (1 point) after probe polish.

Polish Needle Menu (2 of 4)

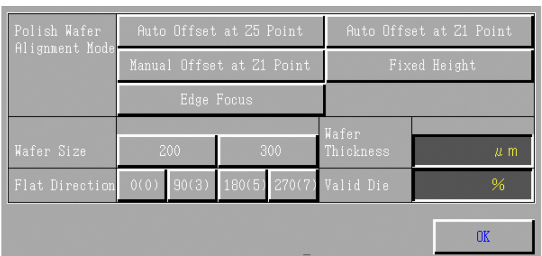


Polish Needle Parameters (Page 2/4)

Parameter Name	Setting/Range	Contents
Intervals Between Polish	0–9,999 Chips	This parameter is active when Polish Mode is set to POLISHER or POLISHER & BRUSH. Sets the probe polish cleaning cycle interval based upon the number of die tested.
Needle Polish Height Direction	AUTO, FIX	This parameter is active when Polish Mode is set to POLISHER or POLISHER & BRUSH. Sets whether or not to fix the contact Z position offset amount for the probe polish pad based on the measurements used during alignment. AUTO: Do not fix the contact Z position offset amount. The probe polish pad alignment measurements will be validated and the Z axis offset will be variable. FIX: Fix the contact Z position offset amount. Perform probe polish using the positions taught on the *Needle Polishing Plate Position Menu*. Display this menu from the Main Menu by pressing DIAGNOSTICS, VARIOUS ADJUSTMENTS, STAGE ADJUSTMENTS, SPECIFIC POSITION SETTING, NEEDLE POLISHING PLATE POSITION.
Brush X Direction Level Positioning Amount, Brush Y Direction Level Positioning Amount	0–999 µm	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets the X and Y direction brush transfer amount used during a brush probe polish cycle. To reach the third *Polish Needle Menu*, Polish Mode must be set to POLISH WAFER.
Brush Overdrive Amount	0–200 µm	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets the amount of encroachment (overdrive amount) from the position where the brush touches the probe tip.

Parameter Name	Setting/Range	Contents
Brush Contact Count	1–99 Times	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets the number of times the brush touches the probes.

Polish Needle Menu (3 of 4)



Polish Needle Parameters (Page 3/4)

Parameter Name	Setting/Range	Contents
Polishing Wafer Alignment Mode	AUTO OFFSET AT Z5 POINT, AUTO OFFSET AT Z1 POINT, MANUAL OFFSET AT Z1 POINT, FIXED HEIGHT, EDGE FOCUS	This parameter is active when Polish Mode is set to POLISH WAFER. Sets the method used to offset the polish wafer Z contact position. AUTO OFFSET AT Z5 POINT: The prober automatically recognizes the five point thickness of the polish wafer, and makes contact with the probes. AUTO OFFSET AT Z1 POINT: The prober automatically recognizes thickness of the polish wafer, and makes contact with the probes. MANUAL OFFSET AT Z1 POINT: Set the polish wafer thickness manually. FIXED HEIGHT: Contacts the probe using the probe polish wafer thickness which was obtained using 3.4 Inputting Probe Tip Positions (see page 65). EDGE FOCUS: It automatically recognizes the thickness of four peripheral point on the probe polish wafer that will contact the probe. This is an exclusive process feature for a probe polish wafer (part # 3210-303958-11). **NOTE** **If an assist/error occurs when you are aligning the polish wafer, pressCANCEL on the *Assist Menu* to unload the wafer without polishing. You then cannot perform probe polish until the next set number of wafers is reached because the polish wafer count has been cleared.**
Wafer Size	200, 300	This parameter is active when Polish Mode is set to POLISH WAFER. Sets the polish wafer size. 200: For 200 mm wafers. 300: For 300 mm wafers.

Parameter Name	Setting/Range	Contents
`Flat Direction`	0° (0), 90° (3), 180° (5), 270° (7)	This parameter is active when `Polish Mode` is set to POLISH WAFER. Sets the direction of the flat on the polish wafer. 0° (0): Sets the direction to the 0° position. 90° (3): Sets the direction to the 90° direction. 180° (5): Sets the direction to the 180° direction. 270° (7): Sets the direction to the 270° direction.
`Wafer Thickness`	0–1,000 µm	This parameter is active when `Polish Mode` is set to `Polish Wafer`. Sets the thickness of the polish wafer.
`Valid Die`	1–100%	This parameter is active when `Polish Mode` is set to POLISH WAFER. Sets the diametric ratio of the polishing area with respect to the size of the polish wafer. To reach the fourth *Polish Needle Menu*, a WAPP specification must be active. Press SET DETAILS on the *Polish Needle Menu (3 of 4)*. The *Polish Needle Menu (4 of 4)* is displayed.

Polish Needle Menu (4 of 4)

Polish Needle Parameters (4/4)

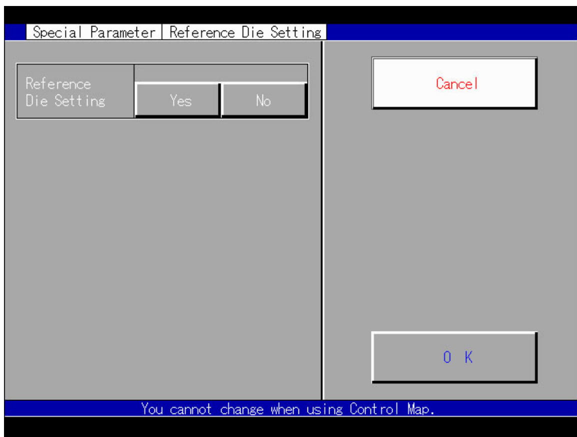
Parameter Name	Setting/Range	Contents
`Intervals Between Polish`	0–9,999 Die	This parameter is active when `Polish Mode` is set to POLISHER or POLISHER & BRUSH. Sets the probe polish cleaning cycle interval based upon the number of die tested.
`Brush X Direction Level Positioning Amount, Brush Y Direction Level Positioning Amount`	0–9,999 µm	This parameter is active when `Polish Mode` is set to BRUSH or POLISHER & BRUSH. Sets the X and Y direction brush transfer amount used during a brush probe polish cycle.
`Brush Overdrive Amount`	0–200 µm	This parameter is active when `Polish Mode` is set to BRUSH or POLISHER & BRUSH. Sets the probe overdrive amount that is applied once the probes make contact with the brush.

Parameter Name	Setting/Range	Contents
Brush Contact Count	1–99 Times	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets the number of times the probes make contact with the brush.
Needle Polish Height Direction	AUTO, FIX	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets whether or not to fix the contact Z position offset amount for the probe polish pad based on the measurements used during alignment. AUTO: Do not fix the contact Z position offset amount. The probe polish pad alignment measurements will be validated and the Z axis offset will be variable. FIX: Fix the contact Z position offset amount.
Polish Needle Transfer Amount	0–9,999 µm	This parameter is active when Polish Mode is set to BRUSH or POLISHER & BRUSH. Sets the transfer amount to the next contact position.
Intervals at Detection Processing	EVERY TIME, FIRST TIME ONLY	This parameter is active when Needle Polish Height Detection is set to AUTO. Sets the probe polish pad alignment interval. EVERY TIME: Execute alignment for every probe polish cycle. FIRST TIME ONLY: Execute alignment until the Z axis offset amount of the probe polish pad is stabilized. It is cleared at lot end and WAPP replacement.
Needle Polish Height Detection Tolerance Value	0–100 µm	This parameter is active when Intervals at Detection Processing is set to FIRST TIME ONLY. Sets the tolerance for the alignment measurement results. If the most three recent values for the Z axis probe polish pad offset are within this tolerance, alignment will not be executed next time.

4.15 Reference Die Parameter 0462.1

Pressing REFERENCE DIE SETTING allows you to access and change the reference die parameter setting.

Reference Die Setting Menu



Reference Die Parameter

Parameter Name	Setting/Range	Contents
`Reference Die Setting`	YES, NO	Indicates the use of a reference die. YES: A reference die will be set and designated by a red “X” on the RTWM for each test wafer. NO: A reference die will not be set. **NOTE** **Note: When `Select Probe Area` or Select Skip Area are set to Yes, it will be necessary to input a reference die during setup, regardless of whether or not Reference Die is set to YES on this menu.**

4.16 Sample Testing Parameters 0463.1

Pressing SAMPLE TESTING allows you to access and change the sample testing parameter settings. Sample testing can be performed only when GPIB communications R and Q command Pass/Fail are counted. You cannot use sample testing with *Circumference Marking*.

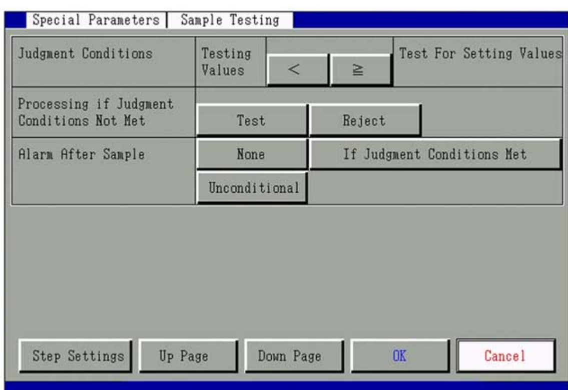
Sample Testing Menu (1 of 2)

Sample Testing Parameters (Page 1/2)

Parameter Name	Setting/Range	Contents
`Sample Testing Mode`	TEST, SKIP, NONE	Sets whether to perform sample testing, and defines the testing method. You can sample up to 100 die. TEST: Perform sample testing on the selected die. SKIP: Skip the selected die, but perform sample testing for all other die. NONE: Does not perform sample testing. **NOTE** **The die for sample testing can be selected through the *Sample Testing/Step Settings Menu*, which is accessed by pressing STEP SETTINGS. The parameters on this menu are explained later in this section.**
`Monitor Die X, Y`	0—99	This parameter sets the monitor die number of X and Y axes directions in the sample die. It is used when testing the monitor die that aligned regularly in the sample die.
`Monitor Die Size`	0—99,999	This parameter sets the monitor die size. It is used for testing the monitor die when there are multiple die in the sample die.

Parameter Name	Setting/Range	Contents
Testing Processing After Sample Test	UNLOAD, TEST ALL	This parameter is active when Sample Testing Mode is set to TEST. Sets the wafer processing method used after performing a sample test. UNLOAD: If the wafer meets the sample test criteria, unload it, load the next wafer, and perform sample testing. TEST ALL: If the conditions of the sample test are met, test each die on the wafer before it is unloaded. The actual testing conditions can be compared to the sample test results after completing a sample test. If the testing conditions are met, testing starts on the initial die and the sample test results are cleared.
Test All Conditions	PASS, FAIL, YIELD	This parameter is active when Test Processing After Sample Test is set to TEST ALL. Sets the comparison criteria used during a TEST ALL sample test. Press the display area next to Setting Value for the items you will compare, and input the judgment values. PASS: Compare the number of sample test die that passed to the Setting Value for the Pass category. FAIL: Compare the number of sample test die that failed to the Setting Value for the Fail category. YIELD: Compare the sample test yield percentage to the Setting Value for the Yield category.

Sample Testing Menu (2 of 2)



Sample Testing Parameters (Page 2/2)

Parameter Name	Setting/Range	Contents
Judgement Conditions	Testing Value < Test for Setting Values, Testing Value ≥ Test for Setting Values	This parameter is active when Test Processing After Sample Test is set to TEST ALL. Sets the conditions for performing TEST ALL. Testing Value < Test for Setting Values: Perform TEST ALL when the test result is less than the judgment standard value. Testing Value ≥ Test for Setting Values: Perform TEST ALL when the test result is greater than or equal to the judgment standard value.

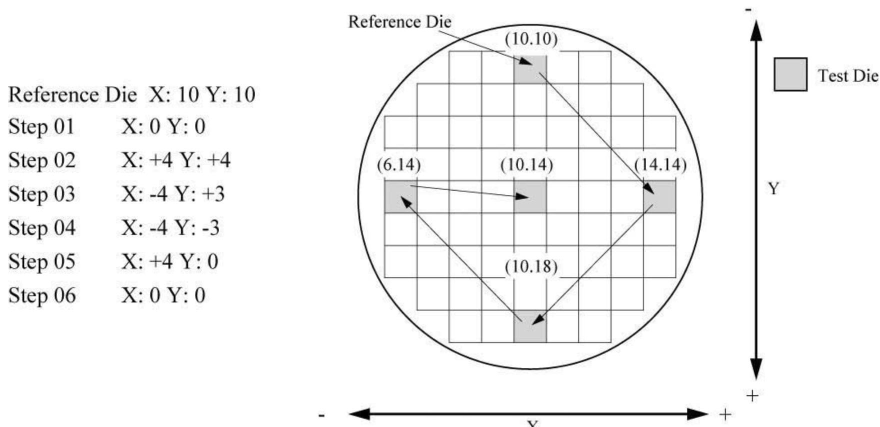
Parameter Name	Setting/Range	Contents
Processing if Judgement Conditions Not Met	TEST, REJECT	This parameter is active when Test Processing After Sample Test is set to TEST ALL. Sets the wafer processing method used after the prober compares sample test results to the actual testing conditions, and those conditions are not met. TEST: Test all die on the wafer, then unload. REJECT: Unload as a reject wafer. No additional testing is performed.
Alarm After Sample	NONE, IF JUDGMENT CONDITIONS MET, UNCONDITIONAL	This parameter is active when Sample Testing Mode is set to TEST or SKIP. Sets the display conditions for the assist menu after sample testing is completed. The IF JUDGMENT CONDITIONS MET menu choice is active only when Test Processing After Test is set to TEST ALL. NONE: Do not display an assist menu after sample testing is completed. IF JUDGMENT CONDITIONS MET: Display an assist menu only if the judgment conditions are met. UNCONDITIONAL: Always display an assist menu after sample testing is completed.

4.17 When the Sample Testing Mode is Set to Test 0464.1

1 Select the test die for sample testing. You can select up to 100 die.

2 Set the reference die as the sample test reference, and set subsequent test die using the relative die count. Set the end position step in X and Y as 0.

Test Die Designation



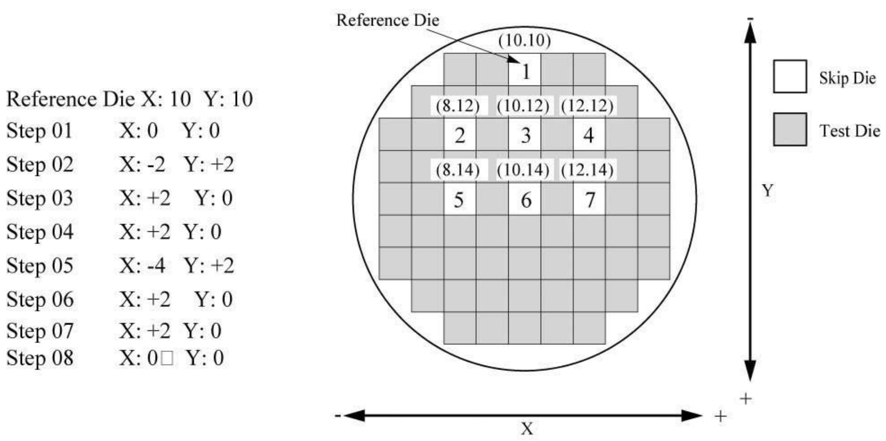
Sample testing is performed only on the selected test die. Sample testing is not performed on test die in the skip area or outside the probe area on the control map.

4.18 When the Sample Testing Mode is Set to Skip 0465.1

1 When sample testing is performed on skip die, select the skip die that will not be sample tested. You can select up to 100 die.

2 Set the reference die as the sample-test reference, and set subsequent skip die using the relative die count. Set the end position step in X and Y as 0.

Selecting Skip Die

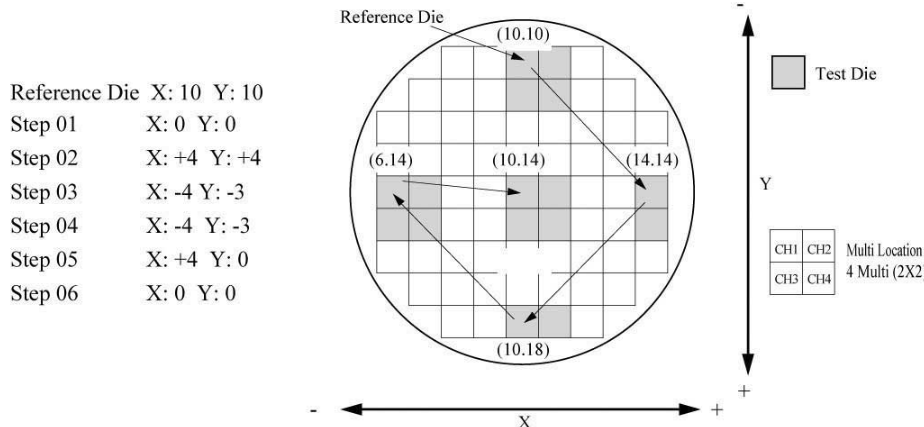


Sample testing is performed on the non-selected skip die. Sample testing is not performed on the selected skip die or outside the probe area on the control map.

4.19 Sample Testing with Multi-cards 0466.1

1 When sample testing with multi-cards, the multi-location CH1 tests the sample test die. CH2 and subsequent channels test only the die in the valid area. Also, sample testing ignores free optimum probing modes set in the control map.

Sample Testing with Multi-Cards

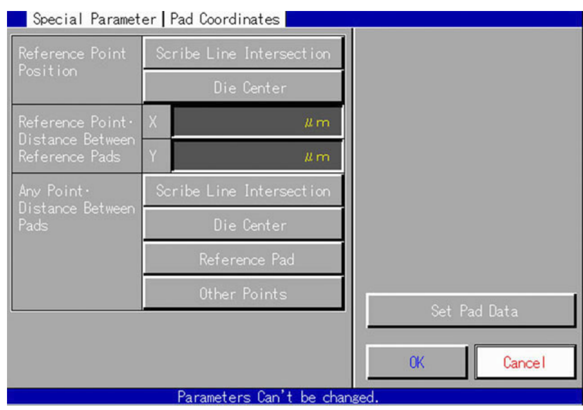


2 When you are finished, press OK to exit the *Sample Testing/Step Setting Menu*. If you have made any changes to the settings, a check menu is displayed stating `Is it OK to change the setting value?` Press YES to save the changed settings, or press NO to cancel the changes.

4.20 Pad Coordinate Parameters 0467.1

Pressing PAD COORDINATE allows you to access and change the pad coordinates parameter settings and check pad positions.

Pad Coordinates Parameters Menu



Pad Coordinate Parameters

Parameter Name	Setting/Range	Contents
Reference Point Position	SCRIBE LINE INTERSECTION, DIE CENTER	Sets the reference point for calculating the reference pad position. SCRIBE LINE INTERSECTION: Use the street (scribe line intersection) as reference points. DIE CENTER: Use the die center as reference points. NOTE **The current system software Version Rzz00-R014.05, does not support Die Center, so the setting is fixed at Scribe Line Intersection.**
Reference Point Distance Between Reference Pads	0 µm (X, Y)	Displays the distance from the reference pad reference point to each of the other registered pads. These distances are used by the prober to locate each pad during wafer alignment. NOTE **The current system software, Version Rzz00-R014.05, does not support the reference point and reference pad distances. The setting is fixed at 0 µm.**

Parameter Name	Setting/Range	Contents
Any Point Distance Between Pads	SCRIBE LINE INTERSECTION, DIE CENTER, REFERENCE PAD, OTHER POINTS	Sets the reference points for calculating the position of the input pad. SCRIBE LINE INTERSECTION: Use the scribe line intersections as reference points. DIE CENTER: Use the pad center as reference points. REFERENCE PAD: Use the reference pad as the reference point. OTHER POINTS: Use other positions as the reference points. NOTE **The current system software, Rzz02-R014.05, does not support settings other than** REFERENCE PAD**. The setting is fixed as** REFERENCE PAD**.**

4.21 Checking Pad Positions 0468.1

1 Press SET PAD DATA on the *Pad Coordinates Menu*. The *Pad Data Menu* is displayed.

Pad Data Menu

2 Set each parameter by pressing STD, PMI, PCI, and/or PTPA. Refer to the table below for a description and explanation of each menu option. To change lists press either DOWN PAGE or UP PAGE.

Pad Position Classes

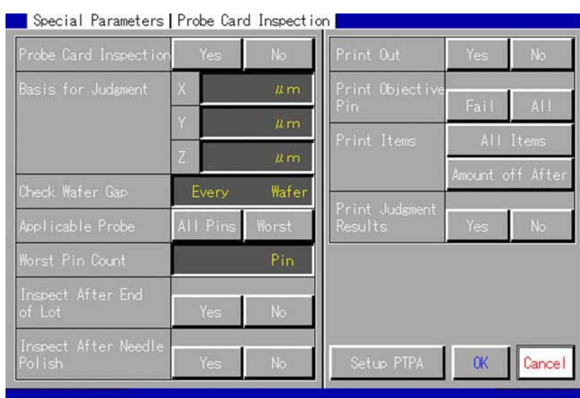
Class	Description
STD	Standard: registered pad that is used for probe card alignment
PMI	Probe Mark Inspection: pad that is used for probe mark inspection
PCI	Probe Card Inspection: the pin that corresponds to that pad will be inspected during PCI
PTPA	Probe to Pad Alignment: the pin that corresponds to that pad will be used as an additional alignment pin during probe card alignment

3 After confirming all of the settings, press OK to return to the *Pad Coordinates Menu*.

4.22 Probe Card Inspection Parameters 0469.1

Pressing PROBE CARD INSPECTION allows you to access and change the probe card inspection (PCI) parameters.

Probe Card Inspection Menu



Probe Card Inspection Parameters

Parameter Name	Setting/Range	Contents
Probe Card Inspection	YES, NO	Sets whether to perform PCI. When you perform PCI, you can compare the judgment standards and the expected contact position of the probe with the other menu settings. If a **nonstandard** probe is found during inspection, the *PCI Results Display Menu* is displayed. YES: Perform PCI. NO: Do not perform PCI. **NOTE** **Probe Card Inspection must be set to YES to activate the other menu items.**
Basis for Judgement	N/A	Sets the acceptable tolerance range for the amount of probe displacement in the X, Y, and Z directions. (X: 0-200 µm, Y: 0-200 µm, Z: 0-100 µm). **NOTE** **The *PCI Results Display Menu* is displayed if the PCI comparison shows that there is displacement over the tolerance range of the expected contact position.**
Check Wafer Gap	Every 0— 50 Wafer	Sets the intervals between PCI based on the number of wafers tested. However, when this parameter is set to 0, PCI is performed only on the first wafer of the lot. Setting Example: Setting Value = 5: PCI is performed on the 1st, 6th, 11th, etc., wafers.

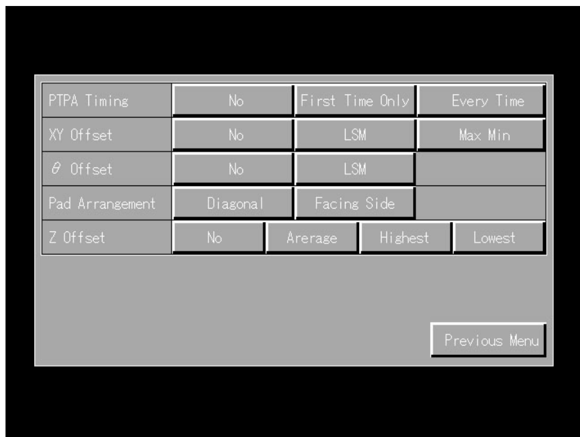
Parameter Name	Setting/Range	Contents
Applicable Probe	ALL PINS, WORST	Sets the probe that will be inspected during PCI. ALL PINS: All probes that contact the PCI pads are used each time PCI is performed. WORST: Limits PCI to the probe with the largest displacement (worst) based on the first PCI on the current lot.
Worst Pin Count	1—99 Pin	This parameter is active when Applicable Probe is set to WORST. Sets the number of worst pins for the PCI. Probes are inspected during PCI in order, from the worst displacement to the least. NOTE **The displacement amount is taught when the expected actual probe positions are recognized in the PCI results, but Z, X, and Y direction accuracies differ according to the ASU recognition accuracy. Therefore, determining the quality of the contact position on the pad is important, and worst ordering is done using displacement in the X and Y direction.**
Inspect After End of Lot	YES, NO	Sets whether to perform PCI after testing on the lot. YES: Perform PCI after testing on the lot is completed. PCI is displayed before the wafer is unloaded, but after testing on the lot is completed. NO: Do not perform PCI after testing on the lot is completed.
Inspect After Needle Polish	YES, NO	Sets whether to perform PCI after probe polish is completed. YES: Perform PCI after probe polish is completed. After PCI is finished, the prober wait until cleaning is completed before beginning PMI. NO: Do not perform PCI after probe polish is completed.
Print Out	YES, NO	Sets whether to print out the PCI results. YES: Print out the PCI results. NO: Do not print out the PCI results. NOTE **The current system software, version Rzz00–R014.05, does not support this parameter.**
Print Objective Pin	FAIL, ALL	This parameter is active when Print Out is set to YES. Sets the probe type that is printed in the PCI result printout. FAIL: Only print non-standard probes. ALL: Print all executed probes. NOTE **The current system software, version Rzz00–R014.05, does not support this parameter.**

Parameter Name	Setting/Range	Contents
`Print Items`	ALL ITEMS, AMOUNT OFF AFTER	This parameter is active when `Print Out` is set to YES. If 26-line printer is used, this parameter is set to AMOUNT OFF AFTER. Sets the items that are printed in the PCI results. ALL ITEMS: Print all items. AMOUNT OFF AFTER:This setting is automatically selected when printing out items without a `Probe Needle Coordinate` or when the prober has a 26-line printer. NOTE **The current system software, version Rzz00–R014.05, does not support this parameter.**
`Print Judgement Results`	YES, NO	This parameter is active when `Print Out` is set to YES. Sets whether or not to print judgement results on the PCI results printout. YES: Print out the judgement results. NO: Do not print out the judgement results. NOTE **The current system software, version Rzz00–R014.05, does not support this parameter.**

4.23 PTPA 0470.1

1 Press SETUP PTPA on the *Probe Card Inspection Menu*. The *PTPA Menu* is displayed.

PTPA Menu



2 Set each parameter. Refer to the table below for a description and explanation of each menu option.

3 After confirming all of the settings, press PREVIOUS MENU on the *PTPA Menu*. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input and the *Probe Card Inspection Menu* is displayed.

Probe Card Inspection Parameters

Parameter Name	Setting/Range	Contents
`PTPA Timing`	NO, FIRST TIME ONLY, EVERY TIME	Sets whether PTPA will be performed during probe card alignment. NO: PTPA will not be performed during probe card alignment. FIRST TIME ONLY: PTPA will be performed when the probe card is first aligned at the beginning of any new lot. EVERY TIME: PTPA will be performed during every probe card alignment sequence.

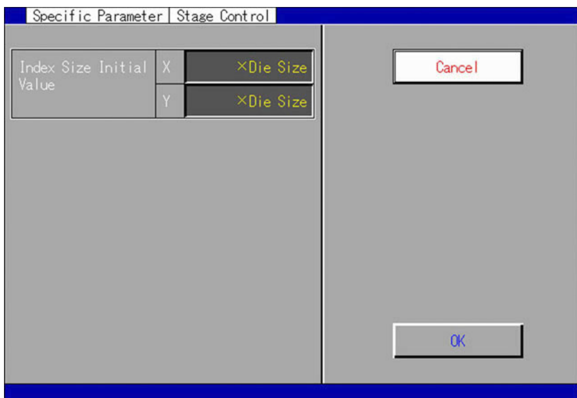
Parameter Name	Setting/Range	Contents
XY Offset	No, LSM, Max Min	This parameter is valid when PTPA Timing is set to First Time Only or Every Time. Sets the method used for determining the XY offset for PTPA. No: An XY offset will not be calculated for PTPA. LSM: An XY offset will be calculated using the least significant multiple. This is an automatic calculation where the prober determines the least amount of necessary correction, and uses that information to create the best offset to be used for PTPA. Max Min: An XY offset will be calculated using a max/min calculation. This is an automatic calculation where the prober determines which probe is off the least and which is off the most, and uses that information to determine the best offset to be used for PTPA.
Theta Offset	No, LSM	This parameter is valid when PTPA Timing is set to First Time Only or Every Time. No: A theta offset will not be calculated for PTPA. LSM: A theta offset will be calculated using the least significant multiple. This is an automatic calculation where the prober determines the least amount of correction needed and uses that information to create the best offset to be used for PTPA.
Pad Arrangement	Diagonal, Facing Side	This parameter is valid when PTPA Timing is set to First Time Only or Every Time. Sets the bonding pad shape in order to aid the probe-to-pad contact calculation. Diagonal: There is little deviation allowed in the probe card probe position. Facing Side: The pad is rectangular, therefore the probe deviation can vary greatly.

Parameter Name	Setting/Range	Contents
Z Offset	NO, AVERAGE, HIGHEST, LOWEST	This parameter is valid when PTPA TIMING is set to FIRST TIME ONLY or EVERY TIME. Sets the method used for determining the Z offset for PTPA. NO: A Z offset will not be calculated for PTPA. AVERAGE: A Z offset will be calculated using the average Z height of the pins. This is an automatic calculation where the prober determines the best offset to be used for PTPA. HIGHEST: A Z offset will be calculated using the pin with the highest Z height. This is an automatic calculation where the prober determines the best offset to be used for PTPA. LOWEST: A Z offset will be calculated using the pin with the lowest Z height. This is an automatic calculation where the prober determines the best offset to be used for PTPA. NOTE **If the contact height is adjusted by GPIB communication, the PTPA Z correction will not be performed.**

4.24 Stage Control Parameter 0471.1

Pressing STAGE CONTROL allows you to access and change the stage control parameter setting.

Stage Control Parameter Menu



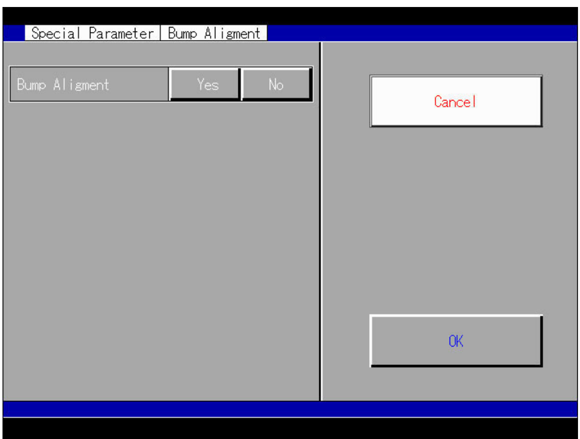
Stage Control Parameter

Parameter Name	Setting/Range	Contents
Index Size Initial Value	X: 1-10 X DIE SIZE, Y: 1-10 X DIE SIZE	Sets the initial INDEX amount in terms of die size. This setting will only be used when the *Stage Control Parameters Menu* is displayed on the touch screen.

4.25 Bump Alignment Parameter 0472.1

Pressing BUMP ALIGNMENT allows you to access and change the bump alignment parameter setting.

Bump Alignment Parameter Menu



Bump Alignment Parameter

Parameter Name	Setting/Range	Contents
`Bump Alignment`	YES, NO	This parameter is active when a bump pad is inputted. Sets whether or not to execute a bump pad alignment. YES: Execute a bump pad alignment. NO: Do not execute a bump pad alignment.

4.26 Hot Chuck Parameters 0473.1

Pressing HOT CHUCK allows you to access and change the hot chuck parameter settings. In order for `Hot Chuck` to appear as a choice on the *Wafer Parameter Item Selection Menu*, the HOT CHUCK setting must have been activated on the *Hard Select (Multi) Menu*.

Hot Chuck Parameters Menu

Hot Chuck Parameters

Parameter Name	Setting/Range	Contents
`Hot Chuck`	YES, NO	Sets whether or not to use temperature control with the Hot Chuck. YES: Use temperature control. NO: Do not use temperature control. **NOTE** **`Hot Chuck` must be set to YES before any other parameters on this menu can be changed.**
`Temperature`	50.0—150.0° C	Sets the chuck top temperature when testing.
`Heater OFF`	YES, NO	Temporarily turns the temperature control off so that the electric heater will not affect testing. YES: Turns the heater off before testing. When testing for an extended period, the next test will take more time because the chuck temperature may have dropped. The next die will not be tested until the specified temperature is reached. NO: Do not turn the heater off before testing. **NOTE** **The heater is turned off when its temperatures reach the temperature tolerance range.**
`Temperature Range`	0.0—5.0° C	Sets the temperature tolerance range for testing. If the chuck top is not within the temperature range setting, testing will not start.

4.27 Contact Correction at High Temp Parameters 0499.1

Pressing CONTACT CORRECTION AT HIGH TEMP allows you to access and change the contact correction at high temperature parameters. You can set the `Preheat` and `Alignment by Die` options on this menu. `Preheat` heats the probe card for testing to reduce the thermal expansion coefficient that can have an effect on testing. `Alignment by Die` aligns the probe and wafer at each index, and corrects the probe card contact position for the rate of change caused by thermal expansion.

Contact Correction at High Temperature Measurement Menu

Contact Correction at High Temp Operation Parameters

Parameter Name	Setting/Range	Contents
`Preheat`	YES, NO	Sets whether to enable `Preheat`. YES: Enable `Preheat`. NO: Disables `Preheat`.
`At Lot Start`	YES, NO	This parameter is active when `Preheat` is set to YES. Sets whether or not to execute `Preheat` after probe card alignment. YES: At the start of a lot, execute `Preheat` after probe card alignment. NO: Do not execute `Preheat` after probe card alignment.
`Re-preheating during Measurement`	YES, NO	This parameter is active when `Preheat` is set to YES. Sets whether or not to monitor the stage position during the test, and perform `Preheat`. YES: Monitor the stage position during the test, and perform `Preheat` before the next test if the stage stays lower than the separate position for a certain period of time. NO: Do not perform `Preheat`.
`Between Lots`	YES, NO	This parameter is active when `Preheat` is set to YES. Sets whether or not to move the stage to the preheat position when the lot is completed, and then perform `Preheat` until the next lot starts. YES: Move the stage to the preheat position when the lot is completed, and perform `Preheat` until the next lot starts. NO: Do not perform `Preheat` when the lot is completed.

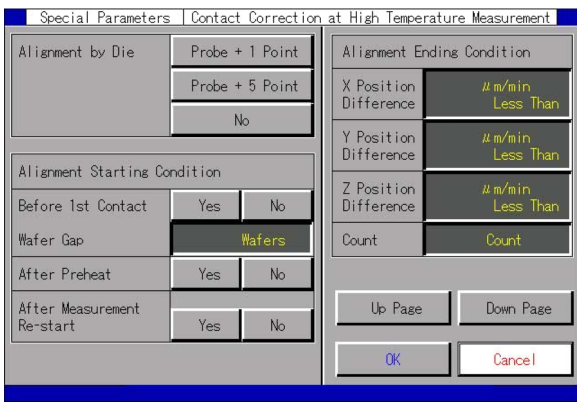
Parameter Name	Setting/Range	Contents
Preheat Time	0–9999 Sec.	This parameter is active when either At Lot Start or Re-preheating during Measurement is set to YES. Sets the maximum time period that Preheat is performed at the start of a lot and/or at re-preheating during a test.
Re-preheat Monitoring Time	30–1,800 Sec.	This parameter is active when Re-preheating during Measurement is set to YES. The times starts when the stage is moved to a position lower than the separate position. After the set period of time, the times executes Preheat before the next test.
Align Probe after Re-preheat	YES, NO	This parameter is active when Re-preheating during Measurement is set to YES. Sets whether or not to align the probe card after it is pre-heated. YES: Align the probe card after it is pre-heated. NO: Do not align the probe card after it is pre-heated.
Re-preheat Time Coefficient	1—30	This parameter is active when Re-preheating during Measurement is set to YES. Sets the gradient of the straight line used to calculate the re-preheat time. The larger the setting, the shorter the time between the Re-preheat Monitoring Timer is timed-out and the maximum preheat.
Minimum Re-preheat Time	0–9999 Sec.	This parameter is active when Re-preheating during Measurement is set to YES. Sets the offset used to calculate the re-preheat time. If the conditions for re-preheat are satisfied, the probe card is preheated for more than the time period set in this parameter.

NOTE **If the stage position is monitored during the test and the stage stays in a position lower than the separate position for a certain period of time when Re-preheating during Measurement is set to YES, the probe card is preheated before the next test starts. In this case, the preheat time is calculated using the formula below using the parameters A (preheat time coefficient) and B (minimum re-preheat time).**

Preheat Time = A x (present time - monitoring timer time-out time) + B.

However, a probe card is not preheated longer than the setting in the Preheat Time parameter.

Contact Correction at High Temp Menu (2 of 2)



Contact Correction at High Temp Operation Parameter

Parameter Name	Setting/Range	Contents
Alignment by Die	PROBE + 1 POINT, PROBE + 5 POINT, NO	Sets whether to execute an Alignment by Die. PROBE + 1 POINT: After executing the probe card alignment as an Alignment by Die, perform a wafer alignment (1 point). PROBE + 5 POINT: After executing the probe card alignment as an Alignment by Die, perform a wafer alignment (5 point). NO: Do not execute an Alignment by Die.
Before 1st Contact	YES, NO	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets whether or not to start/restart Alignment by Die before the first contact after the wafer alignment is completed. YES: Start/restart Alignment by Die before the first contact after the wafer alignment is completed. NO: Do not start/restart Alignment by Die before the first contact after the wafer alignment is completed.
Wafer Gap	1—99 Wafers	This parameter is active when Before 1st Contact is set to YES. Sets the interval by which Alignment by Die is executed before the first contact in terms of wafers.
After Preheat	YES, NO	This parameter is active when Re-preheating during Measurement is set to YES, and Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets whether or not to start/ restart Alignment by Die after executing the re-preheat during the test. YES: Start/restart Alignment by Die after executing the re-preheat during the test. NO: Do not start/restart Alignment by Die after executing the re-preheat during the test.
After Measurement Re-start	YES, NO	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets whether or not to start/restart Alignment by Die when START TESTING on the *Stop Processing Menu* is pressed. YES: Start/restart Alignment by Die when START TESTING on the *Stop Processing Menu* is pressed. NO: Do not start/restart Alignment by Die when START TESTING on the *Stop Processing Menu* is pressed.
X Position Difference	Less than 1—999 µm/min	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets the probe tip X coordinate difference in which there will be no more change. The smaller the setting, the stricter the conditions for the Alignment by Die and the more times it will be performed.
Y Position Difference	Less than 1—999 µm/min	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets the probe tip Y coordinate difference in which there will be no more change. The smaller the setting, the stricter the conditions for the Alignment by Die and the more times it will be performed.

Parameter Name	Setting/Range	Contents
Z Position Difference	Less than 1—999 µm/min	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. Sets the probe tip Z coordinate difference in which there will be no more change. The smaller the setting, the stricter the conditions for the Alignment by Die and the more times it will be performed.
Count	1—99 Counts	This parameter is active when Alignment by Die is set to PROBE + 1 POINT or PROBE + 5 POINT. If the probe tip coordinate difference is smaller than the X Position Difference, Y Position Difference, and Z Position Difference, Alignment by Die is terminated when the number of executions reaches this parameter setting.

NOTE **When At Lot Start and Between Lots are both set to YES, the probe card alignment is executed one time if the next lot is started after preheating for more than the set time period for the preheat between lots.**

If the wafer is switched when Between Lots is set to YES, the preheat monitoring timer that times preheat between lots is cancelled.

The preheat timer used to time the preheat between lots is cancelled if SETUP, CHANGEOVER, or Diagnostics on the Main Menu are pressed.

Do not change the card manually if Between Lots is set to YES, because the stage position will be very close to the card when idling.

If an inker initial is performed when preheat is executed between lots, the preheat monitoring timer used to time a preheat between lots is cancelled.

When Align Probe after Re-preheat is set to YES, Alignment by Die is set to PROBE + 1 POINT or PROBER + 5 POINT, and the execution conditions for Alignment by Die are completed after preheat, the probe card alignment after preheat will not occur.

If the SACC is operated during the test, Alignment by Die will be restarted regardless of the After Start of Measurement parameter setting.

If the time until the start of testing for the next lot does not reach the Preheat Time setting when preheat between lots is executed, preheat at lot start is executed for the time difference.

If an error occurs during preheat or Alignment by Die, an SRQ4B response to the Z command sent from the tester to finish the lot is sent.

Operation Parameters

This chapter lists, describes, and defines the P-12XL operation parameter settings. **5.2 Accessing Operation Parameters (see page 203)** provides the steps to navigate to the appropriate operation parameter menu, make any necessary changes, and save the new settings. The menu screen and available settings of each operation parameter are presented in the following topics.

5.1 Operation Parameters: Overview 0474.1

Operation parameters contain detailed information about the prober and how it will operate during testing. Operation parameters are global and will affect all product files the same; they are not file specific. The operation parameters are listed below:

- 5.7 Machine Number Parameter (see page 213)
- 5.8 Buzzer Parameters (see page 214)
- 5.5 Unload Stop (see page 208)
- 5.9 Card/Wafer Blow Operation Parameters (see page 215)
- 5.10 Indexing Units Parameter (see page 217)
- 5.11 Loader Transfer Parameters (see page 218)
- 5.12 Unload Flat Position Parameters (see page 220)
- 5.13 Cassette Type Parameter (see page 222)
- 5.14 Enable Loader Operations Parameter (see page 223)
- 5.15 Measurement (Test) Menu Parameters (see page 224)
- 5.16 Probe Alignment Parameters (see page 226)
- 5.17 Contact Count Calculation Parameters (see page 229)
- 5.18 Z Axis Parameters (see page 230)
- 5.19 Sample Wafer Parameters (see page 231)
- 5.20 Consecutive Fail Parameters (see page 232)
- 5.21 Stage Movement Limit Parameter (see page 233)
- 5.22 FDI Command Parameter (see page 234)
- 5.23 Map File Parameters (see page 235)
- 5.24 Lamp Control Parameter (see page 236)
- 5.25 Printer Parameters (see page 237)
- 5.26 GPIB Parameters (see page 240)
- 5.27 Hot Chuck On/Off Parameters (see page 242)
- 5.28 Hot & Cold Operating Conditions Parameters (see page 244)
- 5.29 TEMP Control Operating Conditions Parameters (see page 246)

5.2 Accessing Operation Parameters 0476.1

1 Use the following steps to access the *Operation Parameter Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press OPERATION PARAMETER on the *Setup Menu*.

1.3 Press the specific parameter button on the *Operation Parameter Item Selection Menu*. If necessary, use the scroll bar UP and DOWN arrows to view the desired option. The appropriate *Operation Parameter Menu* is displayed.

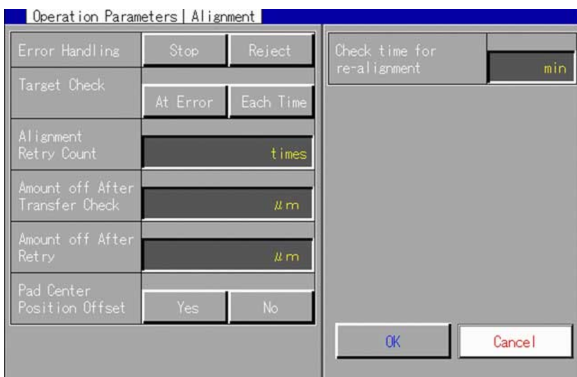
2 Set each parameter. Refer to the appropriate section below for a description and explanation of each menu option.

3 After confirming all of the settings, press OK on the appropriate *Operation Parameter Menu*. A check menu is displayed, asking `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input.

5.3 Alignment Operation Parameters 0478.1

Pressing ALIGNMENT allows you to access and change the alignment operation parameter settings.

Alignment Parameters Menu



Alignment Parameters

Parameter Name	Setting/Range	Contents
Error Handling	STOP, REJECT	Sets how the prober handles errors that occur during alignment. STOP: Stop the prober when an alignment error occurs. An alignment error is displayed and the prober stops. REJECT: Unload the wafer when an alignment error occurs. The wafer is unloaded to the reject FOUP and testing continues.
Target Check	AT ERROR, EACH TIME	A target check is performed for target hole mispositioning. It checks the operation of the alignment bridge target transfer mechanism. If the target hole is anywhere but the set position, wafer alignment is retried until the position is within the setting values. AT ERROR: Compares the target hole position registered at the first lot and performs target check only if it is displaced from the setting value. EACH TIME: Performs a target check for each wafer tested.
Alignment Retry Count	0—10 times	Sets how many times to retry wafer alignment for the target check. An assist/error occurs if the number of wafer alignment retries exceeds the setting value.
Amount Off After Transfer Check	0–100 µm	This parameter is active when Target Check is set to AT ERROR. Sets the displacement amount when performing target check at errors.
Amount Off After Retry	0–10 µm	Sets the amount of displacement that may be present when retrying wafer alignment.
Pad Center Position Offset	YES, NO	Sets whether to offset the pad position by detecting the pad center using PMI pad training data. This will eliminate any differences between pads when the reference pad and input pads contact the reference pins and input pins. YES: Automatically detect the pad center and offset each pad position. NO: Do not detect the pad center.

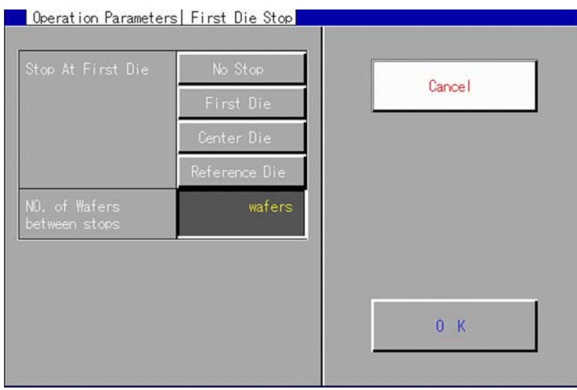
Parameter Name	Setting/Range	Contents
Check Time for Re-alignment	0–120 min	To ensure the accuracy of the contact height between the probes and the wafer, wafer alignment must be completed in a set amount of time. If the chuck top is below the alignment bridge for too long, heat from the chuck may affect the temperature of the camera. If alignment is stopped unexpectedly beyond the set number of minutes, the prober will need to execute another alignment before testing can continue.
Reg. Pad Position Check	YES,NO	This parameter is active when FILE PARAMETER MULTIPLE TESTS is set to NO. Sets whether to check if the position of the registered pad designated at the time of wafer input is on the same die as the reference pad. YES: Check the position of the input pad. If the position of the input is not within the same die as the reference pad, the warning message will be displayed. Press CONFIRM to return to the designation of the street intersection. NO: Do not check the position of the input pad.

5.4 Die Stop Parameters 0479.1

This procedure describes how to access and change the die stop parameters.

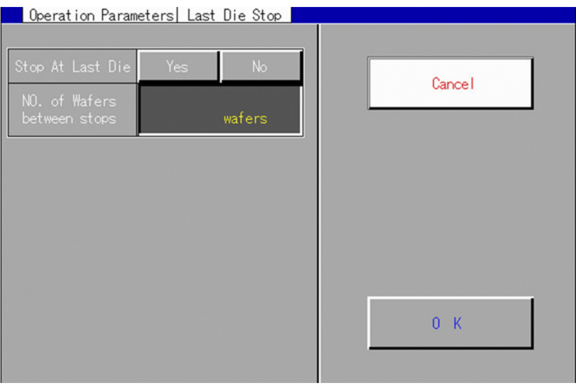
Pressing STOP AT FIRST DIE allows you to access and change the first die stop parameter settings.

First Die Stop Menu



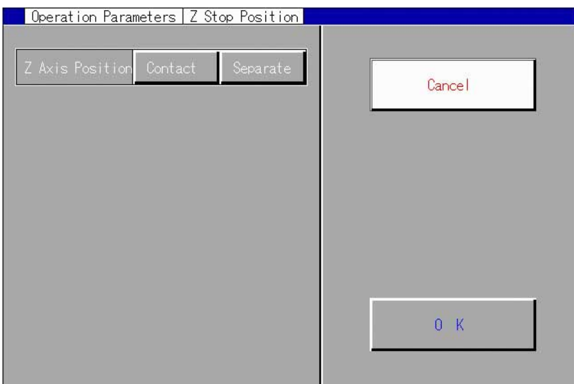
Pressing STOP AT LAST DIE allows you to access and change the last die stop parameter settings.

Last Die Stop Menu



Pressing Z AXIS POSITION allows you to access and change the Z position stop parameter settings.

Z Stop Position Menu

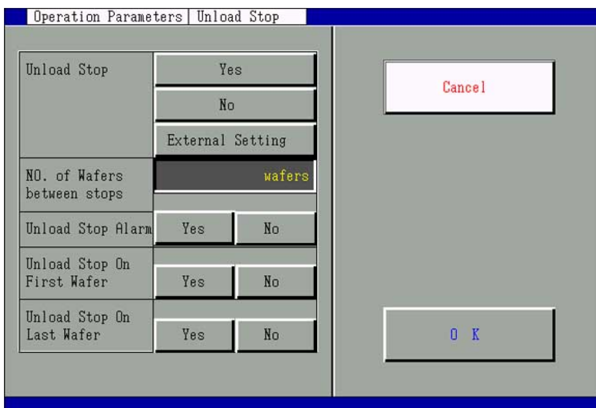


Die Stop Parameters

Parameter Name	Setting/Range	Contents
First Die Stop Parameters		
Stop at First Die	No Stop, First Die, Center Die, Reference Die	Sets whether to stop the prober after alignment, and if so, the stopping position. Sets the contact position to check before testing begins. The Z position at stop is set in the Z Position at Stop Menu. No Stop: Continue operation and testing. First Die: Stop the prober at the first test die. Center Die: Stop the prober at the center die. Reference Die: Stop the prober at the reference die.
NO. of Wafers Between Stops	0— 99 Wafers	This parameter is active when Stop at First Die is set to First Die, Center Die or Reference Die. Sets the number of wafers between prober stops. 0 or 1: Stop for each wafer. 2–99: Stop after the set number of wafers. Example: Setting Value = 5: Stop on the 1st, 6th, 11th, etc. wafers.
Last Die Stop Parameters		
Stop at Last Die	Yes, No	This parameter is active when GPIB is set to No. Sets whether to stop the prober after testing the last die on the selected wafer. Yes: Stop the prober after the last tested die. No: Do not stop the prober after the last tested die.
No. of Wafers Between Stops	0—99 Wafers	This parameter is active when Stop at Last Die is set to Yes. Sets the interval between prober stops. 0 or 1: Stop for every wafer. 2—99 Stop the prober at the set number of wafers. Example: Setting Value = 5: Stop on the 1st, 6th, 11th, etc. wafers.
Z Position at Stop Parameters		
Z Axis Position	Contact, Separate	This parameter is active when you press Stop during testing to stop the prober. Sets the wafer and probe contact condition when the prober is stopped. Contact: Stop when the wafer and probe are in contact. Separate: Stop when the wafer and probe are not in contact.

5.5 Unload Stop 1486.1

Pressing UNLOAD STOP allows you to access and change the Unload Stop parameter settings.



Unload Stop Parameters

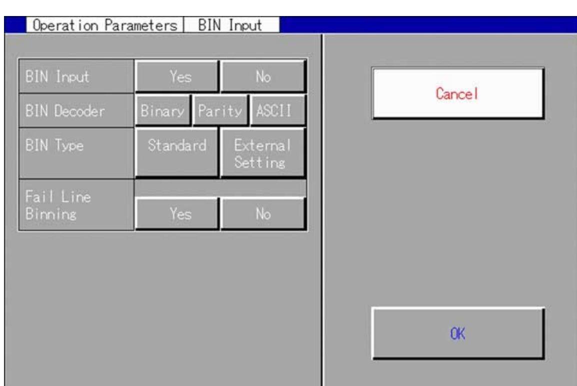
Parameter Name	Settings	Contents
Unload Stop	YES, NO, EXTERNAL SETTING	Sets whether to transfer the tested wafer to the wafer table.
No. of Wafers between Stops	0–50	This parameter is active when `Unload Stop` is set to YES. Sets the interval for transferring tested wafers to the wafer table. 0: Transfer every tested wafer (no operator call). 1–50: Transfer the set number of wafers.
Unload Stop Alarm	YES, NO	This parameter is valid when `Unload Stop` is set to YES and `No. of wafers between stops` is set between 1 and 50 wafers. Sets whether to use an operator call when a wafer is transferred to the wafer table. YES: Output an operator call. NO: Do not output an operator call.

Parameter Name	**Settings**	**Contents**
Unload Stop on First Wafer	YES, NO	Sets whether to transfer the first tested wafer to the wafer table. YES: Transfer the first tested wafer to the wafer table. The first tested wafer is transferred to the wafer table and an operator call is executed. Testing stops for the next wafer. Press OK on the message menu to start testing. If there is only one wafer in the FOUP, the unload stop operation is not performed on the initial wafer. NO: Do not transfer the first tested wafer to the wafer table.
Unload Stop on Last Wafer	YES, NO	Sets whether to transfer the last tested wafer of the lot to the wafer table. YES: Transfer the last tested wafer of the lot to the wafer table. The last tested wafer is transferred to the wafer table and an operator call is executed. If you press OK on the message menu to unload the wafer to the FOUP, then the lot is completed. NO: Do not transfer the last tested wafer of the lot to the wafer table.

5.6 BIN Input Operations Parameters 0480.1

Pressing BIN INPUT allows you to access and change the BIN input operations parameters. These parameters set the BIN data input conditions when using BIN data in the testing results. BIN data is subdivision data for handling categorized pass and fail test results. The prober converts BIN data into category symbols. These are grouped into the pass categories and fail categories. Pass categories are symbolized by 1-5 and fail categories are symbolized by A-S.

BIN Input Menu

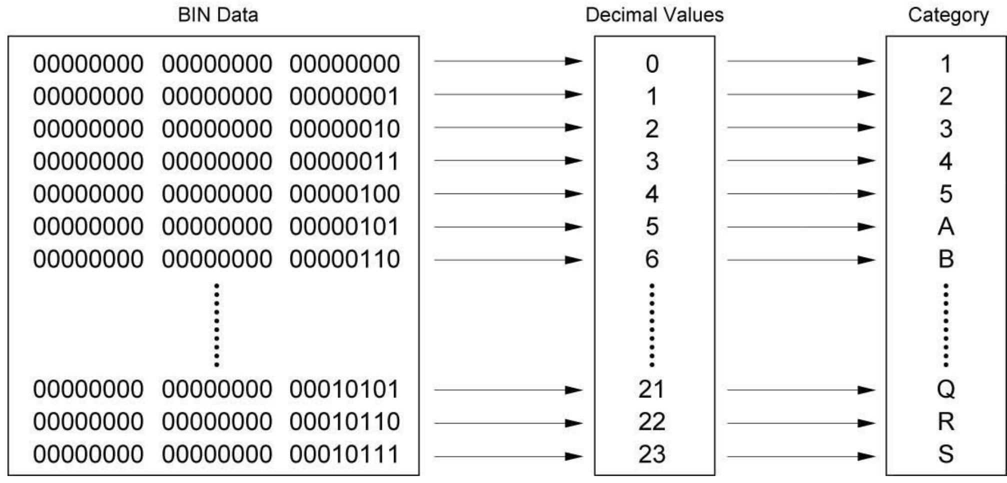


BIN Input Operations Parameters

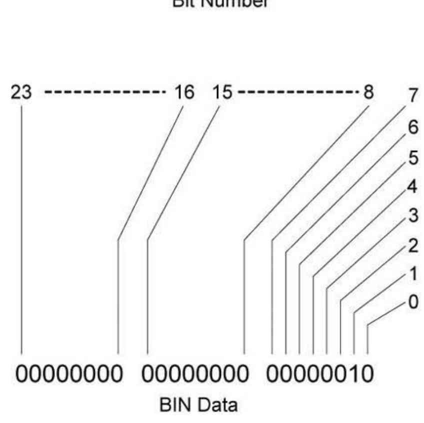
Parameter Name	Setting/Range	Contents
BIN Input	YES, NO	Sets whether to use BIN data. YES: Use BIN data in the test results. BIN data is transferred from the tester to the prober. NO: Do not use BIN data in the test results. In order to use BIN data, you need a BIN or GPIB interface to transmit signals to the tester. When using BIN Interface: BIN data input as 24 Categories Max (Binary 3 byte). When using GPIB Interface: BIN data input as 32 Categories Max (Binary 4 byte). When using BIN Interface 3 byte data 00000000 00000000 00000000 00000001 When using GPIB Interface 4 byte data BIN Data

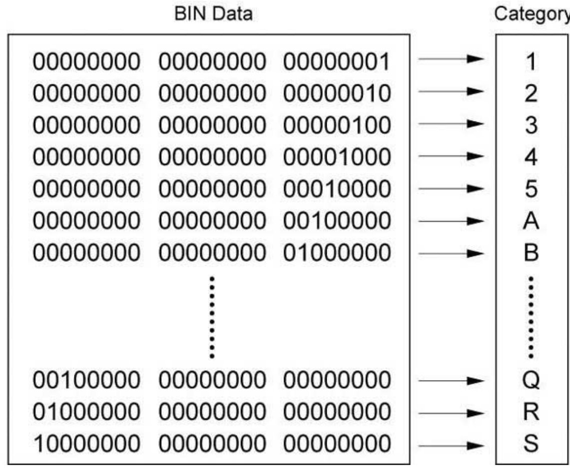
Parameter Name	Setting/Range	Contents
`BIN Decoder`	BINARY, PARITY, ASCII	Sets the conversion method for the BIN data in reference to the category. BINARY: To convert BIN data to decimal values for the category. PARITY: Apply the BIN data bit number to the category. ASCII: Use when converting BIN data for compatibility with ASCII code. **NOTE** **The current system software, Version Rzz00-R014.05, does not support the ASCII function.**
`BIN Type`	STANDARD, EXTERNAL SETTING	Sets the category symbols. STANDARD: Use standard category. (Pass Category = 1-5; Fail Category = A-S). EXTERNAL SETTING: Load BIN data that was created on a personal computer to the prober.
`Special BIN Input`	YES, NO	Sets the method for taking in BIN data. YES: Take in the BIN categories using the five tester signals of FAIL 1 through 4 and PASS. The five BIN data signals are decoded as binary. The five BIN data signals are arranged as shown in the following graphic. PASS | FAIL 4 | FAIL 3 | FAIL 2 | FAIL 1 BIN Data Signal Arrangement NO: Inputs BIN data using standard BIN interface.

Conversion Method Using Binary



Conversion Method Using Parity

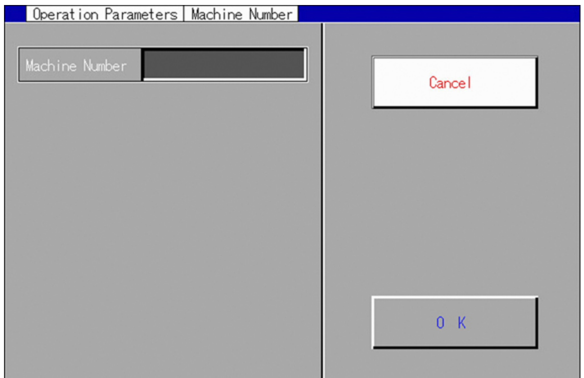




5.7 Machine Number Parameter 0529.1

Pressing MACHINE NO. allows you to access and change the machine number parameter setting.

Machine Number Parameter Menu



Machine Number Operation Parameter

Parameter Name	Setting/Range	Contents
Machine Number	20 CHARACTERS	Sets the prober name. The name set for the machine number is used as the printer's title on printouts. The machine number is also output from the prober to the tester when using a GPIB interface so that the tester can identify the prober.

5.8 Buzzer Parameters 0482.1

Pressing BUZZER allows you to access and change the buzzer parameter settings. These parameters set the operating conditions for the buzzer when an operator call is executed.

Buzzer Parameters

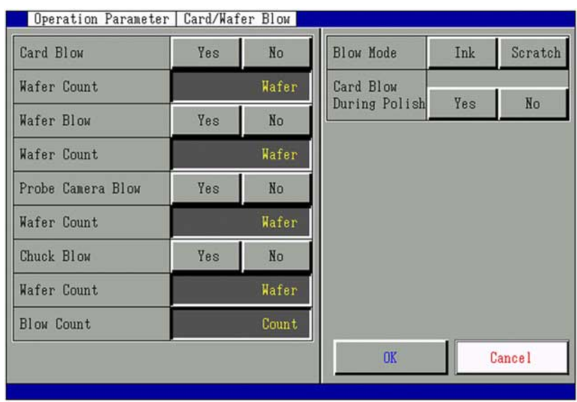
Parameter Name	Setting/Range	Contents
Buzzer	USE, DON'T USE	Sets whether the buzzer rings when there is an error or assist. USE: Ring the buzzer when an error or assist occurs. DON'T USE: Do not ring the buzzer when an error or assist occurs.
Buzzer Timer	USE, DON'T USE	This parameter is active when Buzzer is set to USE. Sets the operating time for the buzzer. USE: Ring the buzzer for only five seconds. DON'T USE: Ring the buzzer until it is stopped by the operator.

5.9 Card/Wafer Blow Operation Parameters 0483.1

Pressing CARD/WAFER BLOW allows you to access and change the card/wafer blow operations parameters to set the air blow conditions for air blow of the probe card, wafer, and chuck camera (for probers equipped with the automatic setup (ASU) camera).

NOTE **The current system software version, Rzz00-R014.05, does not support the *Card/Wafer Blow Menu*.**

Card/Wafer Blow Parameter Menu



Card/Wafer Blow Parameters

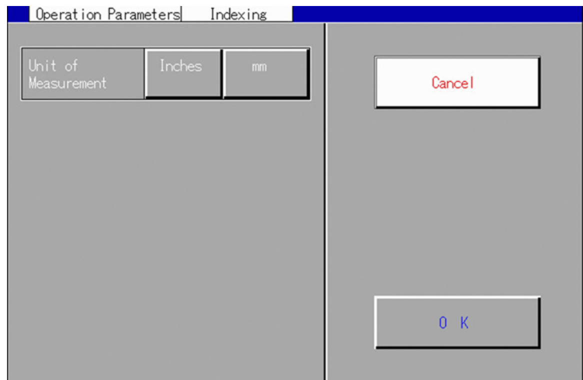
Parameter Name	Setting/Range	Contents
Card Blow	YES, NO	Sets whether to air-blow the card. YES: Execute the air blow. After testing the wafer, an air blow on the probe card is executed for approximately two seconds. NO: Do not execute the air blow.
Wafer Count	0–50 Wafers	This parameter is active when Card Blow is set to YES. Sets the interval between card blows. 0: Execute the card blow only after testing the first wafer. 1: Execute the card blow for each wafer test. 2—50 Execute the card blow for the number of set wafers. Example: Setting Value = 5: Card blows will be performed after testing the 1st, 6th, 11th, etc. wafer.
Wafer Blow	YES, NO	Sets whether to air– blow the wafer. YES: Execute the air blow. After wafers are loaded to the chuck top, air blow on the wafer is executed for approximately two seconds. NO: Do not execute the air blow.

Parameter Name	Setting/Range	Contents
Wafer Count	0–50Wafers	This parameter is active when Wafer Blow is set to YES. Sets the interval between wafer blows. 0: Execute wafer blows only after testing the first wafer. 1: Execute wafer blows for each test wafer. 2—50 Execute wafer blow for the set number of wafers. Example: Setting Value = 5: Wafer blows will be performed for the 1st, 6th, 11th, etc. wafer.
ASU Camera Blow	YES, NO	Sets whether or not to perform an air blow on the chuck camera. YES: Execute the air blow. The air blow is executed for approximately two seconds on the target mark and the chuck camera before alignment. NO: Do not execute the air blow.
Wafer Count	0–50 Wafers	This parameter is active when Chuck Camera Blow is set to YES. Sets the interval for the number of wafers between chuck camera blows. 0: Execute the chuck camera blow before aligning the first wafer. 1: Execute the chuck camera blow before aligning each wafer. 2—50 Execute the chuck camera blow for the set number of wafers. Example: Setting Value = 5: Chuck camera blows will be performed before aligning the 1st, 6th, 11th, etc. wafer.
Blow Mode	INK, SCRATCH	Sets the mode when executing blows for the fail marking.
Card Blow During Polish	YES, NO	Sets whether to execute a card blow during probe polish. YES: Execute a card blow during probe polish. NO: Do not execute a card blow during probe polish.

5.10 Indexing Units Parameter 0484.1

Pressing INDEX UNIT allows you to access and change the indexing units parameter.

Indexing Units Parameter Menu



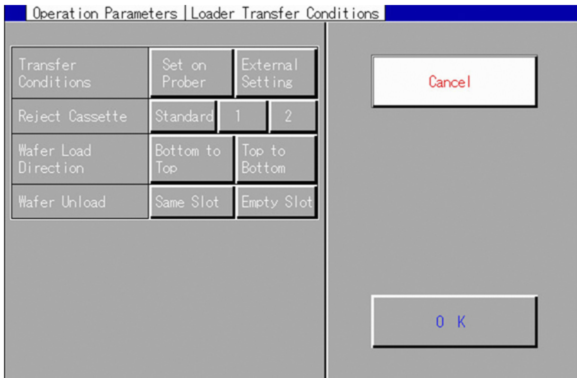
Indexing Unit Operation Parameters

Parameter Name	Setting/Range	Contents
Unit of Measurement	INCHES, MM	Sets the transfer increment amounts for the X and Y axes. INCHES: Sets the units to inches (0.1 mil). MM Sets the units to metric (µm).

5.11 Loader Transfer Parameters 0485.1

Pressing LOADER TRANSFER CONDITION allows you to access and change the loader transfer parameter settings.

Loader Transfer Conditions Menu



Loader Transfer Conditions Parameters

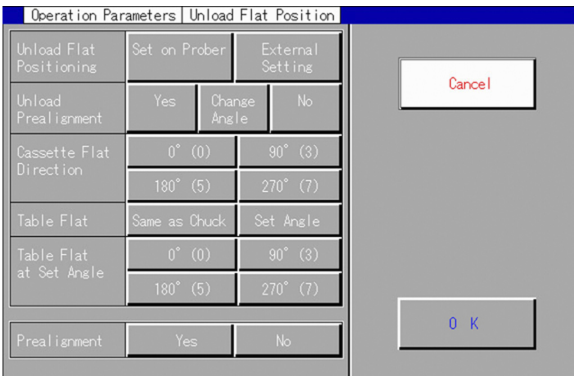
Parameter Name	Setting/Range	Contents
Transfer Conditions	SET ON PROBER, EXTERNAL SETTING	Sets the parameter reference source that determines transfer conditions. SET ON PROBER: Set by parameters on this menu. EXTERNAL SETTING: Set by transfer-conditions data created on an external PC. **NOTE** **Transfer Conditions must be set to SET ON PROBER to activate the other menu items.**
Reject Cassette	STANDARD, 1, 2	Sets the FOUP for unloading the wafer when an alignment error, such as a reject, tester reject, or OCR reject, occurs. STANDARD: Unload the wafer to the FOUP from which it was loaded. 1: Use FOUP 1 as the reject FOUP. Wafers that had an alignment error are unloaded to FOUP 1. 2: Use FOUP 2 as the reject FOUP. Wafers that had an alignment error are unloaded to FOUP 2. **NOTE** **When a wafer alignment error occurs, an alignment assist menu is displayed. Press CONFIRM → CANCEL → LOAD NEXT WAFER on the menu and the wafer will be unloaded to the FOUP selected in this parameter. The next wafer will then be loaded.**

Parameter Name	Setting/Range	Contents
Wafer Load Direction	Bottom to Top, Top to Bottom	Sets the order in which wafers are loaded from the FOUP. Bottom to Top: Load wafers from the bottom slot in order. Top to Bottom: Load wafers from the top slot in order. NOTE **The numeric order of the FOUP slot numbers is based on this setting.**
Wafer Unload	Same Slot, Empty Slot	This parameter is active when Unload Stop is set to No. Selects the slot for unloading wafers to the FOUP. Same Slot: Unload the wafer to the same slot from which it was loaded. Empty Slot: Unload to empty slots.

5.12 Unload Flat Position Parameters 0486.1

Pressing UNLOAD FLAT POSITION allows you to access and change the unload flat position parameters. This parameter sets the conditions for transferring the tested wafer to either the FOUP or the unload table.

Unload Flat Position Menu



Unload Flat Position Parameters

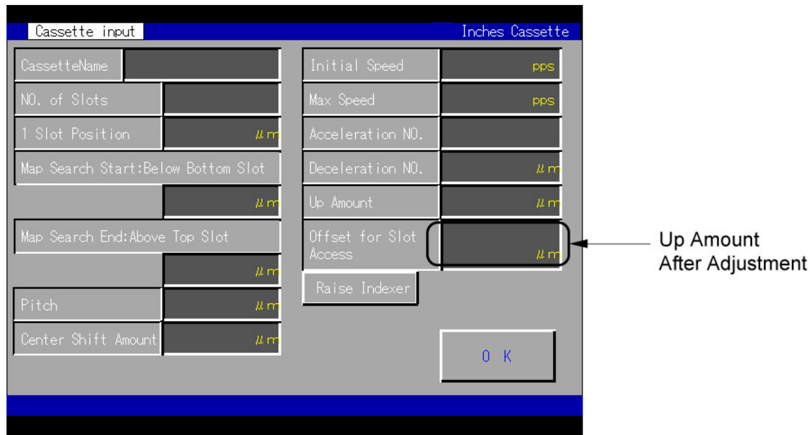
Parameter Name	Setting/Range	Contents
`Unload Flat Position`	SET ON PROBER, EXTERNAL SETTING	Sets the parameter reference source to determine the wafer flat while unloading. SET ON PROBER: Refer to the parameters set on this menu. EXTERNAL SETTING: Refer to the transfer conditions data created on a PC. **NOTE** **`Unload Flat Positioning` must be set to SET ON PROBER and `Prealignment` must be set to YES to activate the other menu items (except `Prealignment`).**
`Unload Prealignment`	YES, CHANGE ANGLE, NO	This parameter is active when `Prealignment` is set to YES. Sets the method for transferring the wafer to either the FOUP or the wafer table. YES: Execute prealignment and wafer angle change. The wafer is centered and the flat orientation is set to a selected angle when transferring the wafer to the FOUP or the wafer table. CHANGE ANGLE: Execute only a wafer change angle for the wafer. Prealignment will not be performed. NO: Do not execute prealignment. **NOTE** **Optical detection is performed when `Unload Prealignment` is set to YES. This process takes a few seconds to complete.**
`Cassette Flat Direction`	0° (0), 90° (3), 180° (5), 270° (7)	This parameter is active when `Unload Prealignment` is set to YES or CHANGE ANGLE. Sets the flat for unloading wafers to FOUPs.

Parameter Name	Setting/Range	Contents
`Table Flat`	Same as Chuck, Set Angle	This parameter is active when `Unload Prealignment` is set to Yes or Change Angle. Sets whether or not to set the flat orientation in the table the same as on the main chuck when transferring the wafer to the unload table. Same as Chuck: Set the same as the flat orientation on the main chuck. Set Angle: Do not set the same as the flat orientation on the main chuck. Use the flat orientation selected below when transferring a wafer to the unload table.
`Table Flat at Set Direction`	0° (0), 90° (3), 180° (5), 270° (7)	This parameter is active when `Table Flat` is set to Set Angle. Sets the wafer flat orientation direction while transferring it to the unload table.
`Prealignment`	Yes, No	Sets whether to execute prealignment when transferring wafers from the FOUP to the main chuck. Yes: Execute prealignment. No: Do not execute prealignment. **NOTE** **Set Prealignment to** Yes **when testing.** No **is provided for checking the prober's movement and for maintenance purposes; wafers cannot be tested if prealignment is turned off.**

5.13 Cassette Type Parameter 0487.1

Pressing SELECT CASSETTE TYPE allows you to access and change the FOUP type parameters.

Cassette Type Parameter Menu



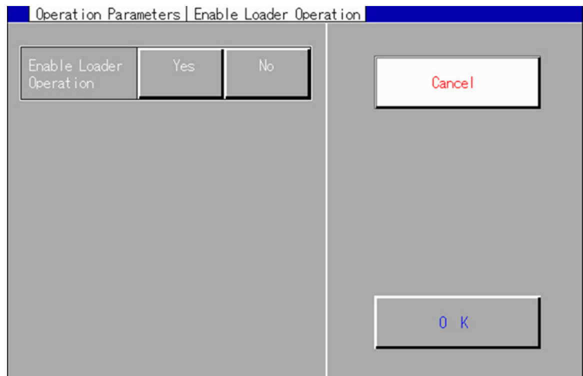
Cassette Type Operation Parameter

Parameter Name	Setting/Range	Contents
`Cassette Type`	Select the FOUP input name per size.	This parameter is active when you input the FOUP data. Sets the FOUP data for the wafer sizes being tested. Select the name of the FOUP data displayed for each size in `Standard Cassette`, `Custom Cassette 1`, and `Custom Cassette 2`. **NOTE** **You can input two types of FOUP data for each size in `Custom Cassette 1` and `Custom Cassette 2`. FOUP data conforming to SEMI Standards is input for `Standard Cassette`.**

5.14 Enable Loader Operations Parameter 0488.1

Pressing ENABLE LOADER OPERATION allows you to access and change the enable loader operation parameter settings.

Enable Loader Operation Menu



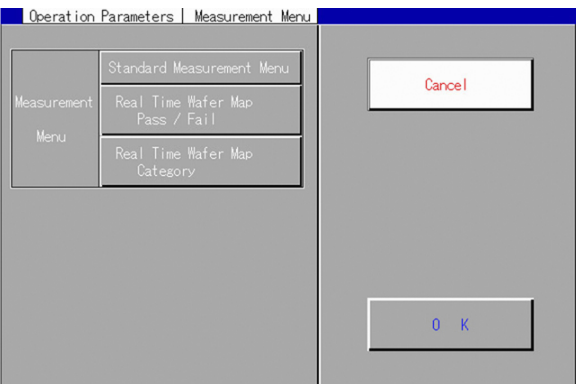
Enable Loader Operations Parameter

Parameter Name	Setting/Range	Contents
`Enable Loader Operation`	YES, NO	Sets whether FOUPs can be removed during testing. This is valid when checking how the wafers are unloaded into the FOUP. YES: Allows FOUP removal. NO: Does not allow FOUP removal.

5.15 Measurement (Test) Menu Parameters 0489.1

Pressing MEASURE MENU allows you to access and change the measurement (test) menu parameter settings.

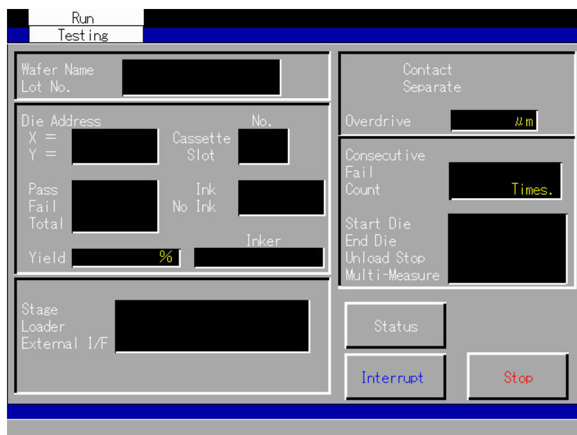
Measurement Menu



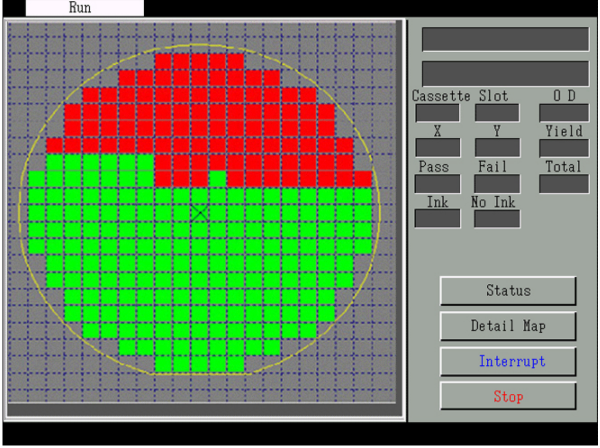
Measurement (Test) Menu Operation Parameter

Parameter Name	Setting/Range	Contents
Measurement Menu	STANDARD MEASUREMENT MENU, REAL TIME WAFER MAP PASS/FAIL, REAL TIME WAFER MAP CATEGORY	Sets the type of testing display. STANDARD MEASUREMENT MENU: Displays the *Standard Testing Menu* (shown below) to show testing information with no visible wafer map. This testing menu displays more overall and statistical information than the other types of maps. REAL TIME WAFER MAP PASS/FAIL: Displays the *Real Time Wafer Map Menu* (shown below) to show the pass and fail information on a wafer map graphic. Does not provide the depth of information found on the *Standard Test Menu*; however, information is easier to access through the graphical representation. REAL TIME WAFER MAP CATEGORY: Displays pass and fail categories on a wafer map graphic. Does not provide the depth of information found on the Standard Test Menu. Information is classified into color-coded categories, a feature not found on the *Real Time Wafer Map Menu*.

Standard Testing Menu



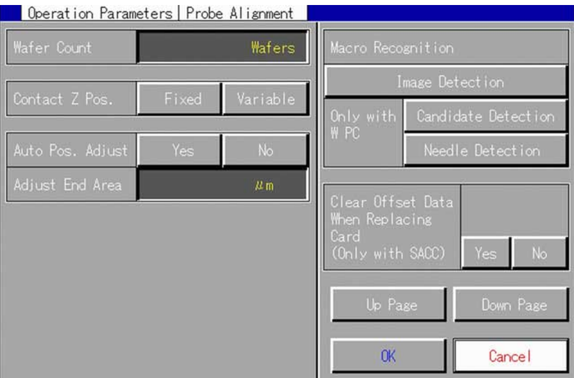
Real Time Wafer Map Menu



5.16 Probe Alignment Parameters 0490.1

Pressing PROBE ALIGNMENT allows you to access and change the probe alignment parameter settings.

Probe Alignment Parameters Menu



Probe Alignment Operation Parameter

Parameter Name	Setting/Range	Contents
`Wafer Count`	0—50Wafers	Sets the intervals for probe alignment. 0: Execute probe alignment before testing the first wafer. 1: Execute probe alignment before testing every wafer. 2–50 Execute probe alignment for the set number of wafers. Example: Setting Value = 5: Probe alignment is performed before testing the 1st, 6th, 11th, etc. wafers. **NOTE** **If you press UNLOAD STOP when `Hot Chuck` is set to YES and `Unload Stop` is set to YES or EXTERNAL SETTING, probe alignment is performed before the next wafer is testing, regardless of the setting for `Wafer Count` in the Probe Alignment Parameters.**
`Contact Z Pos.`	FIXED, VARIABLE	Sets whether to make the contact Z position offset (the Z axis movement amount) a fixed value. Otherwise this value could shift based on the probe alignment measurements when performing multiple probe alignments on the same lot. X, Y, and theta contacts are always automatically offset. FIXED: Makes the contact Z position offset amount stationary. VARIABLE: Allows the contact Z position offset amount to change based on the value returned by probe alignment. The Z axis offset is variable because probe alignment is measuring the slight differences in the surface of the wafer. Those differences will be applied to adjust the Z axis movement.

Parameter Name	Setting/Range	Contents
Auto Pos. Adjust	YES, NO	This parameter is active when Preheat is set to YES. The prober will continue to perform probe alignment before each wafer until the probes have stabilized and are no longer moving due to the heat transfer from the hot chuck. When position displacement is outside the tolerance, auto position adjust will not execute. YES: Performs auto position adjustment. NO: Does not perform auto position adjustment.
Adjust End Area	0—99 µm	After each probe alignment, the amount of probe displacement is checked. If the displacement is less than the Adjust End Area amount, probe alignment will not continue.
Macro Recognition Image Detection	IMAGE DETECTION, CANDIDATE DETECTION, NEEDLE DETECTION	Sets the macro recognition method. IMAGE DETECTION: Stores the image either in the Bright or Dark view fields and detects the image that matches the stored one. This function is not available if the wafer has IMAGE DETECTION NEEDLE DETECTION set for the probe card data. CANDIDATE DETECTION: Detects multiple images in positions where a correlation between those images and the input image can be obtained. It then calculates the optimal input position based on the correlation. This function is only available if a cantilever probe card (WPC) is in use. This function is not available if the wafer has IMAGE DETECTION or NEEDLE DETECTIONset for the probe card data. NEEDLE DETECTION:Seeks the input position by detecting the probe tip coordinations and compares the arrangements. This function is only available if a cantilever probe card (WPC) is in use. This function is not available if the wafer has IMAGE DETECTION or NEEDLE DETECTION set for the probe card data.
Clear Offset Data When Replacing Card	YES, NO	This parameter is active when the SACC is enabled in the Hardware Options section of the *Hard Select (Yes/No) Menu*. Sets whether or not to clear the X, Y, and theta contact point offset amounts when the probe card is replaced using the SACC. YES: Clear the offsets. NO: Do not clear the offsets.

Probe Alignment Menu (2 of 2)

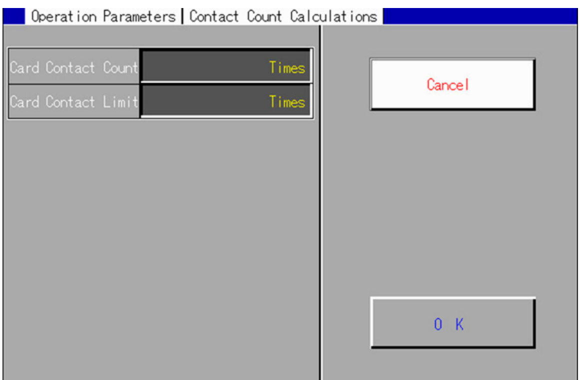
Probe Alignment Operation Parameter

Parameter Name	Setting/Range	Contents
Monitoring	YES, NO	YES: Monitor probe alignment. When performing probe alignment for the first lot, compare with the input data. When performing probe alignment for the second lot or beyond, compare with the previous probe alignment result. The displacement of the probe's center of gravity is verified by comparing the probe's X, Y, and Z center of gravity detected in every probe alignment, the center of gravity is calculated for each recognized pin, with the probe input data or the previous probe alignment result. If the displacement is greater than the expected value, it is judged as a probe alignment error and an assist message is displayed. This prevents damage to the wafer and card because of contact failures. NO: Do not monitor probe alignment.
Changeable Tolerance Value X,Y, and Z	X: 0—999 µm, Y 0—999 µm, Z: 0—999 µm	This parameter is active when Monitoring Probe Alignment is set to YES. The change in probe alignment results is monitored based on this value. If X, Y, or Z is set to 0, that axis will not be monitored.
Probe Alignment Retry Count	0—99 Times	This parameter is active when Monitoring Probe Alignment is set to YES. When the displacement is greater than the changeable tolerance value, probe alignment is retried as many times as set in this function.
Preheat Time at Retry	0—1800Sec.	This parameter is active when Monitoring Probe Alignment is set to YES and Preheat is set to YES in the Contact Correction at High Temp Parameter. Sets the preheat time when retrying probe alignment. When the preheat time set to 0, preheat will not be executed.

5.17 Contact Count Calculation Parameters 0491.1

Pressing CUMULATIVE CONTACT COUNT allows you to access and change the contact count calculation parameters. This parameter is required to limit probe card usage before the card is changed.

Contact Count Calculations Menu



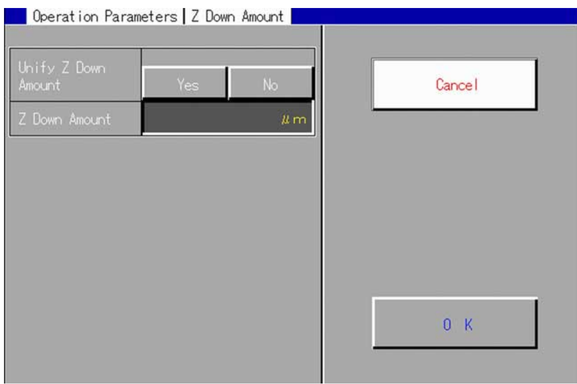
Contact Count Calculations Parameters

Parameter Name	Setting/Range	Contents
`Card Contact Count`	N/A	Displays the number of probe card contacts. Reset this count when the probe card is replaced.
`Card Contact Limit`	0—99,999 Times	Sets the limit to the amount of probe card contact. When the set count is reached for `Card Contact Count`, a message is displayed. Replace the probe card and reset the card contact count.

5.18 Z Axis Parameters 0492.1

Pressing Z DOWN AMOUNT allows you to access and change the Z axis parameter settings.

Z Down Amount Menu



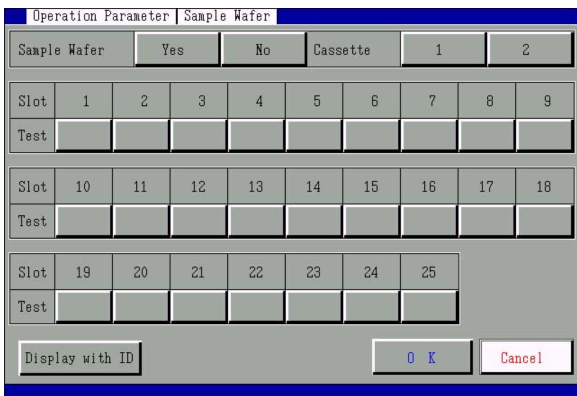
Z Down Amount Operation Parameters

Parameter Name	Setting/Range	Contents
`Unify Z Down Amount`	YES, NO	Sets whether or not to unify the Z axis lowering amount during contact regardless of the wafer being tested. YES: Unify the lowering amount of the Z axis during contact. NO: Do not unify the lowering amount of the Z axis during contact. Set the Z Down Amount for each wafer to test in the Contact Parameters.
`Z Down Amount`	0—1000 μm	This parameter is active when `Unify Z Down Amount` is set to YES. Sets the lowering amount of the Z axis to be unified.

5.19 Sample Wafer Parameters 0493.1

Pressing SAMPLE WAFER allows you to access and change the sample wafer parameters. Press YES for `Sample Wafer` on the *Sample Wafer Menu*. Now select the additional wafer for testing. Select the FOUP that contains the wafer to be tested. Once you select the FOUP, select the wafer to be tested. For example, to designate the wafer in slot number 21, press NO under the `21` to change it to YES.

Sample Wafer Menu



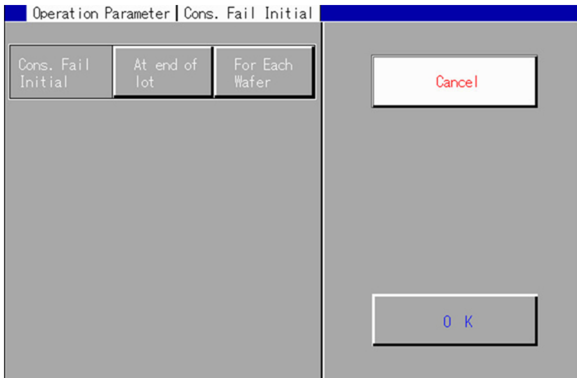
Sample Wafer Operation Parameter

Parameter Name	Setting/Range	Contents
`Sample Wafer`	YES, NO	Sets whether to limit testing to the wafers in the FOUP. YES: Limit testing to the wafers selected on this menu. NO: Do not limit testing, test all wafers in the FOUP.

5.20 Consecutive Fail Parameters 0494.1

Pressing CONS. FAIL INITIAL allows you to access and change the consecutive fail parameter settings.

Cons. Fail Initial Menu



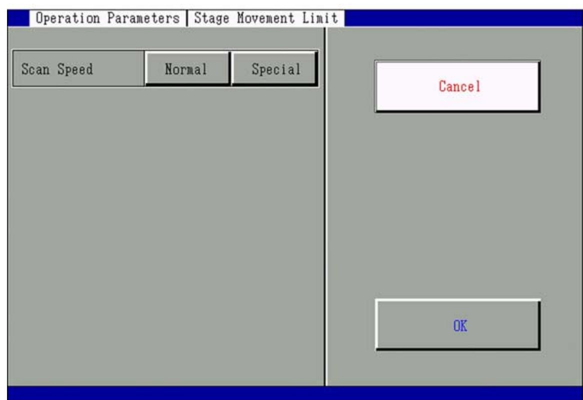
Consecutive Fail Parameters

Parameter Name	Setting/Range	Contents
`Cons. Fail Reset (Initial)`	AT END OF LOT, FOR EACH WAFER	This parameter is active when `Consecutive Fail Mode` is set to 1: STOP in the Consecutive Fail Parameter. Sets the conditions for resetting the consecutive fail count. AT END OF LOT: Reset the count after lot testing. FOR EACH WAFER: Reset the count after testing each wafer.

5.21 Stage Movement Limit Parameter 0495.1

Pressing STAGE MOVEMENT LIMIT allows you to access and change the stage movement limit parameter settings.

Stage Movement Limit Menu



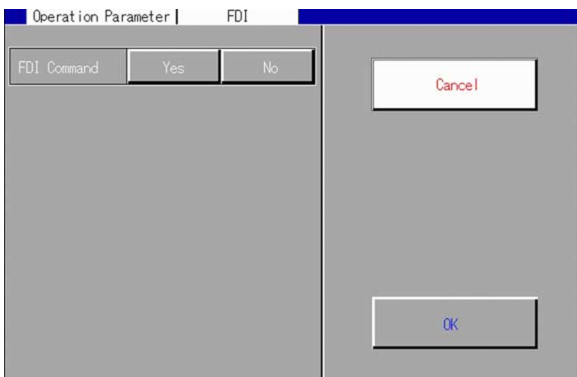
Stage Movement Limit Operation Parameter

Parameter Name	Setting/Range	Contents
`Scan Speed`	NORMAL, SPECIAL	Sets how the stage moves when indexing from die to die when performing the contact check function. NORMAL: The stage will index at normal speed. SPECIAL: The stage will index at a slower speed.

5.22 FDI Command Parameter 0496.1

Pressing FDI allows you to access and change the probe card inspection (PCI) parameter settings.

FDI Command Menu



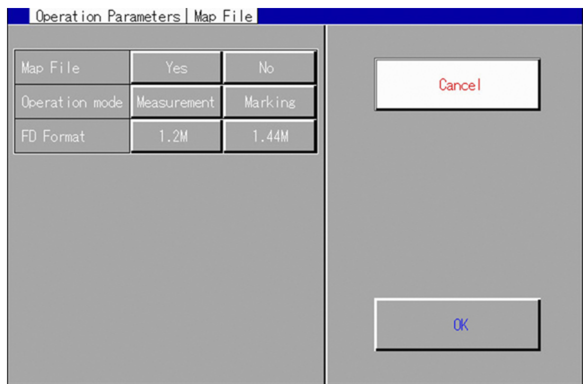
FDI Operation Parameter

Parameter Name	Setting/Range	Contents
FDI Command	YES, NO	This sets whether or not to offset the map coordinates by using the center die information from the tester. This function is effective when the prober is connected to a KLA-Tencor Integrator system. YES: (Use.) Offset the map coordinates by using the center die information from the tester. NO: (Not to use.) Offset the map coordinates by using the result of wafer alignment.

5.23 Map File Parameters 0497.1

Pressing MAP FILE allows you to access and change the map file parameters.

Map File Parameters Menu



Map File Operation Parameters

Parameter Name	Setting/Range	Contents
Map File	YES, NO	Sets whether or not to transfer the test results data to the map file. YES: Transfer test results data to the map file. NO: Do not transfer test results data to the map file.
Operation Mode	MEASUREMENT, MARKING	Sets the prober's operation mode (as a testing or a marking prober.) MEASUREMENT: Use the prober as a testing prober. MARKER: Use the prober as a marking prober. **NOTE** **If you set Operation Mode to MARKER, you will not be able to test the circuit patterns on the wafer. If you are going to use this prober specifically for marking, refer to the individual specifications provided with this prober.** **NOTE** **The current system software, version Rzz00–R014.05, does not support this parameter.**

5.24 Lamp Control Parameter 0498.1

Pressing LAMP CONTROL allows you to access and change the lamp control parameters.

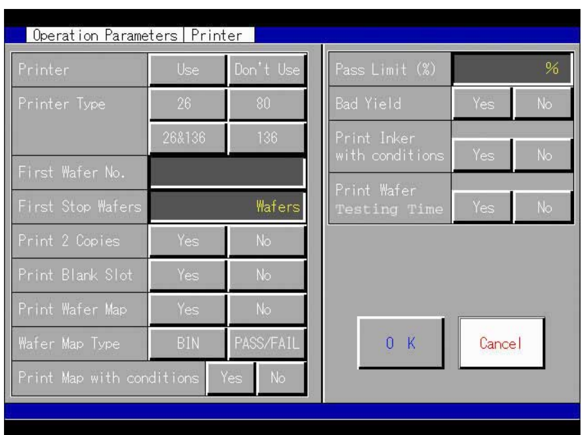
Lamp Control Operation Parameter

Parameter Name	Setting/Range	Contents
Control by the Lamp Setup File	YES, NO	This sets whether or not to control the prober lamp control using the control file made in “Alarm Monitor Lightning Conditions” in SMCWIN (Testing Data Setting System). YES: Control the prober lamp control using the control file made in “Alarm Monitor Lighting Conditions” in SMCWIN (Testing Data Setting System). Create this file on a PC and then load it on the prober. NO: Do not control the prober lamp control using the control file made in “Alarm Monitor Lighting Conditions” in SMCWIN (Testing Data Setting System) on a PC. NOTE **This function is effective only if the lamp control is standard.**

5.25 Printer Parameters 0500.1

Pressing PRINTER allows you to access and change the printer parameter settings.

Printer Parameters Menu



NOTE **For `Printer` to appear as a choice on the** ***Operation Parameter Item Selection Menu*****, the PRINTER setting must have been activated on the** ***Hard Select (Multi) Menu*****. Also, `Printer` must be set to YES on the** ***Hard Select (Yes/No) Yes/No Menu*****. If the printer is not enabled in these two places, the prober does not recognize that a printer can be used.**

Printer Operation Parameters

Parameter Name	Setting/Range	Contents
`Printer`	USE, DON'T USE	Sets whether to use the printer. **NOTE** **`Printer` must be set to USE to activate the other menu items.**
`Printer Type`	26, 80, 26&136, 136	Sets the printer type. A 26-digit printer is built-in on the prober. Other printers are external connecting types.
`First Wafer No.`	1–50	This parameter is active when `Printer` is set to USE, `Transfer Conditions` is set to EXTERNAL SETTING in the Loader Transfer Condition Parameter, and the Wafer Loading Condition Parameter is set using SMCWIN (Testing Data Setting System). Sets a user-input number for the first tested wafer that is used when printing the wafer number in the testing results. All subsequent wafer numbers that appear in the testing results will increase in number by one. However, the wafer numbers are not printed when the parameter is set to 0.
`First Stop Wafer`	1–50 Wafers	This parameter is active when `Printer Type` is set to 80. Sets the test wafer count to output test results using category totals. When the test wafer count reaches the appropriate setting, the test results total up the tested wafers and print the results. Printing will not occur if the parameter is set to 0.

Parameter Name	Setting/Range	Contents
Print 2 Copies	YES, NO	This parameter is active when Printer Type is set to 26. Sets whether or not to print two copies when printing the test results after completing the lot testing. YES: Print two copies. NO: Print one copy.
Print Blank Slots	YES, NO	Sets whether to print empty slots in the test results. YES: Print empty slots. If there are empty slots, the prober prints the slot number and EMPTY. NO: Do not print empty slots.
Print Wafer Map	YES, NO	This parameter is active when Printer Type is set to 26. Sets whether or not to print the wafer map with the test results. YES: Print wafer maps. NO: Do not print wafer maps.
Wafer Map Type	BIN, PASS/FAIL	This parameter is active when Print Wafer Map is set to YES. Sets the print method for printing out wafer maps. BIN: Print out test results in category classifications. Make sure to set the BIN Input parameter to YES. PASS/FAIL: Classify pass and fail, and print. Passed die are printed with a bullet. Failed die are printed with an **F** .
Print Map with Conditions	YES, NO	This parameter is active when Print Wafer Map is set to YES. Sets whether or not to add conditions when printing wafer maps. Whether or not to print wafer maps is judged by the Pass Limit (%) setting value. YES: Set conditions on printing wafer maps. After testing one wafer, print a wafer map only when the following condition is met: (Total pass dies/Total testing dies) X 100 greater than or equal to Pass Limit (%). NO: Do not set conditions on printing wafer maps. Wafer maps are printed regardless of the conditions after testing one wafer.
Print Limit (%)	1—100%	This parameter is active when Print Wafer Map is set to YES. Sets the conditions for Print Map with Conditions.
Bad Yield	YES, NO	Sets whether to print **BAD YIELD** in the printed test results if the yield per tested wafer is below the value set for the Yield Limit in the Gross Parameters. YES: Print **BAD YIELD** . After testing one wafer, print a wafer map only when the following condition is met: (Total pass dies ÷ Total testing dies) x 100 ≥ Pass Limit (%). NO: Do not set conditions for printing wafer maps. Wafer maps are printed regardless of the conditions after testing one wafer.

Parameter Name	Setting/Range	Contents
`Print Inker with Conditions`	YES, NO	Sets whether to print the inker usage status, **ON/OFF** , in the test results. YES: Print inker status (**ON/OFF**). NO: Do not print inker status (**ON/OFF**). NOTE **The current system software, version Rzz00–R014.05, does not support this parameter.**
`Print Wafer Testing Time`	YES, NO	Prints the length of time required for the wafer to be tested, from start to finish. YES: Print the wafer testing time. NO: Do not print the wafer testing time.

5.26 GPIB Parameters 0501.1

Pressing GPIB allows you to access and change the GPIB parameter settings.

GPIB Menu

GPIB Operation Parameters

Parameter Name	Setting/Range	Contents
GPIB	YES, NO	Sets whether GPIB will be the communication protocol used by the tester and prober. YES: GPIB will be used as the communication protocol. NO: GPIB will not be used as the communication protocol.
Stop at Reference Die	YES, NO	Sets whether the prober will pause at the reference die and wait for the tester to issue a SRQ46H command. YES: The prober will pause at the reference die and issue a SRQ46H command. NO: The prober will not pause at the reference die and issue a SRQ46H command.
Receive Parameters	YES, NO	Sets whether to use the input signal, an H command, N command, or i command, from the controller in regard to the SRQ output signal from the prober to the controller when testing starts. YES: Use the input signal from the controller, an H command, N command, or i command. SRQ52H is output when START or SETUP START on the *Run Menu* is selected and testing starts with the input of the H command, N command, or i command. NO: Use the input signal from the controller, an H command, N command, or i command.
Random Wafer Testing	YES, NO	Sets whether the controller will tell the prober, through a GPIB command, which wafers in the FOUP should be tested. YES: The controller will tell the prober which wafers in the FOUP boat should be tested. NO: The controller will not tell the prober which wafers in the FOUP boat should be tested.
Watch Time for GPIB Timing	0–999 Sec.	If communication is lost, or if there is an error in communication, this parameter sets how long the prober will wait before displaying a communication error.

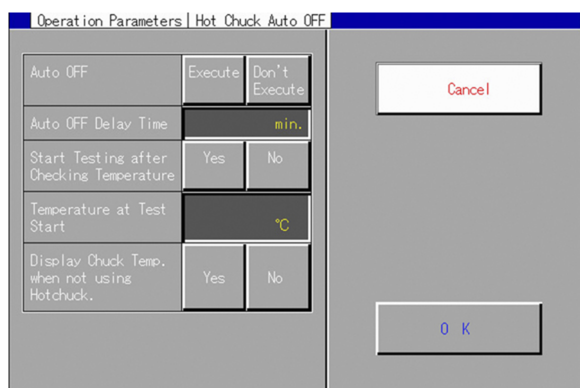
Parameter Name	Setting/Range	Contents
Contact Check	YES, NO	Sets whether the controller will determine the contact point during a contact check. An input signal, ZXXCRLF, is transmitted from the controller for an output signal from the prober to the controller, SRQ. YES: The controller will determine the contact point. NO: The controller will not determine the contact point.
Cassette Map	YES, NO	Sets whether, after the prober maps the FOUP, it will send that map to the controller. YES: The prober will send the FOUP map to the controller. NO: The prober will not send the FOUP map to the controller.

5.27 Hot Chuck On/Off Parameters 0502.1

Pressing HOT CHUCK AUTO OFF allows you to access and change the hot chuck on/off parameters.

NOTE **In order for `Hot Chuck Auto Off` to appear as a choice on the *Operation Parameter Item Selection Menu*, the HOT CHUCKsetting must have been activated on the *Hard Select (Multi) Menu*. If it was not set, the prober does not recognize that the hot chuck function can be turned on or off.**

Hot Chuck Auto Off Menu



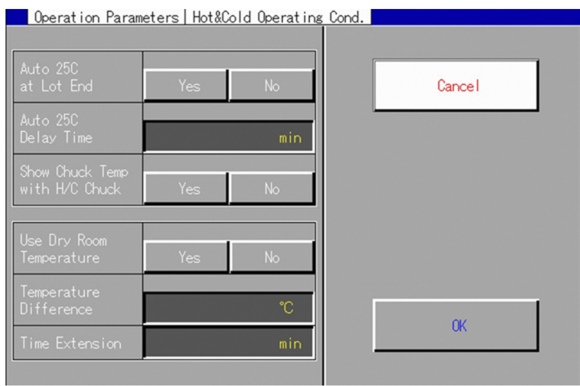
Hot Chuck Fixed Auto Off Parameters

Parameter Name	Setting/Range	Contents
`Auto OFF`	EXECUTE, DON'T EXECUTE	This parameter is active when `Hot Chuck` on the *Hot Chuck Menu* is set to YES. Sets whether to control the chuck top temperature to 25° C after testing the lot. EXECUTE: Control the temperature of the chuck top to 25° C. The prober automatically lowers the hot chuck temperature to 25° C after the lot testing is completed. DON'T EXECUTE: Do not control the temperature of the chuck top to 25° C.
`Auto OFF Delay Time`	0—99 min.	This parameter is active when the `Auto OFF` is set to EXECUTE. Sets the number of minutes the prober should wait once the lot is completed before dropping the chuck temperature to 25° C.
`Start Testing After Checking Temperature`	YES, NO	This parameter is active when `Hot Chuck` on the *Hot Chuck Menu* is set to YES. Sets whether or not to wait to start testing until the temperature has dropped to the setting made in `Temperature at Test Start`. Use this setting when changing from wafers tested at high temperatures on the hot chuck to wafers tested at room temperature without using the hot chuck. YES: Stand-by to start testing until the temperature drops below the setting made in `Temperature at Test Start`. NO: Do not stand-by to start testing until the temperature drops below the settings made in `Temperature at Test Start`. Start testing regardless of the chuck top temperature.

Parameter Name	Setting/Range	Contents
`Temperature at Test Start`	20.0—99.9° C	Sets the starting temperature for testing. This parameter is active when `Start Testing After Checking Temperature` is set to YES.
`Display Chuck Temp. When Not Using Hotchuck`	YES, NO	This parameter is active when `Hot Chuck` on the *Hot Chuck Menu* is set to NO. Sets whether or not to display the chuck top temperature on the menu when not using the hot chuck. YES: Display chuck top temperature. NO: Do not display chuck top temperature.

5.28 Hot & Cold Operating Conditions Parameters 0503.1

Hot & Cold Operating Cond. Menu



Hot & Cold Operating Conditions Parameters

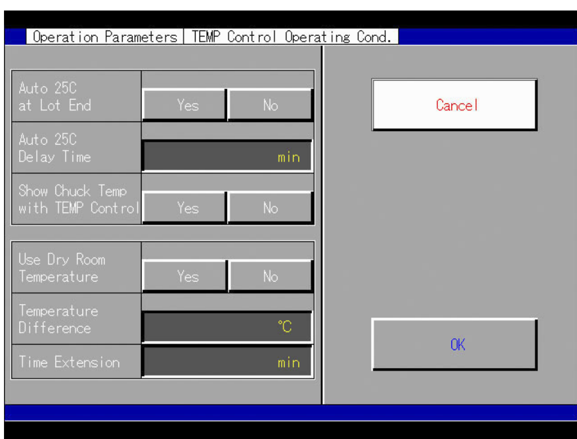
Parameter Name	Setting/Range	Contents
Auto 25° C	YES, NO	Sets whether to control the chuck top at 25° C after lot testing. YES: Control chuck top temperature to 25° C when the lot is completed. The prober waits until the chuck top temperature reaches 25° C after a lot is finished before starting the next lot. NO: Do not control the chuck top temperature to 25° C when lot testing is complete. The prober starts the next test with the current chuck top temperature.
Auto 25° C Delay Time	0—99 min.	This parameter is active when Auto 25C at Lot End is set to YES. Sets the number of minutes the prober waits once the lot is complete before lowering the temperature to 25° C.
Show Chuck Temp with TEMP Control	YES, NO	Sets whether to display the chuck top temperature on the display when not using the hot and cold chuck. YES: Display the chuck-top temperature. NO: Do not display the chuck-top temperature.
Use Dry Room Temperature	YES, NO	Cooling water is used to control the temperature of the chuck top from a high temperature to room temperature and from high temperature to low temperature. In order to prevent condensation from forming because of the temperature differences, dry air is used to cool at the normal chuck temperature (up to 20° C). The dry room temperature is a function that supplies dry air not only when the chuck top temperature is low, but also at other times. This function sets whether or not to use the dry room temperature function. YES: Use the Dry Room Temperature function. The Dry Room Temperature function will work with the following conditions: When the set testing temperature is min. 20° C. (The temperature when testing is set in the wafer parameters.) When the chuck-top temperature is higher than the setting when starting temperature control. NO: Do not use the Dry Room Temperature function.

Parameter Name	Setting/Range	Contents
`Temperature Difference`	5—50° C	This parameter is active when `Use Dry Room Temperature` is set to YES. Sets the starting time of the dry room temperature. When the difference between the chuck top temperature and the temperature control setting reaches this value, dry room temperature is activated. Example: Set temperature to 25° C, temperature difference to 10° C: When the chuck top temperature for starting temperature control reaches above 35° C, dry air is supplied.
`Time Extension`	1—30min	This parameter is active when `Use Dry Room Temperature` is set to YES. Sets the operation ending time for the `Use Dry Room Temperature` function. Sets how many minutes after the chuck top temperature reaches the set temperature to stop the dry air supply. **NOTE** **When initializing the system, the `Use Dry Room Temperature` function will stop once and then restart during initialization, depending on the status.**

5.29 TEMP Control Operating Conditions Parameters 0504.1

Pressing TEMP CONTROL OPERATING COND. allows you to access and change the temperature control operating conditions parameters. Depending on the specifications of the chuck top, the following parameters will not need to be set.

TEMP Control Operating Conditions Menu



TEMP Control Operating Conditions Parameters

Parameter Name	Setting/Range	Contents
`Auto 25° C at Lot End`	YES, NO	Sets whether to control the chuck top at 25° C after lot testing. YES: Control chuck top temperature to 25° C when the lot is completed. The prober waits until the chuck top temperature reaches 25° C after a lot is finished before starting the next lot. NO: Do not control the chuck top temperature to 25° C when lot testing is complete. The prober starts the next test with the current chuck top temperature.
`Auto 25° C Delay Time`	0—99min	This parameter is active when `Auto 25° C at Lot End` is set to YES. Sets the number of minutes the prober waits once the lot is complete before lowering the temperature to 25° C.
`Show Chuck Temp with TEMP Control`	YES, NO	Sets whether to display the chuck top temperature on the menu when not using the D 172 chuck. YES: Display the chuck-top temperature. NO: Do not display the chuck-top temperature.

Parameter Name	Setting/Range	Contents
Use Dry Room Temperature	YES, NO	Cooling water is used to control the temperature of the chuck top from a high temperature to room temperature and from high temperature to low temperature. In order to prevent condensation from forming because of the temperature differences, dry air is used to cool at the normal chuck temperature (up to 20° C). The dry room temperature is a function that supplies dry air not only when the chuck top temperature is low, but also at other times. This function sets whether or not to use the dry room temperature function. YES: Use the Dry Room Temperature function. The Dry Room Temperature function will work with the following conditions: When the set testing temperature is min. 20° C. (The temperature when testing is set in the wafer parameters.) When the chuck-top temperature is higher than the setting when starting temperature control. NO: Do not use the Dry Room Temperature function.
Temperature Difference	5—50° C	This parameter is active when Use Dry Room Temperature is set to YES. Sets the starting time of the dry room temperature. When the difference between the chuck top temperature and the temperature control setting reaches this value, dry room temperature is activated. Example Set temperature to 25° C, temperature difference to 10° C: When the chuck top temperature for starting temperature control reaches above 35° C, dry air is supplied.
Time Extension	1—30min.	This parameter is active when Use Dry Room Temperature is set to YES. Sets the operation ending time for the Use Dry Room Temperature function. Sets how many minutes after the chuck top temperature reaches the set temperature to stop the dry air supply. NOTE **When initializing the system, the Use Dry Room Temperature function will stop once and then restart during initialization, depending on the status.**

C H A P T E R 6

Creating an Advanced Setup File

This chapter describes the advanced features that are involved in creating a setup file. The advanced features include inputting probe mark, inspection, and probe and skip area parameters. Each section describes the purpose of the associated procedures, and provides the menu paths to the appropriate screens for performing them.

6.1 Designating and Training Probe Mark Inspection (PMI) Pads 0505.1

Probe Mark Inspection (PMI) is a quality check to ensure that the probes are contacting the pads. If the probes make contact off the pad, wafer and probe card damage can occur. The probe card probes can cause cracks in the insulation surrounding the pad, making the die unusable.

Setting Probe Mark Inspection criteria includes several distinct functions. PMI will not be successful unless all parts of the PMI setup are performed correctly. The different PMI setup functions are explained, in order in the following procedures.

The steps for setting PMI criteria are listed below:

- Specifying Inspection Pad Positions
- Specifying Inspection Parameters
- Specifying the Inspection Range and Performing Batch Pad Training
- Performing Individual Pad Training (as needed)

6.2 Designating Inspection Pads 0506.1

Introduction

Purpose:

To input inspection pad positions, teach the pad shape (image processing). These operations are necessary to be able to perform Probe Mark Inspection (PMI) and Probe Card Inspection (PCI).

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The procedures in the following sections are designed to be performed in order. The procedures should not be performed out of order, nor should you omit procedures.**

This procedure assumes that a FOUP of wafers is on the load port, or a single wafer is on the wafer table. If a FOUP is not loaded, the procedure cannot be completed.

The procedure also assumes that the probe card used to create the wafer file is loaded on the prober. If the proper probe card is not loaded, the procedure cannot be completed.

1 Use the following steps to access the *Probe Mark Inspection Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press WAFER PARAMETER on the *Change Setup Wafer Data Menu*.

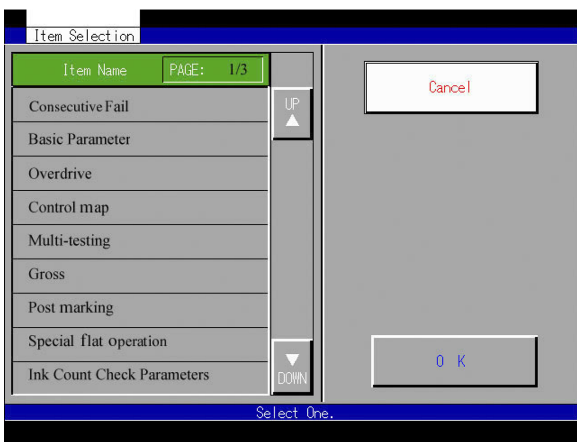
1.4 Press FILENAME on the *Wafer Parameters Menu*.

1.5 Select the filename for which you want to set up PMI. If necessary, use the UP and DOWN scroll buttons to find the filename.

1.6 After selecting the filename, press OK.

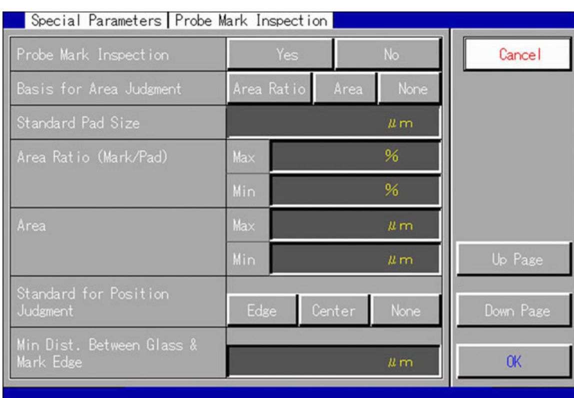
1.7 Press WAFER PARAMETERS on the *Wafer Parameter Menu*. The *Wafer Parameters Item Selection Menu* is displayed.

Wafer Parameters Item Selection Menu



1.8 Press PROBE MARK INSPECTION on the *Wafer Parameters Item Selection Menu*. If necessary, use the scroll bar UP and DOWN arrows to locate the PMI parameter. The *Probe Mark Inspection Menu (1/5)* is displayed.

Probe Mark Inspection Menu (1/5)



2 Set PROBE MARK INSPECTION to YES to activate PMI.

3 Verify the settings on all five pages of PMI parameters. Refer to **4.11 Probe Mark Inspection Parameters (see page 162)** for more details.

4 After confirming all the settings, press OK. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input and the *Wafer Parameters Item Selection Menu* is displayed.

5 Use the following steps to load a wafer to the chuck top.

5.1 Press CANCEL on the *Wafer Parameters Item Selection Menu*.

5.2 Press PREVIOUS MENU on the *Wafer Parameters Menu*.

5.3 Press SETUP WAFERon the *Change Setup Wafer Data Menu*.

5.4 Press WAFER LOAD/UNLOAD on the *Wafer Input Menu*.

5.5 Press LOAD WAFER on the *Setup Wafer Menu*.

5.6 Select the source of the wafer (CASSETTE 1 or TABLE). The wafer is transferred to the chuck top.

6 Press SEMI-AUTO SETUP WAFER on the *Wafer Input Menu*. The upper left, upper right, and lower right edge positions are used to input the surface map automatically. After inputting the three positions, the wafer center is displayed.

If the prober was unable to calculate the position of the wafer edge, an error will be generated. Use the control buttons to position the crosshairs on the edge and press OK. The prober will use the new edge position to calculate the other edge positions.

NOTE When the edge position cannot be input because of the position of the second orientation flat, use the control buttons to position the crosshairs on the second flat arc; however, do not move the stage more than 40° from the wafer sensor.

7 Use the stage control buttons to position crosshairs on the street intersection.

Stage Control Menu

8 Press OK. The street intersection is input as macro pattern 1. The prober moves in the X and Y directions to position the crosshairs on the street intersection and automatically enter macro pattern 2 and macro pattern 3.

The macro pattern data is used for offsetting the alignment in the theta direction. After transferring macro pattern 3, the prober performs image processing for rough tuning.

NOTE If you must reenter the macro pattern data, the prober will compare the new street intersection with the previously input intersection. If the distance between these two intersections is more than a quarter of a die size, a check menu will be displayed. Press CONTINUE on the check menu to use the new street intersection. Press ABORT to cancel the changes.

NOTE If the prober cannot locate the street intersections for macro pattern 2 or 3, an assist will be generated. Use the control buttons to position the crosshairs on the street intersection and press OK. The prober will use the new street intersection to calculate the other macro pattern positions.

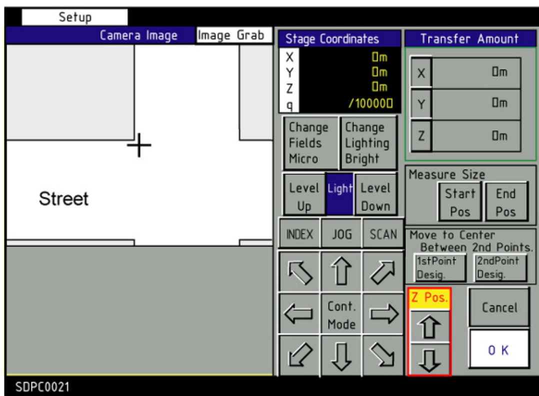
9 If you set `Target Sense` to YES in the Wafer Setup Options, then a *Stage Control Menu* is displayed to input the target sense pattern. For the purposes of this procedure, press OK.

The bridge camera switches to micro view, and the center of the wafer is displayed.

10 Use the following steps to set the origin position for the wafer map.

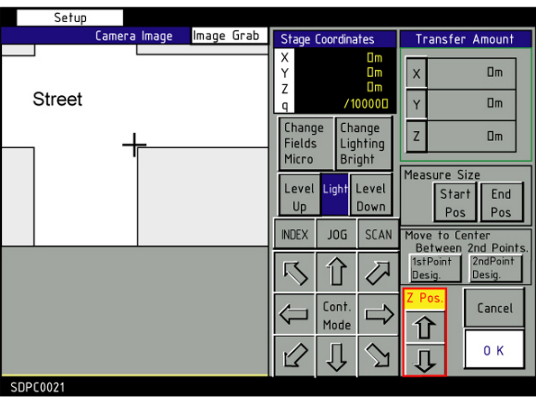
10.1 Position the crosshairs on the street intersection's upper left corner and press 1st Point Desig.

▼ **Stage Control Menu**



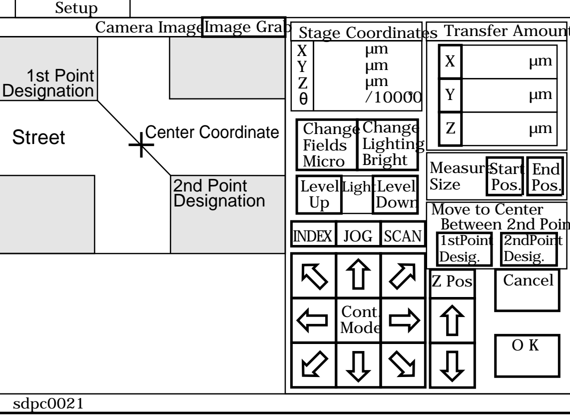
10.2 Position the crosshairs on the street intersection's lower right corner.

▼ **Stage Control Menu**



10.3 Press 2nd Point Desig. The prober automatically positions the crosshairs at the middle position using the positions setup using 1st Point Desig and 2nd Point Desig.

▼ **Stage Control Menu**



NOTE **Some wafers have a mark on the center of the intersection, and this mark might not match the position calculated by the prober. If the wafer has such a mark, use the calculated position.**

11 Press OK. The origin position for the wafer map is set.

12 Use the following steps to semiautomatically enter the micro pattern:

12.1 Set the `Transfer Amount` for `X` and `Y` to 1-5 µm.

12.2 Use the control buttons to position the crosshairs on the corner of a pattern that is repeatable, has straight edges, and displays a high contrast level. Avoid probe pads since they may cause a repeatability problem if some have probe marks and others do not. If there are no clear corners, position the crosshairs on the intersecting points of the wiring near the street. Choose a target that is coplanar in the Z axis to the pads.

12.3 Press OK. The camera implements a focus routine and checks different light levels. Micro pattern 1 is input. Enter micro patterns 2 through 5 based on micro pattern 1.

If the prober cannot enter the micro pattern, an assist is generated. If this occurs, then use the control buttons to position the crosshairs on the street intersection and press OK. The prober will start inputting the micro patterns again using the new position.

12.4 After all five micro patterns have been input, a check menu is displayed stating `Designate 2nd Micro Pattern.` For the purposes of this procedure, press NO.

NOTE **The steps to enter a second micro pattern are the same as the steps for inputting the first micro pattern; however, the micro pattern only needs to be input once. Inputting a second micro pattern can prevent mis-recognition of the original micro pattern, but it is not necessary for completing file setup. If you enter a second micro pattern, be sure to enter a different pattern from the first.**

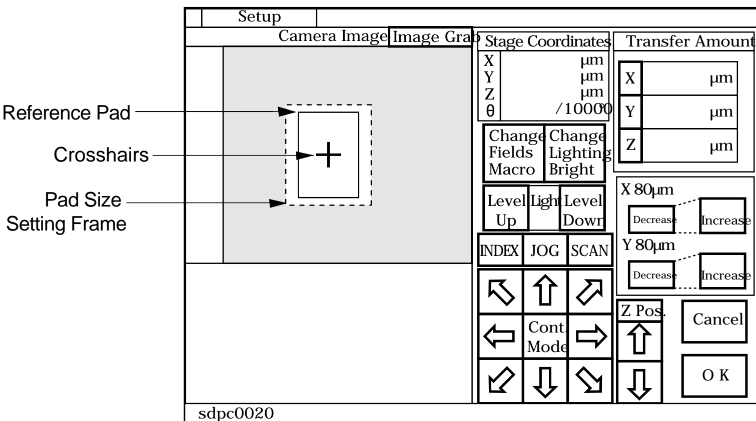
13 Use the following steps to enter the reference pad position:

13.1 Use the control buttons in `SCAN mode` to drive the stage to a probe pad that matches the reference pin position that was input when you performed **3.4 Inputting Probe Tip Positions (see page 65)**.

13.2 Switch to `JOG mode` and center the crosshairs on the center of the pad. A pad size setting frame is also displayed.

13.3 If the height of the bump pads differs from the die and pad surfaces, the change the size of the pad size setting frame to fit around the edge of the pad by pressing INCREASE or DECREASE for the `X or Y Direction`.

Stage Control Menu



13.4 Press OK. The reference pad is input, and the stage moves to the area where the first registered pad should be located (corresponding to the registered pin 2).

13.5 Center the crosshairs on the center of the pad. If necessary, adjust the size of the pad size setting frame to fit around the edge of the pad and adjust the X/Y centering of the crosshairs.

13.6 Press OK. The first registered pad is input, and the stage moves to the area where it calculates that the second registered pad will be located (corresponding to registered pin 3).

13.7 Center the crosshairs on the center of the pad. If necessary, adjust the size of the pad size setting frame to fit around the edge of the pad and adjust the X/Y centering of the crosshairs.

13.8 Press OK. The second registered pad is input, and the stage moves to the area where the third registered pad is located (corresponding to registered pin 4).

13.9 Center the crosshairs on the center of the pad. If necessary, adjust the size of the pad size setting frame to fit around the edge of the pad.

13.10 Press OK The third registered pad is input. After the reference pad and the three registered pad positions have been input, the *Inspection Pad Input Menu* is displayed.

Inspection Pad Input Selection Menu

The following list defines the menu items on the *Inspection Pad Input Selection Menu*:

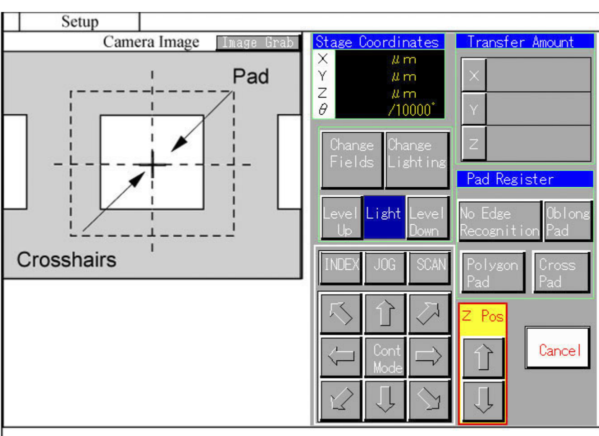
- To enter new inspection pads, press POSITION DESIGNATION USING TEACHING. The *Stage Control Menu* is displayed.

- To use probe card probe tip coordinate data, insert a floppy disk that contains the pad coordinate data and press LOAD PAD COORDINATES FROM FD.
- To not enter inspection pads, press DON'T INPUT. When `Probe Mark Inspection` is set to YES on the *Probe Mark Inspection Menu*, the *Training Menu* is displayed. When `Probe Mark Inspection` is set to NO, the *Stage Control Menu* is displayed.

NOTE **If you are altering the inspection pads for a preexisting file, the *Designate Inspection Pad Selection Menu* will be displayed. To use the previously input inspection pads, press** USE PREVIOUS POSITION DATA**. To reenter the inspection pads, press** RESET PAD POSITION**. To delete the previously input inspection pads, press** CLEAR PAD DESIGNATION (DON'T USE)**.**

14 For the purposes of this procedure, press POSITION DESIGNATION USING TEACHING. The *The Stage Control Menu* is displayed.

Pad Position Designation Menu



15 Use the following steps to enter the inspection pads.

15.1 Use the stage control buttons to position the crosshairs on the center of the pad you choose for PMI on the crosshairs.

15.2 Enter the pad shape.

- For square or oblong-shaped pads, press OBLONG PADS.
- For polygon-shaped pads, press POLYGON PAD.
- For plus-sign shaped pads, press CROSS PAD.
- For all other shaped pads or for no edge recognition, press NO EDGE RECOGNITION.

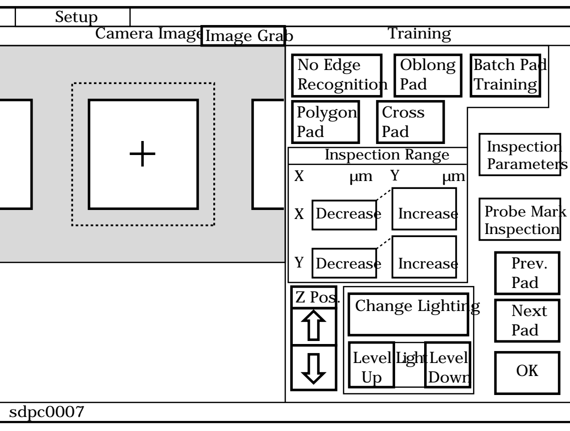
The selected pad shape is input for the inspection pad.

15.3 Repeat steps 15.1 and 15.2 for each inspection pad you enter.

15.4 Press CANCEL to finish. A check menu is displayed stating `Exit position designation?`.

15.5 Press YES. The *Training Menu* is displayed.

Training Menu



6.3 Inputting Inspection Parameters 0507.1

Introduction

Purpose:

Once the inspection pad positions are input, you must input the inspection parameters. Inspection parameters cover the lighting and contrast used during the inspection.

Required Resources:

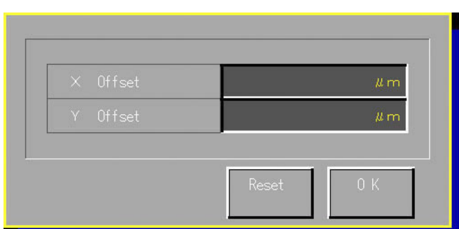
Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The procedures in the following sections are designed to be performed in order. You should not perform these procedures out of order, nor should you omit procedures.**

This section assumes that you have just completed inputting inspection pad positions and your touch screen is displaying the *Training Menu*. Refer to **6.2 Designating Inspection Pads (see page 251)** **for information on inputting inspection pad positions.**

1 Press INSPECTION PARAMETERS on the *Training Menu*. The *Inspection Parameters Menu* is displayed.

Inspection Parameters Menu



2 Set each parameter, referring to the following table.

Inspection Parameters

Parameter Name	Setting/Range	Contents
`Lighting Amount Adjustment Mode`	AUTO, MANUAL	AUTO: Adjust the lighting automatically during training. MANUAL: Adjust the lightning at the beginning of training only.
`Automatic Lighting Amount Adjustment for Each Pad`	YES, NO	YES: Adjust the lighting individually for each pad. NO: Adjust the lightning at the beginning or training only.

Parameter Name	Setting/Range	Contents
Probe Mark Contrast	STANDARD, LOW CONTRAST	STANDARD: When the probe mark is clearly visible. LOW CONTRAST: When the probe mark is barely visible. The low contrast setting optimizes the prober to recognize probe marks that are difficult to distinguish.
Polygon Edge Recognition Sensitivity	-100 to +100	Since recognition of glass edges is difficult when training polygon edges, set the range of recognition sensitivity from -100 to +100. The recognition sensitivity setting will depend on the image being displayed. For example: If the glass edge is faint, increase the sensitivity. If it is too grainy, decrease the sensitivity. NOTE **Polygon Edge Recognition Sensitivity is an option only when you are training polygon pads.**
Grain Size	0 to 10 μm (diameter)	Select the grain size that will not be recognized (diameter 0 to 10 μm) by the prober. This setting prevents the prober from confusing grains as probe marks, which could cause a mis-recognition error.

3 After setting the parameters, press OK. The PMI inspection pad number 1 is displayed on the *Training Menu*.

6.4 Specifying the Inspection Range and Training Batch Pads 0508.1

Introduction

Purpose:

To input the inspection range and perform batch pad training.

You must input the inspection range and teach the pad shape (image processing) before you can perform PMI or PCI.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

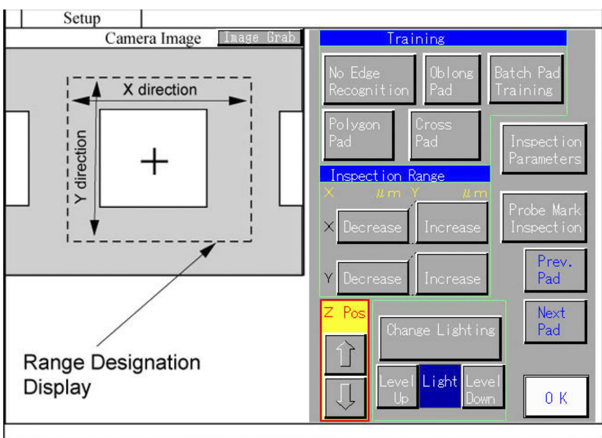
NOTE **This procedure assumes that you have just finished inputting the inspection parameters, and the *Training Menu* is displayed. Certain procedures in this chapter are designed to be performed in order, namely 6.2 Designating Inspection Pads (see page 251) through 6.4 Specifying the Inspection Range and Training Batch Pads (see page 261). You should not perform these procedures out of order, nor should you omit procedures.**

This procedure assumes that you have just completed specifying the inspection parameters and your touch screen is displaying the Training Menu. Refer to 6.3 Inputting Inspection Parameters (see page 259) for information on inputting inspection parameters.

1 PMI inspection pad 1 should be displayed on the *Training Menu*. The lighting amount may need to be adjusted if the `Lighting Amount Adjustment Mode` is set to `Manual`. If you increase or decrease the lighting amount more than necessary, it will be impossible to recognize the glass edge and/or probe mark.

2 Press DECREASE or INCREASE for `Inspection Range` while checking the range designation display to input the inspection range in the X and Y directions. The inspection range should be a minimum of 10 µm larger than the pad. The current range will be displayed on the *Training Menu*.

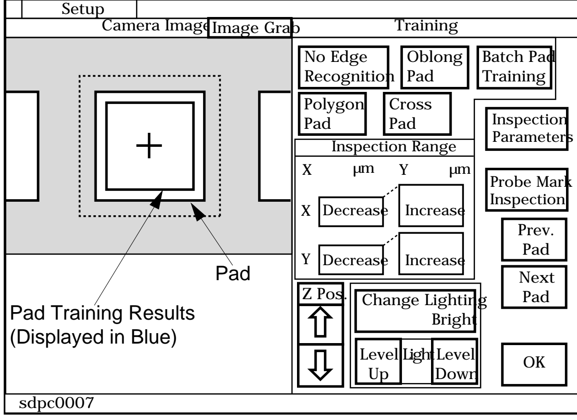
Training Menu



3 After inputting the inspection range, select the pad training method. Two methods can be used for pad training: batch training and individual training.

To select and perform batch pad training, press BATCH PAD TRAINING. A message is displayed stating `!! Performing` Pad training is performed on all inspection pads. When batch training is finished, a message menu stating is displayed stating `Batch Training Completed.`

Training Menu



Batch training performs training on all of the inspection pads and then displays the training results. A pad will fail batch training if it already has a probe mark. Individual training performs training on the PMI pads that fail batch training. Refer to **6.5 Training Individual Pads (see page 264)** for more details.

4 Press OK on the message menu. If `Print Judgment Results` was turned on in the wafer parameters for PMI, the training results will be displayed. (Pad training results are based on the judgement standards set in the PMI parameters.)

If batch pad training fails, go to **6.5 Training Individual Pads** **(see page 264)** to perform individual pad training for the failed pads.

5 Perform a sample PMI test to check the accuracy of the PMI training. Press PMI on the *Training Menu*. For details on performing the PMI test, refer to **7.6 Testing Probe Mark Inspection (PMI)** **(see page 335)**.

6 Press OK on the *Training Menu*. The *Wafer Input Menu* is displayed.

Once training has been performed, the training results will be displayed.

6.5 Training Individual Pads 0509.1

Introduction

Purpose:

To manually perform individual pad training if batch pad training fails (for example, on pads that contain a probe mark).

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

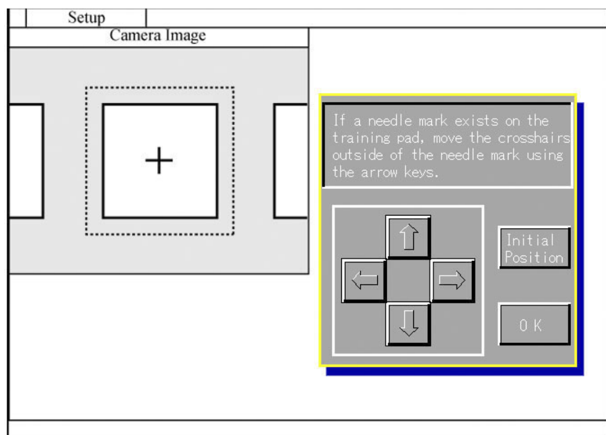
NOTE **This procedure assumes that you have just finished inputting the inspection parameters, and the *Training Menu* is displayed. Certain procedures in this chapter are designed to be performed in order, namely 6.2 Designating Inspection Pads (see page 251) through 6.5 Training Individual Pads (see page 264). You should not perform these procedures out of order, nor should you omit procedures.**

This procedure assumes that you have just completed specifying the inspection parameters and your touch screen is displaying the Training Menu. Refer to 6.3 Inputting Inspection Parameters (see page 259) for information on inputting inspection parameters.

1 Press the button corresponding to the pad shape (e.g., Oblong Pad) on the *Training Menu*. The *Crosshairs Movement Menu* is displayed.

If this pad already has a probe mark, follow the instructions on the screen.

Crosshairs Movement Menu



2 Press OK. Pad training is performed. When completed, a blue box is displayed around the perimeter of the pad, inside the green box.

3 When performing pad training for other PMI pads, press NEXT PAD, and then repeat steps 1 and 2 for the next PMI pad displayed.

4 Perform a sample PMI test to check the accuracy of the PMI training. Press PMI on the *Training Menu*. For details about performing the PMI test, refer to **7.6 Testing Probe Mark Inspection (PMI) (see page 335)**.

5 Press OK on the *Training Menu*. The *Wafer Input Menu* is displayed.

6.6 Inputting the Probe Mark Inspection Area 0511.1

Introduction

Purpose:

To input the Probe Mark Inspection (PMI) area.

A maximum of 200 die can be input for the PMI area. Once you input the PMI area, you can check, disable, or delete it if it is no longer needed.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	A FOUP of wafers or a single wafer Probe card

NOTE **This procedure assumes that a FOUP of wafers is on the load port, or that a single wafer is on the unload table. If a FOUP is not loaded, the procedure cannot be completed.**

This procedure also assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, the procedure cannot be completed.

The probe mark inspection area cannot be set unless `Probe Mark Inspection` is set to YES and `Area` is set to FREE INSPECTION AREA on the *PMI Parameters Menu*.

1 Use the following steps to display the *Reference Die Input Menu*:

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press TRANSFER WAFER on the *Change Setup Wafer Data Menu*. Use the *Transfer Wafer Menu* to manually load a wafer to the chuck.

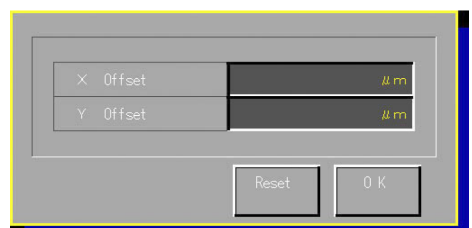
1.4 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.5 Press PROBE AREA on the *Probe Area Setting Menu*. The *Reference Die Camera Menu* is displayed. Press OK.

1.6 Press WAFER MAPto view the *Reference Die Input Menu*.

2 Use the control buttons to position the cursor on the reference die.

Reference Die Input Menu (Wafer Map)



3 Press REFERENCE DIE INPUT. The reference die position is input, and a red “X” is displayed on the reference die.

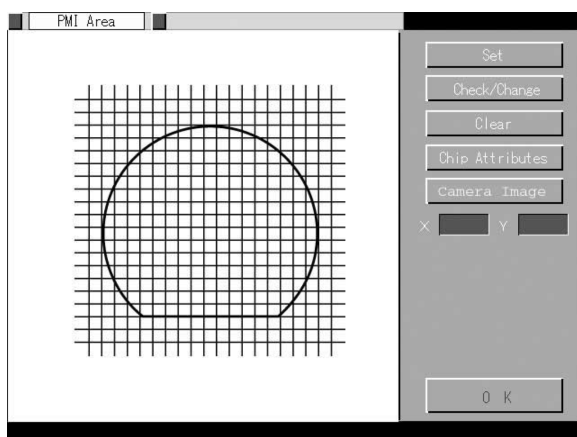
NOTE REFERENCE DIE INPUT **must be pressed for the reference die position to be saved. If you press** OK **first, the message** `The reference die has not been set` **will be displayed**

4 Press OK on the *Reference Die Input Menu*. A message menu is displayed stating `Reference Die is registered.`

5 Press OK on the message menu. The *Select Probe Area Menu* is displayed. For the purposes of this procedure, a probe area will not be input. Press OK on the *Select Probe Area Menu*.

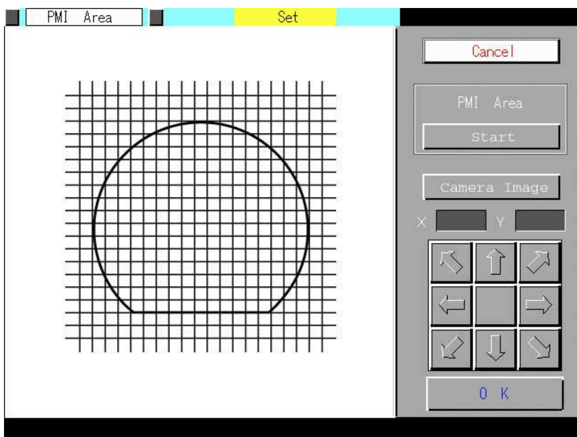
6 A message menu stating `Input Skip Area` is displayed. Press OK. The *Skip Area Select Menu* is displayed. For the purposes of this procedure, a skip area will not be input. Press OK on the *Skip Area Select Menu*. A message menu stating `Input PMI Area` is displayed. Press OK. The *PMI Area Select Menu* is displayed.

PMI Area Select Menu (Wafer Map)



7 Press SET. The *PMI Area Setting Menu* is displayed.

PMI Area Setting Menu (Wafer Map)



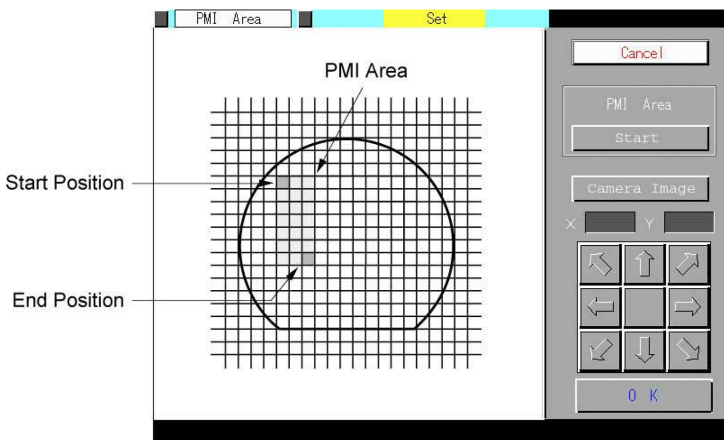
8 Use the control buttons to position the cursor on the PMI area starting position.

9 Press START POSITION. The `PMI Area Start Position` is set.

10 Use the control buttons to position the cursor on the PMI area ending position.

11 Press END POSITION. The rows and columns from the starting position to the ending position are set as the PMI area.

PMI Area Select Menu (Wafer Map)



12 Repeat Step 8 through Step 10 to select additional PMI areas.

13 After setting the PMI areas, press OK. The *PMI Area Select Menu* is displayed.

14 If you do not want to check, change, or delete the set PMI areas, press OK. The PMI areas are input and the *Select IDI Area Menu* is displayed, if ink dot inspection (IDI) is enabled. Otherwise, the software will return you to the beginning of the probe area setting process.

15 Press TRANSFER WAFER on the *Change Setup Wafer Data Menu*.

16 Press UNLOAD WAFER on the *Transfer Wafer Menu*. The wafer is unloaded.

6.7 Checking/Disabling the PMI Area 0512.1

Introduction

Purpose:

To check, disable, or delete the Probe Mark Inspection (PMI) area.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	FOUP of wafers, or a single wafer, Probe card

NOTE **This procedure assumes that a FOUP of wafers is on the load port, or a single wafer is on the unload table. If a FOUP is not loaded, the procedure cannot be completed.**

The procedure also assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, the procedure cannot be completed.

Checking/Disabling the PMI Area

1 Use the following steps to display the *Reference Die Input Menu*:

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press TRANSFER WAFER on the *Change Setup Wafer Data Menu*. Use the *Transfer Wafer Menu* to manually load a wafer to the chuck.

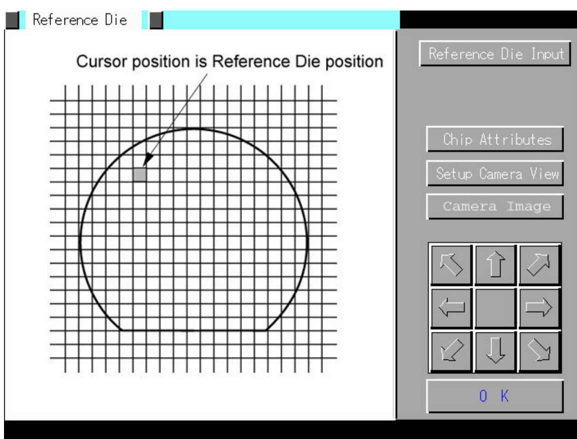
1.4 Press PROBE AREA on the *Change Setup Wafer Data Menu*.

1.5 Press PROBE AREA again. The *Reference Die Camera Menu* is displayed. Press OK.

1.6 Press WAFER MAP to view the *Reference Die Input Menu*.

2 Use the control buttons to position the cursor on the reference die.

Reference Die Input Menu (Wafer Map)



3 Press REFERENCE DIE INPUT. The reference die position is input, and a red “X” is displayed on the reference die.

> **NOTE** REFERENCE DIE INPUT **must be pressed for the reference die position to be saved. If you press** OK **first, the message** `The reference die has not been set` **will be displayed.**

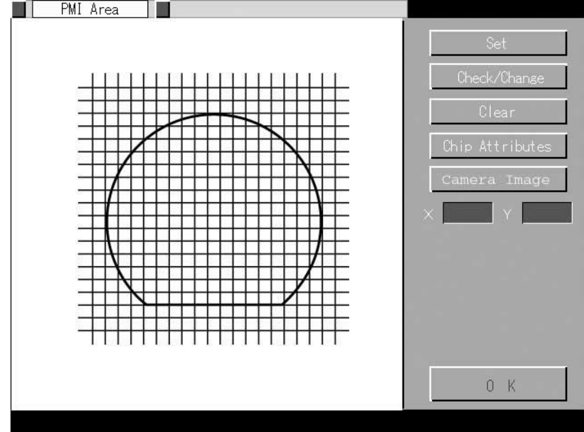
4 Press OK on the *Reference Die Input Menu*. A message is displayed stating `Reference Die is registered.`

5 Press OK on the message menu. The *Select Probe Area Menu* is displayed. For the purposes of this procedure, a probe area will not be input. Press OK.

6 A message menu is displayed stating `Input Skip Area.` Press OK. The *Skip Area Select Menu* is displayed. For the purposes of this procedure, a skip area will not be input. Press OK.

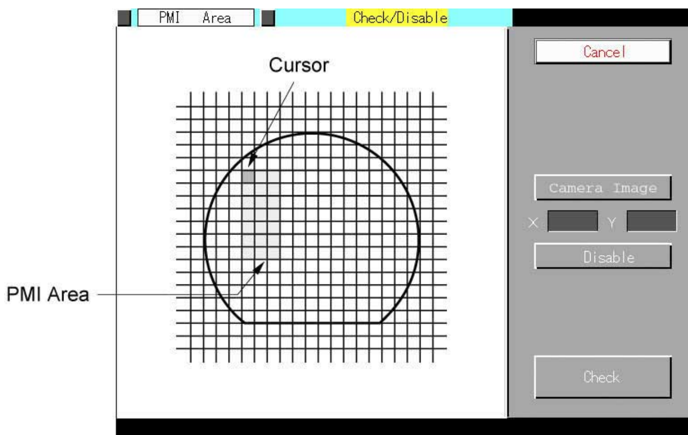
7 A message menu is displayed stating `Input PMI Area`. Press OK. The *PMI Area Select Menu* is displayed.

PMI Area Select Menu



8 Press CHECK/CHANGE on the *PMI Area Select Menu*. The *Check/Disable PMI Areas Menu* is displayed. The cursor moves to the first PMI die position.

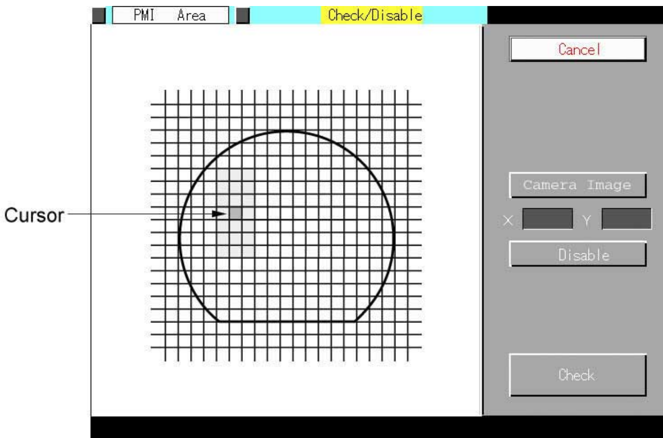
PMI Area Check/Disable Menu (Wafer Map)



9 Check the PMI area. If you do not want to disable the set PMI area, press CANCEL after checking.

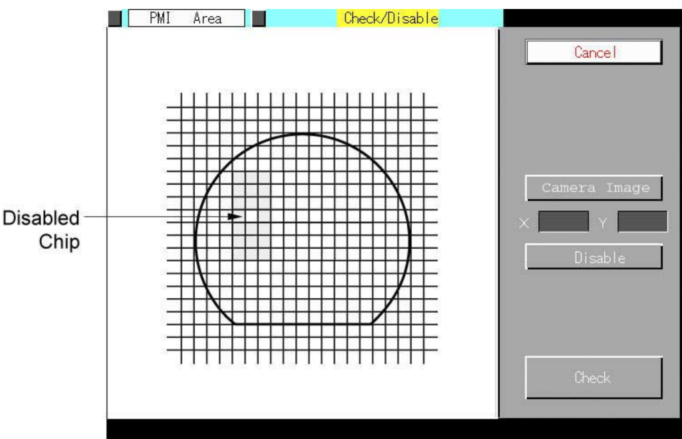
10 Press CHECK and move the cursor to the die you want to disable. The cursor moves in one die increments within the PMI die area.

PMI Area Check/Disable Menu (Wafer Map)



11 Press DISABLE. The selected die is disabled from the PMI area.

PMI Area Check/Disable Menu (Wafer Map)



12 If you want to continue disabling other die, repeat steps 11 and 12.

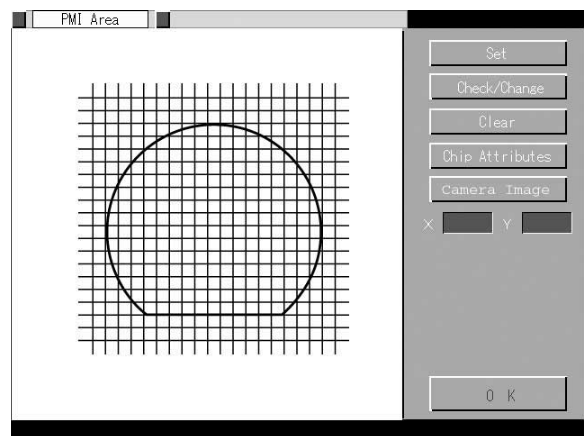
13 After disabling, press CANCEL. A check menu is displayed stating `Save the changed position?`

14 Press YES. The PMI area is updated and the *PMI Area Select Menu* is displayed.

Deleting PMI Areas

15 Press CLEAR on the *Select PMI Area Menu*. A check message is displayed stating `Is it OK to clear?` Press YES. The set PMI area is deleted.

PMI Area Select Menu



16 Press OK. The *Change Setup Wafer Data Menu* is displayed. Press TRANSFER WAFER on the *Change Setup Wafer Data Menu*.

17 Press UNLOAD WAFER on the *Transfer Wafer Menu*. The wafer is unloaded.

6.8 Modifying Operation Parameters 0514.1

Introduction

Purpose:

You can change operating parameters before creating a wafer file. If you are not changing the operation parameters, press INPUT FILE on the *Setup Menu* to create the file.

Required Resources:

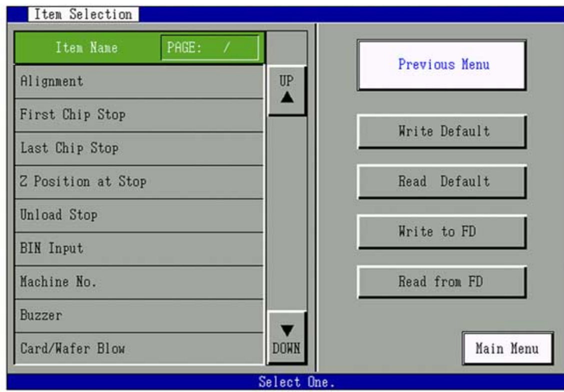
Time:	20 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

Overview:

This procedure describes how to modify existing operating parameters.

1 Press OPERATION PARAMETER on the *Setup Menu*. The *Operation Parameters Item Selection Menu* is displayed.

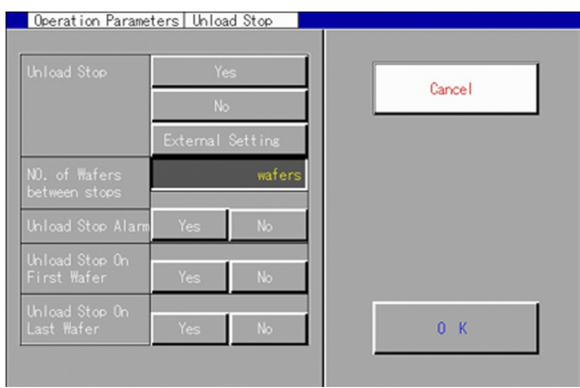
Operation Parameters Item Selection Menu



2 Use the UP and DOWN arrows to scroll through the operating parameters menus. Refer to **5.1 Operation Parameters: Overview (see page 202)** for a complete list of the operating

parameters. Press the operating parameter to be changed. The appropriate parameters menu is displayed (e.g., Unload Stop).

Parameter Setting Menu (Unload Stop Menu shown)

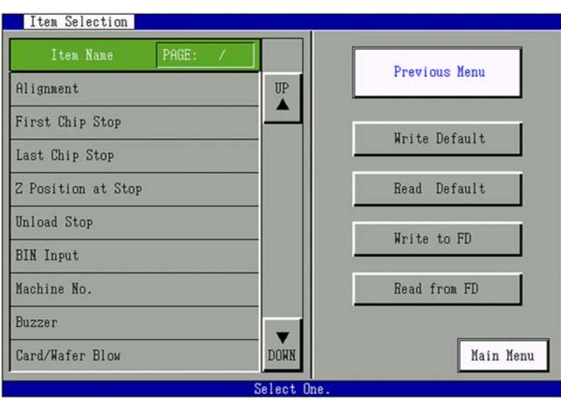


3 Refer to **Chapter 5, Operation Parameters (see page 201)** for information on setting the various operating parameters.

4 After changing an operating parameter, press OK on that parameter menu. A check menu is displayed stating `Is it OK to change the setting value?`

5 Press YES. The settings are validated and the *Operation Parameters Item Selection Menu* is displayed.

Operation Parameter Item Selection Menu



6 Repeat steps 2 through 5 to change other operation parameters.

7 After all changes have been made, press PREVIOUS MENU on the *Operation Parameter Item Selection Menu*. The parameters are saved and the *Setup Start Menu* is displayed.

6.9 Creating a New Wafer File from Existing Data Files 0516.1

Introduction

Purpose:

It is possible to create new wafer files from existing files. This is especially useful for creating a wafer file that is similar to an existing file, requiring only small parameter changes.

Required Resources:

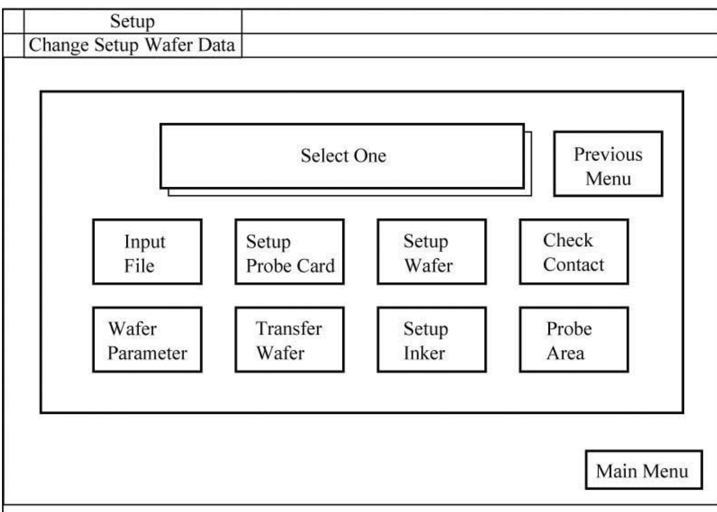
Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

Creating a New File by Inputting Files

1 Press SETUP on the *Main Menu*.

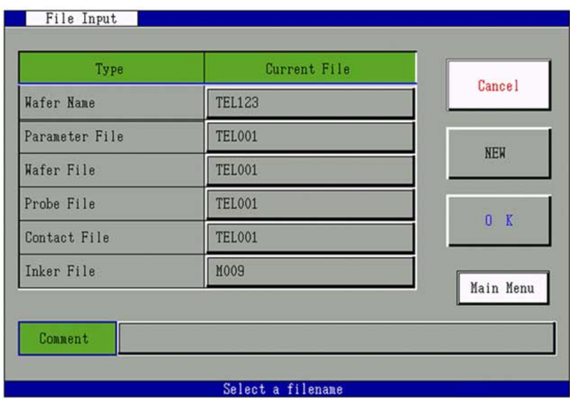
2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



3 Press INPUT FILE. The *File Input Menu* is displayed.

File Input Menu



4 Press NEW. A keyboard is displayed.

5 Use the keyboard to input the new wafer file name (up to 20 characters), then press RETURN.

NOTE **If a file with the same name already exists, a message menu is displayed stating `This file already exists.` Press YES to replace the existing file. Press NO to input a different filename.**

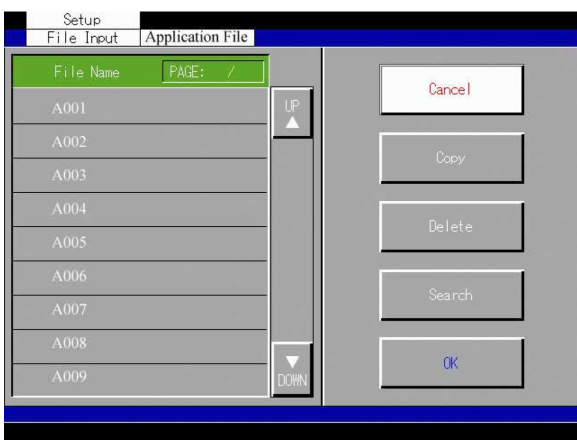
6 The keyboard is displayed again, with a dialog box stating `Input a comment.` Input comments about this wafer file (up to 60 characters) and then press RETURN, or simply press RETURN if you do not wish to input a comment. The *File Input Menu* is displayed with the wafer filename and comment.

7 Press YES. The filenames of the current wafer data files are given the same names and the *Setup Menu* is displayed.

NOTE **The filename of the existing file is displayed for the following data types: Parameter File, Wafer File, Probe File, Contact File, and Marking File.**

8 Press the file type that contains the data file you wan to use (Ex. Parameter File). The *Data File Item Selection Menu* is displayed for files of that data type.

Data File Selection Menu



9 Select the filename that contains the data you want to use (Ex. A002). If necessary, use the scroll buttons to page through the entire list.

10 After checking the wafer name displayed, press OK. Press OK. The *File Input Menu* is displayed. The selected file name is displayed for that data type.

11 Repeat steps 8 through 10 to select the remaining data files you want to use. The selected data type filenames are displayed on the *File Input Menu*.

File Input Menu

File Input

Type	Current File
Wafer Name	TEL123
Parameter File	TEL001
Wafer File	TEL001
Probe File	TEL001
Contact File	TEL001
Inker File	M009

Cancel

NEW

O K

Main Menu

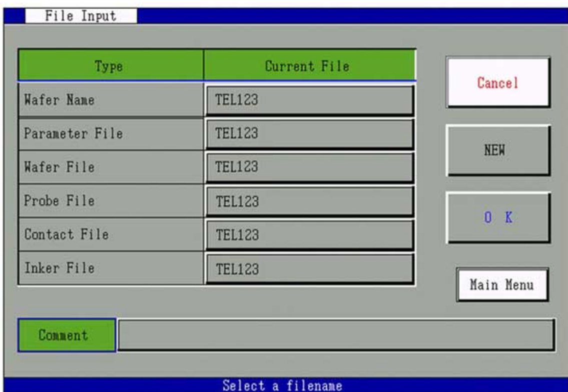
Comment

Select a filename

12 The filenames are input for the new wafer file, and a check menu stating is displayed with the message `Do you want to unify filenames?` The new wafer file will be saved whether you choose YES or NO, but the data files will be handled differently. Read the explanations below to determine whether you want to select YES or NO.

- By pressing YES: A copy is made of all the data files within this wafer file. Each data file is given the same name as the wafer file. If you change the original data file, it will not be updated here. However, if you delete the data file here, the original data file will not be deleted. If you want the data files to remain independent of one another, select YES.
-

File Input Menu



- By pressing NO: A link is made to each of the data files included in this wafer file. They are not copied, and they retain their original filenames. If the original data file is changed, it will use the

updated data file here. However, if you delete the data file here, the original data file will also be deleted.

•

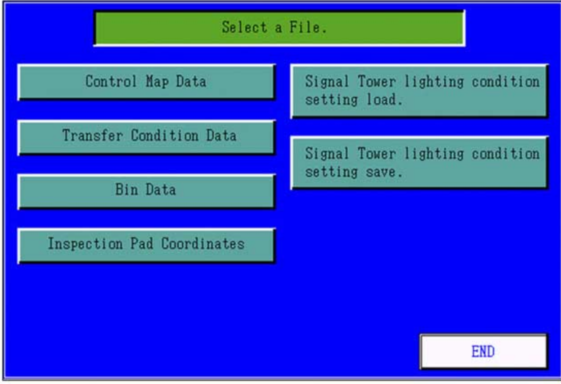
13 After you select YES or NO, the wafer file is saved and the *Change Setup Wafer Data Menu* is displayed.

Creating a New File Using a Control Map

NOTE **If you set `Control Map` to USE on the *Wafer Parameter Menu*, you can load a control map created on an external PC. If you change a control map, you need to change it on an external PC, then load it onto the prober. Use the following steps to load a control map created on an external PC.**

14 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load/Save Menu* is displayed.

File Load/Save Menu



15 Insert the floppy disk containing the control map into the prober floppy disk drive.

16 Press CONTROL MAP DATA. A check menu is displayed.

17 Press YES. The control map is loaded and input into the application file. When a control map is loaded that has the same name as an existing file, the existing file will be overwritten. When the control map has finished loading, the *Setup Menu* is displayed.

6.10 Editing Existing Wafer File Data 0517.1

Introduction

Purpose:

This procedure explains how to select an existing wafer file and change its data using the *Change Setup Wafer Data Menu*. Wafer file data is changed only after loading a probe card and a FOUP of wafers into the prober and transferring a wafer to the chuck top. Be sure to re-input the probe tip positions and the probe parameters after changing all other data.

Required Resources:

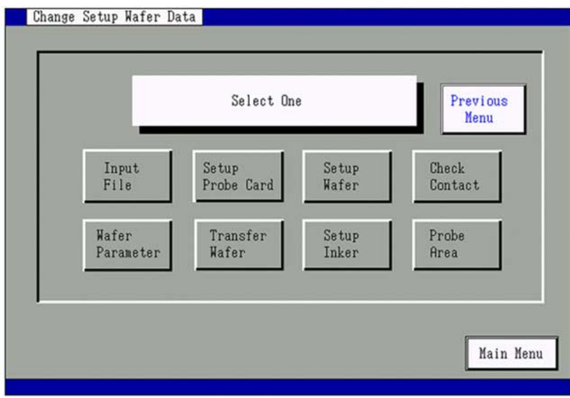
Time:	20 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

Overview:

This procedure describes how to change wafer data in existing files. Use the following steps to change wafer data in existing files:

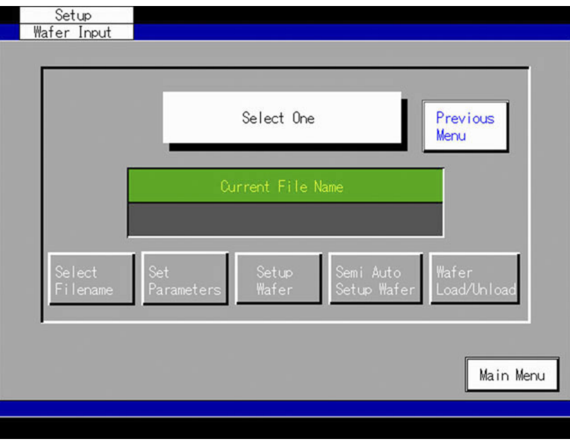
1. Press SETUP on the *Main Menu*.
2. Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



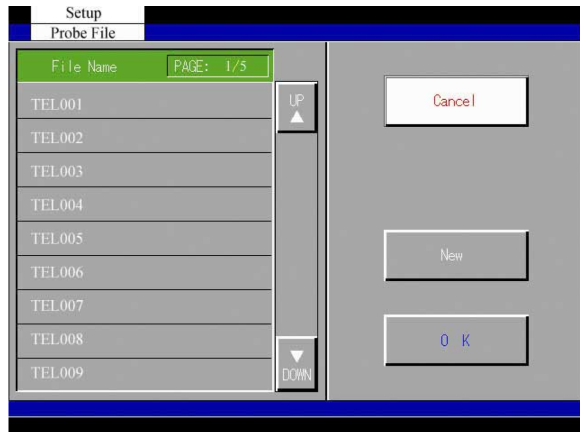
3 Press SETUP WAFER on the *Change Setup Wafer Data Menu*. The *Wafer Input Menu* is displayed.

Wafer Input Menu



4 Press SELECT FILENAME. The *File List Menu* is displayed.

File List Menu



NOTE **Pressing NEW will copy the selected data file. A keyboard is displayed. Input a new name on the keyboard.**

5 Select the filename for which to change the data. Use the UP and DOWN arrows to scroll through the list of filenames.

6 After selecting the filename, press OK. The data for the selected filename is displayed on the *Wafer Input Menu*.

6.11 Editing Basic Parameters in Existing Files 0518.1

Introduction

Purpose:

This procedure describes how to edit basic wafer parameters on existing wafer files. This allows the basic parameters of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

NOTE **Wafer parameters must be set in the following two locations: the *Wafer Input Menu* and the *Basic Parameters Menu*. The parameter settings must be identical in both menus.**

1 Use the following steps to access the *Basic Parameters Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

1.3 Press WAFER PARAMETER on the *Change Setup Wafer Data Menu*.

1.4 Press PARAMETERS on the *Wafer Parameters Input Menu*.

1.5 Press BASIC PARAMETER on the *Wafer Parameter Item Selection Menu*. The *Basic Parameters Menu* is displayed.

Basic Parameters Menu

2 Verify all parameters and edit any necessary settings. Refer to **3.2 Inputting Data to Create a Wafer File (see page 52)** for details on how to change basic wafer parameters.

3 After changing the parameters, press OK. A check menu is displayed stating `Do you want to validate this data?` Press YES. The wafer data parameters are validated and the check menu `Do you want to save to a file?` is displayed. Press YES. The wafer parameters are set, and the *Wafer Parameters Item Selection Menu* is displayed.

4 Press OK on the *Wafer Parameters Item Selection Menu*.

5 Press MAIN MENU on the *Wafer Parameters Input Menu* to return to the *Main Menu*.

6.12 Editing Specific Wafer Parameters 0519.1

Introduction

Purpose:

Specific wafer parameters can be altered in existing wafer files. This allows specific parameters of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

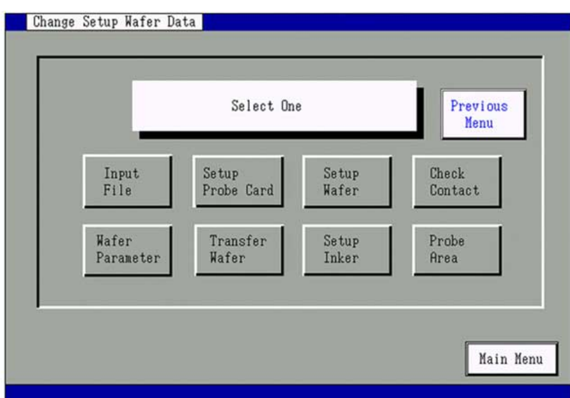
Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

1 Use the following steps to access the *Wafer Parameters Item Selection Menu*.

1.1 Press SETUP on the *Main Menu*.

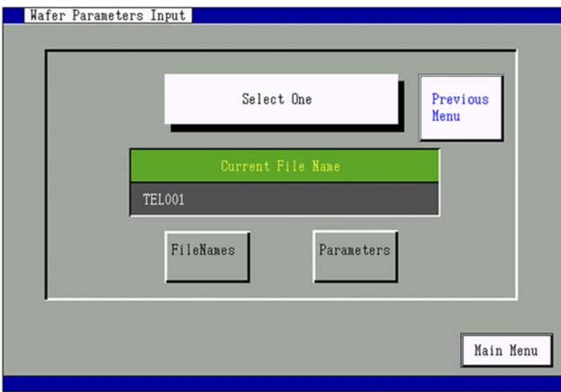
1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



1.3 Press WAFER PARAMETER on the *Change Setup Wafer Data Menu*. The *Wafer parameter Menu* is displayed.

Wafer Parameter Menu

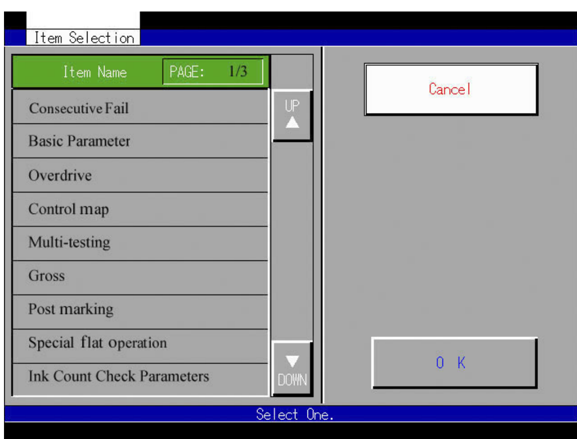


1.4 Press FileNames. The *File List Menu* is displayed.

1.5 Press the filename of the data to check or change. Use the scroll buttons to change the file list. After selecting the filename, press OK.

1.6 Press Parameter on the *Wafer Parameters Input Menu*. The *Wafer Parameters Item Selection Menu* is displayed.

Wafer Parameters Item Selection Menu



2 If necessary, use the scroll bar UP and DOWN arrows to view the desired option. Press the parameter item needed to be changed; the associated parameter setting menu is displayed.

3 Refer to **Chapter 4, Wafer Parameters (see page 143)** for details on how to change wafer parameters.

4 After changing the wafer parameters, press OK. A check menu stating `Do you want to save the change in a file?` is displayed. Press Yes. The parameters are validated and the *Wafer Parameters Item Selection Menu* is displayed.

5 Repeat Steps 2 through 4 for all wafer parameters needed to be changed.

6 After setting all parameters, press OK on the *Wafer Parameters Item Selection Menu*. The parameters are input, and the *Wafer Parameters Menu*is displayed.

6.13 Editing Registered Setup Wafer Data File Parameters 0520.1

Introduction

Purpose:

This procedure explains how to select an existing wafer file and change its setup wafer data file parameters using the *Change Setup Wafer Data Menu*. Wafer file data is changed only after loading a probe card and a FOUP of wafers into the prober and transferring a wafer to the chuck top. Be sure to re-input the probe tip positions and the probe parameters after changing all other data.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

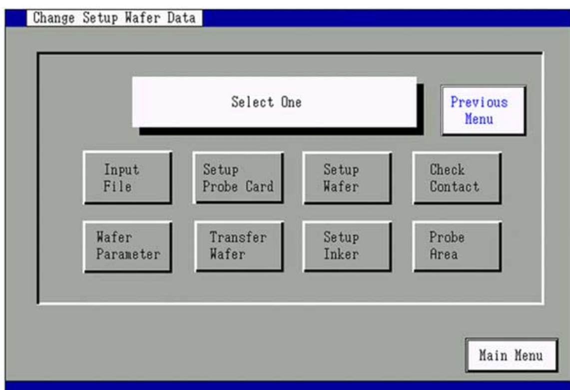
NOTE **Wafer parameters must be set in the following two locations, and the settings must be identical: the *Wafer Input Menu* and in *Wafer Parameters* under the *Basic Parameters Menu*.**

1 Use the following steps to access the *Basic Parameters Menu*.

1.1 Press SETUP on the *Main Menu*.

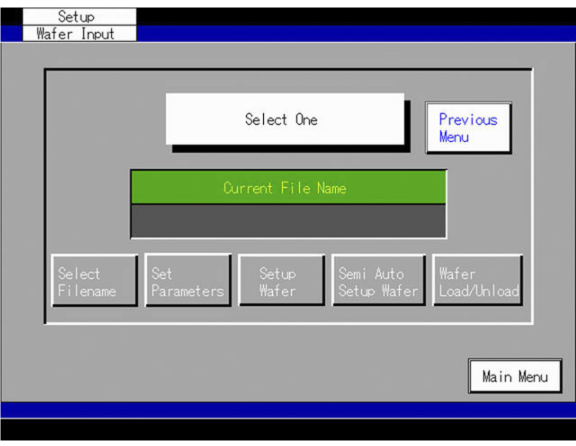
1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



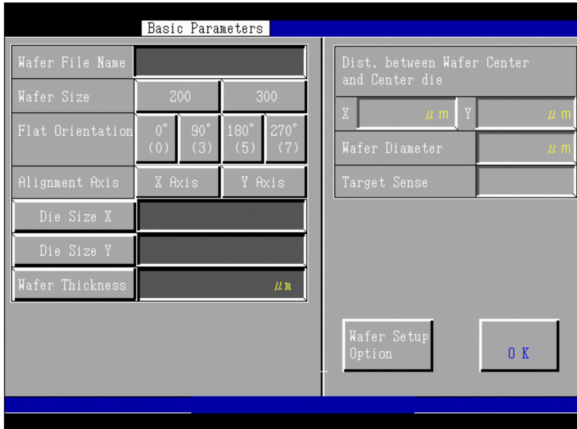
1.3 Press SETUP WAFER on the *Change Setup Wafer Data Menu*. The *Wafer Input Menu* is displayed.

Wafer Input Menu



1.4 Press SET PARAMETERS on the *Wafer Input Menu*. The *Basic Parameters Menu* is displayed.

Basic Parameters Menu



2 Verify the parameters and edit any necessary settings. Refer to the table below for a description and explanation of each menu option.

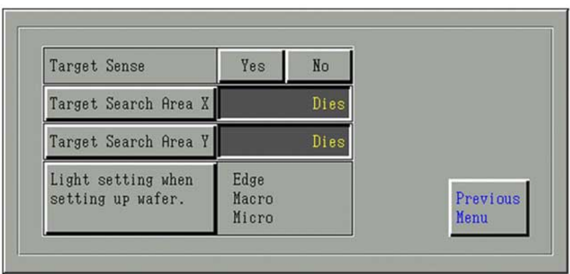
Probe Alignment Operation Parameter

Parameter Name	Setting/Range	Contents
`Wafer Size`	200, 300	Sets the size of the test wafer.
`Flat Orientation`	0° (0), 90° (3), 180° (5), 270° (7)	Sets the wafer flat direction once the wafer is transferred to the chuck top.
`Alignment Axis`	X AXIS, Y AXIS	Sets the alignment axis. The alignment axis is the axis perpendicular to the axis containing the largest die size value.
`Die Size X`	300–80,000 µm or 118–31,496 0.1 mil.	Sets the die size in the X direction. The prober is guaranteed for die sizes of 350–76000 µm or 137.8–29921 0.1 mil.
`Die Size Y`	300–80,000 µm or 118–31,496 0.1 mil.	Sets the die size in the Y direction. The prober is guaranteed for die sizes of 350–76,000 µm or 137.8–29,921 0.1 mil.
`Wafer Thickness`	0–5,000 µm	Sets the wafer thickness. There is no need to input a precise value for the wafer thickness; however, do not input 0–µm.

Parameter Name	Setting/Range	Contents
Dist. between Wafer Center and Center Die	—	Displays the distance between the center of the wafer and the center die in X and Y. The distance is input automatically once the wafer setup process is complete.
Wafer Diameter	—	Displays the diameter of the wafer.
Target Sense	YES, NO	Displays whether or not the Target Sense feature was used to create the current wafer file.

3 Press WAFER SETUP OPTION. The *Wafer Setup Option Menu* is displayed. Refer to the table below to set the parameters.

Wafer Setup Option Menu



Probe Alignment Operation Parameter

Parameter Name	Setting/Range	Contents
Target Sense	YES, NO	Displays whether or not the Target Sense feature was used to create the current wafer file. YES: Input the target sense when inputting the wafer. NO: Do not input the target sense when inputting the wafer.
Target Search Area X	0–10 die	Sets the X direction target-die search area in number of die. This parameter is active when Target Sense is used. **NOTE** **When the prober searches for target die, it does so in a circular manner. When enlarging the target-die search area, be sure that there are no patterns similar to the target die in the search area for at least a 1-die area. A similar pattern could cause an error.**
Target Search Area Y	0–10 die	Sets the Y direction target-die search area in number of die. This parameter is active when Target Sense is used. **NOTE** **When the prober searches for target die, it does so in a circular manner. When enlarging the target-die search area, make sure that there are no patterns similar to the target die in the search area for at least a 1-die area. A similar pattern could cause an error.**

4 Press LIGHT SETTING WHEN SETTING UP WAFER. The *Light Setup Menu* is displayed. Refer to the following table to set the parameters.

Light Setup Menu

Basic Parameters (Light Setting when Setting Up Wafer)

Parameter Name	Setting/Range	Contents
`Light Setting When Setting Up Wafer`	BRIGHT, DARK, AUTO	Sets the lighting visual field used during edge, macro, and micro recognition during wafer setup. The bright visual field is automatically input as the light setting for wafer setup. However, there are instances when the other lighting settings are appropriate. You can set the `Lighting Field (Bright or Dark)` in advance for use when setting up wafers. If recognition does not occur properly, you can change to a different setting. BRIGHT: Lights the wafer from above. DARK: Lights the wafer from an angle. AUTO: Automatically switches to the appropriate visual field according to conditions. Each recognition during wafer input is performed using the selected Light Field (Bright when it is set to AUTOMATIC). If recognition is not possible, switch to a different light field and retry recognition. The Lighting Field being used when detection occurs is input into the input data. Each recognition during wafer alignment is performed using the selected Lighting Field. If recognition is not possible, switch to a different light filed and retry recognition. An assist will be generated if the Lighting Field used in wafer setup and wafer alignment cannot be used for detection.

5 Press PREVIOUS MENU on the *Light Setting when Setting Up Wafer Menu*.

6 Press PREVIOUS MENU on the *Wafer Setup Option Menu*.

7 Press OK on the *Basic Parameters Menu*. A check menu is displayed with the message, `Do you want to validate the data?` Press YES. The basic parameters are input and the *Wafer Input Menu* is displayed.

6.14 Editing Probe Card Data File Parameters 0521.1

Introduction

Purpose:

Probe card parameters can be altered in existing wafer files. This allows the probe card parameters of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

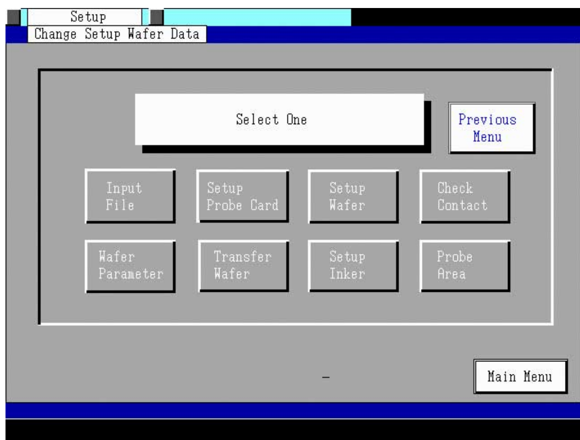
Time:	20 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

1 Use the following steps to access the *Probe Card Parameter Menu*.

1.1 Press SETUP on the *Main Menu*.

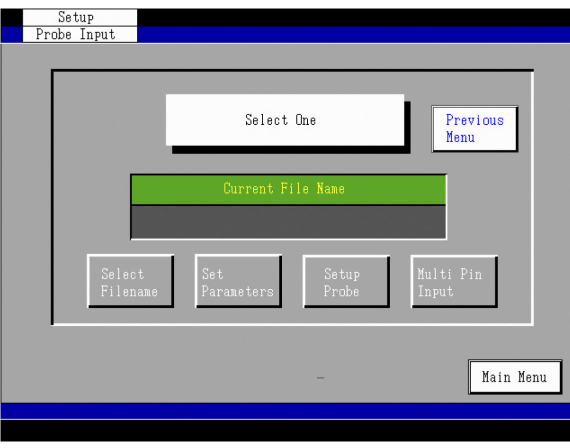
1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



1.3 Press SETUP PROBE CARD. The *Probe Card Input Menu* is displayed.

▾ **Probe Card Input Menu**



1.4 Press SET PARAMETERS on the *Probe Card Input Menu*. The *Probe Card Parameter Menu* is displayed.

▾ **Probe Card Parameter Menu**

2 Verify the parameters and change any necessary settings. Refer to **3.3 Inputting Probe Card Parameters (see page 59)** for a description and explanation of each menu option.

3 After changing the parameters, press OK on the *Probe Card Parameter Menu*. A check menu is displayed stating `Do you want to validate this data?` Press YES. The probe card parameters are validated and a check menu is displayed stating `Do you want to save to a file?` Press YES. The probe card parameters are input and the *Probe Card Input Menu* is displayed.

6.15 Editing Probe Card Data Pin Registration 0522.1

Introduction

Purpose:

This procedure describes how to alter probe-tip positions in existing wafer files. This allows the probe tip positions of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	Probe Card

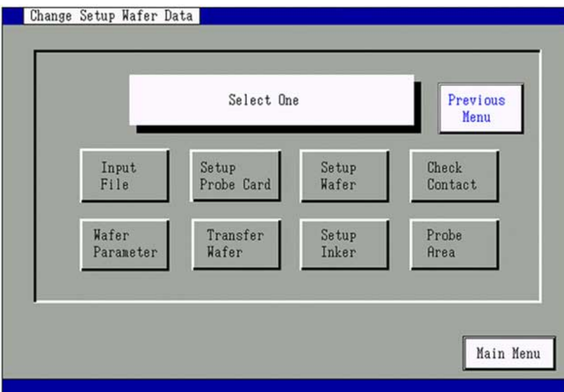
NOTE **This procedure assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, the procedure cannot be completed.**

1 Use the following steps to access the *Stage Control Menu*.

1.1 Press SETUP on the *Main Menu*.

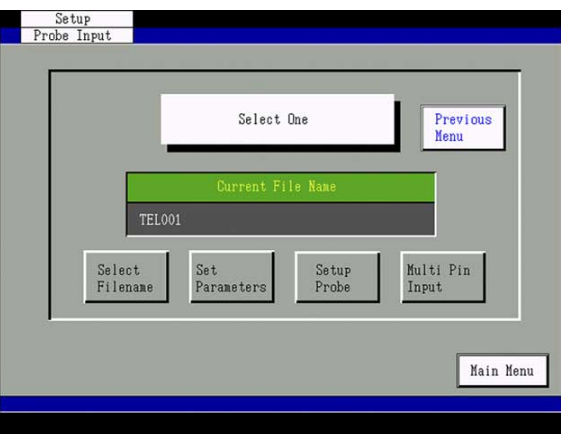
1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



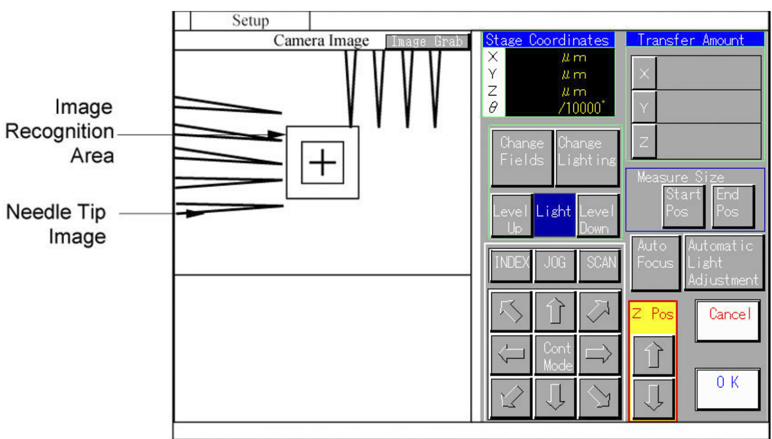
1.3 Press SETUP PROBE CARD on the *Change Setup Wafer Data Menu*. The *Probe Card Input Menu* is displayed.

Probe Card Input Menu



1.4 Press SETUP PROBE on the *Probe Card Input Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



2 Input the probe tip position. Refer to **3.4 Inputting Probe Tip Positions (see page 65)** for details on inputting the probe-tip positions. After inputting the probe tip positions, the *Probe Card Input Menu* is displayed.

6.16 Managing Lot Parameters 0523.1

Introduction

Purpose:

Lot parameters allow the user to input data about the lot that will be tested before testing begins. Lot parameters contain descriptive and characteristic information about the lot.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

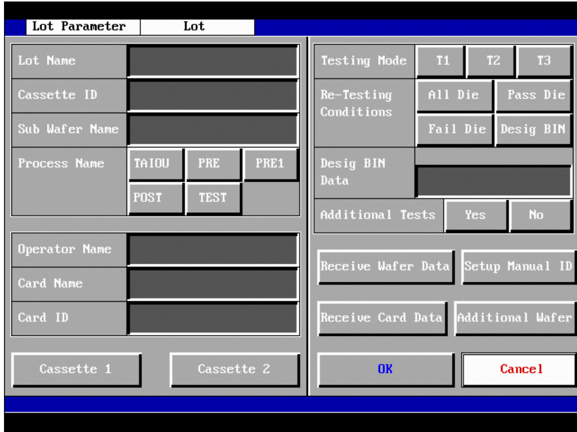
Overview:

This procedure describes how to set lot parameters.

Checking Lot Parameters

1 Press SET LOT on the Run Menu. The Lot Parameters Menu is displayed.

Lot Parameters Menu



2 Set each parameter. A description and explanation of each menu choice is provided in the following table:

Lot Parameter Descriptions

Parameter Name	Setting	Description
Input Lot No	YES, NO	Sets whether or not to use lot management. YES: Use lot management. NO: Do not use lot management.
Stop Lot	YES, NO	This parameter is active when Input Lot No is set to YES and the prober has second loader specifications. Sets whether to stop testing after the first FOUP. YES: Stop testing after the first FOUP. When testing stops a message menu is displayed. NO: Do not stop testing after the first FOUP. Testing continues on the second FOUP wafers.
Cassette 1 Lot Name	20 characters	This parameter is active when Input Lot No is set to YES. Sets the first FOUP lot name.
Cassette 2 Lot Name (In-Line Tool Option)	20 characters	This parameter is active when Input Lot No is set to YES and the prober has second loader specifications. Sets the second FOUP lot name.
Operator Name	20 characters	This parameter is active when Input Lot No is set to YES. Sets the operator's name.
Card No.	20 characters	This parameter is active when Input Lot No is set to YES. Sets the probe card name.
Parameter 1 - 4	20 characters	This parameter is active when Input Lot No is set to YES. Allows you to input up to four lot management comments.
Testing Mode	T1, T2, T3	Sets the number of times to test the lot. T1: Test the lot one time. T2: Test the lot two times. T3: Test the lot three times.
Re-Testing Conditions	ALL DIE, PASS DIE, FAIL DIE, DESIGNATED BIN	This parameter is active when Testing Mode is set to either T2 or T3. Selects the retest die. ALL DIE: Retest all die. PASS DIE: Only retest passed die. FAIL DIE: Only retest failed die. DESIGNATED BIN: Only retest die corresponding to the BIN data input in Desig BIN Data.
Desig BIN Data	20 digits of BIN data (1, 2, 3, 4, 5, A, B, C, ..., S)	This parameter is active when Re-Testing Conditions is set to DESIGNATED BIN. Sets the BIN category codes for the die that will be retested under Re-Testing Conditions.

Parameter Name	Setting	Description
`Additional Tests`	YES, NO	Sets whether to perform additional wafer tests when wafers are added to empty FOUP slots. You must set which wafers will be tested using the `Additional Wafer Menu`. YES: Perform additional wafer tests. NO: Do not perform additional wafer tests.

3 Once all of the lot parameters are set, press OK on the Lot Parameters Menu. A check menu stating `Do you want to validate the data?` is displayed.

4 Press YES on the check menu The lot parameters are input and another check menu stating `Do you want to save to a file?` is displayed. Press YES. The parameters are saved and the Run Menu is displayed.

Selecting Additional Wafer Tests

NOTE **To access the Additional Wafer Menu, the `Additional Wafer Test Parameter` menu item must be set to YES.**

5 Press ADDITIONAL WAFER on the Lot Parameters Menu. The *Additional Wafer Menu* is displayed.

Additional Wafer Menu

6 Press YES for `Additional Wafer`. Now select the additional wafer for testing.

7 Select the FOUP that contains the wafer to be tested. To select FOUP 1, press 1 for `Cassette`. To select FOUP 2, press 2 for `Cassette`.

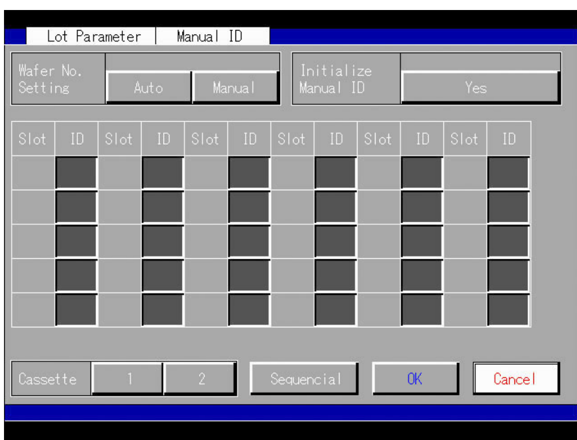
8 Once you select the FOUP, select the wafer to be tested. For example, to designate the wafer in slot number 21, press NO under the `21` to change it to YES.

9 After selecting the wafer for testing, press OK. The Run Menu is displayed.

Inputting Wafer ID Numbers

10 Press SETUP MANUAL ID on the Lot Parameters Menu. The *Manual ID Menu* is displayed.

Manual ID Menu



11 Select the FOUP for which you plan to set wafer ID numbers. To select FOUP 1, press 1 for `Cassette`. To select FOUP 2, press 2 for `Cassette`.

12 Input the wafer ID numbers. To have the prober automatically assign wafer ID numbers, press AUTO for `Wafer No. Setting`. The prober assigns wafer ID numbers based on slot numbers.

13 To manually input wafer ID numbers, press MANUAL for `Wafer No. Setting`.

13.1 Press the ID display area next to the wafer slot number for which you want to set a wafer ID number. For example, to set a wafer ID number for slot seven, press the ID display area next to 7 under `Slot`.

13.2 A numeric keypad is displayed. Input a two digit wafer ID number and press OK. The wafer ID number is input.

To return all of the wafer ID numbers to 0, press YES for `Initialize Manual ID`.

14 After inputting all wafer ID numbers, press OK to return to the Lot Parameters Menu.

6.17 Re-inputting Wafer Alignment Data 0525.1

Introduction

Purpose:

You can re-input wafer alignment data into existing wafer files. This allows the wafer alignment data of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

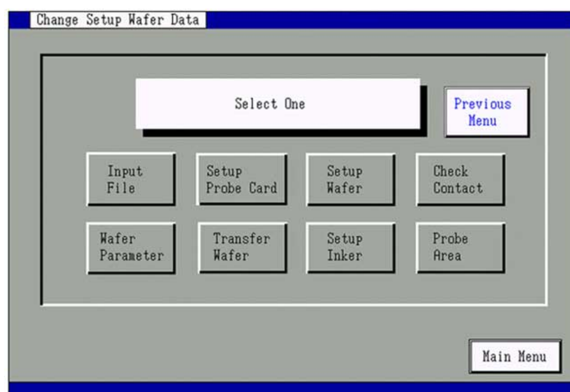
Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The procedure assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, the procedure cannot be completed.**

This procedure also assumes that the FOUP of wafers used to create the wafer file is on the load port, or that a single wafer used to create the wafer file is on the wafer table. If a FOUP is not loaded, the procedure cannot be completed.

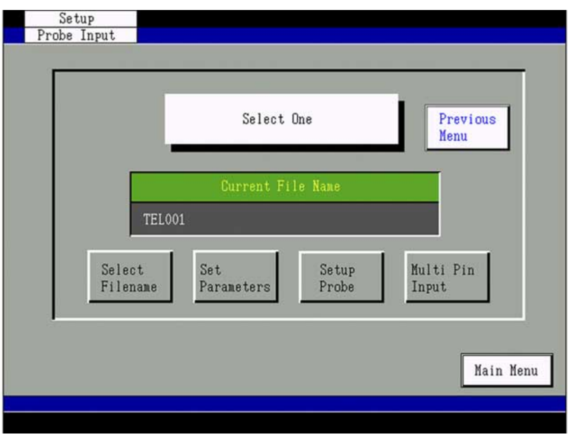
1. Press SETUP on the *Main Menu*.
2. Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



3 Press SETUP WAFER on the *Change Setup Wafer Data Menu*. The *Wafer Input Menu* is displayed.

Wafer Input Menu

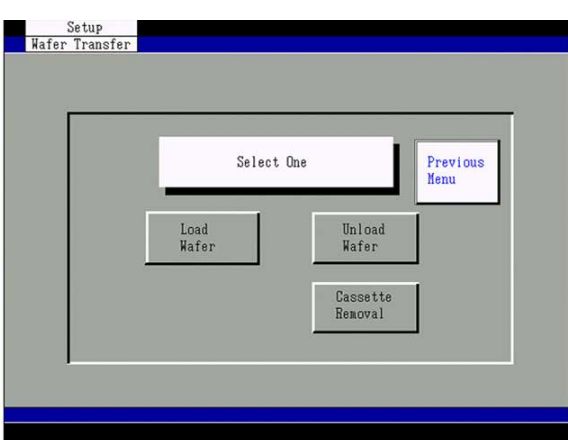


4 Press SELECT FILENAME. The *File List Menu* is displayed.

5 Press the filename for the data you want to check or change. Use the scroll buttons to change the file list. After selecting the filename, press OK.

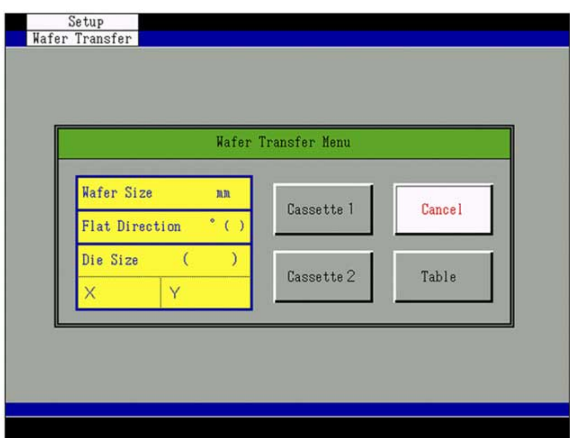
6 Press WAFER LOAD/UNLOAD on the *Wafer Input Menu*. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



7 Press LOAD WAFER. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



NOTE **If you are using a single port loader,** CASSETTE 2 **is not displayed on the** ***Wafer Transfer Menu*****.**

8 To transfer a wafer from a FOUP:

8.1 Press CASSETTE 1. A numeric keypad is displayed.

NOTE **In you are using a dual port loader, press either** CASSETTE 1 **or** CASSETTE 2**.**

8.2 Using the numeric keypad, input the slot number of the wafer to be transferred and press OK.

CAUTION **Mechanical Hazard**

When the FOUP moves to the loading/unloading position, it can pinch fingers or hands. Do not place your hands between the FOUP and the prober.

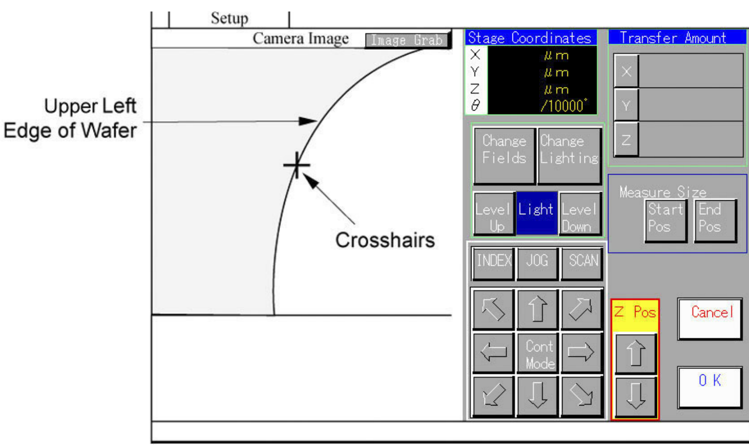
9 To transfer a wafer from the wafer table, press TABLE. The designated wafer is transferred to the chuck top. After the transfer is complete, the *Transfer Wafer Menu* is displayed.

10 Select the method with which to re-input wafer data on the *Wafer Input Menu*.

- To input the wafer data manually, press SETUP WAFER.
- To input the wafer data semiautomatically, press SEMI-AUTO SETUP WAFER.

The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



11 Use one of the following methods to input the wafer data.

- Refer to **3.10 Inputting Wafer Edge Positions (Manual) (see page 91)** and the procedures that follow it for details on inputting setup file data manually using manual teaching.
- Refer to **3.13 Wafer Edge Detection (Semiautomatic) (see page 99)** for details on inputting setup file data semiautomatically using semiautomatic teaching.

6.18 Changing Contact Check Parameters 0527.1

Introduction

Purpose:

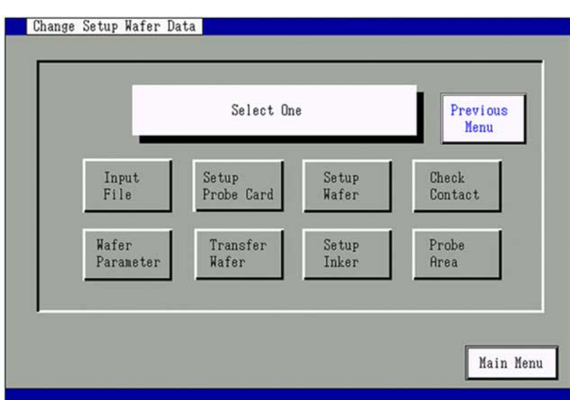
You can change contact check parameters in existing wafer files. This allows the contact check parameters of one file to be altered so that the file can be used in many situations, saving the time required to set up a new file.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	N/A
Parts or Consumables:	N/A

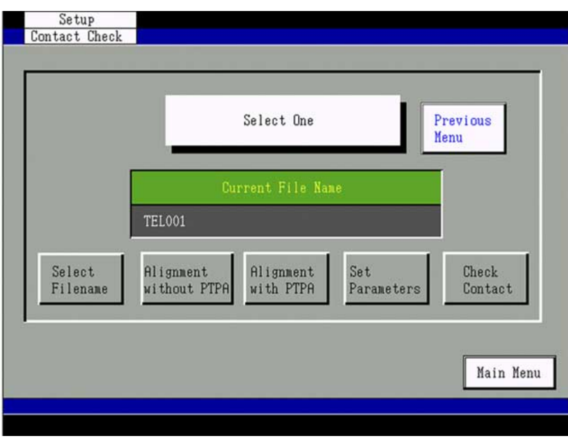
1. Press SETUP on the *Main Menu*.
2. Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

Change Setup Wafer Data Menu



3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Check Contact Menu* is displayed.

Check Contact Menu

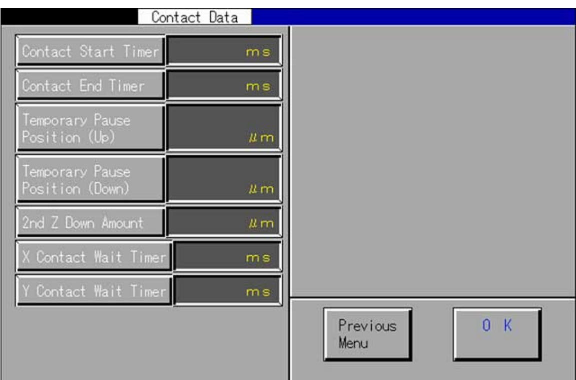


4 Press SELECT FILENAME. The *File List Menu* is displayed.

5 Press the filename for the data that you want to check or change. Use the scroll buttons to change the file list. After selecting the filename, press OK.

6 Press SET PARAMETERS on the *Check Contact Menu*. The *Contact Data Menu* is displayed.

Contact Data Menu



Refer to 3.19 Configuring Contact Check Parameters (see page 113) for definitions of the following parameters:

- `Overdrive MAX (see MAX. Overdrive)`
- `Overdrive Amount`
- `Overdrive Return (see Return Amount)`
- `Z Down Amount`
- `X Offset`
- `Y Offset`
- `No. of Contacts (see Contact Count)`

- X PTPA Correction (see X Offset-second column)
- Y PTPA Correction (see Y Offset-second column)
- Z PTPA Correction (see Z Offset-second column)
- θ PTPA Correction (see θ Offset-second column)

The other menu items are listed and explained below:

Parameter	Setting	Content
2nd Overdrive Amount	-Overdrive Amount to (Overdrive MAX. - Overdrive Amount) µm	This parameter is active when Contact Count (No. of Contacts) is set to two or more times. Sets the overdrive amount for the last contact. For example, if this parameter is set to -30 and the overdrive amount is set to 80, the last contact overdrive amount would be 80 + (-30) = 50.
Overdrive Return	0 to Overdrive Amount µm	This sets the Z axis lowering amount (Return Amount) from the position where the pad contacts the probe.

7 Press DETAIL PARAMETERS on the *Contact Data Menu*. The *Detail Parameters Menu* is displayed.

Detail Parameters Menu

8 Set the parameters. Refer to the table below for details.

Parameter	Setting	Content
Contact Start Timer	0–10,000 ms	Sets the time the prober will wait to raise the Z axis after the X and Y axes were moved. This allows the wafer to settle (cease movement) after the XY stage has moved.
Contact End Timer	0–10,000 ms	Sets the time the prober will wait to end contact after the Z axis was raised. This allows the wafer to settle (cease movement) after the chuck was raised.
Temporary Pause Position (Up)	0 TO (Z DOWN AMOUNT + OVERDRIVE) µm	Sets the position where the prober will wait during the Contact Start Timer cycle. After the Contact Start Timer setting is exceeded, the chuck will rise to the Overdrive position.

Parameter	Setting	Content
`Temporary Pause Position (Down)`	0 TO (Z DOWN AMOUNT + OVERDRIVE) µm	This parameter is active when there is a positive overdrive amount. After the `Contact End Timer` setting is exceeded, the chuck is lowered.
`2nd Z Down Amount`	0 TO Z DOWN AMOUNT µm	This parameter is active when there is a positive overdrive amount and the `Contact Count` is set to two or more times. Sets the additional amount the Z axis will lower after the second contact is made.

9 After changing the contact check parameters, press OK. A check menu is displayed stating `Do you want to validate this data?`

10 Press YES. The contact parameters are input and the *Contact Check Menu* is displayed.

6.19 Performing a Contact Check 0528.1

Selecting a Contact Check File

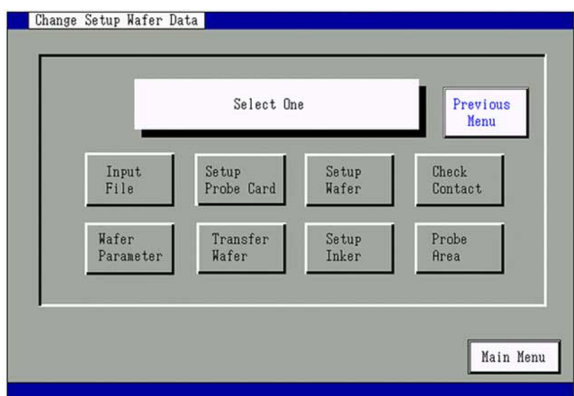
NOTE **This procedure assumes that a FOUP of wafers is on the load port, or that a single wafer is on the unload table. If a FOUP is not loaded, the procedure cannot be completed.**

The procedure also assumes that the probe card used to create the wafer file is loaded into the prober. If the proper probe card is not loaded, the procedure cannot be completed.

1 Press SETUP on the *Main Menu*.

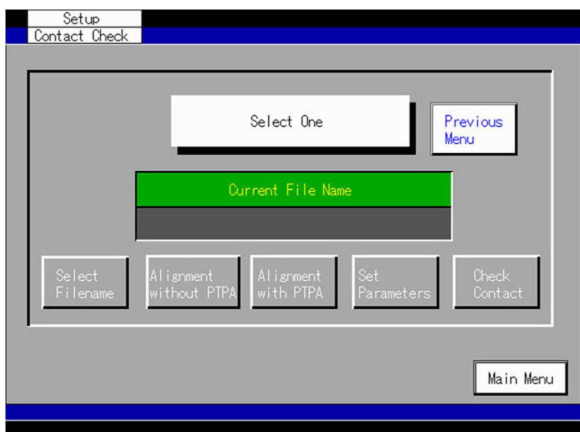
2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

Change Setup Wafer Data Menu



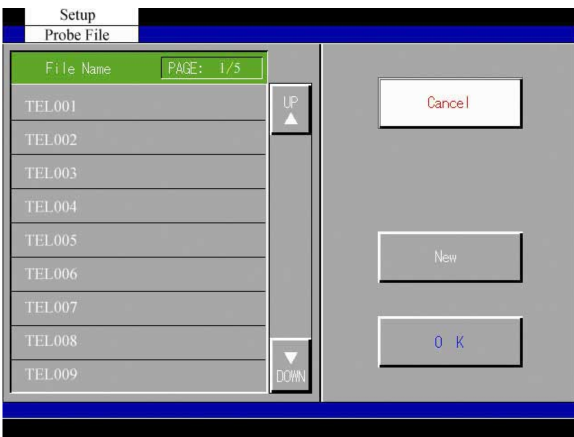
3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

Contact Check Menu



4 Press SELECT FILENAME. The *File List Menu* is displayed.

File List Menu

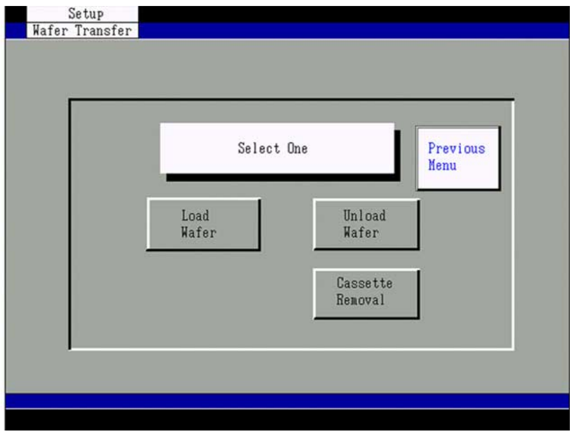


5 Press the filename of the data to check or change. Use the scroll buttons to change the file list. After selecting the filename, press OK. The selected filename is displayed on the *Contact Check Menu*.

Performing Alignment

6 Press TRANSFER WAFER on the *Change Setup Wafer Data Menu*. The *Wafer Transfer Menu* is displayed.

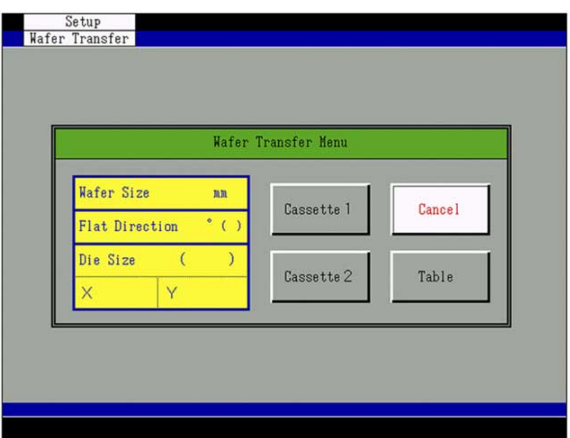
Wafer Transfer Menu



NOTE **This step is not necessary if a wafer has already been transferred.**

7 Press LOAD WAFER. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



NOTE **If you are using a single port loader,** CASSETTE 2 **is not displayed on the** ***Wafer Transfer Menu*****.**

8 To transfer a wafer from the FOUP:

8.1 Press CASSETTE 1. A numeric keypad is displayed.

NOTE **If you are using a dual port loader, press** CASSETTE 1 **or** CASSETTE 2**.**

8.2 Using the numeric keypad, input the slot number of the wafer to be transferred and press OK.

CAUTION **Mechanical Hazard**

The FOUP will move to the load position and can pinch fingers or hands. Do not place your hands between the FOUP and the prober.

9 To transfer a wafer from the wafer table, press TABLE. The designated wafer is transferred to the chuck top. After the transfer is complete, the *Change Setup Wafer Data Menu* is displayed.

10 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

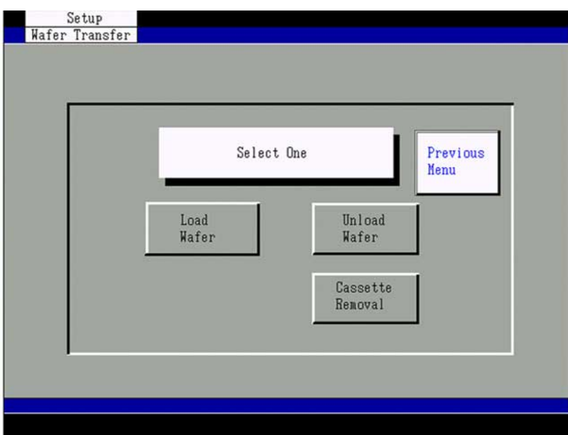
11 Press ALIGNMENT WITHOUT PTPA on the *Contact Check Menu*. Probe alignment and wafer alignment are performed. After alignment, the *Contact Check Menu* is displayed.

Performing PTPA Alignment

NOTE **This process performs probe alignment and wafer alignment for the PTPA probes.**

12 To transfer a wafer to the chuck top, press TRANSFER WAFER on the *Change Setup Wafer Data Menu* The *Wafer Transfer Menu* is displayed.

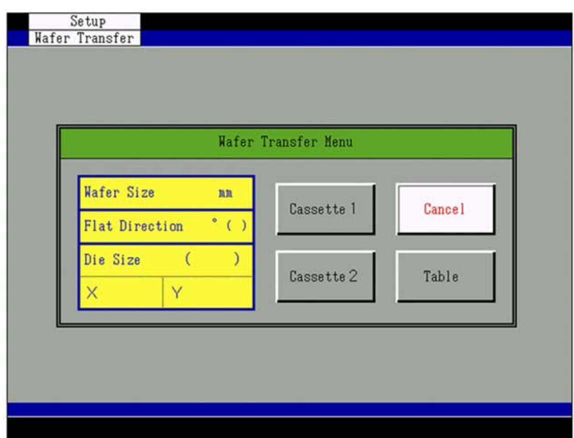
Wafer Transfer Menu



NOTE **This action is unnecessary if a wafer has already been transferred.**

13 Press LOAD WAFER. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



NOTE **If you are using a single port loader,** CASSETTE 2 **is not displayed on the** ***Wafer Transfer Menu*****.**

14 To transfer a wafer from the FOUP:

14.1 Press CASSETTE 1. A numeric keypad is displayed.

NOTE **If you are using a dual port loader, press** CASSETTE 1 **or** CASSETTE 2**.**

14.2 Using the numeric keypad, input the slot number of the wafer to be transferred and press OK.

Mechanical Hazard

The FOUP will move to the load position and can pinch fingers or hands. Do not place your hands between the FOUP and the prober.

15 To transfer a wafer from the wafer table, press TABLE. The designated wafer is transferred to the chuck top. After the transfer is complete, the *Change Setup Wafer Data Menu* is displayed.

16 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

17 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. PTPA probe alignment and wafer alignment are performed. After alignment, the *Contact Check Menu*is displayed.

6.20 Correcting the PTPA Position and the XY Offsets 0385.1

Introduction

Purpose:

To check, correct, and/or offset the contact position.

The contact position is automatically determined by the prober based on the settings of the probe card and the wafer file data. A user can check the contact position and offset it using the *Stage Control Menu*. If file data has been altered, checking the PTPA position and inputting correctional offsets is recommended.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A FOUP of wafers or single wafer; Probe card

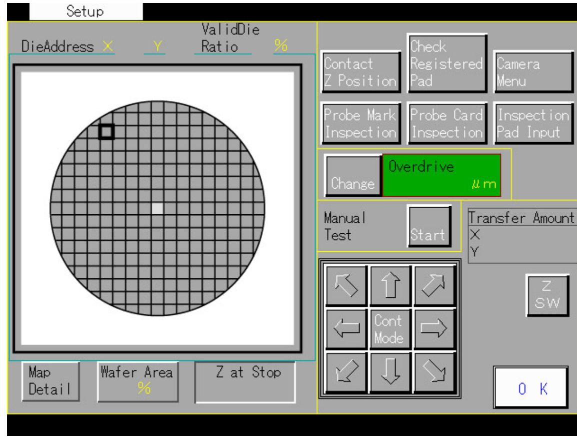
NOTE This procedure assumes that a FOUP of wafers is on the load port, or a single wafer is on the wafer table. If a FOUP is not loaded, the procedure cannot be completed.

The procedure also assumes that the probe card used to create the wafer file is mounted in the prober. If the proper probe card is not mounted, the procedure cannot be completed.

Checking the Contact Positions

1 Press CHECK CONTACT on the *Check Contact Menu*. The prober performs a total alignment; the *Contact Down Position Menu* is displayed.

Contact Down Position Menu



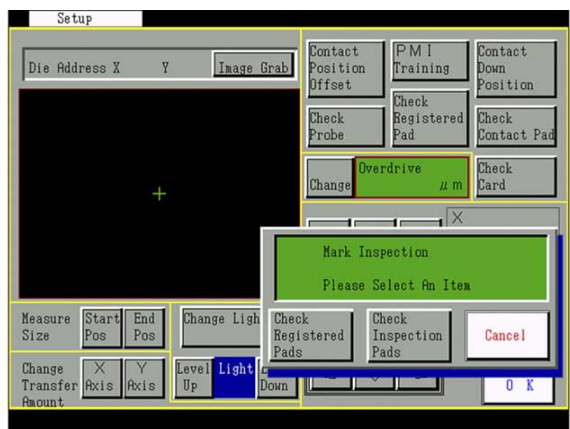
2 Use the control buttons to position the shaded square over the die to be checked.

3 Press Z SW. The probes make contact with the specified die.

4 Press Z SW. The probes separate from the wafer surface.

5 Press CAMERA MENU on the *Contact Down Position Menu*, and then press CHECK REGISTERED PADS on the *Camera Menu*. A message menu is displayed stating, `Mark Inspection. Please Select an Item.`

Message Menu



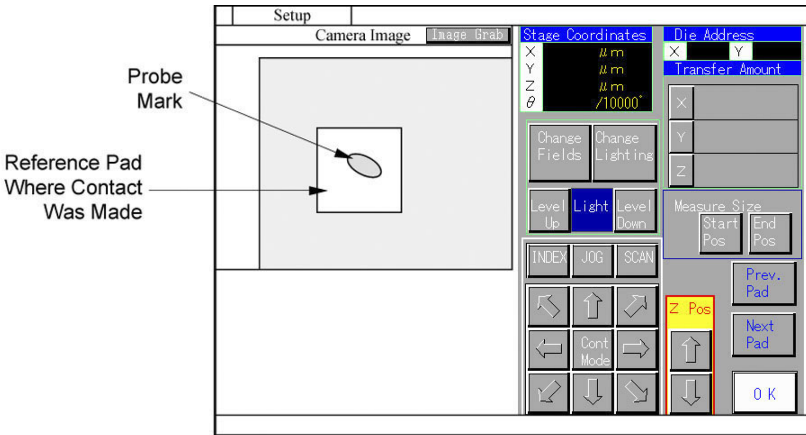
6 There are three choices on this menu: CHECK REGISTERED PADS, CHECK INSPECTION PADS, and CANCEL.

NOTE **If the wafer file contains the inspection pad addresses for PMI, PCI, or PTPA, then a message menu is displayed stating `Mark Inspection. Please Select an item.`**

If the wafer file contains no inspection pad addresses for PMI, PCI, or PTPA, the standard registered alignment pads are displayed on the *Stage Control Menu*.

Press CHECK REGISTERED PAD. The standard and registered alignment pads are displayed on the *Stage Control Menu*.

Stage Control Menu



NOTE **Two kinds of overdrive are displayed on the *Contact Down Position Menu*: Z1 and Z2 mm.**

The first overdrive, Z1, is the actual Z up amount after the software compensation for probe load. The second overdrive, Z2, is the setting amount from the overdrive parameter.

7 Check the probe mark position. Press NEXT PAD to view the next registered pad; the registered pads are displayed in order. When the probe mark is off the pad, it is necessary to offset the contact position. The next procedure describes how to offset the contact position.

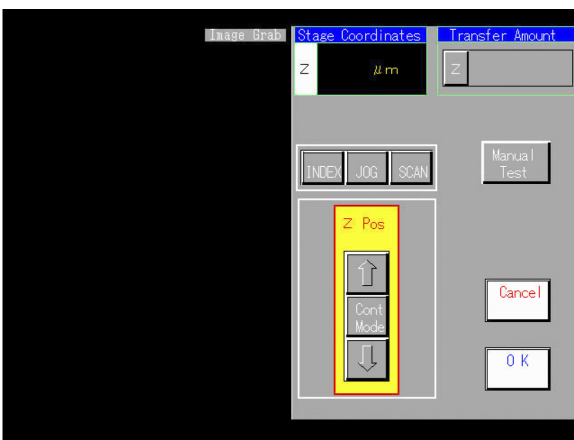
8 If there is no problem with the contact position, press OK. The *Contact Down Position Menu* is displayed. Press OK on the *Contact Down Position Menu* to complete the contact check. The *Check Contact Menu* is displayed.

Z Contact Position Offset

NOTE **The `Z Contact Position Offset` should be used if the probe mark was too heavy or too light. Because Z controls the up/down motion of the chuck, adjusting this parameter causes the contact height to change.**

9 Press CONTACT Z POSITION on the *Contact Down Position Menu*. The *Z Position Setting Menu* is displayed.

Z Position Setting Menu



10 Use the up/down arrow buttons to set the chuck top rise position while checking the Z coordinate.

CAUTION **Property Damage Hazard**

Before you press the up arrow, be sure to set the indexing amount to JOG. If the indexing amount is too large, the probe card could be damaged by the impact of the die striking the probes.

11 After checking if the new amount of Z offset is producing the desired results, press OK. A check menu is displayed with the message `Teach preset amount?`

12 Press YES. The Z offset amount is saved in the wafer file parameters and the *Contact Down Position Menu* is displayed.

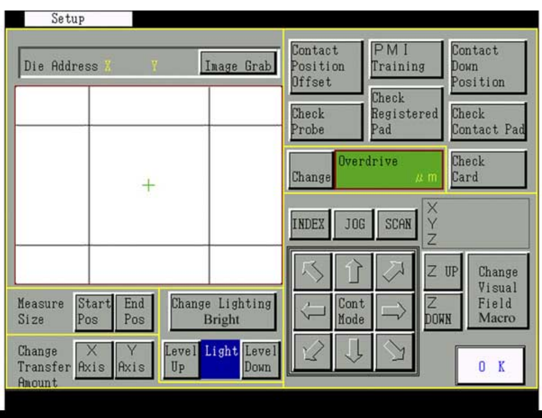
After changing the offset to complete the contact check, press OK. The *Contact Check Menu* is displayed.

XY PTPA Correctional Offset

NOTE **Use the XY PTPA Correction if the probe marks are all out of position along the linear axis. Since X and Y controls the left/right and forward/backward motion of the main chuck, adjusting this parameter repositions the probes into the correct position.**

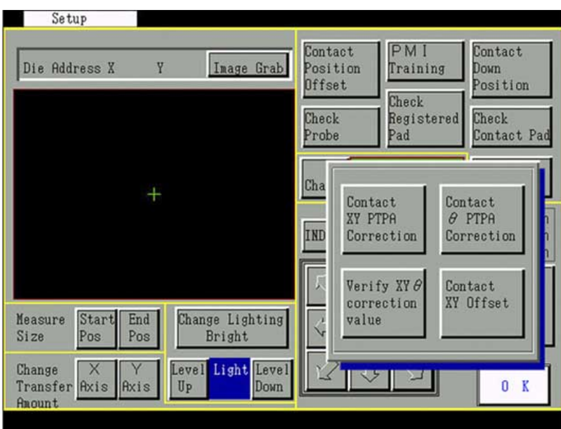
13 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



14 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

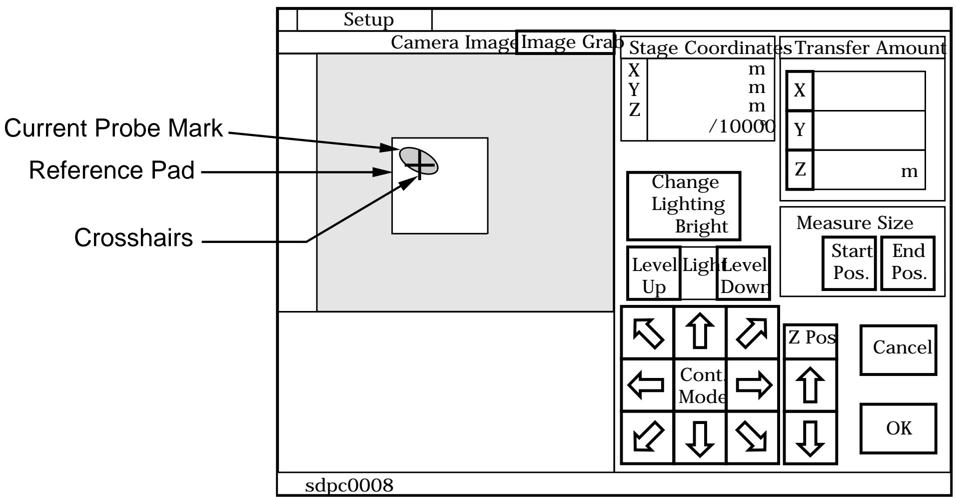
Contact Position Offset Selection Menu



15 Press CONTACT XY PTPA CORRECTION. The reference pad, designated by the wafer file parameters, is displayed on a *Stage Control Menu*.

16 Use the arrow buttons to move the crosshairs to the center of the probe mark.

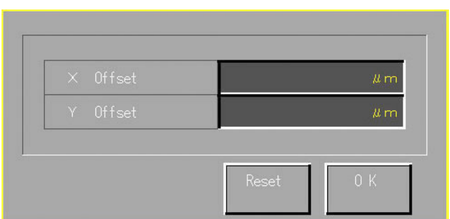
Stage Control Menu



17 Press OK. A message menu is displayed stating, `Teach preset amount?`

18 Press YES. The *XY Offset Display Menu* is displayed.

XY Offset Display Menu



19 Check the value displayed on the *XY Offset Display Menu*. The values displayed for the X and Y PTPA correction represent the amount that the crosshairs on the *Camera Menu* were moved. After checking the displayed offset for each axis, press OK. The offset amounts are saved and the *Camera Menu* is displayed.

NOTE **The original position will be reset if the new contact position exceeds 100 µm from the point of origin, because a value exceeding this limit cannot be input as the XY offset. You must specify an offset within the limit.**

20 If necessary, press RESET to change the contact position XY offset again.

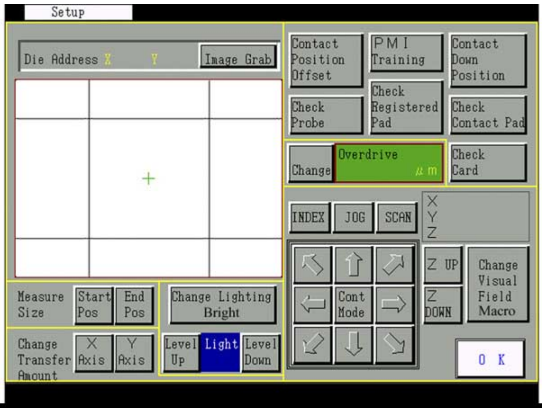
21 After changing the offset, press OK on the *XY Offset Display Menu* to complete the contact check. The *Contact Check Menu* is displayed.

Theta PTPA Contact Position Correctional Offset

NOTE **The Theta PTPA Contact Position Correctional offset should be used if each probe mark position differs in rotational placement per pad along the theta axis. Imprecise alignment is the primary cause of this type of problem. Since theta controls the rotation of the chuck, adjusting this parameter can help to further align the wafer and the probe card. If a theta offset does not correct the placement problem, the probe card itself should be inspected for flaws.**

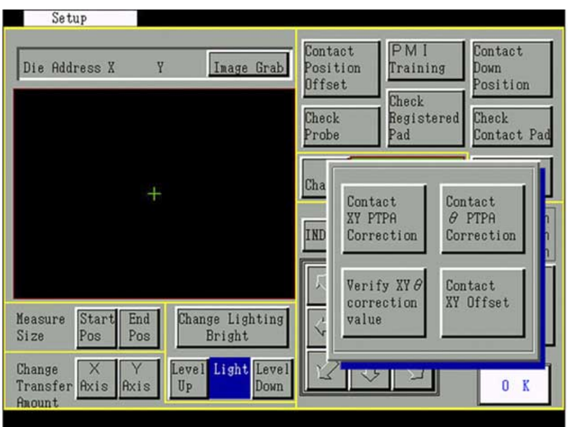
22 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



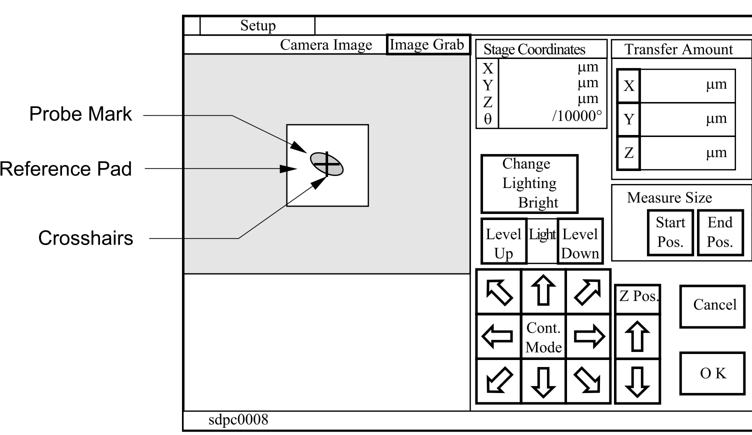
23 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

Contact Position Offset Selection Menu



24 Press CONTACT θ PTPA CORRECTION. The reference pad, designated by the wafer file parameters, is displayed on the *Stage Control Menu*.

Stage Control Menu



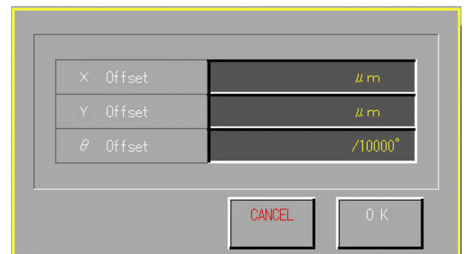
25 Use the control buttons to position the center of the probe mark on the crosshairs.

26 Press OK. Registered pad 2 is displayed.

27 Repeat steps 25 and 26 to position the probe mark center for the other registered pads on the crosshairs.

28 After positioning all of the registered pads, press OK. The *XYθ Offset Amount Display Menu* is displayed. It shows the new position calculated by the prober.

XYθ Offset Amount Display Menu



29 After checking the offset amount for each direction, press OK. A check menu is displayed stating, `The wafer will be aligned because Theta was offset.` After wafer alignment is performed, the *Camera Menu* is displayed. The offset amount for the theta direction is saved in the offset amounts parameter.

Press CANCEL to retain the original offset amounts and contact position.

NOTE **The XYθ correction amount can no longer be changed.**

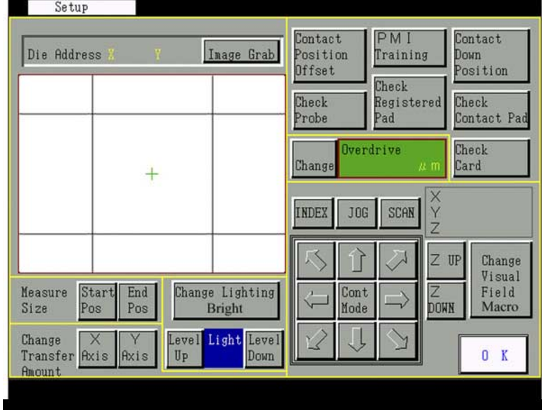
30 Press OK on the *Camera Menu*. The *Contact Check Menu* is displayed.

Contact XY Position Offset

NOTE **The Contact XY Position Offset is an intentional shift in the XY axis contact position, not including the overdrive amount calculated by the prober. This positioning is applied after alignment is performed, and is used to offset the calculated contact position to the desired position.**

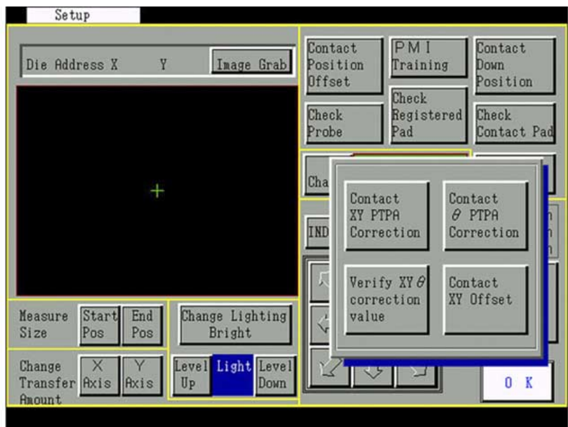
31 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



32 Press CONTACT POSITION OFFSET on the *Camera Menu*. The *Contact Position Offset Selection Menu* is displayed.

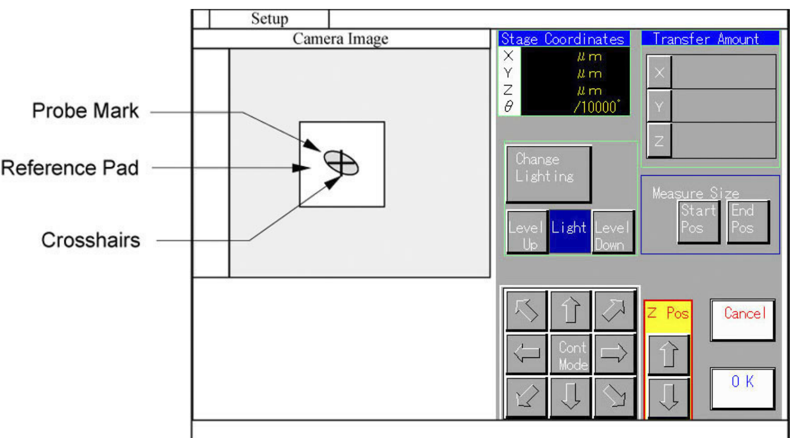
Contact Position Offset Selection Menu



33 Press CONTACT XY OFFSET. The reference pad, specified by the wafer file parameters, is displayed on the *Stage Control Menu*.

34 Use the control buttons to position the crosshairs over the contact position.

Stage Control Menu



35 Press OK. A message is displayed stating `Teach preset amount?` Press YES. The *XY Offset Display Menu* is displayed. The values displayed for the X and Y offset represent the amount that the crosshairs on the *Stage Control Menu* were moved.

XY Offset Display Menu

36 After checking the displayed offset for each axis, press OK. A check menu is displayed stating `Save Preset Amount?`

If necessary, press RESET to change the contact position XY offset again.

37 Press YES on the check menu. The offset amounts are saved and the *Camera Menu* is displayed.

38 Press OK. The *Contact Check Menu* is displayed.

CHAPTER 7

Software Utilities

This chapter describes the software utilities available for data file manipulation and backups, error and assist recovery, and while probing is paused. Each section describes the purpose of the associated procedures, and provides the menu paths to the appropriate screens for performing them.

7.1 Measuring Die Sizes and Distances on a Wafer 0531.1

Introduction

Purpose:

To measure die sizes and wafer distances using the *Stage Control Menu*.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A FOUP of wafers An individual wafer

1 Load a wafer onto the chuck top.

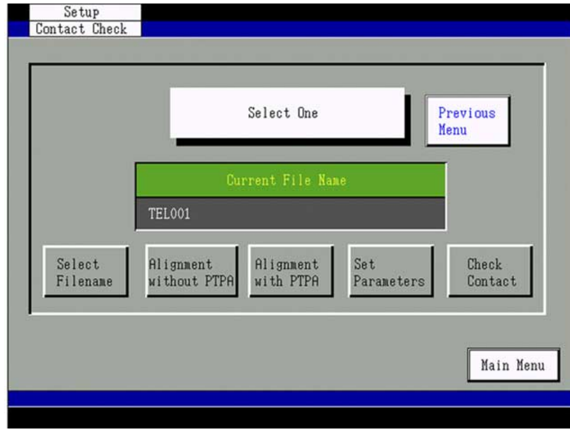
2 Use the following steps to align the probe card and wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

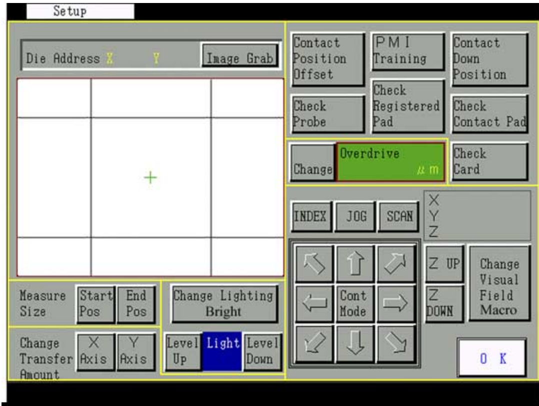
Contact Check Menu



3 Press ALIGN WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

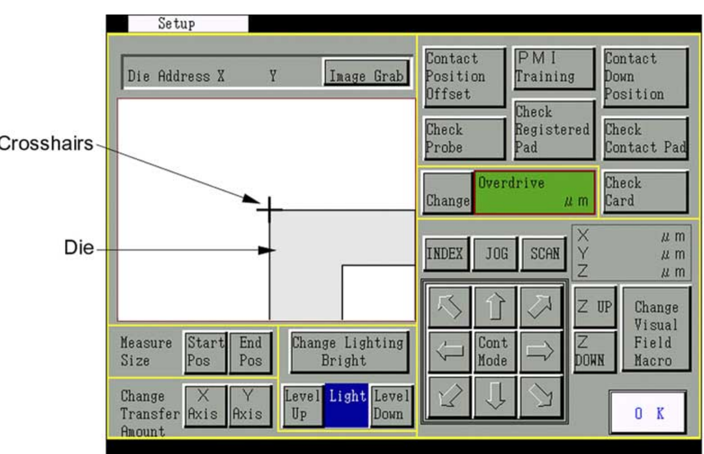
4 Press CHECK CONTACT on the *Contact Check Menu*. The *Camera Menu* is displayed.

Camera Menu



5 Use the control buttons to position the crosshairs over the point from which to start measuring. When measuring die sizes, position the crosshairs on any die corner.

Camera Menu

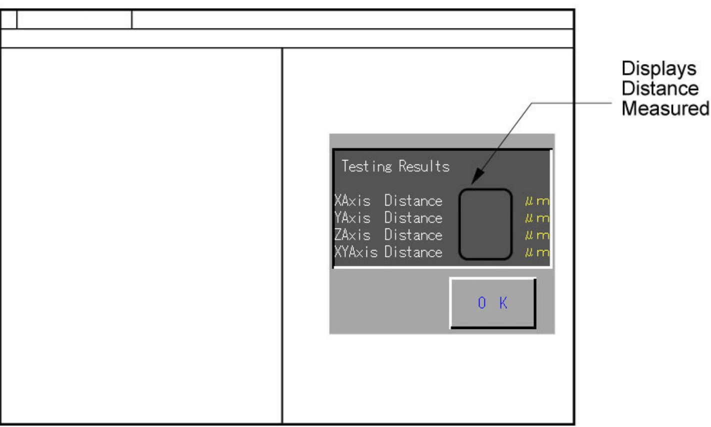


6 Press START POS next to `Measure Size`.

7 Use the control buttons to position the crosshairs over the point where you want measurement to end. If you want to measure the XY directions simultaneously, position the crosshairs over the diagonally opposite corner.

8 Press END POS next to `Measure Size`. The distance measured is displayed on the *Testing Results Menu*.

▾ **Testing Results Menu**



9 After checking, press OK. The *Camera Menu* is displayed.

10 Press OK on the *Camera Menu*. The *Contact Check Menu* is displayed.

11 Press MAIN MENU on the *Contact Check Menu*. The *Main Menu* is displayed.

7.2 Checking Contact Points on the Inspection Pad 0532.1

Introduction

Purpose:

To use the check contact function to check contact points selected by the prober.

The predetermined inspection pad contact points are displayed using the probe recognition results. (This does not account for the overdrive amount.) The probe tip corresponding to the pad can be checked on the camera view. When probe recognition has not been executed, you must execute probe recognitions for each channel to be used.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

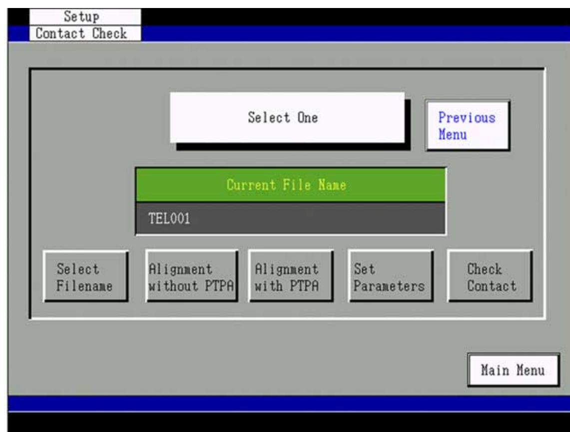
2 Use the following steps to align the wafer and probe card and access the *Camera Menu*.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

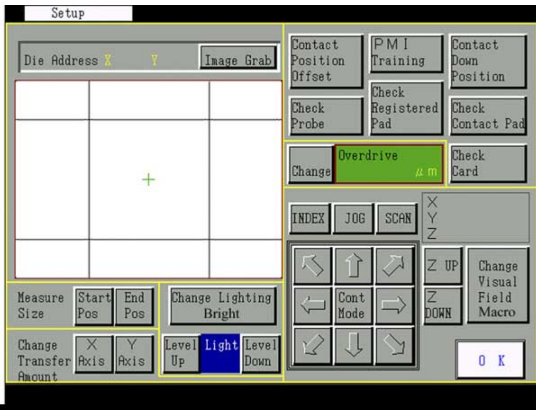
Contact Check Menu



3 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

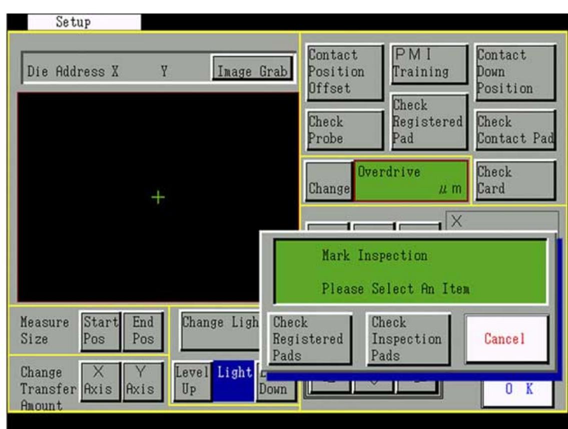
4 Press CHECK CONTACT on the *Contact Check Menu*. The *Camera Menu* is displayed.

Camera Menu



5 Press CHECK CONTACT PAD on the *Camera Menu*. A message menu is displayed stating `Mark Inspection. Please Select An Item.`

Message Menu



6 Press CHECK INSPECTION PADS.

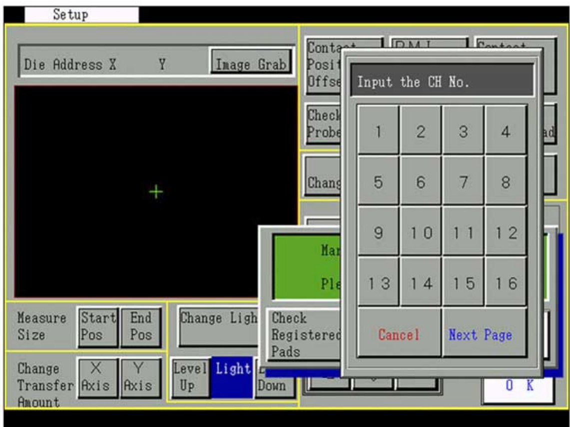
If you are not using a multi-channel probe card, the first inspection pad is displayed on the *Stage Control Menu*. Go to step 7.

If you are using a multi-channel probe card, use the following steps to display the *Multi Channel No. Inputting Menu*:

6.1 Press CHECK INSPECTION PADS. The *Multi Channel No. Inputting Menu* is displayed.

NOTE **If a contact check is performed during testing or CHECK REGISTERED PADS is pressed, the *Multi Channel No. Inputting Menu* will not be displayed.**

▼ **Multi-Channel No. Input Menu**



6.2 Input the multi-channel number.

If you are using a multi-channel probe card, input the channel number to be used since the scheduling relevant to probe mark (pad) and probe contact is not determined except for during testing.

The prober performs probe recognition for each channel being used. (If probe recognition was performed one or more times for each channel being used, it is not performed.) If automatic recognition of the probe pin fails, set the pin manually using the assist menu displayed on the touch panel.

The first inspection pad is displayed on the *Stage Control Menu*.

7 Check the contact point. The position of the crosshairs shows the contact point.

NOTE **The crosshair position shows where the probe tip first contacted the wafer. It is not the center of the mark.**

8 Press NEXT PAD to display, in order, the pads that were input. You can check the contact positions of all registered pads.

9 Press CHECK PROBE to display the probe tip corresponding to the pad.

10 After you have finished checking, press OK.

11 Press OK on the *Camera Menu*. The *Contact Check Menu* is displayed.

12 Press MAIN MENU on the *Contact Check Menu*. The *Main Menu* is displayed.

7.3 Checking Valid Die Rates 0533.1

Introduction

Purpose:

To check valid die rates on the wafer area to see which die the prober recognizes as 100% complete.

Checking valid die rates allows the operator to accurately set a probe area to avoid damaging the probe by contact with partial die around the wafer edge. This procedure is also useful for setting the probe area.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

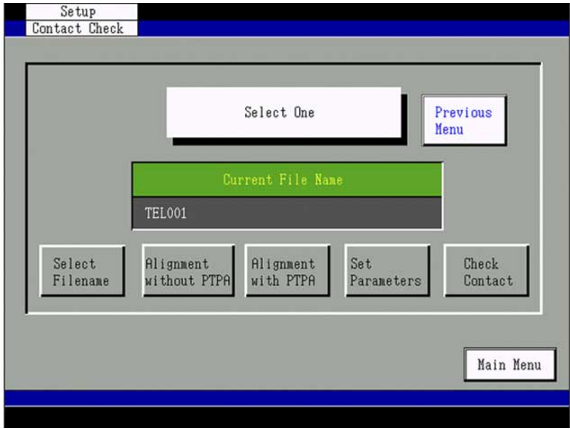
2 Use the following steps to align the probe card and wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

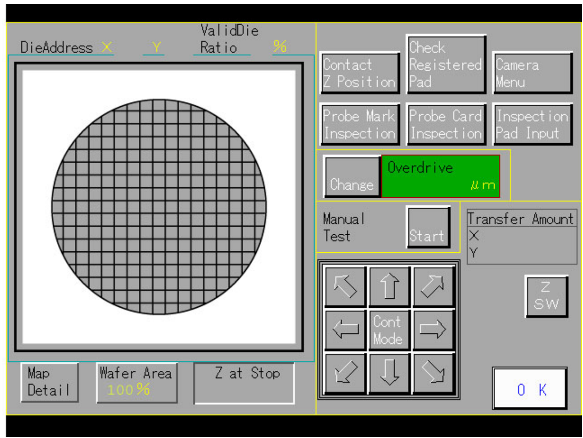
Contact Check Menu



2.4 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

3 Press CHECK CONTACT. The *Contact Down Position Menu* is displayed.

Contact Down Position Menu



4 Press WAFER AREA on the *Contact Down Position Menu*. A numeric keypad is displayed.

5 Use the numeric keypad to input the valid wafer area rate. The area rate you input is displayed in `Wafer Area %`.

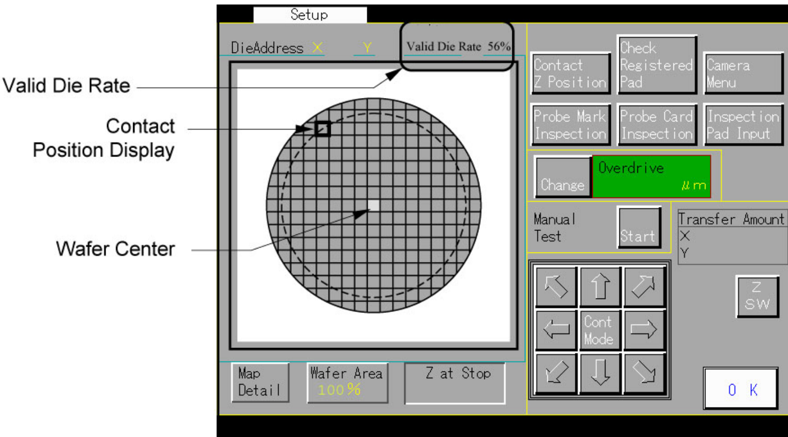
- When the area rate = 100%: All die on the wafer are applicable.
- When the area rate < 100%: Only die that read 100% in the `Valid Die Rate %` display are completely within the wafer area % specified.

NOTE **The wafer area rate is not the same as the probe area setting. If the wafer area rate recognizes some die as complete but they were not included in the probe area, they will not be probed.**

6 Verify that the wafer area rate you input in step 4.

7 Use the control buttons to move the contact position display to any die. The valid ratio is displayed for that die in the upper right side of the image on the display.

Contact Down Position Menu



- When the wafer area is 100%, die that are displayed as having a valid rate less than 100% are incomplete die on the wafer.

- When the wafer area is less than 100%, the valid die rate of the die displayed outside the wafer area is displayed as 0%.

8 After checking, press OK. The *Contact Check Menu* is displayed.

9 Press MAIN MENU. The *Main Menu* is displayed.

7.4 Checking the Reference and Registered Probes 0534.1

Introduction

Purpose:

To check the reference and registered probes.

After wafer file setup, you can go back and check the probes (a reference pin and input pins 2, 3, and 4) specified during the procedure for inputting a probe card.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

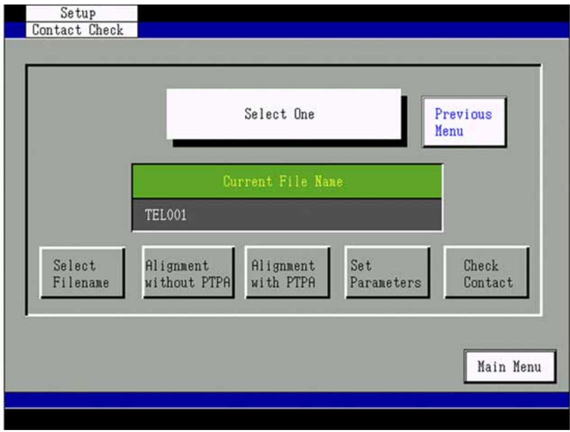
2 Use the following steps to align the probe card and wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

Contact Check Menu

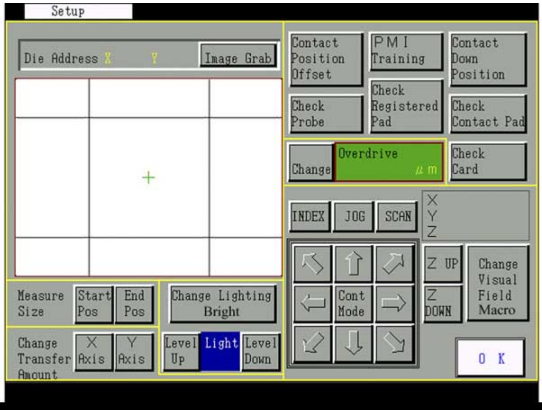


2.4 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned again.

3 Press CHECK CONTACT. The *Contact Down Position Menu* is displayed.

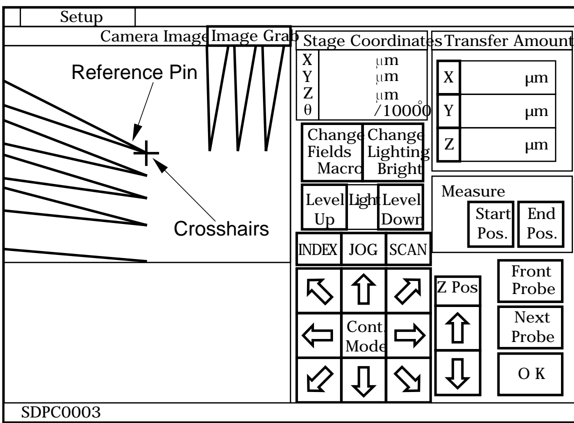
4 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



5 Press CHECK PROBE on the *Camera Menu*. The reference pin is displayed on the *Stage Control Menu*.

Stage Control Menu



6 Check the reference pin position. Press NEXT PROBE to check other input pin positions. The *Camera Image Menu* will display the next input pin.

7 After checking, press OK. The *Camera Menu* is displayed.

8 Press OK. The *Contact Check Menu* is displayed.

9 Press MAIN MENU to return to the *Main Menu*.

7.5 Measuring Contact Position Displacement 0535.1

Introduction

Purpose:

To measure the prober contact position displacement to determine the size of the pad scrub mark made by the probe.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

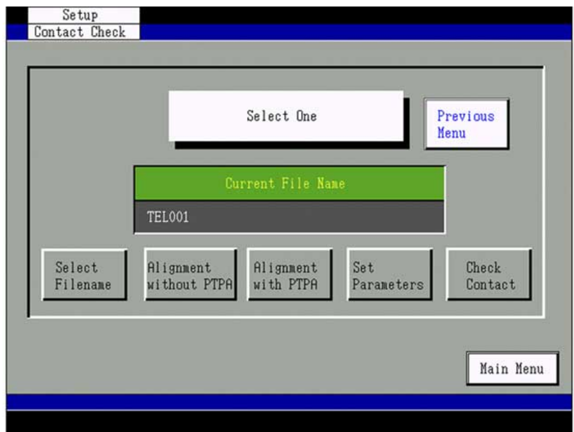
2 Use the following steps to align the probe card and the wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

Contact Check Menu

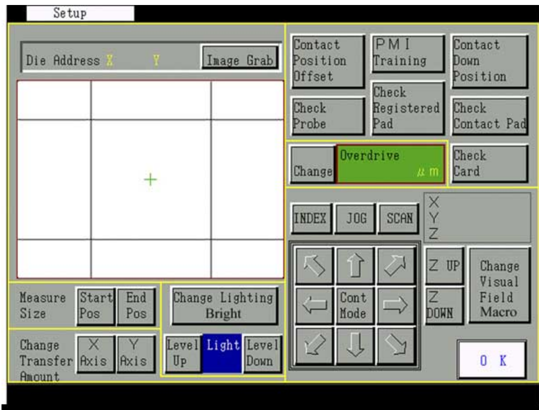


2.4 Press ALIGNMENT WITH PTPA on the *Check Contact Menu*. The probe card and wafer are aligned.

3 Press CONTACT CHECK. The *Contact Down Position Menu* is displayed.

4 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu

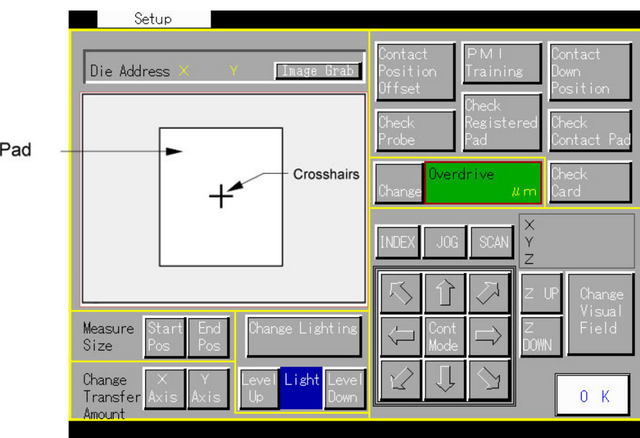


5 Select the INDEX mode and use the control buttons to select the die you want to check.

6 Press CHANGE VISUAL FIELD to select micro magnification.

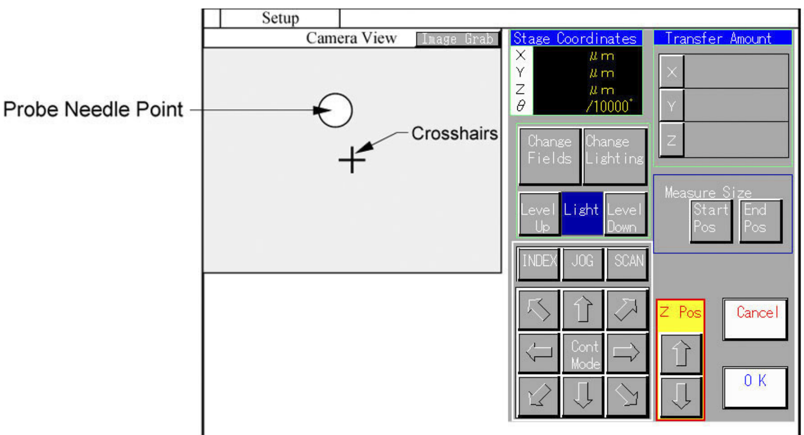
7 Select the JOG or SCAN mode, and position the crosshairs over the contact position (probe mark) to be checked.

Camera Menu



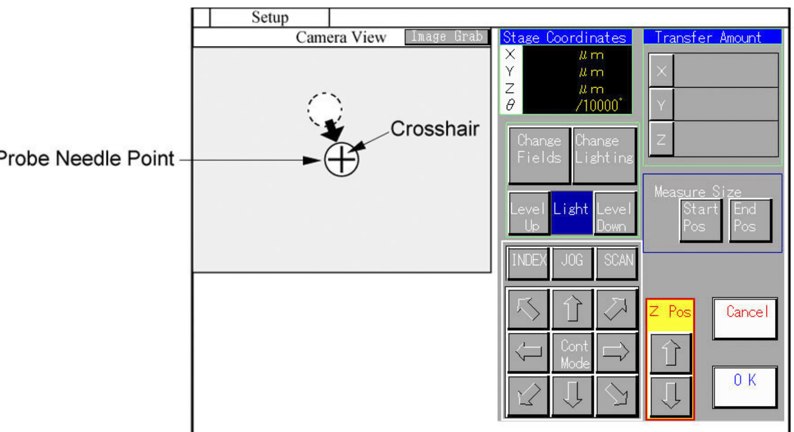
8 Press CHECK CARD. The tip of the prober for contacting the designated position is displayed on the *Stage Control Menu*.

Stage Control Menu



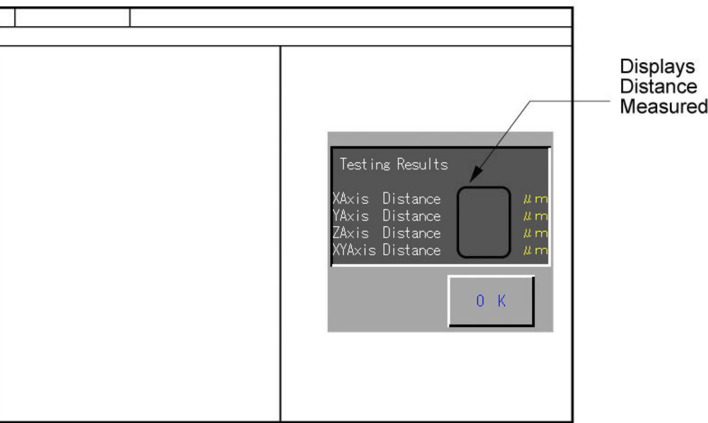
9 Use the control buttons to position the crosshairs over the prober tip.

Stage Control Menu



10 Press END POS next to `Measure Size`. The displacement amount is displayed on the *Testing Results Menu*.

Testing Results Menu



11 After checking the amount, press OK on the *Testing Results Menu*.

12 Press OK on the *Camera Menu*.

13 Press MAIN MENU on the *Contact Check Menu* to return to the *Main Menu*.

7.6 Testing Probe Mark Inspection (PMI) 0536.1

Introduction

Purpose:

This function allows you to perform sample PMI tests to verify that the parameters are specified correctly. If PMI fails during the trial test, use the *PMI Judgement Results Menu* to evaluate the probe mark failure. If you set the standard PMI judgment results, reset the PMI settings.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

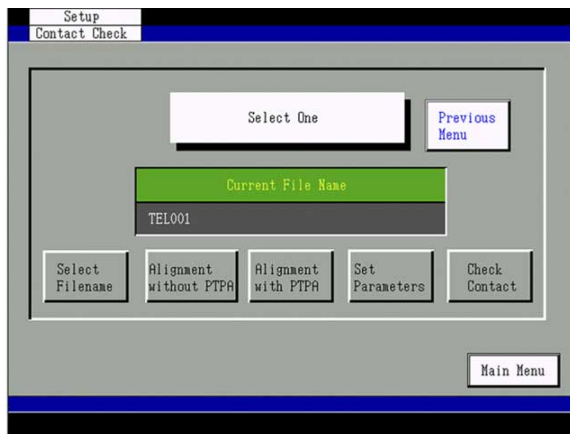
2 Use the following steps to align probe card and the wafer.

2.1 Press SETUP on the *Main Menu*. The *Setup Menu* is displayed.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

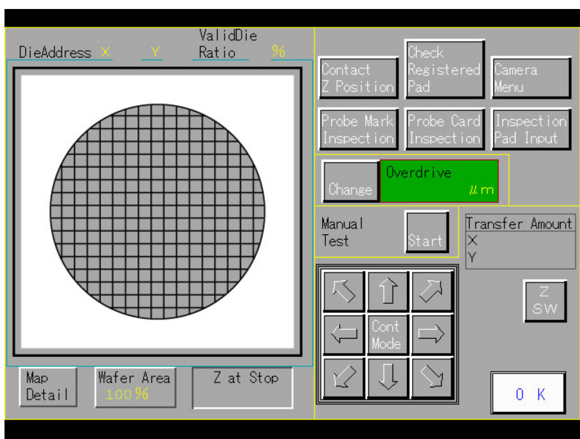
Contact Check Menu



2.4 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

3 Press CHECK CONTACT to display the *Contact Down Position Menu*.

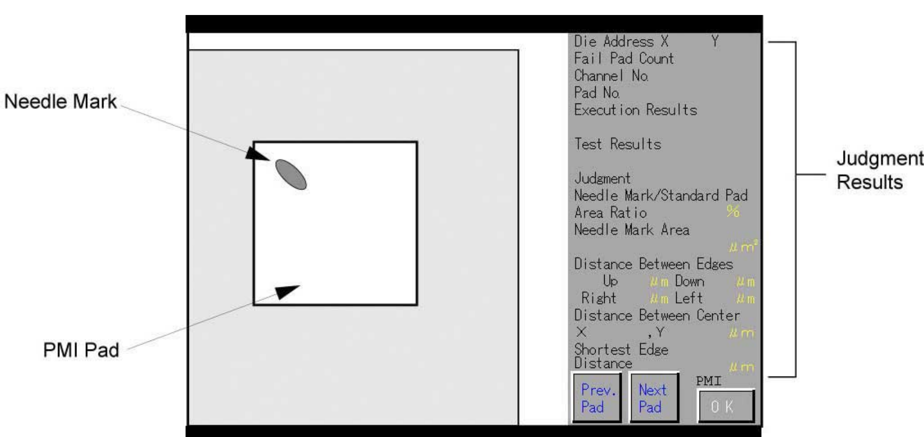
Contact Down Position Menu



4 Press PROBE MARK INSPECTION on the *Contact Down Position Menu*. PMI is performed

5 PMI is performed. The `PMI Pad and Judgment Results` are displayed on the *PMI Judgement Results Menu*.

PMI Judgment Results Menu



In `Wafer Parameters`, when `Pad for Visual Check`is set to FAIL PADS, only the judgment results for nonstandard PMI pads are displayed.

When `Pad for Visual Check` is set to ALL PADS, the judgment results for all PMI pads are displayed.

6 Check the judgment results. To check subsequent PMI pads, press NEXT PAD.

7 After checking, press OK. The *Contact Down Position Menu* is displayed.

8 Press OK on the *Contact Down Position Menu*. The *Check Contact Menu* is displayed.

9 Press MAIN MENU on the *Check Contact Menu* to return to the *Main Menu*.

7.7 Retraining PMI During Contact Check 0537.1

Introduction

Purpose:

To retrain PMI during contact check, perform pad training. The method for performing pad training and the end results are the same.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

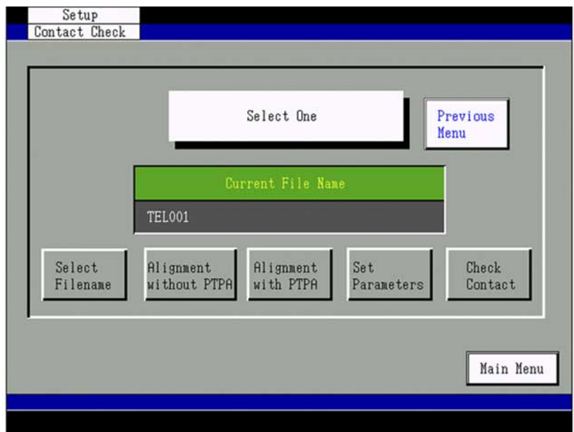
2 Use the following steps to align the probe card and the wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

Contact Check Menu

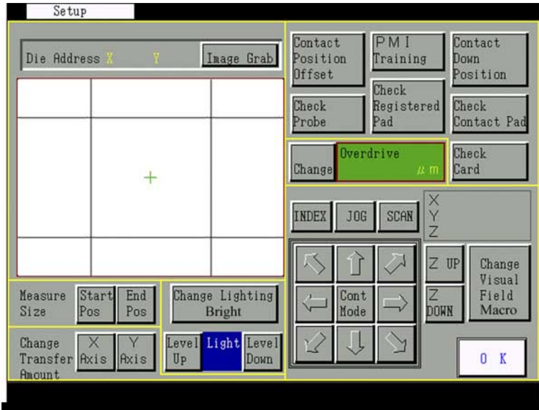


2.4 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

3 Press CHECK CONTACT. The *Contact Down Position Menu* is displayed.

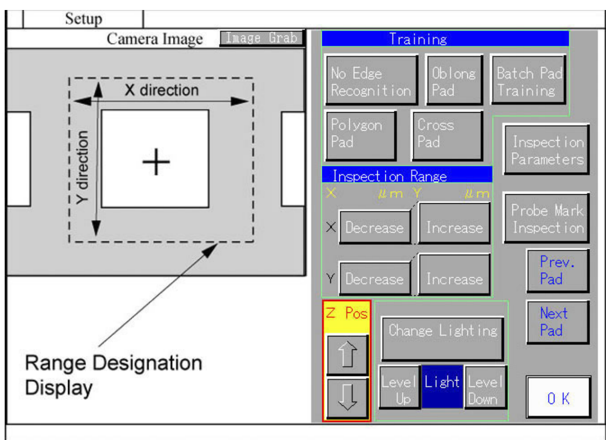
4 Press CAMERA MENU on the *Contact Down Position Menu*. The *Camera Menu* is displayed.

Camera Menu



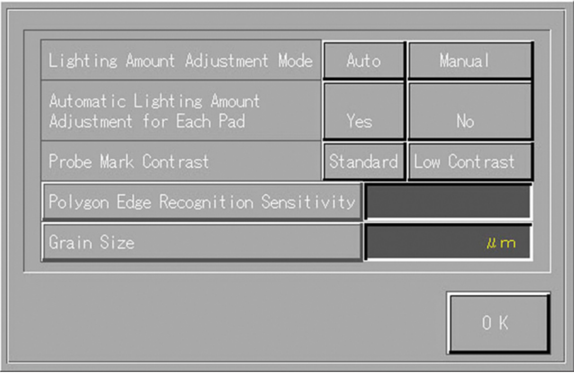
5 Press PMI TRAINING on the *Camera Menu*. The *Training Menu* is displayed.

Training Menu



6 Press INSPECTION PARAMETERS on the *Training Menu*. The *Inspection Parameters Setting Menu* is displayed.

Inspection Parameters Setting Menu



7 Set the parameters using the following table as a reference.

Inspection Parameters

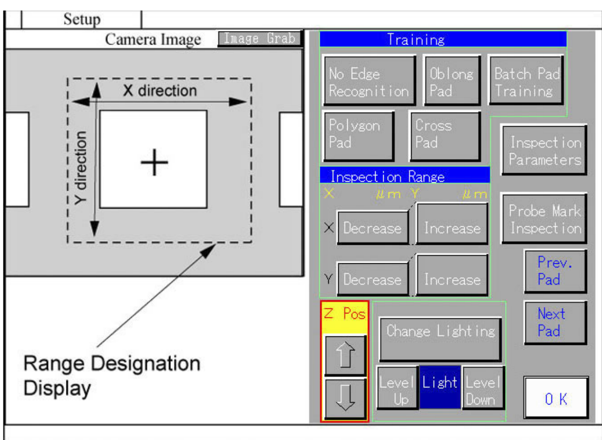
Parameter Name	Setting/Range	Contents
Lighting Amount Adjustment Mode	AUTO, MANUAL	AUTO: Adjust the lighting automatically during training. MANUAL: Adjust the lighting manually during training.
Automatic Lighting Amount Adjustment for Each Pad	YES, NO	YES: Adjust the lighting individually for each pad. NO: Adjust the lighting at the beginning of training only.
Probe Mark Contrast	STANDARD, LOW CONTRAST	STANDARD: When the probe mark is clearly visible. LOW CONTRAST: When the probe mark is barely visible. The low contrast setting optimizes the prober to recognize probe marks that are difficult to distinguish.
Polygon Edge Recognition Sensitivity	-100 to +100	Since recognition of glass edges is difficult when training polygon edges, set the range of recognition sensitivity from -100 to +100. The recognition sensitivity setting will depend on the image being displayed. Example: If the glass edge is faint, increase the sensitivity. If it is too grainy, decrease the sensitivity. **NOTE** **Polygon Edge Recognition Sensitivity is an option only when training polygon pads.**
Grain Size	0 to 10 µm (diameter)	Select the grain size that will not be recognized (a diameter of 0 to 10 µm) by the prober. This setting prevents the prober from confusing grains as probe marks, which could cause a mis-recognition error.

8 After setting each parameter, press OK. PMI inspection pad 1 should be displayed on the *Training Menu*.

9 If the Lighting Amount Adjustment Mode is set to MANUAL, the lighting amount is adjusted properly. If you increase or decrease the lighting amount more than necessary, you will not be able to recognize the glass edge and/or probe mark.

10 Press DECREASE or INCREASE for `Inspection Range` while checking the range designation display on the *Training Menu*µm larger than the pad. The current range will be displayed on the *Training Menu*.

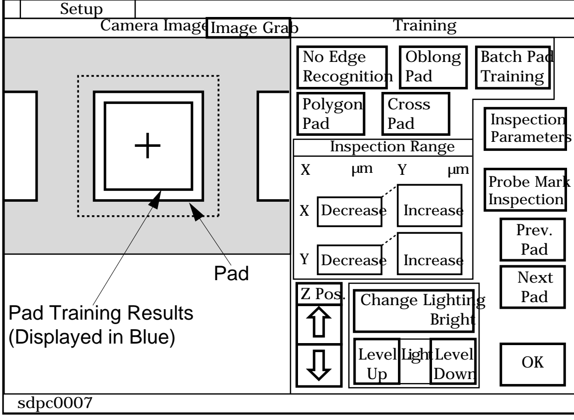
Training Menu



11 After inputting the inspection range, select the pad training method. Two different methods can be used for pad training: batch training and individual training.

To select and perform batch pad training, press BATCH PAD TRAINING. A message is displayed stating `!! Performing` . Pad training is performed on all inspection pads. When batch training is complete, a message menu is displayed stating `Batch Training Completed.`

Training Menu



Batch training performs training on all of the PMI pads and then displays the training results. A pad will fail batch training if it already has a probe mark on it.

Individual training performs training on the PMI pads that fail batch training. Refer to **6.5 Training Individual Pads (see page 264)** for details.

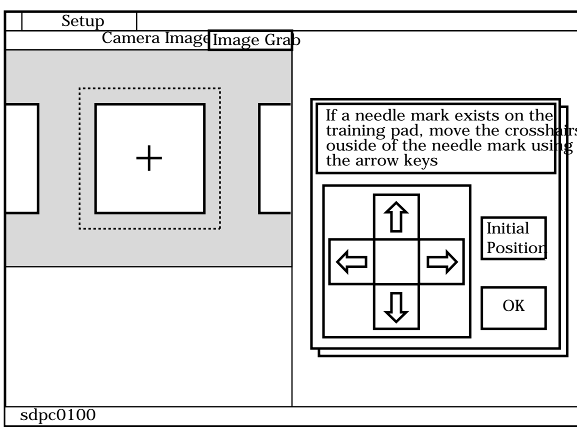
12 Press OK on the message menu. If `Print Judgment Results` was turned on in the wafer parameters for PMI, the training results will be displayed. (Pad training results are based on the judgement standards set in the PMI parameters.)

If batch pad training fails, use the following steps to perform the individual pad training for the failed pads.

12.1 Press the button corresponding to the pad shape (e.g., OBLONG PAD). The *Crosshairs Movement Menu* is displayed.

If this pad already has a probe mark, follow the instructions on the screen.

Crosshairs Movement Menu



12.2 Press OK. Pad training is performed. When it is complete, a blue box is displayed around the perimeter of the pad inside the green box.

12.3 When performing pad training for other PMI pads, press NEXT PAD, then repeat steps 12.1 and 12.2 for the next PMI pad displayed.

13 After completing pad training, press PROBE MARK INSPECTION on the *Training Menu*. The *Probe Mark Inspection Results Menu* is displayed. This information can be saved to a floppy disk or reviewed and accepted by pressing OK.

14 Press OK on the *Training Menu*. The *Camera Menu* is displayed.

15 Press OK. The *Contact Check Menu* is displayed.

16 Press MAIN MENU. The *Main Menu* is displayed.

7.8 Testing Probe Card Inspection (PCI) 0538.1

Introduction

Purpose:

To test the Probe Card Inspection (PCI) to check that the probe card inspection parameters are correct. If a particular probe mark fails PMI, perform a PCI test to check whether the probe has degradation or wear.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A tested wafer

1 Load a wafer onto the chuck top.

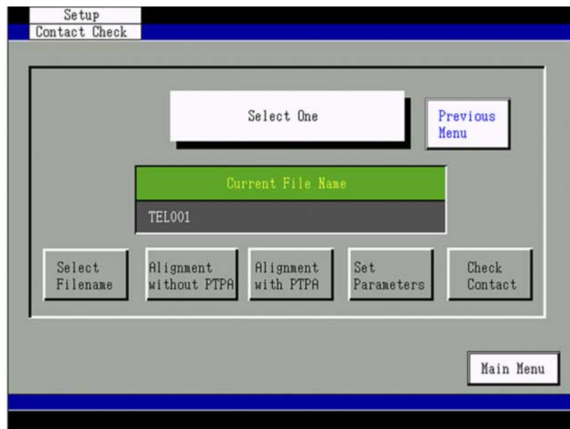
2 Use the following steps to align the probe card and the wafer.

2.1 Press SETUP on the *Main Menu*.

2.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

2.3 Press CHECK CONTACT on the *Change Setup Wafer Data Menu*. The *Contact Check Menu* is displayed.

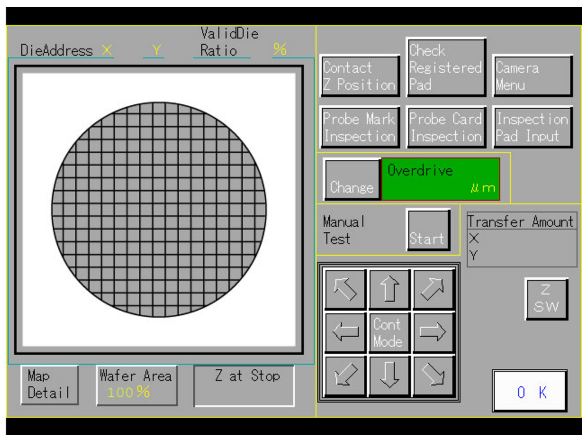
Contact Check Menu



2.4 Press ALIGNMENT WITH PTPA on the *Contact Check Menu*. The probe card and wafer are aligned.

3 Press CHECK CONTACT. The *Contact Down Position Menu* is displayed.

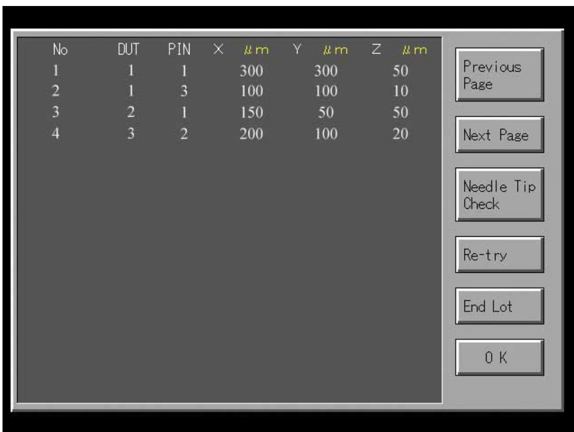
Contact Down Position Menu



4 Press PROBE CARD INSPECTION on the *Contact Down Position Menu*. PCI is performed.

- If there is no position displacement and all PCI result values are within tolerances, the *Contact Down Position Menu* is displayed.
- If there is position displacement and/or the result values are not within tolerances, the *PCI Judgment Results Menu* is displayed.

PCI Judgment Results Menu

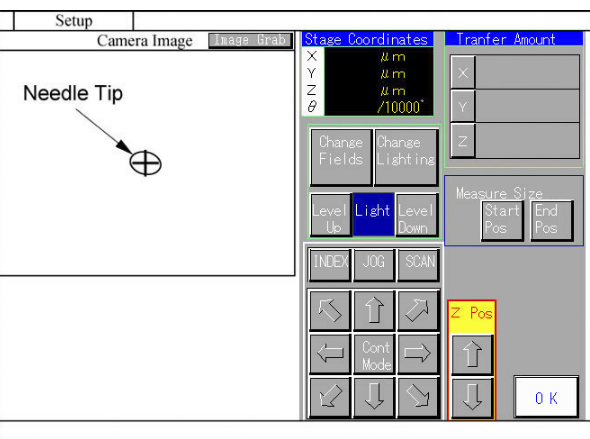


5 Check the judgment results.

6 To check a probe that is out of position, press NEEDLE TIP CHECK. A numeric keypad is displayed.

7 Input the number of the probe you are checking and press OK. The designated probe is displayed on the *Stage Control Menu*.

Stage Control Menu



8 After checking the probes, press OK. The *PCI Judgment Results Menu* is displayed.

9 Press OK. The *Contact Down Position Menu* is displayed.

10 Press OK. The *Contact Check Menu* is displayed.

11 Press MAIN MENU. The *Main Menu* is displayed.

7.9 Copying the Wafer Files 0540.1

Introduction

Purpose:

To copy the wafer files.

This procedure can also be used to copy individual data files by selecting the appropriate file type on the *File Input Menu*: PARAMETER, PROBE, CONTACT, or INKER.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

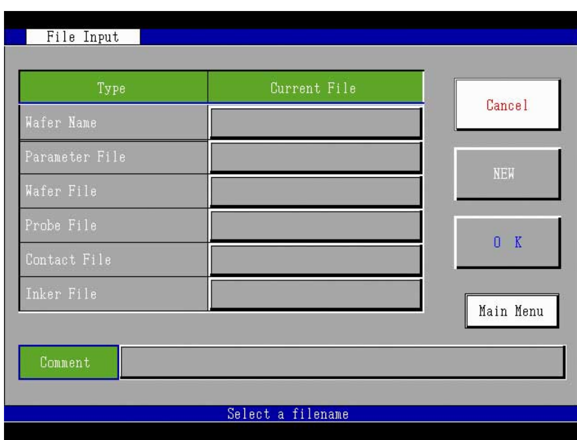
1 Use the following steps to access the *File Input Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*. The *Change Setup Wafer Data Menu* is displayed.

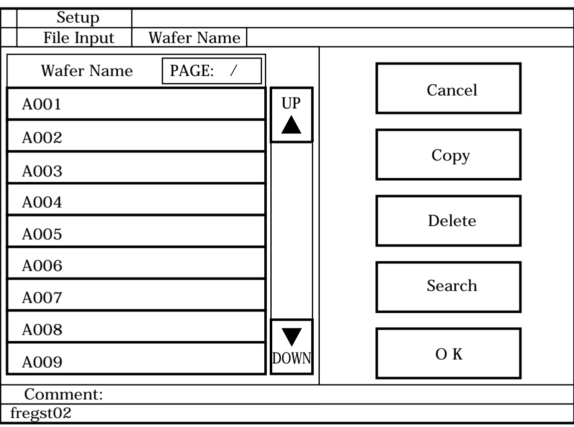
1.3 Press INPUT FILE. The *File Input Menu* is displayed.

File Input Menu



2 Press the display area beside the wafer name. The *Wafer File List Menu* is displayed.

Wafer File List Menu



3 Select the name of the data files to be copied.

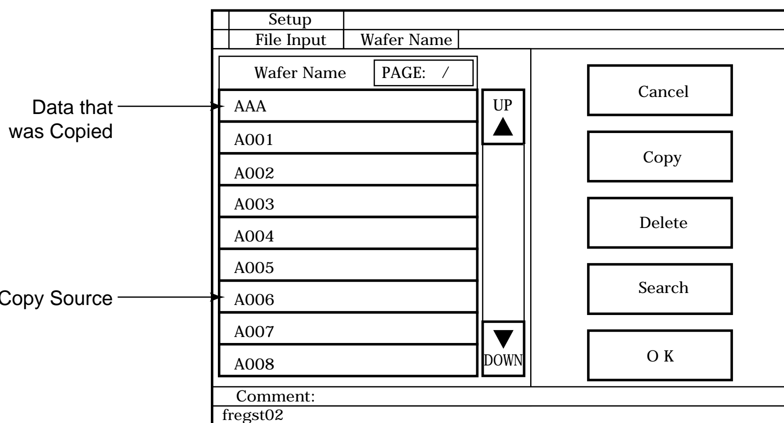
4 Press COPY. The keyboard is displayed.

5 Input the new filename and press RETURN.

NOTE **If the filename you input matches that of an existing file, a check menu is displayed stating `The same name exists. Do you want to overwrite?` To overwrite the existing file, press YES.**

6 A second keyboard is displayed with a dialog box stating `Input a comment`. Input any comments containing a maximum of 60 characters, and press RETURN. The selected data files are copied and the *File List Menu* is displayed.

File List Menu



7 Press OK to load the current wafer file for immediate use.

Press CANCEL to return to the *Change Setup Wafer Data Menu* without selecting a wafer file.

7.10 Deleting Files 0541.1

Introduction

Purpose:

The steps for deleting data files and wafer files are similar. However, when a wafer file is deleted, all the data files contained within that wafer file are also deleted. The effect of deleting a wafer file is discussed later in the procedure.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Deleting Individual Data Files

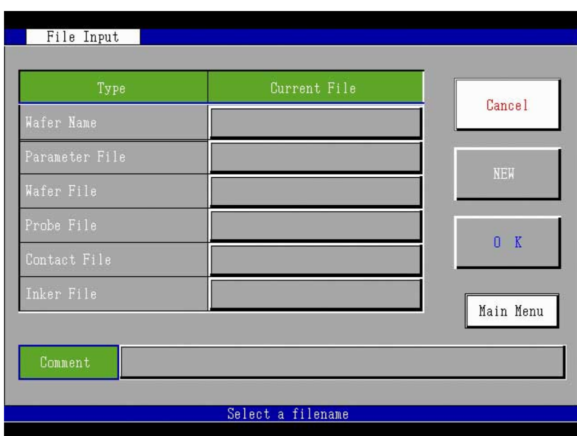
1 Use the following steps to access the *File List Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

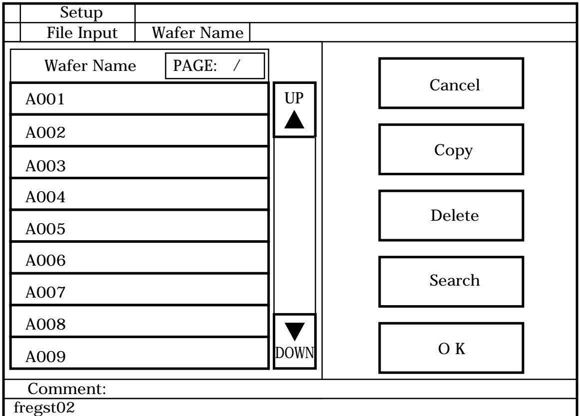
1.3 Press INPUT FILE on the *Change Setup Wafer Data Menu*. The *File Input Menu* is displayed.

File Input Menu



2 Press the display area beside the wafer name you want to delete. The *File List Menu* is displayed.

File List Menu



3 Select the filename of the data to be deleted.

NOTE **Be certain you know where data files are used before you delete them. If a data file is part of one or more wafer files, deleting that data file will corrupt the wafer file(s).**

4 Press DELETE. A check menu is displayed stating `Do you want to delete this file?` Press YES. The selected data is deleted, and the *File List Menu* is displayed.

5 Press the name of the file to use, then press OK; or press CANCEL to return to the *File Input Menu* without specifying a file to use.

6 Press MAIN MENU on the *File Input Menu*. The *Main Menu* is displayed.

Deleting Wafer Files and All Contents

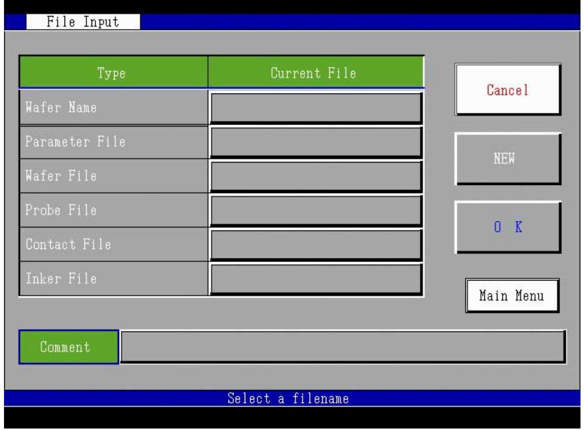
7 Use the following steps to access the *File List Menu*.

7.1 Press SETUP on the *Main Menu*.

7.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

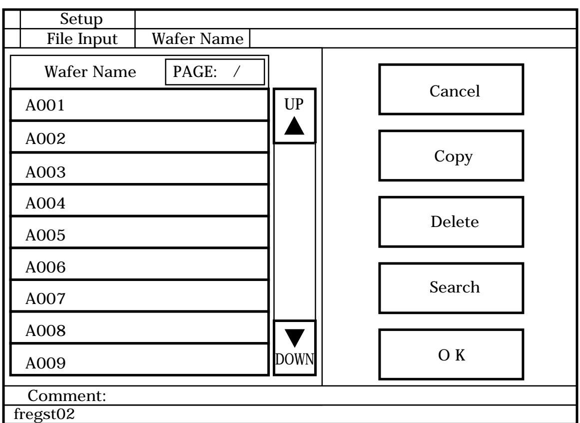
7.3 Press INPUT FILE on the *Change Setup Wafer Data Menu*. The *File Input Menu* is displayed.

File Input Menu



8 Press the display area beside the wafer name. The *File List Menu* is displayed.

File List Menu



9 Select the filename of the data to be deleted.

10 Press DELETE. The *Wafer File Delete Menu* is displayed.

11 Select the file to be deleted.

All data files within the wafer file are set to YES as the default. This means all associated files will be deleted along with the wafer file.

Press NO for any data files that you know are used by more than one wafer file. If any of the data files are linked, they will be deleted from every wafer file in which they occur. This action causes those wafer files to be incomplete and unusable.

12 After specifying which files to delete, press OK. A check menu is displayed stating `Is it OK to delete?`

13 Press YES. The selected wafer file and data files are deleted and the *File List Menu* is displayed. Data that was set to NO in step 5 is not deleted.

7.11 Searching Data Files 0542.1

Introduction

Purpose:

To search data files for specific data or filenames.

This function allows you to search for partial words, the first letter of a word, or the number of the filename; however, it does not allow wild card searches.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

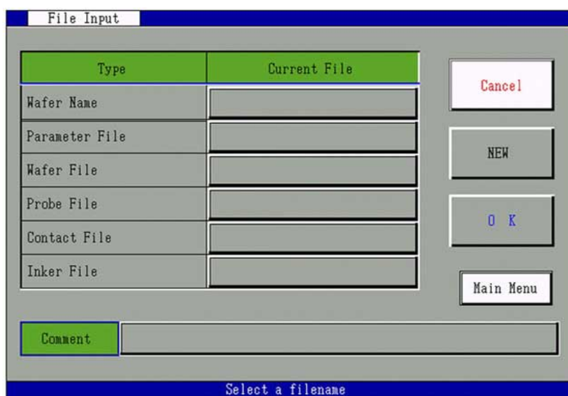
1 Use the following steps to access the *File Input Menu*.

1.1 Press SETUP on the *Main Menu*.

1.2 Press CHANGE SETUP WAFER DATA on the *Setup Menu*.

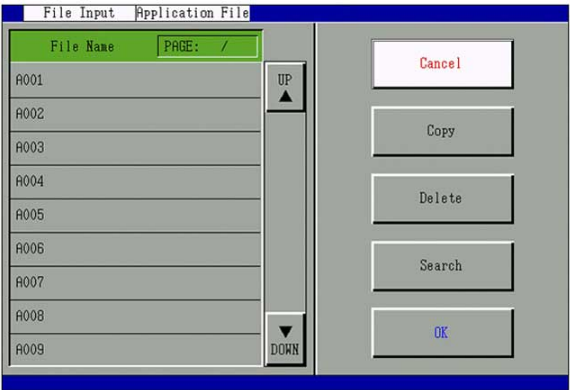
1.3 Press INPUT FILE on the *Change Setup Wafer Data Menu*. The *File Input Menu* is displayed.

File Input Menu



2 Press the display area next to wafer file to be searched. The *Wafer File List Menu* is displayed.

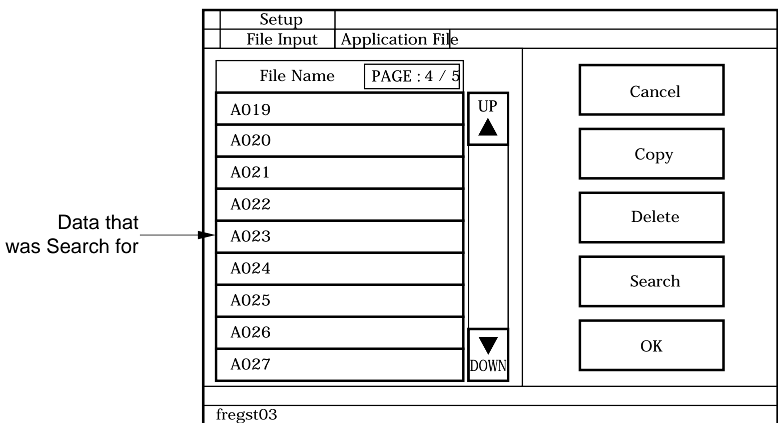
▼ **Wafer File List Menu**



3 Press SEARCH on the *Wafer File List Menu*. A keyboard is displayed.

4 Using the keyboard, input the name or partial name you want to search for and press RETURN. The *File List Menu* displays the first entry that matches your search criteria. If no match exists, a message menu is displayed stating `That file name does not exist.` Press OK on the message menu and try using a different search string.

▼ **File List Menu**



NOTE **To use this procedure to search for data files, select the appropriate file type on the File Input Menu.**

7.12 Formatting a Floppy Disk 0543.2

Introduction

Purpose:

To format a floppy disk.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk

Overview:

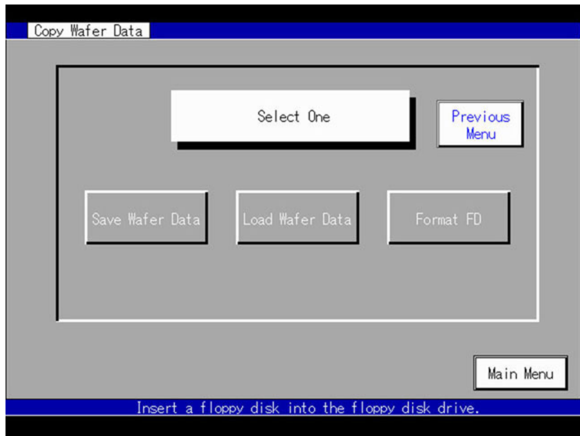
The way the prober formats floppy disks (FD) depends upon the FD format mode you selected in the MMI (man-to-machine interface) settings. Make sure that the format selected is correct before formatting the disk. If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).

NOTE **Check the contents of the floppy disk before formatting; all of the data on the disk will be deleted during the formatting process.**

1 Press SETUP on the *Main Menu*.

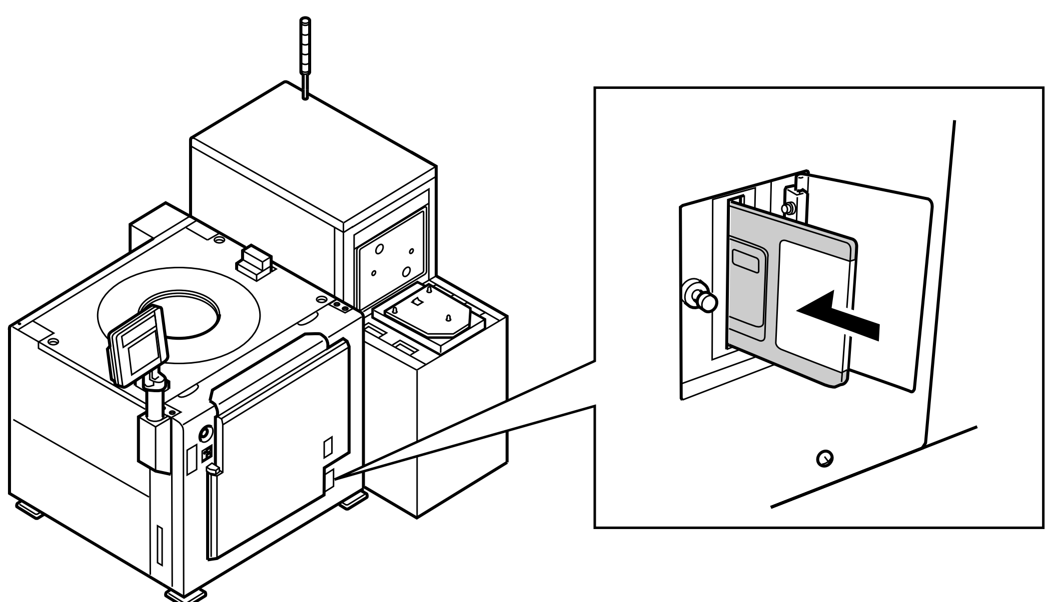
2 Press COPY WAFER DATA TO FD on the *Setup Menu*. The *Copy Wafer Data Menu* is displayed.

Copy Wafer Data Menu



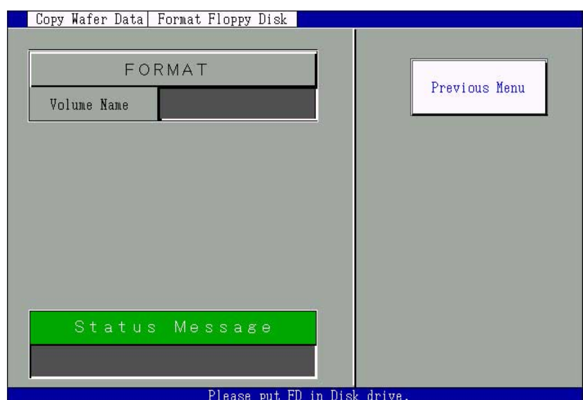
3 Insert a floppy disk into the prober floppy disk drive.

Inserting a Floppy Disk



4 Press FORMAT FD. The *Format Floppy Disk Menu* is displayed.

Format Floppy Disk Menu



5 Press the display area adjacent to `Volume Name`. A keyboard is displayed. Input a disk name containing less than 12 characters, and press ENTER. Confirm that the *Format Floppy Disk Menu* shows the disk name displayed adjacent to `Volume Name`.

6 Press FORMAT. The floppy disk is formatted, and a message is displayed stating `Now Formatting. Please Wait.` When the prober has finished formatting the disk, the status message on the *Format Floppy Disk Menu* will display `Successfully Completed`.

7 Press PREVIOUS MENU to return to the *Copy Wafer Data Menu*.

7.13 Saving Wafer Files to Floppy Disk 0544.1

Introduction

Purpose:

To save wafer files to a floppy disk.

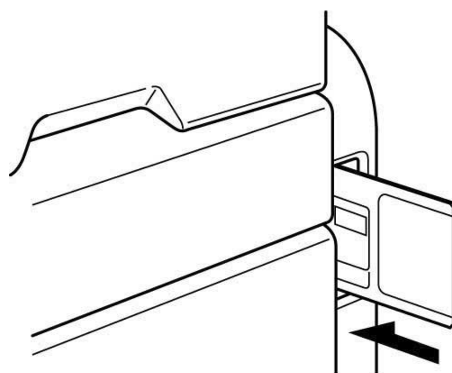
Wafer files are stored on the prober hard drive. You can save those wafer files to floppy disks for use on other probers or to back up the data.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Floppy disks

1 Insert a floppy disk into the prober disk drive.

Inserting a Floppy Disk



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

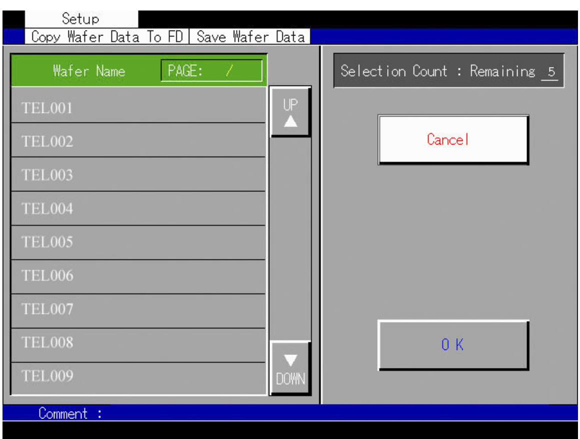
3 Press COPY WAFER DATA TO FD on the *Setup Menu*. The *Copy Wafer Data Menu* is displayed.

4 Press SAVE WAFER DATA.

- If the floppy disk contains existing files, the *Wafer Save Menu* is displayed.

- If the disk is blank, the *Save File Selection Menu* is displayed. Go to step 6.

Save File Selection Menu



5 Select the save method to use. Up to 10 wafer files can be stored on one floppy disk.

NOTE **When you press ADD, if the same name already exists on the floppy disk, a message menu is displayed stating `The wafer file already exists in the FD. Do you want to over write?` To overwrite, press YES.**

- Press ADD to add to the wafer files on the floppy disk.
- Press OVERWRITE to write over preexisting wafer files on the floppy disk; this action erases the older file with the same name.

The *Save File Selection Menu* is displayed.

6 Select the wafer files that you want to save to the floppy disk. You can save up to 10 wafer files on one floppy disk. The number of slots available for additional wafer files that the disk can still hold is displayed on the menu beside `Selection Count Remaining`.

7 Press OK. The message is displayed stating `Now saving. Please wait.` When the selected wafer file is saved to the floppy disk, the *Copy Wafer Data Menu* is displayed.

7.14 Deleting Wafer Files from a Floppy Disk 0545.1

Introduction

Purpose:

To delete unnecessary wafer files from a floppy disk.

Required Resources:

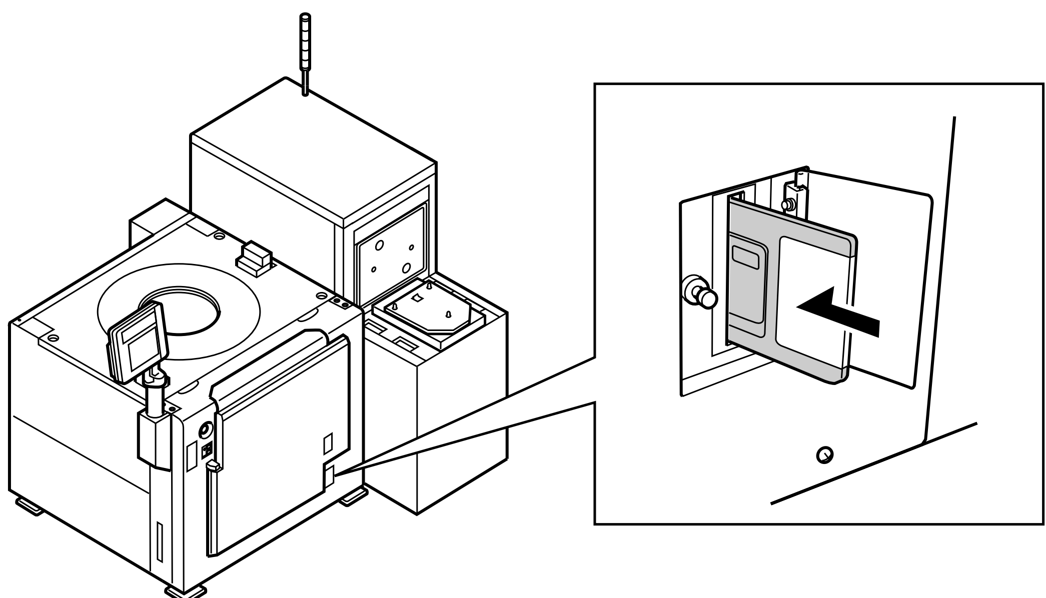
Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing the wafer files to be deleted

Overview:

Use the following steps to delete wafer files from a floppy disk.

1 Insert a floppy disk containing data to be deleted into the prober disk drive unit.

Inserting a Floppy Disk



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Use the following steps to access the *Copy Wafer Data Menu*.

2.1 Press SETUP on the *Main Menu*.

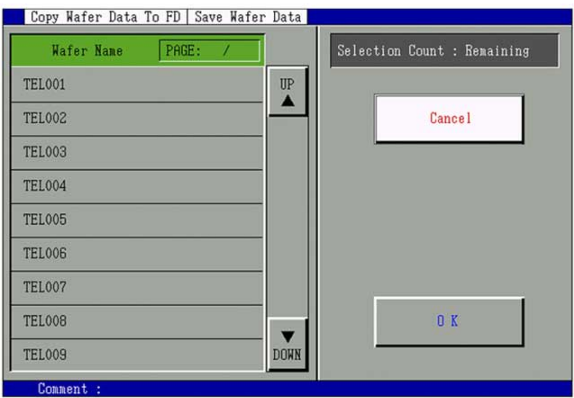
2.2 Press COPY WAFER DATA TO FD on the *Setup Menu*.

2.3 Press SAVE WAFER DATA on the *Copy Wafer Data Menu*. The *Wafer Save Menu* is displayed.

Wafer Save Menu

3 Press DELETE on the *Wafer Save Menu*. The wafer files on the floppy disk are displayed on the *Save File Selection Menu*.

Safe File Selection Menu



4 Select the name of the wafer file to be deleted.

5 Press OK. The message is displayed stating `Now deleting. Please wait` The selected wafer file is deleted and the *Wafer Save Menu* is displayed.

6 Press DELETE again. The *Save Wafer Data Item Selection Menu* is displayed.

7 Press CANCEL on the *Save Wafer Data Item Selection Menu*.

8 Press MAIN MENU on the *Copy Wafer Data Menu* to return to the *Main Menu*.

7.15 Loading Wafer Files from a Floppy Disk 0546.1

Introduction

Purpose:

To load wafer files from a floppy disk to the prober.

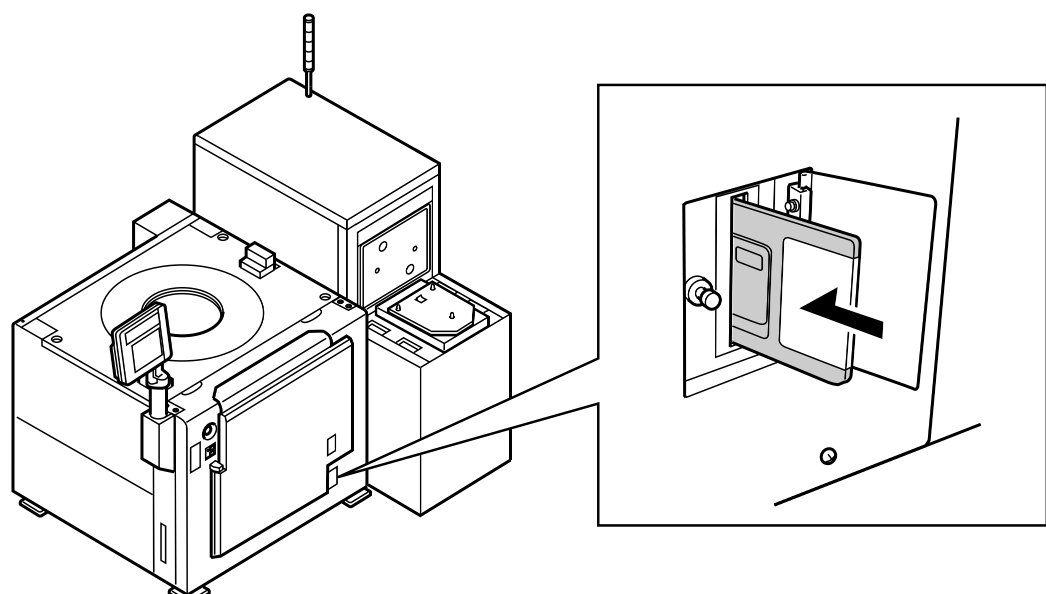
This capability is useful for transferring the same wafer file to several different probers and for restoring backup copies of wafer files.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing wafer files

1 Insert a floppy disk containing wafer files into the prober disk drive unit.

Inserting a Floppy Disk



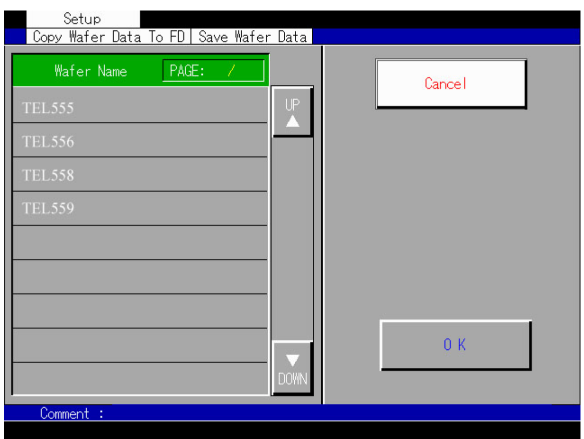
NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press COPY WAFER DATA TO FD on the *Setup Menu*. The *Copy Wafer Data Menu* is displayed.

4 Press LOAD WAFER DATA. The wafer files on the floppy disk are displayed on the *Load Wafer Data Item Selection Menu*.

Load Wafer Data Item Selection Menu



5 Select the name of the wafer file to load to the hard drive.

6 Press OK. The selected wafer file is loaded to the prober hard disk and the *Copy Wafer Data Menu* is displayed.

When the wafer filename (or any data file within it) already exists on the prober hard drive, a check menu is displayed stating `That filename already exists. Write over same name?` Press YES to overwrite. Press NO to cancel the overwrite and choose a different name for the wafer file.

You will be prompted to reply YES or NO for every data file that already exists.

7 Press MAIN MENU on the *Copy Wafer Data Menu* to return to the *Main Menu*.

7.16 Loading Control Maps 0548.1

Introduction

Purpose:

To load control maps to the prober from a floppy disk.

It is necessary to load control maps the first time a wafer file is run. The control maps are created on an external personal computer (PC). If a control map must be changed, it must be changed on a PC and then loaded back to the prober.

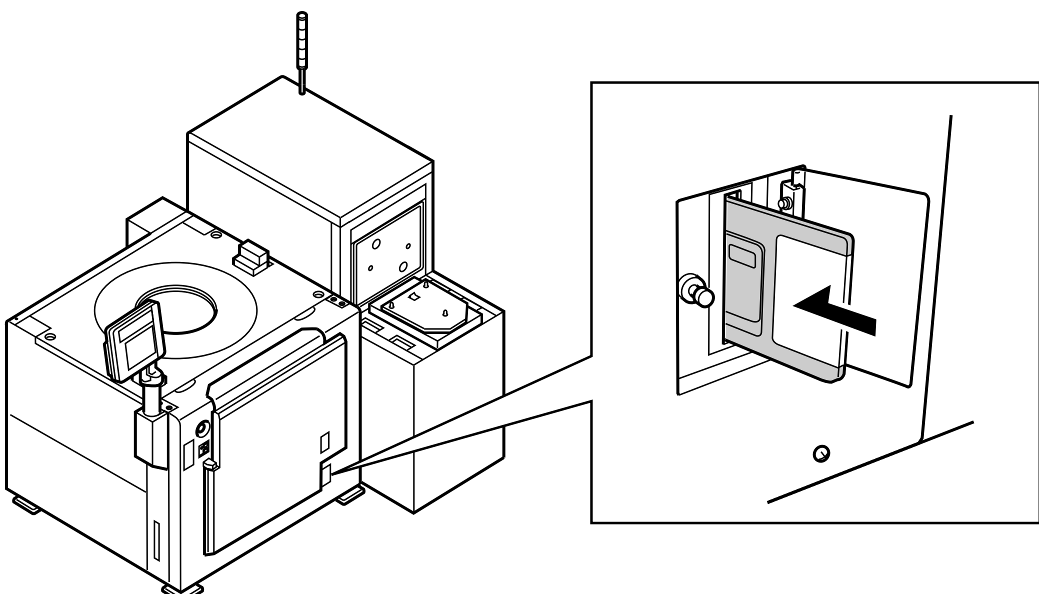
This procedure can be performed only if the wafer parameters for a particular file have been set to USE for `Control Map` on the *Control Map Menu*. To verify or change these settings, follow the procedure described in **4.6 Control Map Parameters (see page 151)**.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing control maps

1 Insert a floppy disk containing the control maps into the prober disk drive unit.

Inserting a Floppy Disk

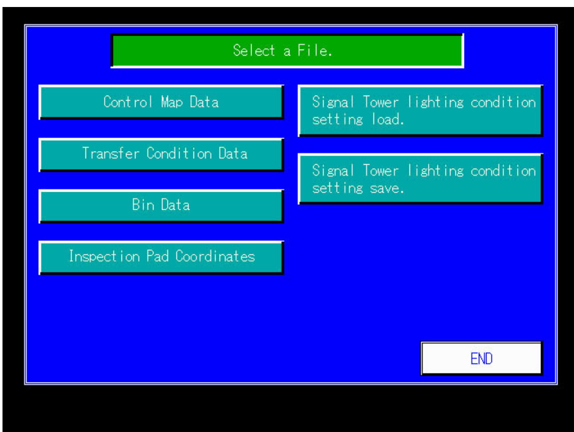


NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load Menu* is displayed.

File Load Menu



4 Press CONTROL MAP DATA. A check menu is displayed stating `Load measurement condition data?`

5 Press YES. The control maps are loaded and input into the parameters file of the currently active wafer file. When the operation is complete, the *Setup Menu* is displayed.

7.17 Loading BIN Data from Floppy Disks 0549.1

Introduction

Purpose:

To load BIN data from a floppy disk to the prober hard disk drive.

BIN data contains the testing categories that the prober uses to interpret the types of passes or fails generated by the tester. An operator can load BIN data that was categorized on an external PC onto the prober hard disk unit.

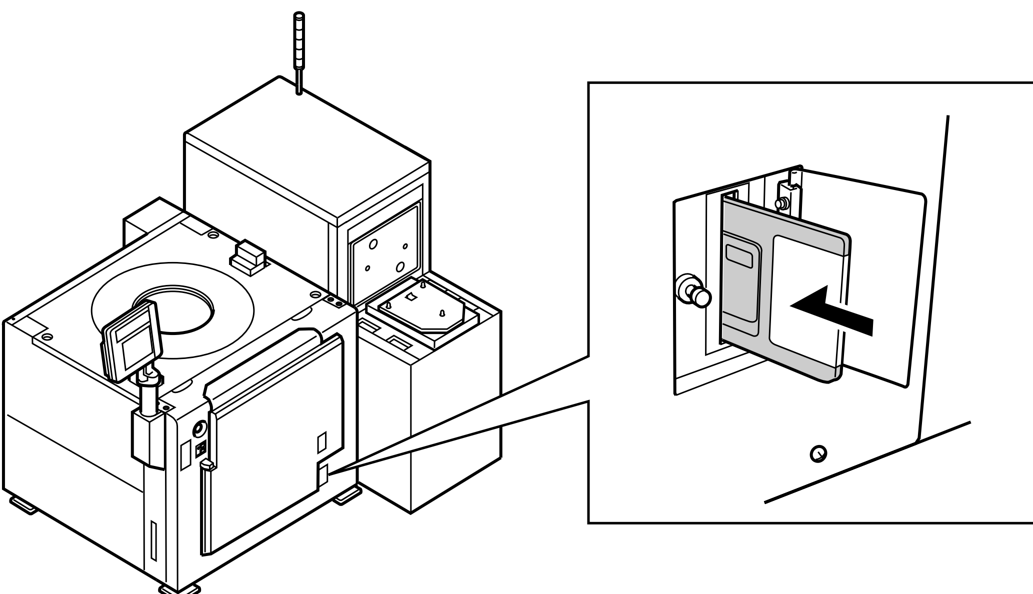
This procedure can be performed only if the wafer parameters for a particular file have been set to YES for `BIN Input` and EXTERNAL SETTING for `BIN Type` on the *BIN Input Menu*. To verify or change these settings, follow the procedure described in **5.6 BIN Input Operations Parameters (see page 210)**.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing BIN data

1 Insert a floppy disk containing the BIN data into the prober disk drive.

Inserting a Floppy Disk

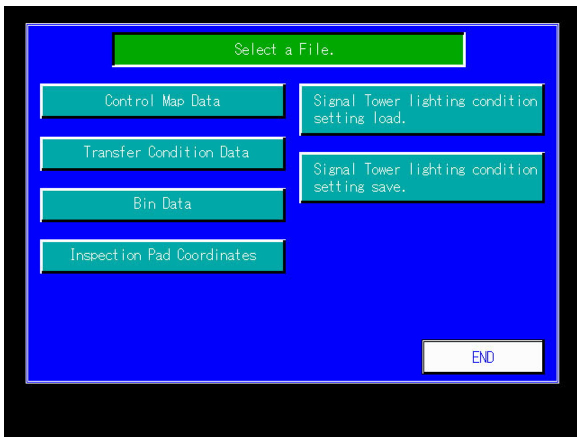


NOTE **If you insert a floppy disk that the prober cannot read, a message menu stating `FD format is different` is displayed. You must use a formatted floppy disk of the correct size (1.2 or 1.4 MB) for the floppy disk drive in your prober.**

2. Press SETUP on the *Main Menu*.

3. Press TESTING PROCEDURES on the *Setup Menu*. The *File Load/Save Menu* is displayed.

File Load/Save Menu



4. Press BIN DATA. A check menu is displayed stating `Load measurement condition data?`

5. Press YES. The BIN data is loaded in the parameters file for the currently active wafer file. When the operation is complete, the *Setup Menu* is displayed.

7.18 Loading Pad Coordinate Data 0550.1

Introduction

Purpose:

To load pad coordinate data to the prober from a floppy disk.

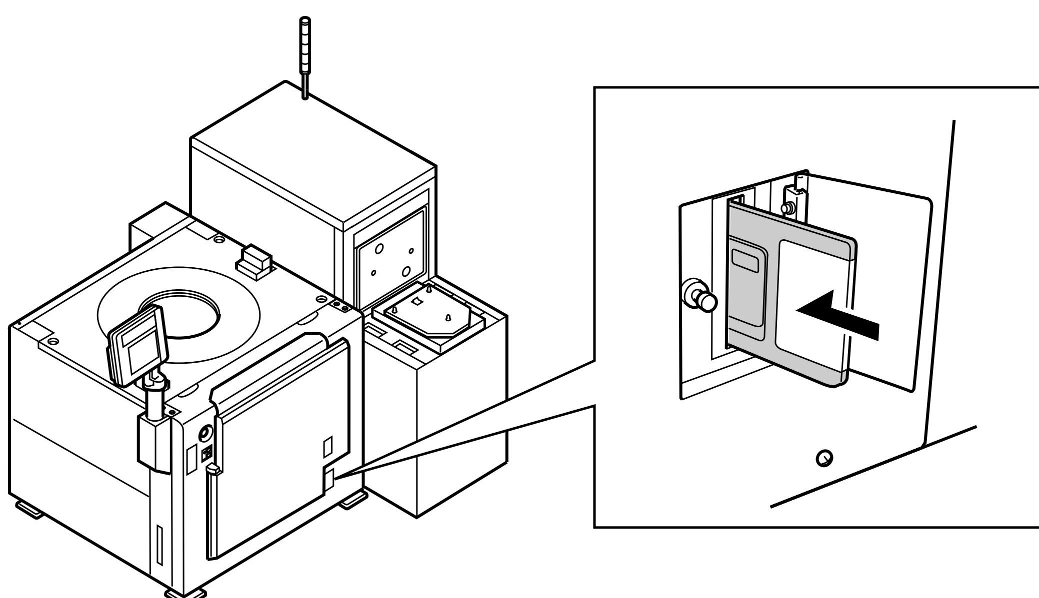
Pad coordinate data contains the probe tip coordinates for the probe card. Pad coordinate data that was created on a PC can be loaded onto the prober's hard drive.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing pad coordinate data

1 Insert a floppy disk containing the pad coordinate data into the prober disk drive unit.

Inserting a Floppy Disk

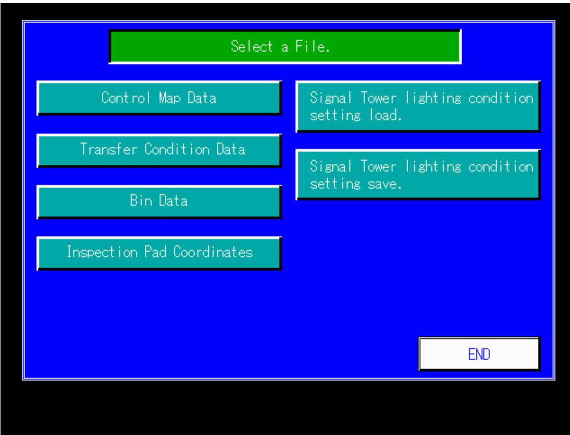


NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load Menu* is displayed.

File Load Menu



4 Press INSPECTION PAD COORDINATES. A check menu is displayed stating `Load the Pad Coordinates?`

5 Press YES. The pad coordinate data is loaded into the parameters file of the currently active wafer file. When the operation is complete, the *Setup Menu* is displayed.

7.19 Loading Transfer Condition Data 0551.1

Introduction

Purpose:

To load transfer condition data to the prober from a floppy disk.

The transfer conditions contain information about how the wafer is transferred during testing. Transfer condition data that was created on a PC can be loaded onto the prober's hard drive.

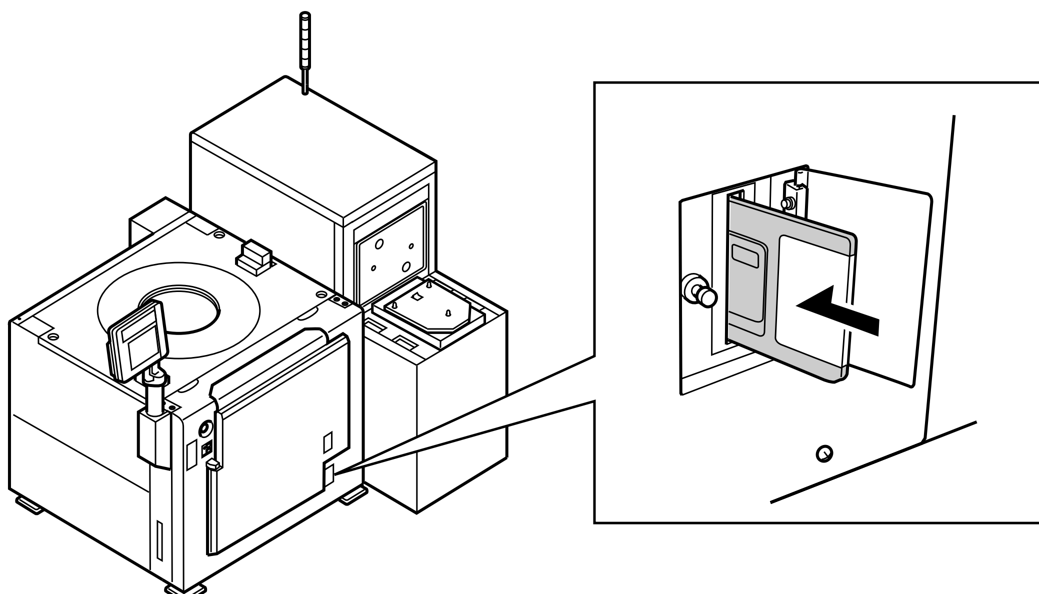
This procedure can be performed only if the wafer parameters for a particular file have been set to EXTERNAL SETTING for `Transfer Conditions` on the *Loader Transfer Conditions Operations Parameter Menu*. To verify or change these settings, follow the procedure described in **5.11 Loader Transfer Parameters (see page 218)**.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing transfer condition data

1 Insert a floppy disk containing the transfer condition data into the prober disk drive unit.

Inserting a Floppy Disk



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load/Save Menu* is displayed.

File Load/Save Menu

4 Press TRANSFER CONDITION DATA. A check menu is displayed stating `Load measurement condition data?`

5 Press YES. The transfer condition data is loaded into the parameters file of the currently active wafer file. When the operation is complete, the *Setup Menu* is displayed.

7.20 Loading Signal Tower Lighting Conditions 0552.1

Introduction

Purpose:

To load signal tower lighting conditions to the prober from a floppy disk.

The signal tower lighting conditions contain the sequence and conditions under which the signal tower lights illuminate. Signal tower lighting conditions created on a PC can be loaded onto the prober's hard drive.

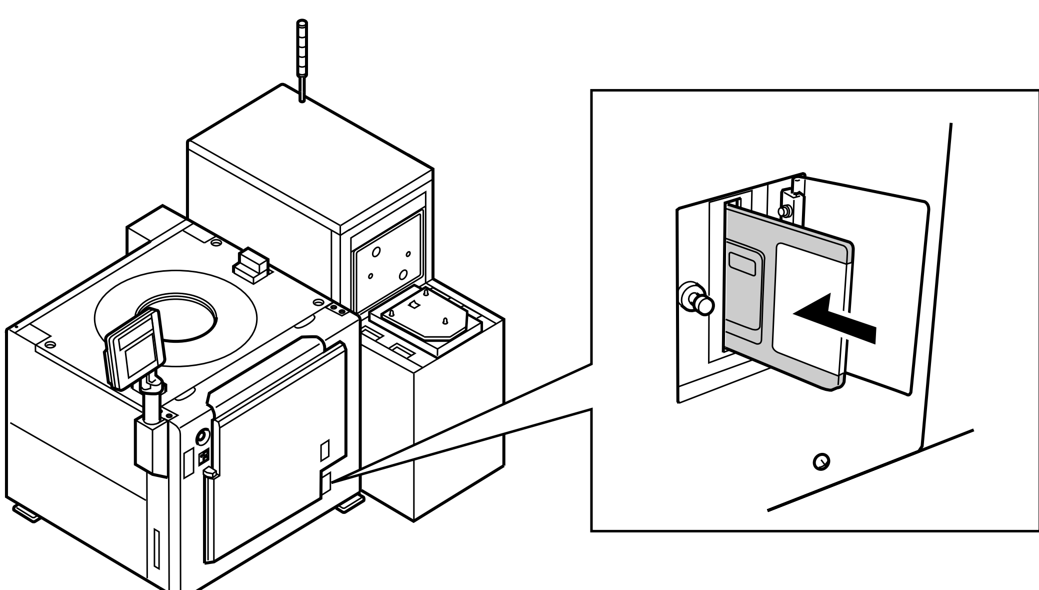
This procedure can be performed only if the wafer parameters for a particular file have been set to YES for `Control by the Lamp Setup File` on the *Lamp Control Operation Parameter Menu*. To verify or change the settings, follow the procedure described in **5.24 Lamp Control Parameter (see page 236)**.

Required Resources:

Time:	minute
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing the signal tower lighting conditions

1 Insert a floppy disk containing the signal tower lighting conditions into the prober disk drive unit.

▾ **Inserting a Floppy Disk**



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load/Save Menu* is displayed.

File Load/Save Menu

4 Press SIGNAL TOWER LIGHTING CONDITION SETTING LOAD. A check menu is displayed stating `Read data from FD?`

5 Press YES. The signal tower lighting conditions are loaded into the parameters file of the currently active wafer file. When the operation is complete, the *File Load/Save Menu* is displayed.

7.21 Saving Signal Tower Lighting Conditions 0553.1

Introduction

Purpose:

To save signal tower lighting conditions to a floppy disk.

The signal tower lighting conditions contain the sequence and conditions under which the signal tower lights illuminate. Signal tower lighting conditions can be saved onto a floppy disk.

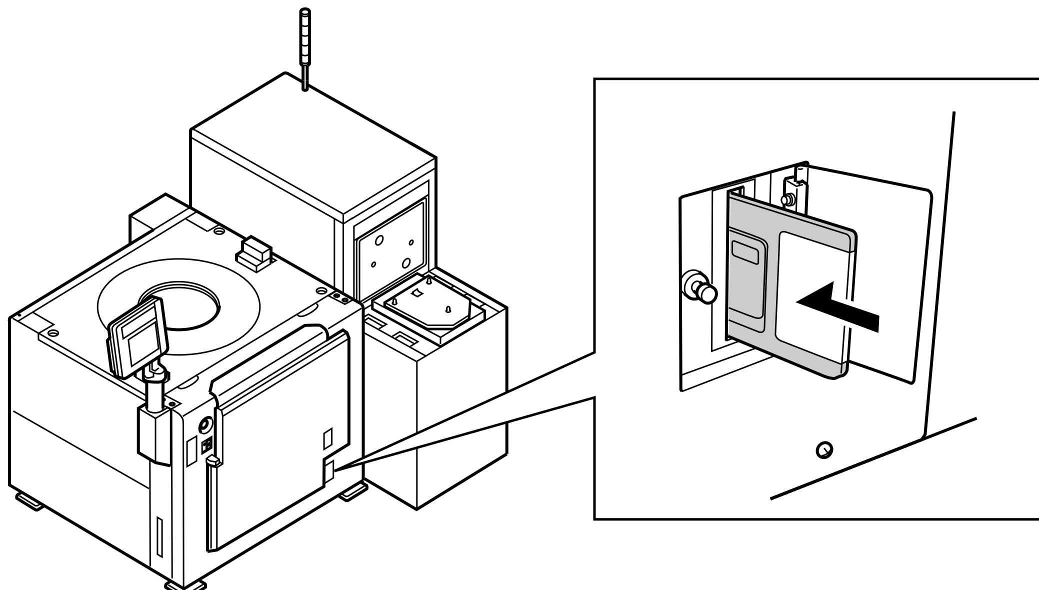
This procedure can be performed only if the wafer parameters for a particular file have been set to YES for `Control by Set File` on the *Lamp Control Operation Parameter Menu*. To verify or change the settings, follow the procedure described in **5.24 Lamp Control Parameter (see page 236)**.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A formatted floppy disk

1 Insert a floppy disk containing the signal tower lighting conditions into the prober disk drive unit.

Inserting a Floppy Disk



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press TESTING PROCEDURES on the *Setup Menu*. The *File Load/Save Menu* is displayed.

File Load/Save Menu

4 Press SIGNAL TOWER LIGHTING CONDITION SETTING SAVE. A check menu is displayed stating `Write this setting on the FD?`

5 Press YES. The signal tower lighting conditions are saved onto the floppy disk. When the operation is complete, the *File Load/Save Menu* is displayed.

7.22 Saving Operation Parameters and Lot Parameters 0555.1

Introduction

Purpose:

To copy and save operation parameter and lot parameter settings to a floppy disk.

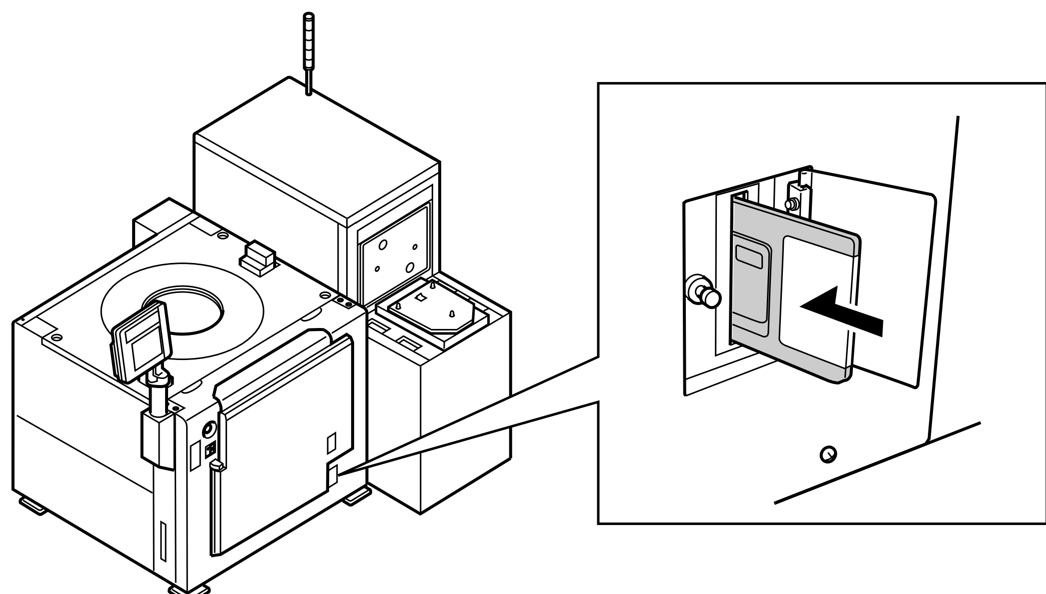
The formatted data can then be used on other probers or saved as a backup file.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A formatted floppy disk

1 Insert the floppy disk into the prober drive unit.

Inserting a Floppy Drive



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press OPERATION PARAMETERS on the *Setup Menu*. The *Operation Parameters Item Selection Menu* is displayed.

Operation Parameters Item Selection Menu

4 Press WRITE TO FD. A check menu is displayed stating `Do you want to write these settings to FD?`

5 Press YES. A message menu is displayed stating `Now saving. Please wait.` The operation parameters and lot parameters are saved. When the operation is complete, the *Setup Menu* is displayed.

NOTE **Only one set of operating parameters can be saved to a floppy disk. Therefore, it is not necessary to specify a filename to be saved.**

7.23 Loading Operating Parameters and Lot Parameters 0556.1

Introduction

Purpose:

To load operation parameters and lot parameters from a floppy disk to the prober drive unit.

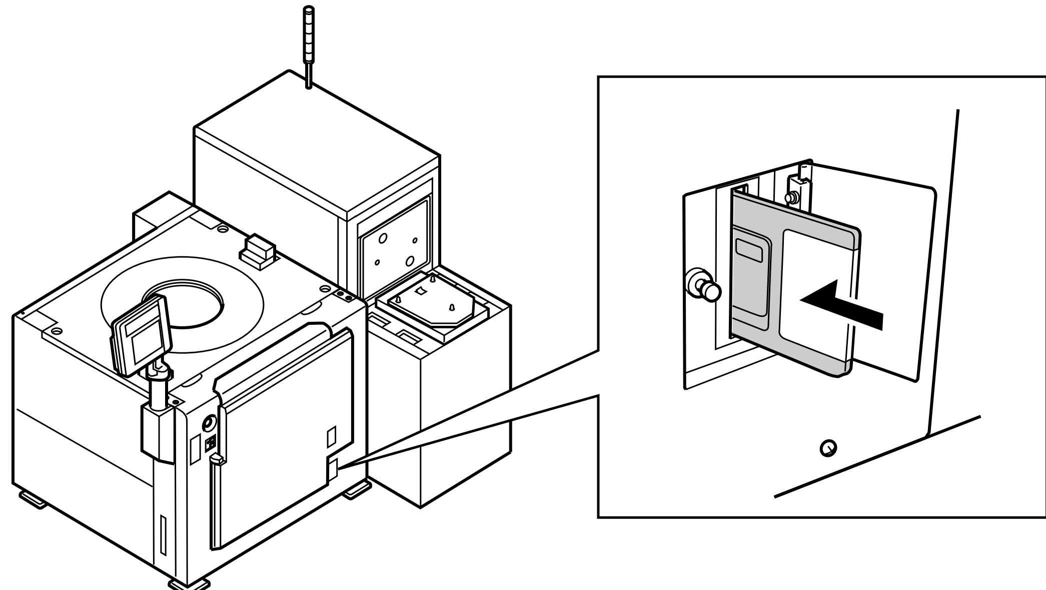
Loading new operation parameters and lot parameters overwrites the existing parameters.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A floppy disk containing the operating parameters and lot parameters you want to load

1 Insert a floppy disk containing the operation parameters and lot parameters into the prober disk drive.

Inserting a Floppy Drive



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

2 Press SETUP on the *Main Menu*.

3 Press OPERATION PARAMETER on the *Setup Menu*. The *Operation Parameters Item Selection Menu* is displayed.

Operation Parameters Item Selection Menu

4 Press READ FROM FD. A check menu is displayed stating `Do you want to read data from the FD?`

5 Press YES. The existing operating parameters and lot parameters are overwritten, and the *Setup Menu* is displayed.

NOTE **Only one set of operating parameters can be saved to a floppy disk; therefore, it is not necessary to specify a filename to be saved.**

7.24 Inputting and Restoring Default Operation and Lot Parameters 0557.1

Introduction

Purpose:

To set default operation parameters and lot parameters and restore the parameters to the default values.

Required Resources:

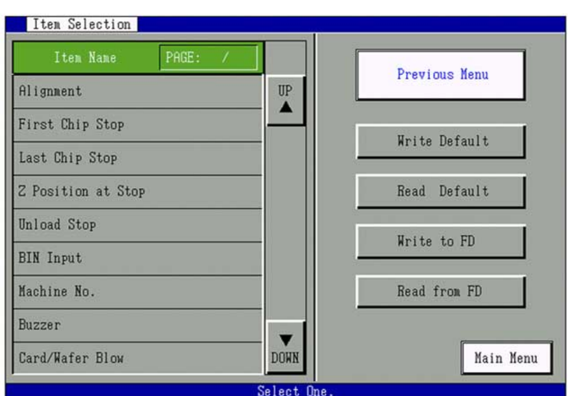
Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Setting Defaults

1 Press SETUP on the *Main Menu*.

2 Press OPERATION PARAMETER on the *Setup Menu*. The *Item Selection Menu* is displayed.

Item Selection Menu



3 Press WRITE DEFAULT. A check menu is displayed stating `Do you want to write default values?`

4 Press YES. A message is displayed stating `Now Saving. Please Wait.` The current operation parameter and lot parameter settings are input as the default values, and the *Item Selection Menu* is displayed.

Restoring Operation and Lot Parameters to Default Values

5 Press SETUP on the *Main Menu*.

6 Press OPERATION PARAMETER on the *Setup Menu*. The *Item Selection Menu* is displayed.

Item Selection Menu

7 Press READ DEFAULT. A check menu is displayed stating `Do you want to return the setting value to Default?`

8 Press YES. The operating parameter and lot parameter settings are returned to the default values, and the *Item Selection Menu* is displayed.

If no default has been set, a message menu is displayed stating `The default value has not been set.` Press OK to clear the message. You will have to input the default parameter settings manually.

7.25 Setting the Running Diagnostic Parameters 0559.1

Introduction

Purpose:

To set the running diagnostic parameters.

When checking the prober movement or aging, you should preset the *Aging Parameters Menu* to prevent communication with the tester and to prevent alignment.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Use the following steps to access the *Aging Parameters Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

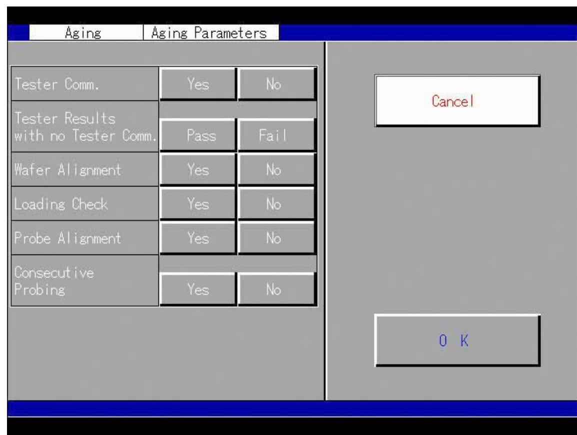
1.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

1.3 Input your password and press INPUT. The *Adjustments Menu* is displayed.

1.4 Press AGING on the *Adjustments Menu*. The *Aging Menu* is displayed.

1.5 Press AGING PARAMETERS on the *Aging Menu*. The *Aging Parameters Menu* is displayed.

Aging Parameters Menu



2 Set each menu option as shown in the table below.

Running Diagnostic Parameter Settings

Menu Option	Settings
`Tester Comm.`	No
`Test Results with no Tester Comm.`	Pass
`Wafer Alignment`	Yes
`Loading Check`	No
`Probe Alignment`	No
`Consecutive Probing`	Yes

3 After confirming all items, press OK. A check menu is displayed stating `Is it OK to change the setting value?` Press Yes. The settings are input, and the *Aging Menu* is displayed.

4 Use the following steps to perform aging.

4.1 Press Main Menu on the *Aging Menu*.

4.2 Press Run on the *Main Menu*. The *Run Menu* is displayed.

4.3 Press Start on the *Run Menu*.

5 When aging is complete and you are ready to begin testing, set the `Aging Parameters` according to the table below.

Running Diagnostic Parameter Settings (After Running Test (Aging))

Menu Option	Settings
`Tester Comm.`	Yes
`Test Results with no Tester Comm.`	Pass or Fail
`Wafer Alignment`	Yes
`Loading Check`	No
`Probe Alignment`	Yes
`Consecutive Probing`	No

7.26 Accessing Log Data 0560.1

You can check the operational logs, which contain the history of the prober's operation, from the current assist/error menu. Thee logs are divided into the following types and are helpful in finding the cause of errors and assists:

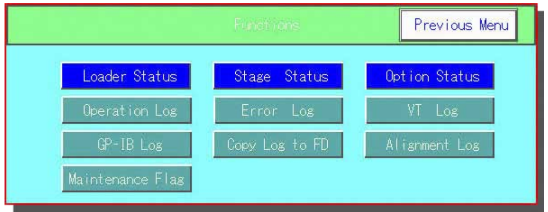
- The operation log tracks each button press.
- The error log tracks the errors and assists that have occurred.
- The VT log is a list of executed instructions.
- The GPIB log tracks communication between the prober and tester.
- The alignment log tracks alignment processes and results.
- The event log tracks all prober events.

When checking the operation, error, and event logs, up to 200 entries can be displayed. The VT and GPIB logs can display up to the first 100 of 600 digits and 1500 error log digits. Up to 12000 operation and error logs, 4000 event logs, and alignment logs for 150 wafers can be saved on one floppy disk.

7.27 Checking Operational Log Data During an Error 0561.1

1 Press FUNCTIONS on the *Assist/Error Menu*. The *Error Processing Functions Menu* is displayed.

Error Processing Functions Menu



NOTE **It is possible to save logs to floppy disks and check their contents from the** ***Diagnostics Menu*** **when the prober is stopped.**

2 Press the log you want to check. The associated log menu is displayed. For example, if you press ERROR LOG to check the error logs, the *Error Log Menu* is displayed.

Error Log Menu

NOTE **When** VT LOG **is pressed, a message is displayed stating** `Saving. Please Wait.` **The VT log data will not be displayed for about 30 seconds because the prober is transferring that data from memory to the hard disk.**

3 Review the log contents. If necessary, press NEXT PAGE or PREVIOUS PAGE to view additional entries.

4 Press PREVIOUS SCREEN to return to the *Assist/Error Menu*.

7.28 Checking, Saving, and Deleting Logs from the Diagnostics Menus 0562.1

Introduction

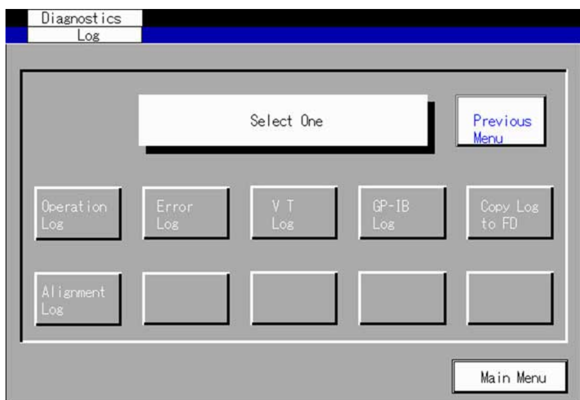
Overview:

You can check logs through the diagnostics menus. This procedure is useful for situations where the prober was rebooted and cannot be initialized.

1 Press Diagnostics on the *Initialize Selection Menu* or the *Main Menu*. The *Diagnostics Menu* is displayed.

2 Press Log on the *Diagnostics Menu*. The *Log Functions Menu* is displayed.

Log Functions Menu



3 Select the log you want to check, delete or copy to a floppy disk.

- Press Operation Log, Error Log, GP-IB Log, VT Log, Alignment Log, or Event Log to view log information.
- Press Copy Log to FD to save log information to a disk. Refer to **7.29 Saving Log Data to a Floppy Disk (see page 383)** for details.
- Press Delete All Logs to delete all log information. A check menu is displayed stating `Delete All Logs?` Press Yes to delete all log information, or press No to cancel the deletion.

NOTE **If you need to format a floppy disk before you can save the logs to the disk, refer to 7.12 Formatting a Floppy Disk (see page 352).**

7.29 Saving Log Data to a Floppy Disk 0563.1

Introduction

Purpose:

To save log data to a floppy disk.

Two methods are available for saving logs to a floppy disk:

Saving Logs Individually

Saving Logs in a Batch

Required Resources:

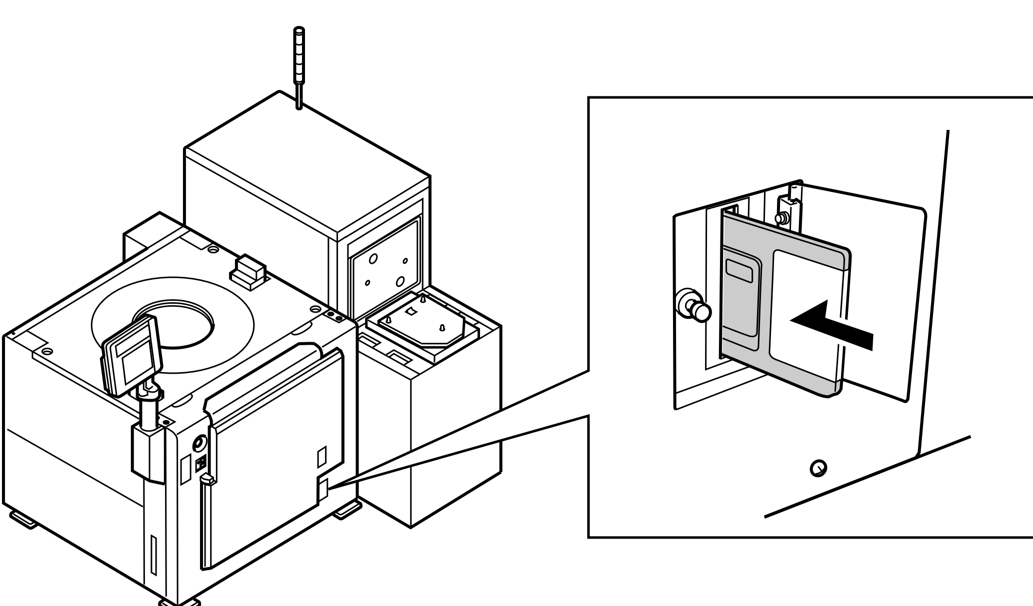
Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	A formatted floppy disk

Saving Logs Individually

NOTE The following procedure describes how to save the logs from the *Assist/Error Menu*. You can also save them from the *Diagnostics Menu* by following the same procedure.

1 Insert a floppy disk into the prober floppy disk drive.

Inserting a Floppy Disk



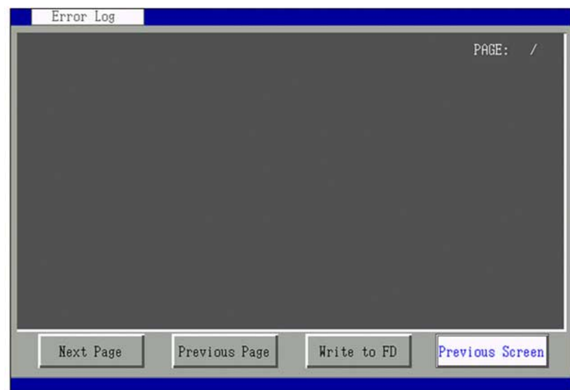
NOTE **If you insert a floppy disk that the prober cannot read, a message menu stating `FD format is different` is displayed. You must use a formatted floppy disk of the correct size (1.2 or 1.4 MB) for the floppy disk drive in your prober.**

Floppy disks cannot be formatted during the testing mode. Formatting must be done during manual use of diagnostics menus. Refer to **7.12 Formatting a Floppy Disk (see page 352)** **for instructions on formatting disks.**

2 Press FUNCTIONS on the *Assist/Error Menu*. The *Error Processing Functions Menu* is displayed.

3 Locate and press the specific log type that you want to save to the floppy disk. For example, if you press ERROR LOG to save the error logs, the *Error Log Menu* is displayed.

Error Log Menu



4 Press WRITE TO FD. The check menu is displayed with the message `Save to the FD?`

5 Press YES. The log data is saved onto the floppy disk, and the *Error Log Menu* is displayed.

NOTE **If the same log filename is already on the floppy disk, it will be overwritten. Log filenames are as follows:**

Operation Log: MMI_LOG.txt

Error Log: ERR_LOG.txt

VT Log: VT_LOG.txt; VT_RESET.txt (Log when resetting)

GPIB Log: GPIB_LOG.txt; GP_RESET.txt (Log when resetting)

Alignment Log: ALNDATA0.txt; ALNDATA1.txt; ALNDATA2.txt; IPLOG.txt; ALNETC.txt; ALNERR.tif; PCI_LOG.txt; KTDUMP.txt; KTIMGAGE.tif; KTKERSU.dat; KTPMISU.dat; KTIDISU.dat; KTIDCSU.dat

Event Log: EVT_LOG.txt

Saving Logs in a Batch

NOTE **The following procedure describes how to save the logs from the *Assist/Error Menu*. You can also save them from the *Diagnostics Menu* by following the same procedure below.**

6 Insert a floppy disk into the prober floppy disk drive.

NOTE **If you insert a floppy disk that the prober cannot read, a message menu stating `FD format is different` is displayed. You must use a formatted floppy disk of the correct size (1.2 or 1.4 MB) for the floppy disk drive in your prober.**

Floppy disks cannot be formatted during the testing mode. Formatting must be done during manual use of diagnostics menus. Refer to 7.12 Formatting a Floppy Disk (see page 352) for instructions on formatting disks.

7 Press FUNCTIONS on the *Assist/Error Menu*. The *Error Processing Functions Menu* is displayed.

8 Press COPY LOG TO FD. All logs are copied onto the floppy disk as one file (P8_LOG.LZH). The error data in the alignment log, (ALNEER.tif), and PCI logs (PCI_LOG.txt) are not saved in the batch file. When the operation is complete, the *Error Processing Functions Menu* is displayed.

7.30 Performing FOUP Indexer Registration 0565.1

Introduction

Purpose:

Any FOUP that does not conform to SEMI standards must be registered manually. This section describes how to perform FOUP indexer registration. This procedure describes how to access and save the settings in the *Cassette Input Menu*, and provides a table describing and explaining each menu option. This procedure also describes how to access and save the settings in the *Raise Indexer Z Menu*, and provides a table describing and explaining each menu option.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Non-SEMI standard FOUP

Performing FOUP Indexer Registration

1 Load the FOUP that needs to be registered onto the load port. The FOUP must contain at least one wafer.

2 Use the following steps to access the *Cassette Input Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

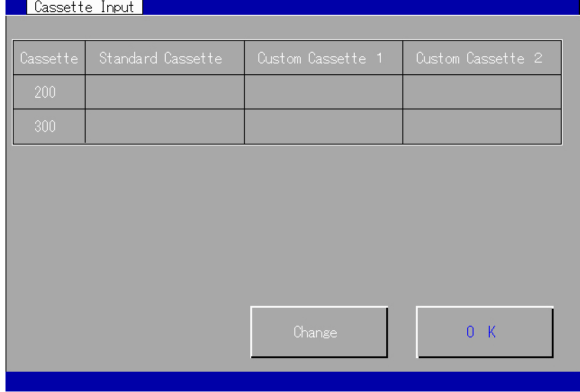
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press LOADER on the *Adjustments Menu*.

2.5 Press REGISTER CASSETTE on the *Loader Item Selection Menu*. If REGISTER CASSETTE is not displayed on the list, use the scroll arrows to change the display. The *Cassette Input Menu* is displayed.

Cassette Input Menu



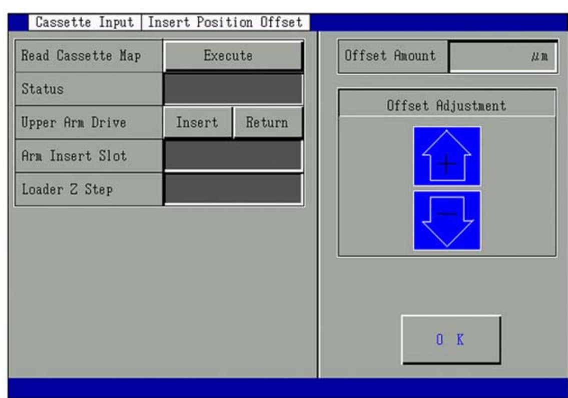
3. Press the display area corresponding to the correct FOUP size and location (in either custom Cassette 1 or custom Cassette 2). The designated area is displayed in a yellow frame.
4. Press CHANGE. The *Cassette Input Parameters Menu* is displayed.

Cassette Input Parameters Menu

5. Record the current `Up Amount` value.
6. Set each parameter on the *Cassette Input Parameters Menu*. Refer to the **Cassette Input Parameters Tables** in Cassette Input Parameters (see page 390) for a description and an explanation of each menu option.

7 Press Raise Loader Z. The *Raise Indexer Z Menu* is displayed. Refer to the **Raise Loader Z Parameters Table** in **Raise Loader Z Parameters (see page 396)** for a description and an explanation of each menu option.

Raise Indexer Z Menu



8 Press Execute for `Read Cassette Map`. A wafer search is performed. The result of the wafer search is displayed in `Status`.

9 Verify that `Status` displays 0.

- If 0 is displayed in `Status`, go to Step 10.
- If a number other than 0 is displayed in `Status`, an error has occurred with the wafer search. Check the values input in step 5 and retry the wafer search.

10 Press the display area adjacent to `Arm Insert Slot`. A numeric keypad is displayed. Input the slot number for the wafer to be used in this calibration. Press OK on the numeric keypad.

11 Press Insert for `Upper Arm Drive`. The loader Z lowers and the upper arm is inserted into the slot specified in the previous step.

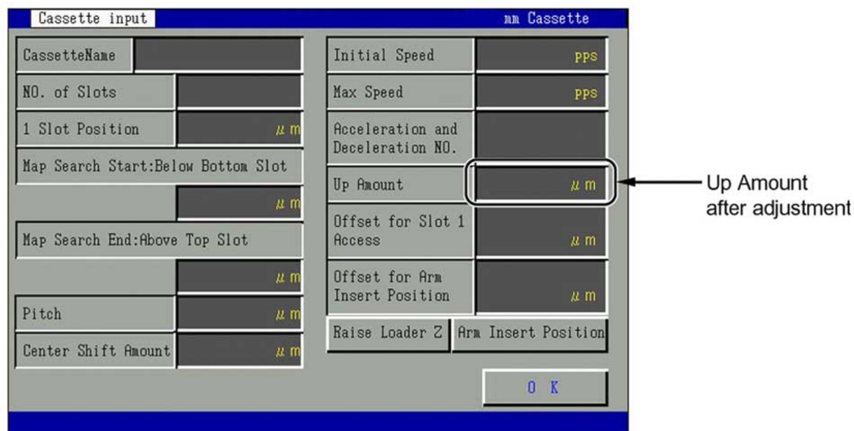
12 Use the arrow buttons to adjust the wafer up position. Raise the loader Z until the wafer is in the middle of its slot.

- Press the DOWN arrow for `Rise Adjustment` to lower the loader Z.
- Press the UP arrow for `Rise Adjustment` to raise the loader Z.

13 After adjusting the position, press Return. The upper arm moves to its original position.

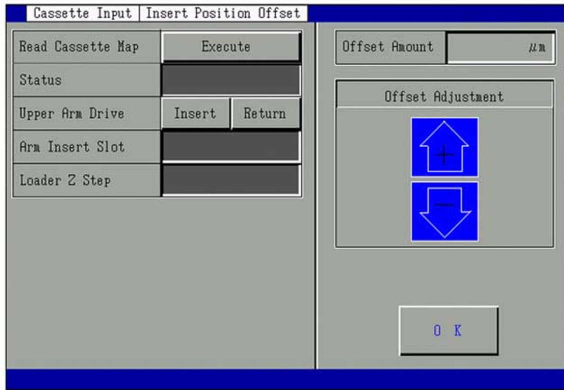
14 Press OK. The new `Up Amount` is displayed on the *Cassette Input Parameter Menu*.

Cassette Input Parameter Menu



15 Press ARM INSERT POSITION. The *Insert Position Offset Menu* is displayed. Refer to the **Insert Position Offset Menu Table** in **Insert Position Offset Menu (see page 397)** for a description and an explanation of each menu option.

Insert Position Offset Menu



16 Press EXECUTE for `Read Cassette Map`. A wafer search is performed. The result of the wafer search is displayed in `Status`.

Mechanical Hazard

The load port will move and can pose a pinch hazard to personnel. Stay clear of the load port when it is moving.

17 Verify that `Status` displays 0.

If a number other than 0 is displayed in `Status`, an error has occurred with the wafer search. Check the values input in step 5 and retry the wafer search.

18 Press INSERT for `Upper Arm Drive`. The loader Z lowers and the upper arm is inserted into the slot (default = 1) displayed in `Arm Insert Slot`.

19 Press OFFSET ADJUSTMENT to adjust the up position of the wafer.

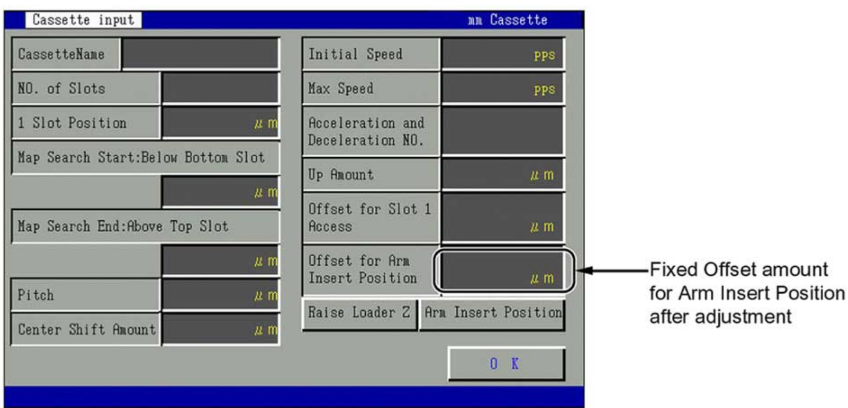
- Press the DOWN arrow for `Offset Adjustment` to lower the loader Z.
- Press the UP arrow for `Offset Adjustment` to raise the loader Z.

Raise or lower the arm so that it will not contact the wafer above or below it.

20 After adjusting the position, press RETURN for `Upper Arm Drive`. The upper arm moves to its original position.

21 Press OK. The new `Up Amount` is displayed on the *Cassette Input Parameter Menu*.

Cassette Input Parameters Menu



22 Use the following steps to initialize the stage and loader.

22.1 Press OK on the *Cassette Input Parameters Menu*. The *Loader Item Selection Menu* is displayed.

22.2 Press PREVIOUS MENU on the *Loader Item Selection Menu*.

22.3 Press MAIN MENU on the *Adjustments Menu*.

22.4 Unload the FOUP.

22.5 Press DIAGNOSTICS on the *Main Menu*.

22.6 Press INITIALIZE on the *Diagnostics Menu*.

22.7 Press SYSTEM on the *Initialize Menu*. The stage and loader initialize.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

Cassette Input Parameters

23 Use the following steps to display the *Cassette Input Menu*.

23.1 Press DIAGNOSTICS on the *Main Menu*.

23.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

23.3 Input your password on the numeric keypad and press INPUT.

23.4 Press LOADER on the *Adjustments Menu*.

23.5 Press REGISTER CASSETTE on the *Loader Item Selection Menu*. If REGISTER CASSETTE is not displayed on the list, use the scroll arrows to change the display.

24 Press the display area for the correct FOUP size and location (in either custom FOUP 1 or custom FOUP 2). The designated area is displayed in a yellow frame.

25 Press CHANGE. The *Cassette Input Parameters Menu* is displayed.

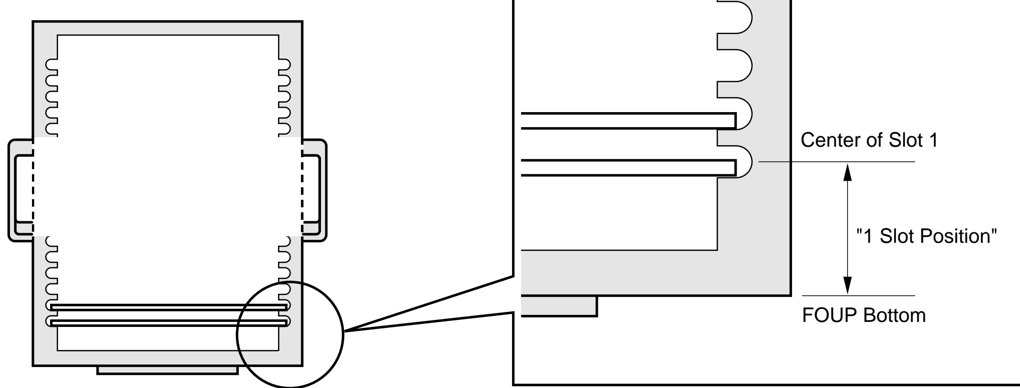
Cassette Input Parameters Menu

26 Set the parameters. Use the following tables for descriptions and explanations of each menu option.

Cassette Input Parameters

Parameter Name	Setting/Range	Contents
`Cassette Name`	20 alphanumeric characters	Sets the name for inputting the FOUP data.
`No. of Slots`	0–99	Sets the number of slots on the FOUP.
`1 Slot Position`	0–99,999 µm	Sets the dimensions from the bottom of the FOUP to the center of slot 1. Use the numeric keypad to input the dimensions (based on the FOUP design drawings) and press OK.

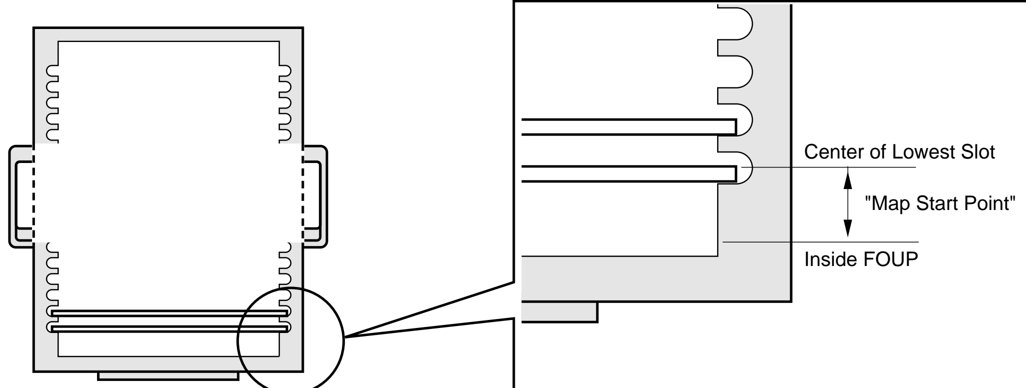
Slot 1 Positions Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
`Map Search End: Below Bottom Slot`	0–99,999 µm	This parameter determines where the wafer search sensors should start looking for wafers in the FOUP. The value input is the distance between the wafer in slot one and the bottom of the inside of the FOUP. (Refer to the drawing.) Use the numeric keypad to input the dimensions based on FOUP design drawings OK. **NOTE** **If the start position is set outside of the range, problems could occur or the arm could be damaged.**

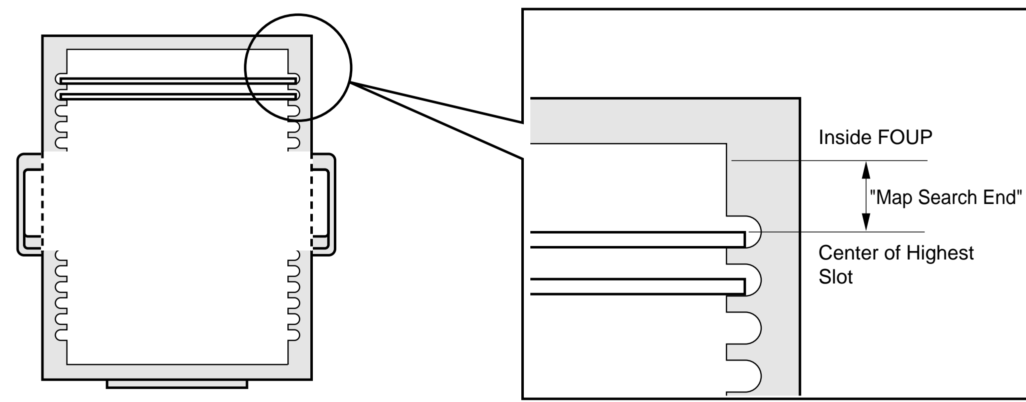
Map Ending Point Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Map Search End: Above Top Slot	-9,999–9,999 µm	Displays the end position of the map search. The wafer search ending point is the setting from the center of the highest slot in the FOUP to the top surface of the inside of the FOUP. Use the numeric keypad to input the dimensions based on the FOUP design drawings and press OK. **NOTE** **If the starting position is set outside of the range, problems could occur or the arm could be damaged.**

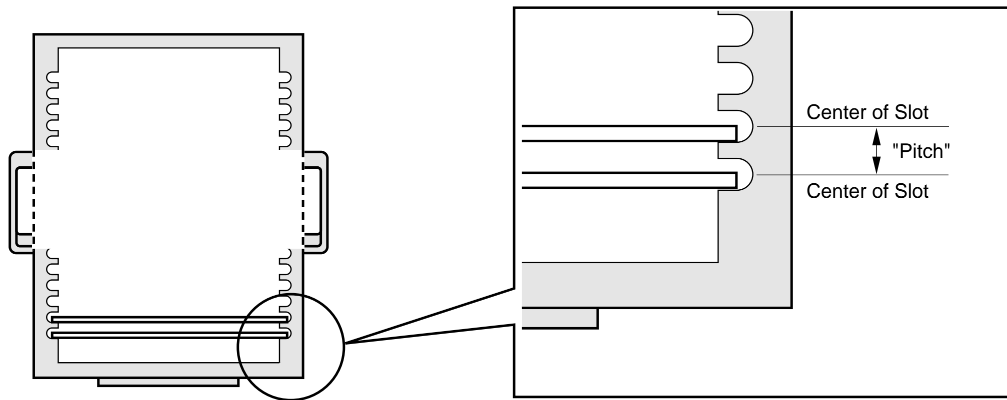
Map Ending Point Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Pitch	0–99,999 µm	Sets the dimensions between each slot center. Use the numeric keypad to input the dimensions based on the FOUP design drawings and press OK.

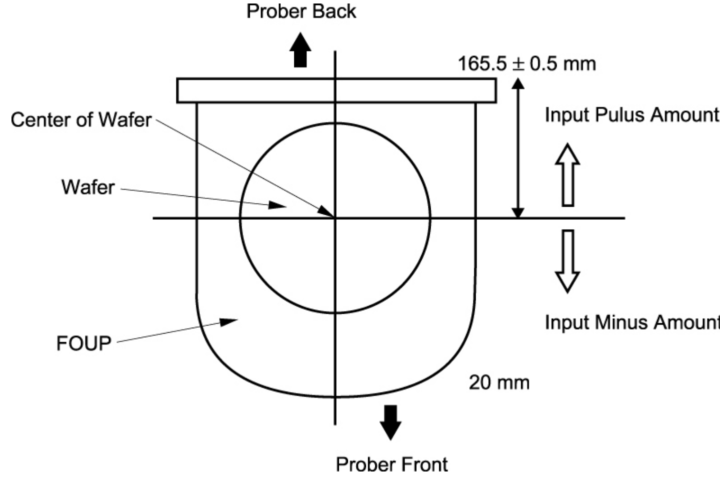
Pitch Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Center Shift Amount	-6000–9,999 µm	Displays the wafer center position for wafers stored in a non-SEMI standard FOUP. If the H bar on the FOUP is shifted forward or backward, input a positive or negative shift amount so the arm will know how to retrieve the wafer. • If the wafer center position is toward the front of the prober when compared to the center of the FOUP, input a negative value. • If the wafer center position is toward the back of the prober when compared to the center of the FOUP, input a positive value.

Center Shift-Amount Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Initial Speed	0–99,999 pps (Pulse Per Second)	Displays the motor initial drive speed for moving the loader Z.
Max. Speed	0–99,999 pps	Displays the maximum speed of the motor for moving the loader Z.
Acceleration and Deceleration NO.	0–19	Displays the acceleration and deceleration speeds of the loader Z motor. Input the acceleration and deceleration speeds and press OK. The speeds shown are in ms/1000 pps. **NOTE** **Refer to the Acceleration/Deceleration Codes Table below when inputting the speeds.**

Acceleration/Deceleration Codes Table

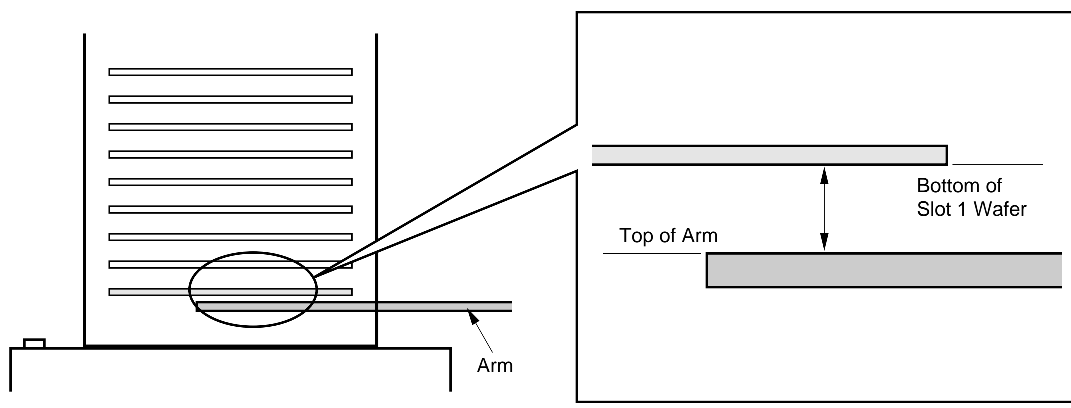
Acceleration/Deceleration Codes										
Code	0	1	2	3	4	5	6	7	8	9

Acceleration/Deceleration Codes										
Acceleration/ Deceleration Speed (ms/1000 pps)	1000	800	600	500	400	300	200	150	125	100
Code	10	11	12	13	14	15	16	17	18	19
Acceleration/ Deceleration Speed (ms/1000 pps)	75	50	30	20	15	10	7.5	5.0	4.0	2.0

FOUP Input Parameters

Parameter Name	Setting/Range	Contents
`Up Amount`	0–9,999 µm	Displays the rising amount of the loader Z when the upper arm takes the wafer from the FOUP.
`Offset for Slot 1 Access/ Arm Insertion Position`	0–9,999 µm	Displays the slot insertion position for the upper arm. The arm should enter the slot slightly below the wafer being removed. This parameter determines the gap between the bottom of the wafer and the upper surface of the arm.

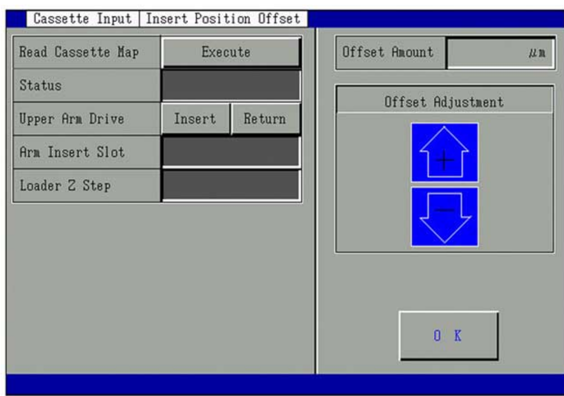
Slot 1 Access Position Offset Amount



Raise Loader Z Parameters

27 Press RAISE INDEXER Z on the *Raise Indexer Z Menu*. The *Raise Loader Z Menu* is displayed.

Raise Loader Z Menu



28 Set each parameter. Refer to the table below for a description and explanation of each menu option.

Raise Loader Z Parameters

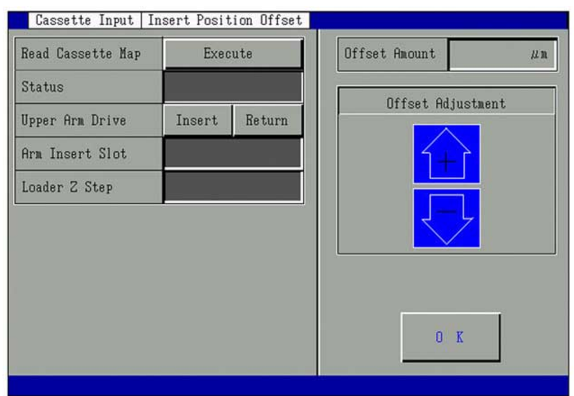
Parameter Name	Setting/Range	Contents
`Read Cassette Map`	EXECUTE	Initiates the wafer search.
`Status`	Mapping Result	Displays the results of the wafer search. If `0` is displayed as a result, mapping will be performed normally. If a nonzero value is displayed as a result, an error will occur in mapping.
`Upper Arm Drive`	INSERT, RETURN	Press INSERT to move the upper arm into the arm insert slot; press RETURN to drive the upper arm to its home position.
`Arm Insert Slot`	0–99	Displays the slot position when adjusting the “up” amount. Input the slot number.
`Loader Z Step`	0–99	Displays the loader Z movement amount when the rise adjustment arrows are pressed. Use the numeric keypad to input the preferred Z movement amount (1 step equals a 10 µm Z movement) and press OK.

29 After confirming all of the settings, press OK on the *Raise Loader Z Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

Insert Position Offset Menu

30 Press ARM INSERT POSITION on the *Cassette Input Parameter Menu*. The *Insert Position Offset Menu* is displayed.

Insert Position Offset Menu



31 Set the parameters. Refer to the following table for descriptions and explanations of each menu option.

Raise Loader Z Parameters

Parameter Name	Setting/Range	Contents
`Read Cassette Map`	EXECUTE	Initiates the wafer search.
`Status`	Mapping Result	Displays the results of the wafer search. If `0` is displayed as a result, mapping will be performed normally. If a nonzero value is displayed as a result, an error will occur in mapping.
`Upper Arm Drive`	INSERT, RETURN	Press INSERT to move the upper arm into the arm insert slot; press RETURN to drive the upper arm to its home position.
`Arm Insert Slot`	0–99	Displays the slot position when adjusting the “up” amount. Input the slot number.
`Loader Z Step`	0–99	Displays the loader Z movement amount when the rise adjustment arrows are pressed. Use the numeric keypad to input the preferred Z movement amount (1 step equals a 10 µm Z movement) and press OK.

32 After confirming all of the settings, press OK on the *Insert Position Offset Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

7.31 Inputting and Changing Passwords and Protecting Parameters 0567.1

Introduction

Purpose:

Passwords and parameter protection ensure that only authorized personnel have access to sensitive menu screens.

There are separate password levels that correspond to different job functions.

Level 1 is the normal operator level. The operator has access to the *Changeover Menu* and *Run Menu*, and to a portion of the *Diagnostics Menu*.

Level 2 is the maintenance operator level. The operator has access to Level 1 menus, in addition to the *Adjustments Menu*.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Inputting Passwords on Password Menus

1 The *Password Menu* appears when an operator attempts to access a restricted section of the software. The *Password Menu* is a numeric keypad on which the operator inputs the required password. For example, press SETUP on the *Main Menu*.

2 The *Password Menu* is displayed. Input the four-digit, level-3 password and press INPUT.

If an incorrect password is input three consecutive times, the software returns to the previous screen.

Changing Password Settings

3 Use the following steps to access the *Password Option Menu*.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press MAINTENANCE on the *Adjustments Menu*. The *Maintenance Menu* is displayed.

3.5 Press PASSWORD on the *Maintenance Menu*. The *Password Option Menu* is displayed.

4 To enable or change an operational password, `Operation Protect` must be set to YES. An operational password places a password on all *Main Menu* items except `Run`.

5 Use the following steps to change the level 2 or level 3 operational password.

5.1 To change the **Level 3** operational password, press CHANGE ADVANCED OPERATOR PASSWORD. The *Password Menu* is displayed.

5.2 To change the **Level 2** maintenance password, press CHANGE MAINTENANCE OPERATOR PASSWORD. The *Password Menu* is displayed.

6 Input the new password and press RETURN. The *Password Menu* is again displayed to confirm the new password.

7 Re-input the new password and press RETURN to save the new password.

NOTE **When inputting the new password, make sure to input the same four digits on both password menus. If different passwords are input, an error message is displayed.**

7.32 Masking and Protecting Parameters 0568.1

Introduction

Purpose:

To input and change passwords on password menus.

Passwords and parameter protection ensure that only authorized personnel have access to sensitive menu screens. Wafer and operating parameters can have protection settings. These settings either remove the parameter from the item selection menu, or make it impossible to change the settings on that particular parameter menu. When a parameter is masked, it is not displayed as a choice on the *Item Selection Menu*.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Masking

NOTE Parameters may be masked, or hidden, from view on the item selection menus through the use of the parameter protection masking function. When a parameter is masked it does not appear as a choice on the parameter item selection menu.

1 Use the following steps to access the *Parameters Limitation Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 A *Password Menu* is displayed. Input the password and press INPUT. The *Adjustments Menu* is displayed.

1.4 Press PARAMETERS LIMITATION on the *Adjustments Menu*. The *Parameters Limitation Menu* is displayed.

2 Press either WAFER PARAMETER MASK, PROTECT OR OPERATION PARAMETER MASK, or PROTECT. An item selection menu containing either all wafer parameters or all operation parameters is displayed.

3 Use one of the following methods to mask parameters.

- To mask all parameters, press MASK ALL. All parameters on the item selection menu will now have the MASK MENU button highlighted.
- To mask an individual parameter, locate the parameter on the item selection menu. The item selection menu is several pages long, therefore you may need to press NEXT PAGE or PREVIOUS PAGE to locate the appropriate parameter. Press the MASK menu button next to the parameter

4 Once all changes are made, press OK. A check menu is displayed stating `Is it OK to change the setting value?` Press YES. The parameters are now masked, and the *Parameters Limitation Menu* is displayed.

Reversing Parameter Masking

5 To reverse the masking of all parameters, return to the item selection menu and press SET NONE. All parameters on the item selection menu will now have the DON'T SET menu button highlighted. To reverse the masking of an individual parameter, return to the item selection menu, locate the masked parameter, and press the DON'T SET MENU button next to that parameter.

6 Once all changes are made, press OK. A check menu stating `Is it OK to change the setting value?` is displayed. Press YES. The parameters are no longer masked and the Parameters Limitation Menu is displayed.

Protect

NOTE **Parameters may be protected, or secured, on the item selection menus through the use of the parameter protection function. When a parameter is protected it appears as a choice on the parameter item selection menu, but it is displayed in yellow text. If the protected parameter is selected, the parameter menu will be displayed but no changes can be made to its settings. The statement "Parameters can not be changed by protection" will appear at the bottom of the parameter menu.**

7 Use the following steps to access the *Parameters Limitation Menu*.

7.1 Press DIAGNOSTICS on the *Main Menu*.

7.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

7.3 A *Password Menu* is displayed. Input the password and press INPUT. The *Adjustments Menu* is displayed.

7.4 Press PARAMETERS LIMITATION on the *Adjustments Menu*. The *Parameters Limitation Menu* is displayed.

8 Press either WAFER PARAMETER MASK, PROTECT OR OPERATION PARAMETER MASK, or PROTECT. An item selection menu containing either all wafer parameter or all operation parameters is displayed.

9 Use one of the following methods to mask parameters.

- To protect all parameters, press PROTECT ALL. All parameters on the item selection menu will now have the PROTECT button highlighted.
- To protect an individual parameter, locate the parameter on the item selection menu. The item selection menu is several pages long, therefore you may need to press NEXT PAGE or PREVIOUS PAGE to locate the appropriate parameter. Press the MASK menu button next to the parameter

10 Once all changes are made, press OK. A check menu is displayed stating `Is it OK to change the setting value?` Press YES. The parameters are now masked, and the *Parameters Limitation Menu* is displayed.

Reversing Parameter Protection

11 To reverse the protection of all parameters, return to the item selection menu and press SET NONE. All parameters on the item selection menu will now have the DON'T SET menu button highlighted. To

reverse the protection of an individual parameter, return to the item selection menu, locate the protected parameter, and press the DON'T SET menu button next to that parameter.

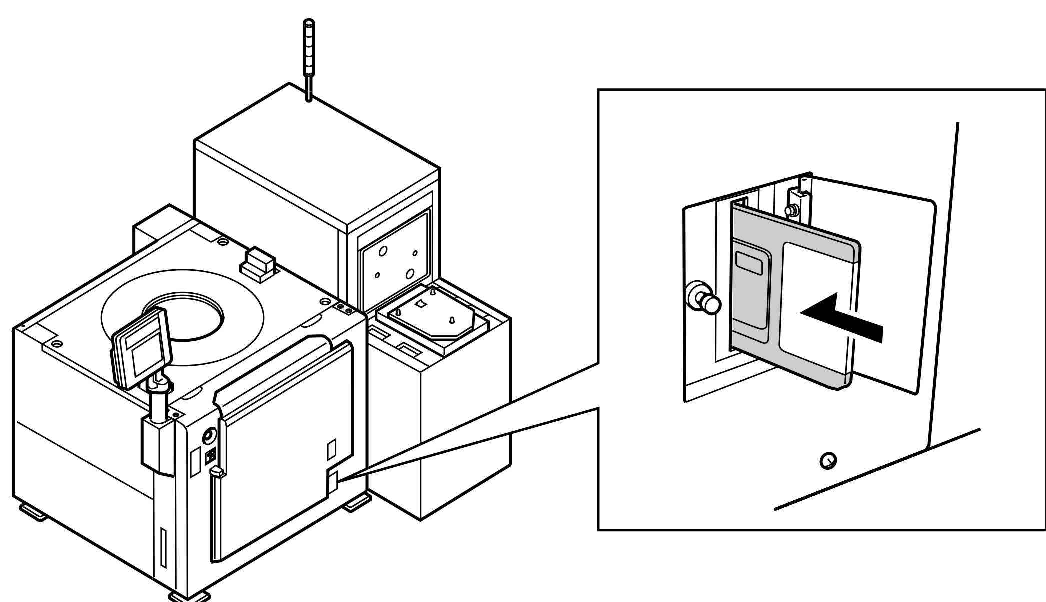
12 Once all changes are made, press OK. A check menu stating `Is it OK to change the setting value?` is displayed. Press YES. The parameters are no longer protected and the Parameters Limitation Menu is displayed.

Saving/Reading Security Settings

NOTE **Parameter masking and protection information can be saved to or read from a floppy disk. This capability allows for different sets of masking and protection information to be stored and used on the prober as necessary.**

13 Insert a floppy disk into the prober disk drive unit.

Inserting a Floppy Disk



NOTE **If a floppy disk is inserted that the prober cannot read, a message menu is displayed stating `FD format is different.` Insert a formatted floppy disk of the correct size (1.2 or 1.4 MB).**

14 Use the following steps to access the *Parameters Limitation Menu*.

14.1 Press DIAGNOSTICS on the *Main Menu*.

14.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

14.3 Input your password on the *Password Menu* and press INPUT. The *Adjustments Menu* is displayed.

14.4 Press PARAMETERS LIMITATION on the *Adjustments Menu*. The *Parameters Limitation Menu* is displayed.

15 Press FD SAVE/LOAD on the *Parameters Limitation Menu*. The *FD Save/Load Menu* is displayed.

16 To save wafer parameter masking and protection information to a floppy disk, press WRITE TO FD next to `Wafer Parameter Mask, Protect Information`. To load wafer parameter masking and protection information from a floppy disk, press READ FROM FD next to `Wafer Parameter Mask, Protect Information`. The prober will save/load the information to/from the floppy disk, and display the *Parameters Limitation Menu*.

17 To save operation parameter masking and protection information to a floppy disk, press WRITE TO FD next to `Operation Parameter Mask, Protect Information`. To load operation parameter masking and protection information from a floppy disk, press READ FROM FD next to `Operation Parameter Mask, Protect Information`. The prober will save/load the information to/from the floppy disk, and display the *Parameters Limitation Menu*.

Machine Setup

This chapter describes the procedures required to set up the prober including setting up the man-to-machine interface (MMI) and other aspects of the prober. Each section describes the purpose of the associated procedure and provides the menu path to the appropriate screens for performing it.

8.1 MMI Setup Menu 0239.1

1 Use the following steps to access the *MMI Setup Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press SETUP MMI on the *Adjustments Menu*. The *MMI Setup Menu* is displayed.

MMI Setup Menu

2 Set each parameter. Refer to the table below for a description and explanation of each menu option.

3 After confirming all of the settings, press OK on the *MMI Setup Menu*. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input and the *Adjustments Menu* is displayed.

MMI Setup Menu Parameters

Option	Setting	Content
`Language`	JAPANESE, ENGLISH	Sets the language displayed on touch screen.
`LCD Backlight`	ON, AUTO OFF	Sets lighting conditions of the touch screen backlight, except during testing. ON: Backlight is always illuminated. AUTO OFF: Backlight turns OFF when not used for a pre-determined time. Touch the touch screen in the lower right corner to reactivate the backlight.
`Full Keyboard`	CLEAR, DON'T CLEAR	When changing a setting, enables current setting contents to be displayed on the keyboard or numeric keypad. CLEAR: Does not display previously inputted characters. DON'T CLEAR: Displays previously inputted characters.

Option	Setting	Content
Joystick Direction	CLOCKWISE,COUNTER CLOCKWISE	Sets direction of XY stage movement when pressing arrow control buttons. CLOCKWISE: Moves XY stage in same direction as arrow control buttons. COUNTER CLOCKWISE: Moves XY stage in opposite direction of arrow control buttons.
Contact Map Direction	CLOCKWISE,COUNTER CLOCKWISE	Sets contact position direction of movement for the contact map when pressing arrow control buttons. CLOCKWISE: Sets contact position movement in same direction as control buttons. COUNTER CLOCKWISE: Sets contact position movement in opposite direction as control buttons.
Make a Log When Abort	YES, NO	Sets whether to obtain a log on hard disk when aborting. YES: Obtain a log when aborting. NO: Does not obtain a log when aborting.
System Version		Displays system software version installed on prober.
JPN Version		Displays Japanese language version installed.
ENG Version		Displays English language version installed.

8.2 Set Date/Time Menu 0240.1

1 Use the following steps to access the *Set Date/Time Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

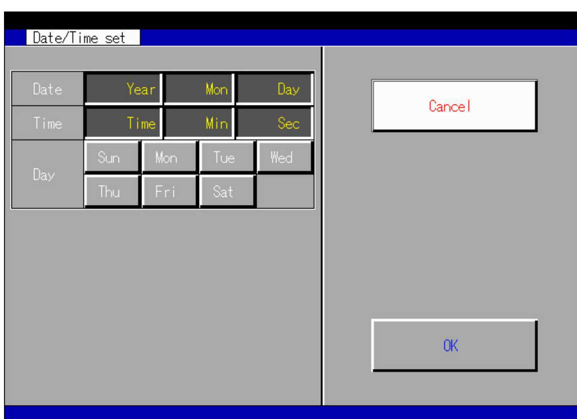
1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press MAINTENANCE on the *Adjustments Menu*.

1.5 Press TIME SETTING on the *Maintenance Menu*. The *Set Date/Time Menu* is displayed.

Set Date/Time Menu



2 Set each parameter. Refer to the table below for a description and explanation of each menu option.

3 After confirming all the settings, press OK. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input and the *Adjustments Menu* is displayed.

Set Date/Time Menu Parameters

Option	Setting	Content
Date	Year 0–99; Mon 1–12; Day 1–31	Sets the year, month, and day.
Time	Time 0–23; Min 0–59; Sec 0–59	Sets the hour, minute, and second.
Day	SUN, MON, TUE, WED, THU, FRI, SAT	Sets the day of the week.

8.3 Hardware Setting (Yes/No) Menu 0241.1

1 Use the following steps to access the *Hardware Settings (Yes/No) Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu* is displayed.

1.5 Press HARD SELECT (YES/NO) YES/NO on the *Hardware Options Item Selection Menu*. The *Hardware Settings (Yes/No) Menu* is displayed.

Hardware Settings (Yes/No) Menu

2 Set each parameter by pressing YES or NO. Refer to the table below for a description and explanation of each menu option. There are four pages of items; to change lists press either NEXT MENU or PREVIOUS MENU.

3 After confirming all of the settings, press OK on the *Hardware Settings (Yes/No) Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

Hardware Setting (Yes/No) Menu Parameters

Item	Contents
Printer	Indicates that the prober has a printer.
GPIB	Indicates that GPIB is installed as the tester/prober communications protocol. The GPIB wafer parameter must be set to YES to use GPIB.
BIN & XY	Turns on the TTL BIN function and TTL XY coordinator. The XY coordinator indicates which die the prober is currently testing.
SACC	Indicates the SACC is used.
Inker	Indicates that an inker is installed on the prober. The type of inker is set under `Inker Parameter` in the Hardware Settings Menu.

Item	Contents
Operation Switch	Provides the ability to use a keyboard as an interface instead of a touch screen.
Joystick	Indicates that the prober has an external joystick.
Micro Scope	Indicates that the prober has a microscope.
Needle Polish	Indicates that the prober has a probe polish pad for cleaning the probes.
Touch Sensor	Indicates that the touch sensor method of detecting wafer-to-probe-card contact will be used.
(valid for the dual port loader specification)	Indicates that the prober has a second loader.
Stage Won't Move at Ld2 Access (valid for the dual port loader specification)	Indicates that the stage will not move when accessing the second loader.
Auto HF	Indicates that the prober has an automatic high frequency balancing unit. This unit holds the test head and is used to rotate it on and off of the prober.
Easy Card Attachment	Indicates that the prober has a card easy-attachment ring.
2nd 1 Cassette	This option is not applicable to P-12XL.
SACC Unit	Indicates that the prober has an SACC unit without an inker arm.
Head Plate Interlock	Indicates that the prober has a head plate interlock.
OCR Motor	Indicates a KLA OCR with a motorized zoom for the optical lens.
Barcode Reader	Indicates that the prober has a barcode reader.
Medium Magnification Bridge	Indicates that the prober has a Shiva bridge type installed. Shiva indicates a third optical lens that provides a magnification between macro and micro.
Operating Rate	The prober has a utilization gauge that tracks when the prober is ON or OFF.
Front Cover Interlock	Indicates that the prober has a front cover interlock.
Double Inker	Indicates that the arm inker mount can hold two inkers instead of one.
Brush Polish	Indicates that the prober has a brush to clean the probes.
RS232C Tester	Indicates that RDP (Robin Duling Protocol) or RS-232 will be used as the tester/prober communications protocol.
Loader Built-in Barcode Reader	Indicates that the prober has a loader with a built-in barcode reader.
Moving Rotary Switch	Provides the ability to manually start and stop the P-12XL with a switch rather than with the touch screen.
Cell Controller	Indicates that the prober will use the KLA networking option.
PN-300	Indicates that the prober will use the TEL PN-300 networking option.
Auto Leveling	This option is not applicable to P-12XL.
Dry Air	Indicates that the prober can use the dry air unit and has plumbing/piping installed.
	This option is not applicable to P-12XL.
PQL	This option is not applicable to P-12XL.

Item	Contents
Card Protect	Indicates that the prober utilizes the card protect unit.
RearFan Control Board	This option is not applicable to P-12XL.
Hot Air	This option is not applicable to P-12XL.
Wide Loader	Indicates that the prober allows the use of a large test head and dual port loader configuration.
Manipulator	Indicates that the prober utilizes the manipulator for the card.
	Indicates that the prober utilizes the UPS (Uninterruptable Power Supply) system option.
APN (Advanced Prober Network)	Indicates that the prober utilizes N-PAF (Network-based Prober Advanced Functions).
M101	Indicates that the prober has the probe card interface ring installed.
Continuity Plate for 50 Φ	This option is not applicable to P-12XL.
SCSP	This option is not applicable to P-12XL.
Front Cover Fixation Lock	For a prober equipped with a Hot/Cold Unit, a front cover fixation lock is installed to prevent opening of the door when the chuck is below 10°.
Precise Z	Indicates that the prober has the precise (micro) Z option.
Handling Warped Wafer	This option is not applicable to P-12XL.
Subchuck Z Motor	This option is not applicable to P-12XL.
Hotchuck 200° C	This option is not applicable to P-12XL.
E84 PI/O	Indicates that the prober uses AMHS (Automated Material Handling System) to bring FOUPs to and from the prober.
Air Cooling	Indicates that the prober has an air cooling system installed in order to quickly cool the chuck when the hotchuck has been in use.

8.4 Hardware Settings (Multiple) Menu 0242.1

1 Use the following steps to access the *Hardware Setting (Multiple) Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu* is displayed.

1.5 Press HARD SELECT (MULTI) MORE THAN 2 on the *Hardware Options Item Selection Menu*. The *Hardware Setting (Multiple) Menu* is displayed.

2 Set each parameter. Refer to the table below for a description and explanation of each menu option.

3 After confirming all of the settings, press OK on the *Hardware Settings (Multiple) Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input, and the *Hardware Options Item Selection Menu* is displayed.

Hardware Settings (Multiple) Menu Parameters

Item	Settings	Content
`SIO`	NA, 1, 2, 3	The Serial I/O (SIO) selection sets the number of RS-232C cards in the prober, either 1, 2, or 3. Select NA if the prober has no RS-232C cards.
`OCR`	NA, 1, 2, 3, 4, 5	The OCR selection sets the type of OCR unit in the prober. Press 1 to set a KLA OCR as the OCR unit. Press 2 to set an ACUMEN OCR as the OCR unit. Press 3 to set an acuReader/VME OCR as the OCR unit. Press 4 to set an ACUMEN BARCODE as the OCR unit. Press 5 to set Siemens as the OCR unit. Press NA if the prober has no OCR unit.
`Temp. Controller`	YES, NO	Sets whether or not the prober is equipped with the Temperature Controller. YES: Equipped with the temperature control. NO: Not equipped with the temperature control.
`Chiller`	YES, NO	Sets whether or not the prober is equipped with the Chiller Unit. YES: Equipped with the Chiller Unit. NO: Not equipped with the Chiller Unit.
`Limit Time for Ultimate Temp.`	0–60 min	Sets the limit time until the chuck top reaches the designated temperature.
`Chiller Setting Temperature`	-15° to 50°C	Sets the temperature of the brine used.
`Chuck Top Temperature Specifications`	-10° to 85°C	Sets the temperature of the upper and lower limit of the chuck top temperature.

Item	Settings	Content
Chiller Temperature Specifications	-15° to 50°C	Sets the upper and lower limit of the brine temperature.
OCR Camera	UPWARD, DOWNWARD	The OCR Camera selection sets the direction of the OCR Camera in relation to the object. Press UPWARD to look up at the object. Press DOWNWARD to look down at the object.
Polisher Type	NA,STANDARD, SPECIAL	Set the Tester I/F to be used. NA: Do not use the Tester I/F. STANDARD: Use the Tester I/F as the standard. SPECIAL: Use the Tester I/F as a special specification.

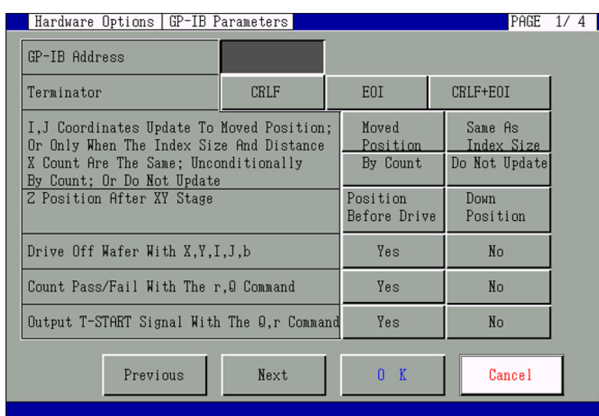
8.5 GPIB Communication Parameters 0243.2

Introduction

Overview:

When the GPIB communications protocol is used during testing, the GPIB ON and OFF conditions must be set manually. This procedure describes how to access and save the settings in the *GPIB Parameters Menu*, and provides a table describing and explaining each menu option.

GPIB Parameters Menu (1 of 4)



1 Use the following steps to access the *GPIB Parameter Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu*is displayed.

1.5 Press GPIB PARAMETER SETTING on the *Hardware Options Item Selection Menu*. The *GPIB Parameters Menu*is displayed.

2 Set each parameter. Press NEXT or PREVIOUS to access all four pages of the *GPIB Parameters Menu*. Refer to the table below for a description and explanation of each menu option.

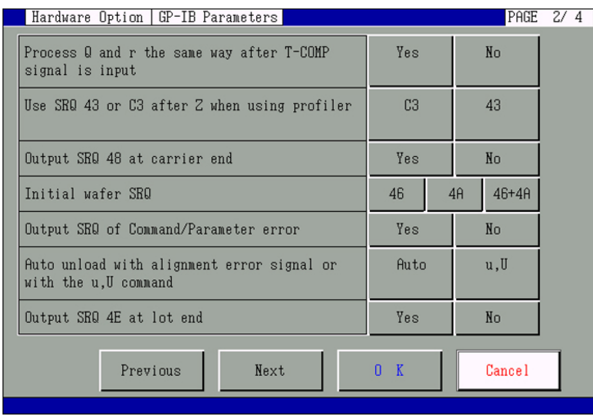
3 After confirming all of the settings, press OK on the *GPIB Parameters Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input, and the *Hardware Options Item Selection Menu* is displayed.

GPIB Communication Menu (1/4) Parameters

Item	Settings	Content
`GPIB Address`	1–31	Sets the prober GPIB addresses.

Item	Settings	Content
Terminator	CRLF, EOI, CRLF + EOI	Sets the codes that indicate the end of GPIB data commands. CRLF: Two bytes for CR (OxOd) and LF (OxOa) are included at the end of a command. EOI: (End of Interrupt) EOI status is set when the last byte of the command is sent (signal sent by tester). CRLF + EOI: CR and LF are added at the end of a command. EOI status is set when the last byte (LF) is sent.
I (X Index), J (Y Index) Coordinates Update to Moved Position; or only when the index size and distance X count are the same; unconditionally by count; or do not update	Moved Position Same As Index Size, By Count, Do Not Update	Sets the conditions for updating coordinates (X,Y) when the stage is transferred by the I or J command. Same As Index Size: When the value of (I,J Command Index Length) x (No. of Times) is an integral multiple equivalent to that of the X and Y die size, the address is updated to that multiple. By Count: Update the coordinates the designated number of times, regardless of the index distance values. Do Not Update: Do not update coordinates under any condition. Does not update the *Real Time Wafer Map*, but probing still occurs according to the setup file specifications; RTWM and probing actual position are not the same.
Z Position After XY Stage	Position Before Drive, Down Position	Sets the Z axis height after driving the XY stage using an XY stage drive command (b, I, J, X, Y, X/Y). Position Before Drive: Stops the XY Stage in its current position before the XY Stage drive command. For example, if the Z axis was in the UP position (contact), it will stop in the UP position. If the Z axis was in the Down position (separate), it will stop in the down position.Down Position: Stops the XY Stage in the Down position regardless of its position before the XY Stage drive command.
Drive Off Wafer with X, Y, I, J, b	Yes, No	Sets whether to transfer the XY Stage to a new location even if the XY stage drive command sends the stage to a location that is outside the probing area. Yes: Transfer the stage to the new location even if it is outside the probing area. No: Do not transfer the stage to the new location.
Count Pass/ Fail with the r, Q command	Yes, No	Sets what commands count pass and fail information. Yes: r command counts fails; Q command counts passes. No: Input and count the pass and fail information using the c or C command.
Output T-Start Signal with the Q,r Command	Yes, No	When the TTL and GPIB interfaces are used together during testing, set whether the TTL tester interface will output the test start signal when the Q or r command is received. Yes: The TTL tester interface will output the test start signal. No: The TTL tester interface will not output the test start signal.

GPIB Parameters Menu (2 of 4)

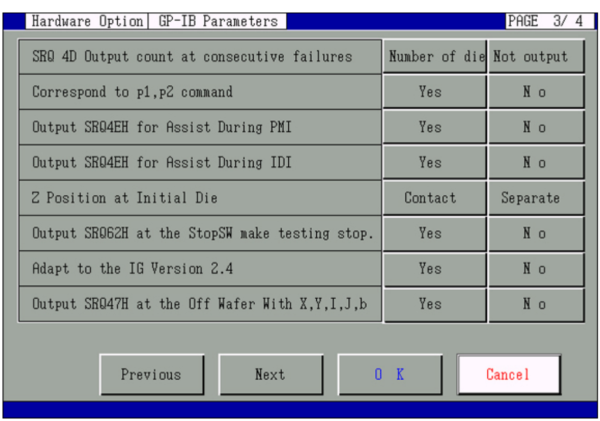


GPIB Communication Menu (2/4) Parameters

Item	Settings	Content
Process Q and r the same way after T-COMP signal is input	Yes, No	This menu item is currently not supported by Rzz00–R014.05 software.
Use SRQ 43 or C3 after Z when Using profiler	C3, 43	This menu item is currently not supported by Rzz00–R014.05 software. SRQ43H and SRQ53H are always output at normal end and at limit over, respectively.
Output SRQ 48 at carrier end	Yes, No	Sets whether to output the SRQ48 signal when probing has finished for all wafers in the FOUP. Yes: Output the SRQ48 signal when probing has finished for all wafers in the FOUP. No: Do not output the SRQ48 signal when probing has finished for all wafers in the FOUP.
Initial Wafer SRQ	46, 4A, 46+4A	Sets the SRQ that is output for the first wafer of the lot. 46H: Output SRQ46H 4AH: Output SRQ4AH 4AH+46H: When 4AH+46HSRQ4AH is output, then SRQ46H is output
Output SRQ of Command/ Parameter error	Yes, No	Sets whether or not to output the SRQ if a GPIB command error or parameter error is detected. Yes: Output SRQFFH if a command error occurs; output SRQFE if a parameter error occurs. No: An error SRQ is not output.
Auto unload with alignment error signal or with the u,U command	Auto, u,U (u,Uis one menu item)	Sets whether to automatically unload after receiving the u or U command after an alignment error SRQ is output. Auto: Unload without waiting for the u or U command. u,U: Unload after receiving the u or U command.

Item	Settings	Content
Output SRQ 4EH at lot end	Yes, No	Sets whether to output an assist SRQ4E when a lot end assist occurs. Yes: Output SRQ4EH No: Do not output SRQ4EH

GPIB Parameters Menu (3 of 4)

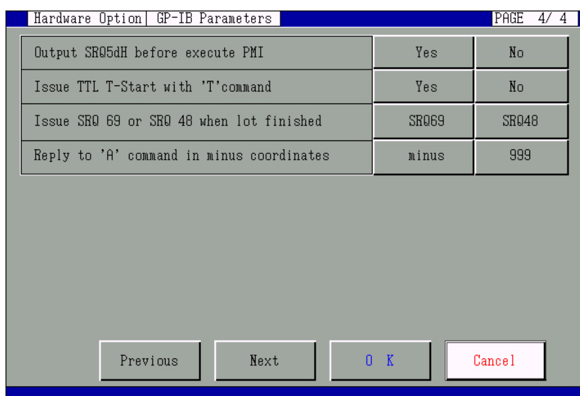


GPIB Communication Menu (3/4) Parameters

Item	Settings	Content
SRQ 4D Output count at consecutive failures	Number of Die, Not Output	Sets whether to output SRQ4DH when a continuous fail occurs. Number of Die: Output a SRQ4D for every die in which a continuous fail occurs. For example, if four die fail, four SRQ4DH are sent to the tester. Not Output: Do not output a SRQ4DH to the tester.
Correspond to p1, p2 command	Yes, No	Sets whether to support probe polish command p1 and p2. Yes: Support p1 and p2 commands. Processing of p commands is also changed. See each command format for details. No: Do not support p1 and p2 commands.
Output SRQ4EH for Assist During PMI	Yes, No	Sets whether to output SRQ4EH when an assist occurs during PMI. Yes: Output SRQ4EH for an assist that occurs during PMI. No: Do not output an SRQ4EH for an assist that occurs during PMI.
Output SRQ4EH for Assist During IDI	Yes, No	Sets whether to output SRQ4EH when an assist occurs during IDI. Yes: Output SRQ4EH for an assist that occurs during IDI. No: Do not output an SRQ4EH for an assist that occurs during IDI.
Z Position at Initial Die	Contact, Separate	Sets the Z axis position when SRQ46 (SRQ4A) is output after moving to the initial die. Contact: Z axis is in the contact position after the stage moves to the initial die. Separate: Z axis is in the separate position after the stage moves to the initial die. The prober needs a Z command to make contact.

Item	Settings	Content
`Output SRQ62H at the StopSW make testing stop`	YES, NO	Sets whether to output SRQ62 when the prober stops the movement of the XY stage transfer command because of the Stop switch. SRQ to the XY stage transfer command will be output after the Stop switch. YES: Output SRQ62H when the prober stops the movement of the XY Stage transfer command because of the Stop switch. NO: Do not output SRQ62H when the prober stops the movement of the XY Stage transfer command because of the Stop switch.
`Adapt to the IG Version 2.4`	YES, NO	Sets whether to use KLA Integrator's software version 2.4. YES: Use the KLA Integrator's software version 2.4. NO: Do not use the KLA Integrator's software version 2.4.
`Output SRQ47H at the Off wafer with X, Y, I, J, b`	YES, NO	Sets whether the return SRQ signal should be 47 when shifting to OFF wafer on the X,Y, I, J, b command. This parameter is active when `Drived Off Wafer with X,Y, I, J, b` is set to YES. Sets whether the prober will output an SRQ47H signal when the stage moves outside of the control map area. YES: Output SRQ47H. When the `Drive Off Wafer with X, Y, I, J, b` is set to YES, the stage can move outside of the control map area. When the stage moves outside the control map area, the prober outputs a SRQ4FH signal which means that test are completed. Some testers, however, want the prober to output a SRQ47H signal when the stage moves outside of the control map area. NO: Do not output SRQ47H.

GPIB Parameters Menu (4 of 4)



GPIB Communication Menu (4/4) Parameters

Item	Settings	Content
`Output SRQ5dH before execute PMI`	YES, NO	Sets whether the prober will output a SRQ5dH signal before PMI begins. YES: Output SRQ5dH. NO: Do not output SRQ5dH.

Item	Settings	Content
Issue T-Start with T Command	YES, NO	Sets whether tester I/F should output the T-start signal when receiving the T command. YES: Output the T-start signal. NO: Do not output the T-start signal.
Issue SRQ69 or SRQ48 when lot finished	SRQ69, SRQ48	Sets SRQ when lot is finished. SRQ69: Output SRQ69H. SRQ48: Do not output SRQ48H.
Reply to 'A' command in minus coordinates	MINUS, 999	Can select the coordinate data format to return with respect to the “A” command when a coordinate is negative value. MINUS: When sending a negative coordinate applied with a minus sign at the beginning. 999: When sending 999.

8.6 SACC Setup Menu 0244.2

1 Use the following steps to access the *SACC Setup Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

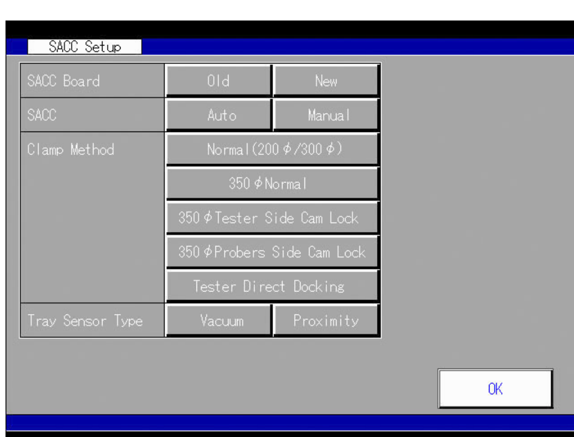
1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Enter your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu*is displayed.

1.5 Press SACC SETUP on page 2 of the *Hardware Options Item Selection Menu*. The *SACC Setting Menu* is displayed.

SACC Setting Menu



2 Set each parameter. Refer to the table below for a description and explanation of each menu option.

3 After confirming all of the settings, press OK on the *SACC Setting Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are entered, and the *Hardware Options Item Selection Menu* is displayed.

SACC Setup Menu Parameters

Item	Setting	Content
SACC Board	OLD, NEW	Sets the type of SACC board Press OLD to set the old type of SACC board. Press NEW to set the new type of SACC board.

Item	Setting	Content
SACC	AUTO, MANUAL	Sets the SACC operation mode. Some functions on the new type of SACC board. Front cover sensor reading function Pogo pin ring operation function 350 Ø card holder may be used Additional messages Press AUTO to set the SACC operation mode to automatic. Press MANUAL to set the SACC operation mode to manual (transfer operations inside the stage are automatic.
Clamp Method	NORMAL (200 Ø/300 Ø), 350 Ø NORMAL 350 Ø TESTER SIDE CAM LOCK, 350 Ø PROBERS SIDE CAM LOCK, TESTER DIRECT DOCKING, TEST HEAD MANUAL LOCK, TESTER SIDE 2IF LOCK	Sets the clamping method of the card holder. Press NORMAL (200 Ø/300 Ø) to set a card holder size of 200 Ø/ 300 Ø. Use when clamping the card holder with the card lock mechanism on the normal insert ring. Press 350 Ø NORMAL to set a card holder size of 350 Ø. Use when clamping the card holder with the card lock mechanism on the normal insert ring. Press 350 Ø TESTER SIDE CAM LOCK to set a card holder size of 350 Ø. Use when clamping the card holder with the cam lock insert ring that fastens to the tester with a vacuum. Press 350 Ø PROBERS SIDE CAM LOCK to set a card holder size of 350 Ø. Use when clamping the card holder to the prober with a cam lock insert ring. Press TESTER DIRECTION DOCKING when the tester can connect directly to the probe card.
Tray Senser (Sensor) Type	VACUUM, PROXIMITY	Sets the type of card-tray sensors that detect the presence of a probe card, either vacuum or proximity. VACUUM: The type of tray sensor is vacuum. PROXIMITY: The type of tray sensor is proximity.

8.7 Testing Control Menu 0245.2

1 Use the following steps to access the *Testing Control Menu (1/2)*.

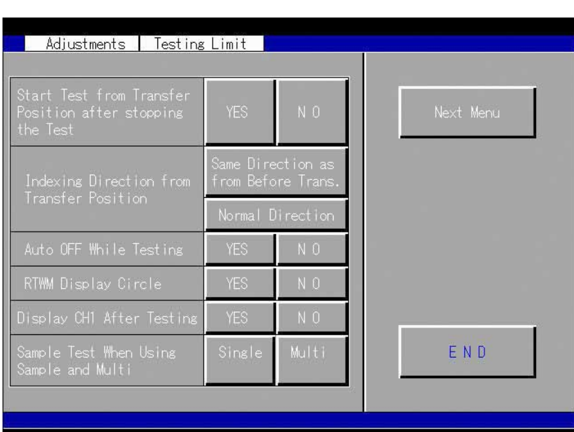
1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press TESTING LIMITATION on the *Adjustments Menu*. The *Testing Control Menu (1/2)* is displayed.

Testing Control Menu (1/2)



2 Set each parameter. Press NEXT MENU or PREVIOUS MENU to access all four pages of the *GPIB Parameters Menu*. Refer to the table below for a description and explanation of each menu option.

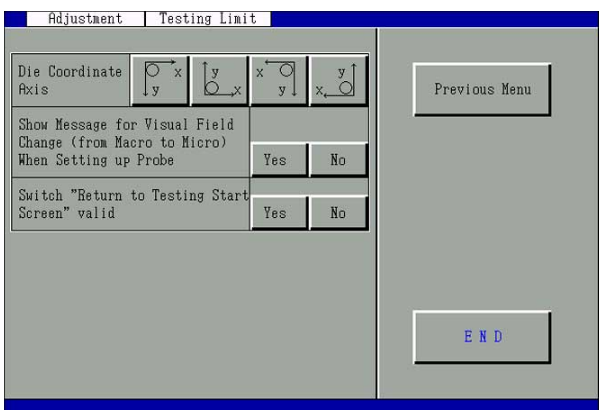
3 After confirming all of the settings, press END on the *Testing Control Menu (1/2)*. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

Testing Control Menu Parameters

Item	Settings	Content
Start Test from Transfer Position After Stopping the Test	YES, NO	Sets whether to display the *Restart After Stop Menu* when restarting a test. This menu will appear after stopping a test. On the *Restart After Stop Menu*, you can select from which die position to restart. Press YES to display the *Restart After Stop Menu*. Press NO to avoid displaying the *Restart After Stop Menu*.
Indexing Direction from Transfer Position	SAME DIRECTION AS FROM BEFORE TRANS., NORMAL DIRECTION	Sets whether the stage should continue stepping in the same direction in which it was moving before STOP was selected. Press SAME DIRECTION AS FROM BEFORE TRANS. to step in the same direction after a stop. Press NORMAL DIRECTION to step in the opposite direction after a stop. Note: NORMAL DIRECTION can only be set under the following conditions: single testing, Optimum Probing Mode is 3, Multi-Testing mode is not set to FREE, and the transfer amount is a positive multiplier of the Y direction die.

Item	Settings	Content
Auto OFF While Testing	YES, NO	Sets the LCD Touch Screen backlight status during testing. Press YES to extinguish the backlight during testing. Press NO to keep the backlight ON. Note: Even if this setting is set to NO, the backlight for the LCD touch screen extinguishes after a preset amount of time if it is not used during testing. The light comes on again when the screen is touched.
RTWM Display Circle	YES, NO	Sets whether to display a yellow line around the wafer on the *Real Time Wafer Map (RTWM)* Press YES to display a line around the wafer. Press NO to avoid displaying a line around the wafer.
Display CH1 After Testing	YES, NO	Sets whether to display the CH1 die position. The channel 1 die position is displayed in a yellow frame. Press YES to display the channel 1 die position. The channel 1 die position is displayed in a yellow frame. Press NO: to avoid displaying the channel 1 die position.
Sample Test When Using Sample and Multi	SINGLE, MULTI	Sets whether to look at only one die during a sample test or to look at multiple die.

Testing Control Menu (2/2)



Testing Control Menu Parameters

Item	Settings	Content
Die Coordinate Axis	Refer to the diagram and the figure above this table.	Test using the selected coordinate axis. 1. The origin is placed in the upper left corner. 2. The origin is placed in the lower left corner. 3. The origin is placed in the upper right corner. 4. The origin is placed in the lower right corner.

Item	Settings	Content
Show Message for Visual Field Change (from Macro to Micro) When Setting Up Probe	YES, NO	Sets whether to display a check message before changing the visual field from macro to micro when setting up the prober. YES: Display the check message. NO: Do not display the check message.
Switch "Return to Testing Start Screen" valid	YES, NO	YES: Return to *Testing Start Menu* when stopping the Test. NO: Do not return to *Testing Start Menu*when stopping the Test.

8.8 TTL Communications Parameters 0246.1

1 Use the following steps to access the *TTL Parameters --Tester Interface Logics Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

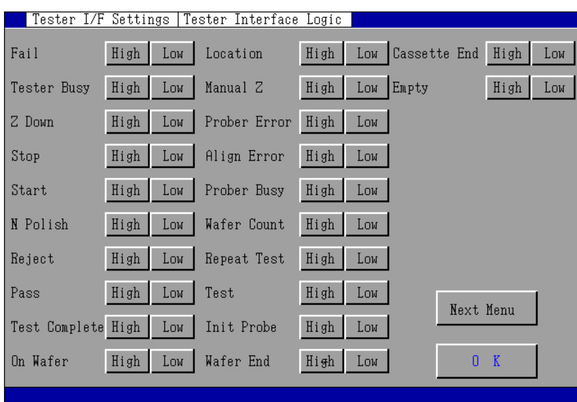
1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Input your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu* is displayed.

1.5 Press TTL PARAMETER SETTING on the *Hardware Options Item Selection Menu*. The *TTL Parameters --Tester Interface Logics Menu* is displayed.

TTL Parameters -- Tester Interface Logics Menu

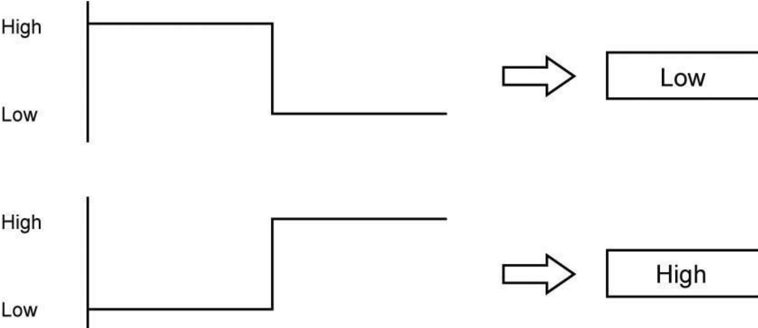


2 Set the ON/OFF conditions of the input and output signals for each item based on tester specifications

2.1 To turn the item on when the signal level changes from high to low, select LOW.

2.2 To turn the item on when the signal level changes from low to high, select HIGH.

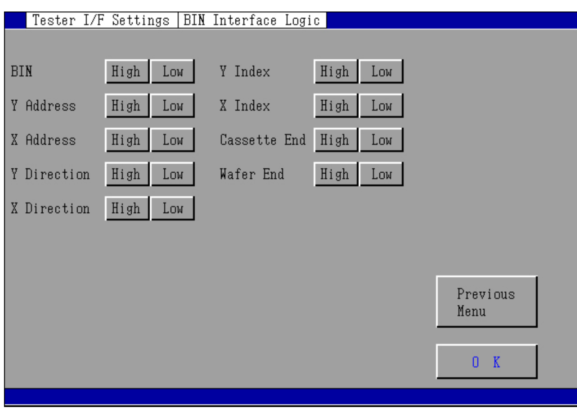
Signal Level



NOTE **To set the test start signal, look for the DIP switches on the front of the TTL board on the main controller. Set these switches to high or low depending upon tester specifications.**

3 After setting all items, press NEXT MENU. The *TTL Parameter -- XY BIN Interface Logics Menu*is displayed.

TTL Parameters -- XY BIN Interface Logics Menu



4 Set the on/off conditions of the input and output signals for each item based upon tester specifications.

4.1 To turn the item on when the signal level changes from high to low, select LOW.

4.2 To turn the item on when the signal level changes from low to high, select HIGH.

5 After setting all items, press OK. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input, and the *Hardware Options Item Selection Menu* is displayed.

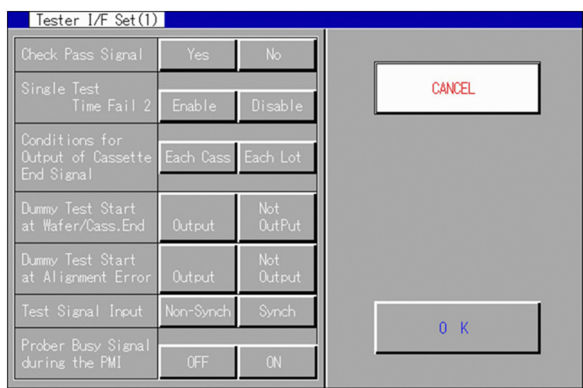
8.9 TTL Interface Parameters Menu 0247.2

Introduction

Overview:

When the TTL communications protocol is used during testing, the TTL interface parameters must be set manually. This procedure describes how to access and save the settings in the*TTL Interface Parameters Menu*, and provides a table describing and explaining each menu option.

Tester I/F Data Set (1) Menu



1 Use the following steps to access the *Tester I/F Data Set (1) Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

1.3 Enter your password on the numeric keypad and press INPUT.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu* is displayed.

1.5 Press TESTER I/F DATA SET (1) on the *Hardware Options Item Selection Menu*. The *Tester I/F Data Set (1)* is displayed.

2 Set each parameter on the *Tester I/F Data Set (1) Menu*. Refer to the table below for a description and an explanation of each menu option.

3 After confirming all of the settings, press OK on the *Tester I/F Data Set (1) Menu*. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are entered, and the *Hardware Options Item Selection Menu* is displayed.

4 Press TESTER I/F DATA SET (2) on the *Hardware Options Item Selection Menu*. The *Tester I/F Data Set (2)* is displayed.

5 Set each parameter on the *Tester I/F Data Set (2) Menu*. Refer to the table below for a description and an explanation of each menu option.

6 After confirming all of the settings, press OK on the *Tester I/F Data Set (2) Menu*. A check menu is displayed stating `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are entered and the *Hardware Options Item Selection Menu* is displayed.

Tester I/F Data Set Menu Parameters

Item	Settings	Content
Check Pass Signal	YES, NO	Sets whether to check the input pass signal from the tester. YES: Check the pass signal and when the pass and fail signals are input at the same time, an error occurs. NO: Do not check the pass signal.
Single Test Time Fail 2	ENABLE, DISABLE	Sets whether to use the input fail 2 signal from the tester. ENABLE: Use the fail 2 signal DISABLE: Do not use the fail 2 signal.
Conditions for Output of Cassette End Signal	EACH CASS., EACH LOT	Sets the output timing of the cassette end output signal from the prober to the tester. EACH CASS.: Output a cassette end signal when all of the wafers in the cassette have been tested. EACH LOT: Output a cassette end signal when the lot 1 wafers have been tested.
Dummy Test Start at Wafer/Cass. End	OUTPUT, NOT OUTPUT	Sets whether to output a test start signal to the tester when wafer end and cassette end signals are sent. OUTPUT: Output a dummy test start signal. The test start signal is output along with the align error signal. NOT OUTPUT: Do not output a dummy test start signal.
Dummy Test Start at Alignment Error	OUTPUT, NOT OUTPUT	Sets whether to output the test start signal to the tester when an align error signal is output. OUTPUT: Output a dummy test start signal. The test start signal is output along with the align error signal. NOT OUTPUT: Do not output the dummy test start signal.
Test Signal Input	SYNCH, NON-SYNCH	Sets the timing the prober uses to receive tested die pass/fail signals from the test result signals (tester data sent from the tester). Set this parameter according to tester specifications, since signal-output timing for pass/fail signals differs among testers. SYNCH: Start reading tester data when receiving the test complete signals. NON-SYNCH: Start reading tester data before transmission of the test start signals.
Prober Busy Signal During PMI	ON,OFF	Select the status of the prober busy signal during PMI. ON: Turns on the prober busy signal during PMI. OFF: Turns off the prober busy signal during PMI
Clear the On-wafer at Wafer End	YES,NO	Select the status of the on-wafer signal when outputting the wafer end signal. YES: Turns off the on-wafer signal before outputting the wafer end signal. NO: Maintains the on-wafer signal for the last tested die before outputting the wafer end signal.

Tester I/F Data Set (2) Menu

Tester I/F Data Set (2) Parameters

Item	Settings	Content
End Dummy Test	YES, NO	Sets whether to receive test complete signals when the test start signal is output as a dummy test start. YES: Receive the test complete signal for the dummy test start. After the test start signal is output, the next test will continue. When the test complete signal is entered, the test start signal is output to test the die. NO: Ignore the test complete input signal for the dummy test start. Ignore the test complete input signal and output test start signal to test the next die.
BUSY Signal Watch Time	0–999 MSEC	Sets the time the prober will wait for the input tester busy signal to go from signal ON to signal OFF. An error will occur if the tester busy signal turns OFF when the designated time is reached. However, when this parameter is set to 0, the prober will enter standby mode until the tester busy signal is OFF.
Test End Signal Watch Time	0–999 MSEC	Sets the time the prober will wait from when the test start signal is output until the test complete signal is entered. An error will occur if the test complete signal is not entered in the designated amount of time. Setting Example: Setting = 0: The prober will enter standby mode until the tester complete signal is OFF.
Wafer End Signal	LEVEL, PULSE	Sets the wafer end signal output method. LEVEL: Output the wafer end signal as a level signal. PULSE: Output the wafer end signal as a pulse signal.
Wafer End Signal Pulse	2–999 MSEC	This parameter is active when `Wafer End Signal` is set to PULSE. Sets the pulse width of the wafer end signal.
Cassette End Signal	LEVEL, PULSE	Sets the FOUP end signal output method. LEVEL: Output the FOUP end signal as a level signal. PULSE: Output the FOUP end signal as a pulse signal.
Cassette End Signal Pulse	2–999 MSEC	This parameter is active when `Cassette End Signal`is set to PULSE. Sets the pulse width of the cassette end signal.

Item	Settings	Content
Wafer Count Signal	LEVEL, PULSE	Sets the wafer count signal output method. LEVEL: Output the wafer count signal as a level signal. PULSE: Output the wafer count signal as a pulse signal.
Wafer Count Signal Pulse	2–999 MSEC	This parameter is active when `Wafer Count Signal` is set to PULSE. Sets the pulse width of the wafer count signal.

Tester I/F Data Set (2) Parameters

Item	Settings	Content
End Dummy Test	YES, NO	Sets whether to receive test complete signals when the test start signal is output as a dummy test start. YES: Receive the test complete signal for the dummy test start. After the test start signal is output, the next test will continue. When the test complete signal is entered, the test start signal is output to test the die. NO: Ignore the test complete input signal for the dummy test start. Ignore the test complete input signal and output test start signal to test the next die.
BUSY Signal Watch Time	0–999 MSEC	Sets the time the prober will wait for the input tester busy signal to go from signal ON to signal OFF. An error will occur if the tester busy signal turns OFF when the designated time is reached. However, when this parameter is set to 0, the prober will enter standby mode until the tester busy signal is OFF.
Test End Signal Watch Time	0–999 MSEC	Sets the time the prober will wait from when the test start signal is output until the test complete signal is entered. An error will occur if the test complete signal is not entered in the designated amount of time. Setting Example: Setting = 0: The prober will enter standby mode until the tester complete signal is OFF.
Wafer End Signal	LEVEL, PULSE	Sets the wafer end signal output method. LEVEL: Output the wafer end signal as a level signal. PULSE: Output the wafer end signal as a pulse signal.
Wafer End Signal Pulse	2–999 MSEC	This parameter is active when `Wafer End Signal` is set to PULSE. Sets the pulse width of the wafer end signal.
Cassette End Signal	LEVEL, PULSE	Sets the cassette end signal output method. LEVEL: Output the cassette end signal as a level signal. PULSE: Output the cassette end signal as a pulse signal.
Cassette End Signal Pulse	2–999 MSEC	This parameter is active when `Cassette End Signal` is set to PULSE. Sets the pulse width of the cassette end signal.
Wafer Count Signal	LEVEL, PULSE	Sets the wafer count signal output method. LEVEL: Output the wafer count signal as a level signal. PULSE: Output the wafer count signal as a pulse signal.
Wafer Count Signal Pulse	2–999 MSEC	This parameter is active when `Wafer Count Signal` is set to PULSE. Sets the pulse width of the wafer count signal.

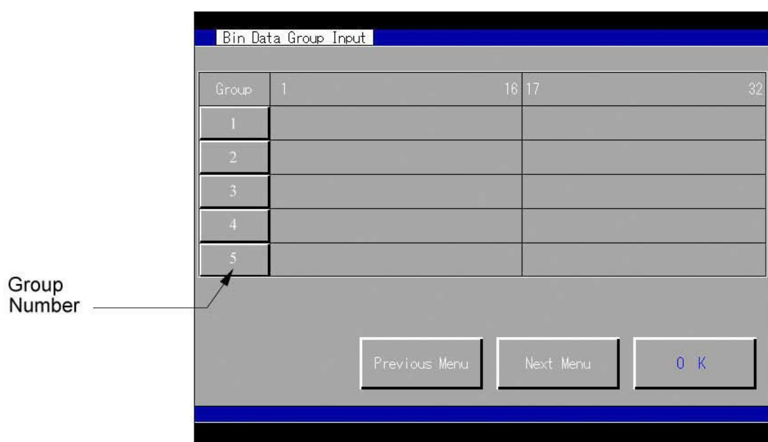
8.10 BIN Data Group Input Menu 0249.1

Introduction

Overview:

The *BIN Data Group Input Menu* controls the BIN data groups and allows the user to check pass/fail categories and multiple BIN data ordering.

BIN Data Group Input Menu



Using the BIN Data Group Input Menu

1 Use the following steps to access the *BIN Data Group Input Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*. The *Adjustments Menu* is displayed.

1.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

1.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

1.4 Press HARDWARE OPTIONS on the *Adjustments Menu*. The *Hardware Options Item Selection Menu* is displayed.

1.5 Press BIN DATA GROUP INPUT on the *Hardware Options Item Selection Menu*. The *BIN Data Group Input Menu* is displayed.

2 Set a category for each group number. When a group number is pressed, a keyboard is displayed. Use the keyboard to input the categories (1 -5, A - S) and press RETURN. To change the group display list, press NEXT MENU.

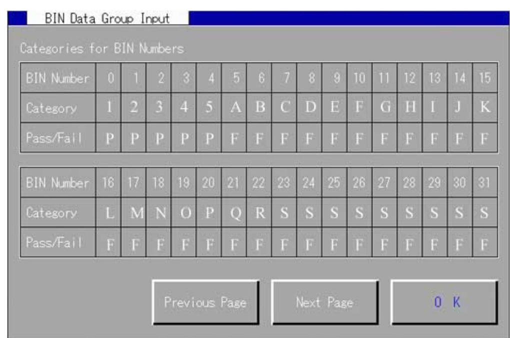
3 After confirming all of the settings, press OK on the *BIN Data Group Input Menu.* A check menu is displayed stating `Rewrite the Data.` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

Checking Pass/Fail Categories

4 Press BIN DATA GROUP INPUT on the *Hardware Options Item Selection Menu.*

5 Press NEXT MENU twice. The *Categories Corresponding to BIN Numbers Menu* is displayed.

▼ **BIN Data Group Input -- Categories Corresponding to BIN Numbers Menu**



6 Check the categories and pass/fail classes. The contents displayed vary according to the settings for the BIN data groups made in `BIN Data Group Input`.

6.1 When `BIN Types` is set to STANDARD: Pass Category = 1-5, Fail Category = A-S.

6.2 When `BIN Types` is set to EXTERNAL SETTING. BIN data is set on a PC and loaded to the prober.

7 After checking, press OK. The *Hardware Options Item Selection Menu* is displayed.

NOTE **To alter the categories or Pass/Fail classes, make changes on a PC and then load them onto the prober.**

Checking Multiple BIN Data Ordering

8 Press BIN DATA GROUP INPUT on the *Hardware Options Item Selection Menu*.

9 Press NEXT MENU three times. The *BIN Data Input Menu* is displayed.

▼ **BIN Data Input Menu**

10 Check the priority order. The choices displayed vary according to the settings for the BIN data groups made on previous menus.

NOTE **When BIN Type is set to** EXTERNAL SETTING**, BIN data is displayed in the priority order set on the PC.**

When BIN Type is set to STANDARD:

- Pass/Fail Order = Fail Ordering
- Low/High Order = Low Ordering
- Category for No BIN input = S

11 After checking, press OK. The *Hardware Options Item Selection Menu* is displayed.

NOTE **To change priority ordering, make the changes on a PC and then load them onto the prober.**

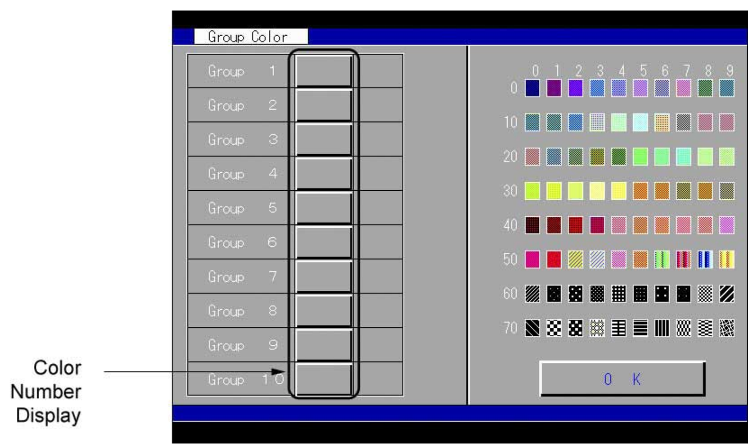
8.11 Group Color Selection Menu 0248.1

Introduction

Overview:

The *Group Color Selection Menu* provides a selection of group colors for BIN data. This section explains how to change the menus and set the parameters.

Group Color Selection Menu



1 Use the following steps to access the *Group Color Selection Menu*.

1.1 Press DIAGNOSTICS on the *Main Menu*.

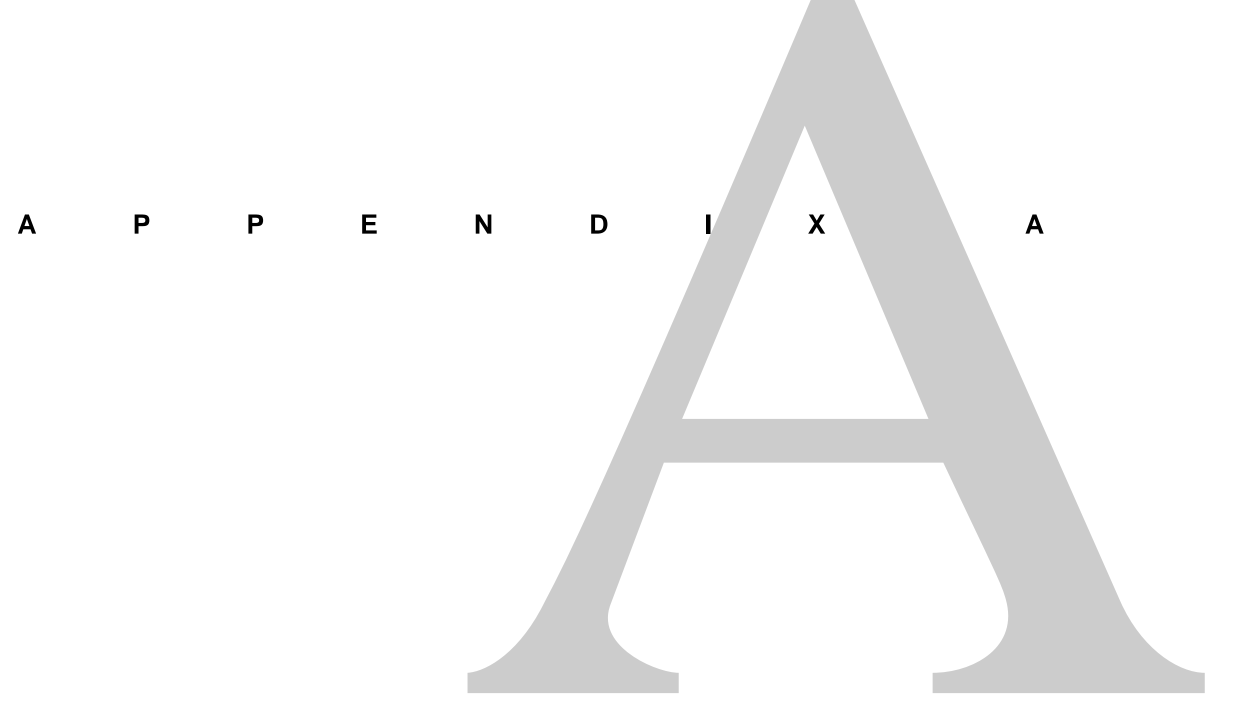
1.2 Press TESTING ITEMS on the *Diagnostics Menu*. The *Testing Items Menu* is displayed.

1.3 Press GROUP COLOR on the *Testing Items Menu*. The *Group Color Selection Menu* is displayed.

2 To set the group color, press the color number display. A numeric keypad is displayed. Input the designated color number and press OK. The color number is input.

3 After confirming all of the settings, press OK on the *Group Color Selection Menu*. A check menu is displayed stating `Rewrite the data?` If the settings are correct, press YES. The settings are input and the *Diagnostics Menu* is displayed.

A P P E N D I X A



Software Hierarchy

This appendix presents the P-12XL Software Hierarchy for version Rzz02–R014.04.

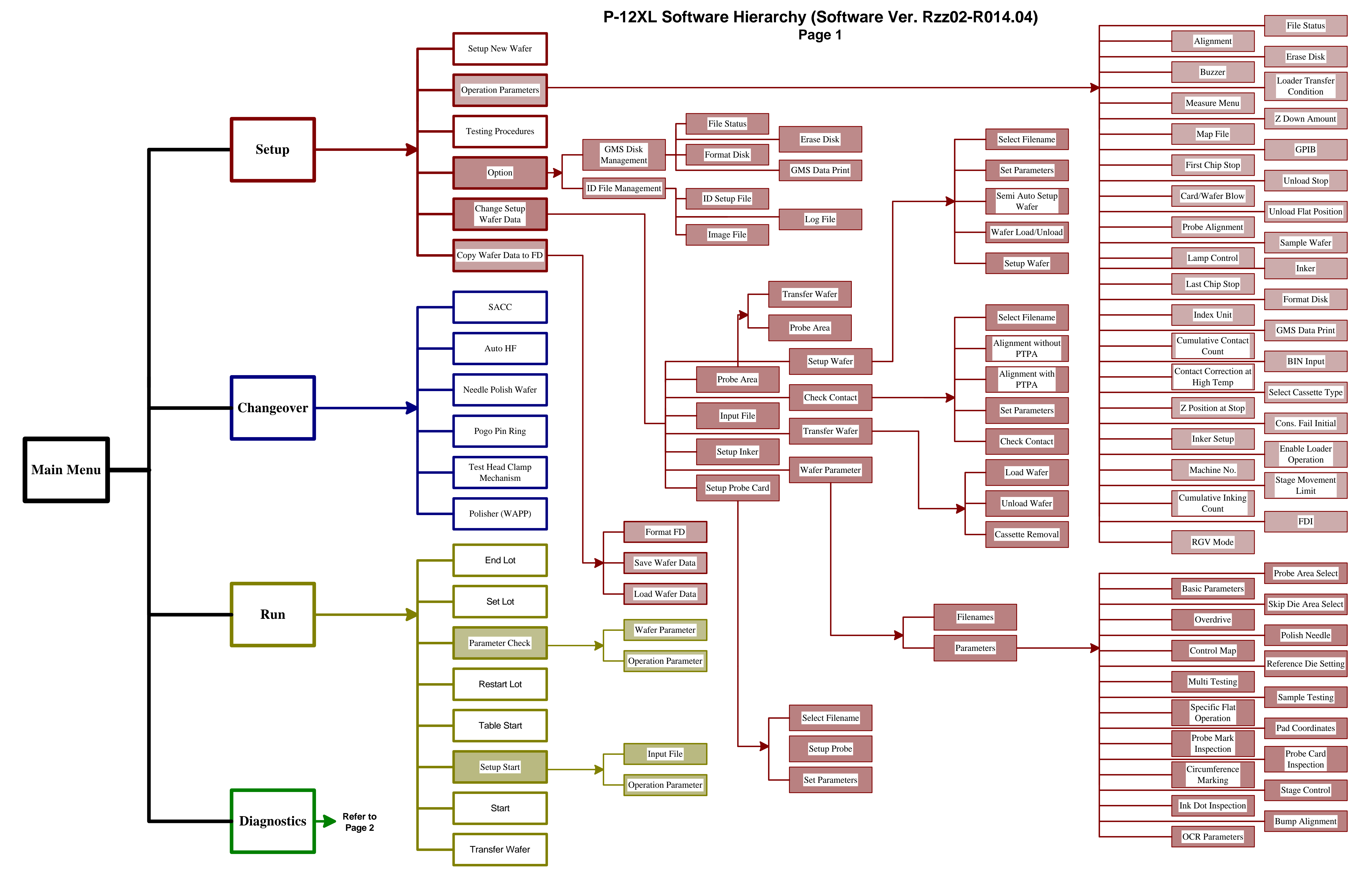
A.1 Software Hierarchy softwarehierarchy.1

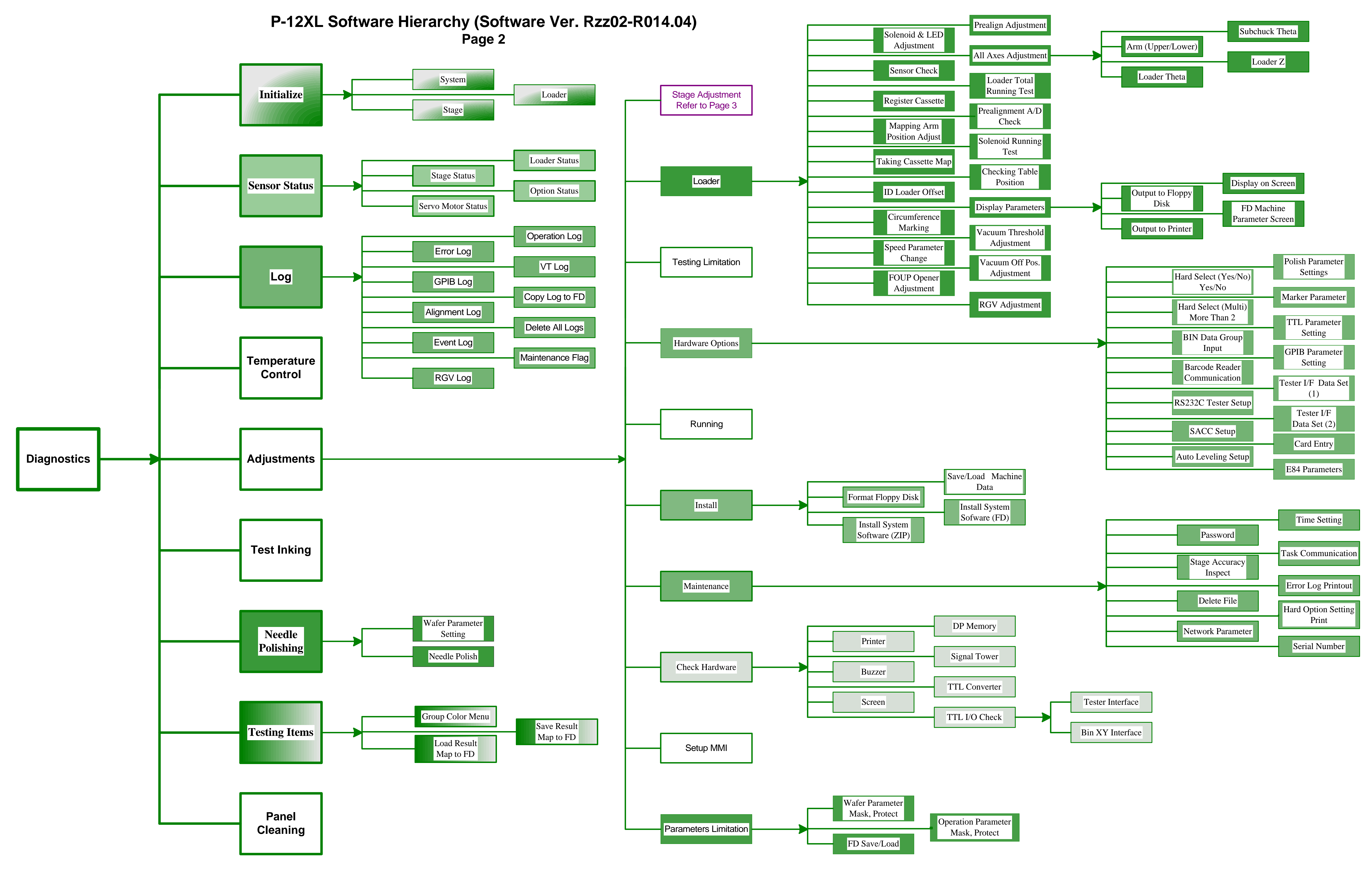
The hierarchy flows from left to right, with each arrow pointing to the available menu options displayed on the screen. The main menu paths (*Setup Menu*, *Changeover Menu*, *Run Menu*, *Diagnostics Menu* and *Stage Adjustment Menu*) are color-coded to illustrate menu options displayed on the touch screen. Each successive branch in the hierarchy displays a unique pattern to facilitate menu navigation.

Appendix Contents

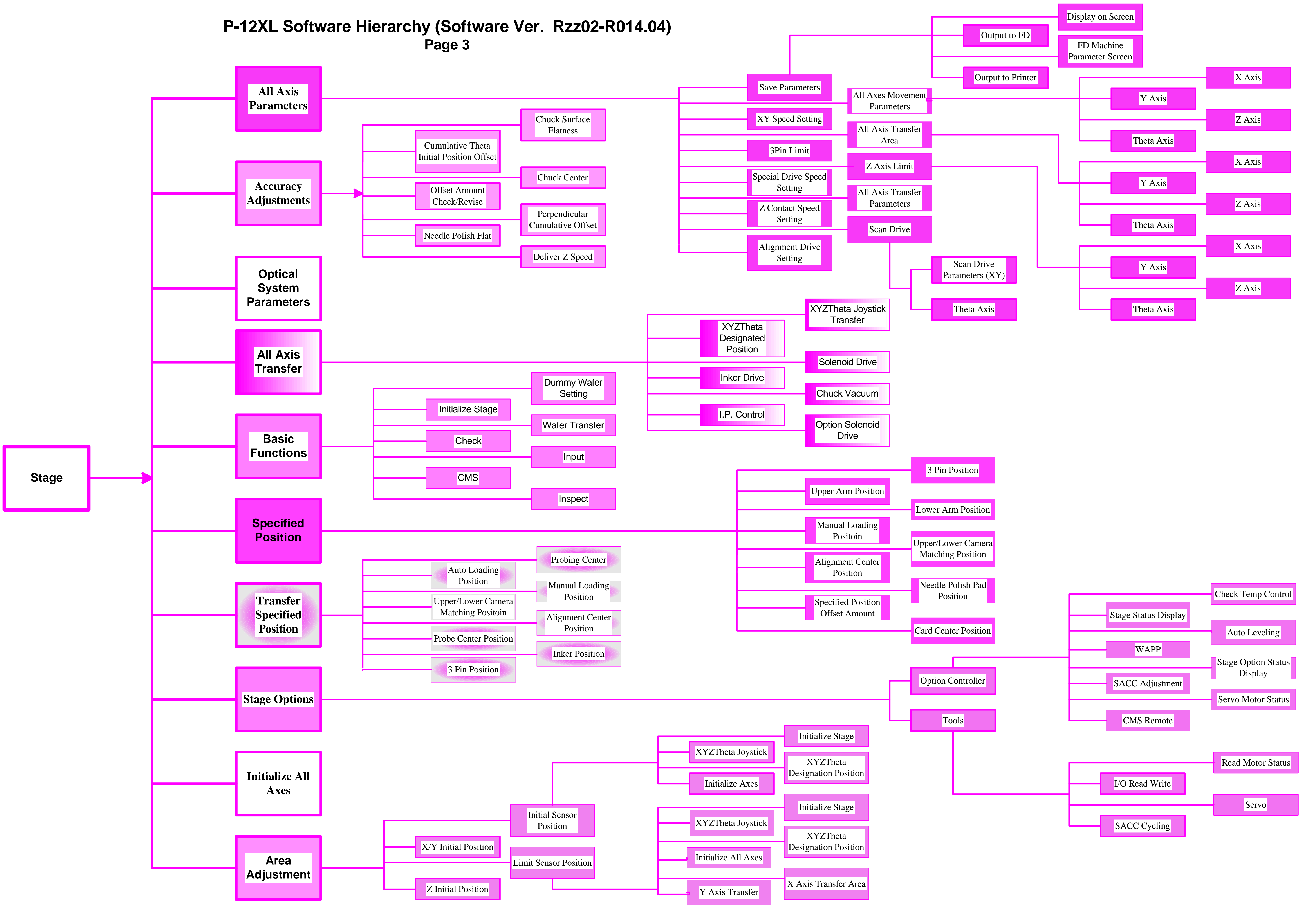
The software hierarchy is broken into three pages. Use the following list to locate the necessary software screen or menu branch.

- **Figure 1** : *Setup Menu*, *Changeover Menu*, and *Run Menu*
- **Figure 2** : *Diagnostics Menu*
- **Figure 3** : *Diagnostics Menu* > *Adjustments Menu* > *Stage Adjustment Menu*


P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)
Page 1
Main Menu
Setup
Changeover
Run
Diagnostics
Refer to Page 2
Setup New Wafer
Operation Parameters
Testing Procedures
Option
Change Setup Wafer Data
Copy Wafer Data to FD
SACC
Auto HF
Needle Polish Wafer
Pogo Pin Ring
Test Head Clamp Mechanism
Polisher (WAPP)
End Lot
Set Lot
Parameter Check
Restart Lot
Table Start
Setup Start
Start
Transfer Wafer
GMS Disk Management
ID File Management
File Status
Format Disk
Erase Disk
GMS Data Print
ID Setup File
Log File
Image File
Transfer Wafer
Probe Area
Setup Wafer
Probe Area
Check Contact
Input File
Transfer Wafer
Setup Inker
Wafer Parameter
Setup Probe Card
Select Filename
Set Parameters
Semi Auto Setup Wafer
Wafer Load/Unload
Setup Wafer
Select Filename
Alignment without PTPA
Alignment with PTPA
Set Parameters
Check Contact
Load Wafer
Unload Wafer
Cassette Removal
Format FD
Save Wafer Data
Load Wafer Data
Wafer Parameter
Operation Parameter
Input File
Operation Parameter
Select Filename
Setup Probe
Set Parameters
Filenames
Parameters
File Status
Alignment
Erase Disk
Buzzer
Loader Transfer Condition
Measure Menu
Z Down Amount
Map File
GPIB
First Chip Stop
Unload Stop
Card/Wafer Blow
Unload Flat Position
Probe Alignment
Sample Wafer
Lamp Control
Inker
Last Chip Stop
Format Disk
Index Unit
GMS Data Print
Cumulative Contact Count
BIN Input
Contact Correction at High Temp
Select Cassette Type
Z Position at Stop
Cons. Fail Initial
Inker Setup
Enable Loader Operation
Machine No.
Stage Movement Limit
Cumulative Inking Count
FDI
RGV Mode
Probe Area Select
Basic Parameters
Skip Die Area Select
Overdrive
Polish Needle
Control Map
Reference Die Setting
Multi Testing
Sample Testing
Specific Flat Operation
Pad Coordinates
Probe Mark Inspection
Probe Card Inspection
Circumference Marking
Stage Control
Ink Dot Inspection
Bump Alignment
OCR Parameters


P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)
Page 2
Diagnostics
Initialize
System
Loader
Stage
Sensor Status
Loader Status
Stage Status
Option Status
Servo Motor Status
Log
Operation Log
Error Log
VT Log
GPIB Log
Copy Log to FD
Alignment Log
Delete All Logs
Event Log
Maintenance Flag
RGV Log
Temperature Control
Adjustments
Test Inking
Needle Polishing
Wafer Parameter Setting
Needle Polish
Testing Items
Group Color Menu
Save Result Map to FD
Load Result Map to FD
Panel Cleaning
Stage Adjustment Refer to Page 3
Loader
Prealign Adjustment
Solenoid & LED Adjustment
All Axes Adjustment
Sensor Check
Loader Total Running Test
Register Cassette
Prealignment A/D Check
Mapping Arm Position Adjust
Solenoid Running Test
Taking Cassette Map
Checking Table Position
ID Loader Offset
Display Parameters
Circumference Marking
Vacuum Threshold Adjustment
Speed Parameter Change
Vacuum Off Pos. Adjustment
FOUP Opener Adjustment
RGV Adjustment
Subchuck Theta
Arm (Upper/Lower)
Loader Z
Loader Theta
Display on Screen
Output to Floppy Disk
FD Machine Parameter Screen
Output to Printer
Testing Limitation
Hardware Options
Polish Parameter Settings
Hard Select (Yes/No) Yes/No
Marker Parameter
Hard Select (Multi) More Than 2
TTL Parameter Setting
BIN Data Group Input
GPIB Parameter Setting
Barcode Reader Communication
Tester I/F Data Set (1)
RS232C Tester Setup
Tester I/F Data Set (2)
SACC Setup
Card Entry
Auto Leveling Setup
E84 Parameters
Running
Install
Save/Load Machine Data
Format Floppy Disk
Install System Sofware (FD)
Install System Software (ZIP)
Maintenance
Time Setting
Password
Task Communication
Stage Accuracy Inspect
Error Log Printout
Delete File
Hard Option Setting Print
Network Parameter
Serial Number
Check Hardware
DP Memory
Printer
Signal Tower
Buzzer
TTL Converter
Screen
TTL I/O Check
Tester Interface
Bin XY Interface
Setup MMI
Parameters Limitation
Wafer Parameter Mask, Protect
Operation Parameter Mask, Protect
FD Save/Load

P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)
Page 3



Glossary

Numeric

arm unit Takes wafers from the carriers and places them on the chuck top. Comprised of an upper arm, lower arm, mapping arm, prealignment sensor, mapping, subchuck, vacuum sensor, vacuum solenoid; located on a the Z axis ball screw with four ball splines.

assist An assist situation is one where the prober requires user assistance to continue work.

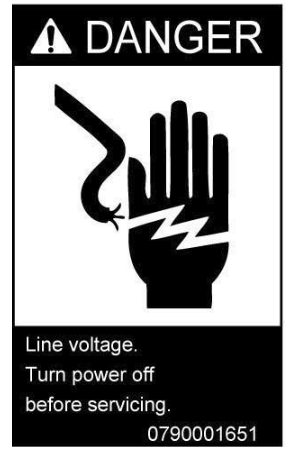
auto HF unit (Automatic High Frequency Balancing Unit). Holds the test head and is used to rotate it onto and off of the prober.

BIN data BIN data are subdivision data for handling categorized pass and fail test results. BIN data are converted by the prober to category symbols. These are grouped into the pass categories and fail categories. Pass categories are symbolized by “1-5” and fail categories are symbolized by “A-S”.

bridge unit Moves the alignment bridge in the Y direction. Comprised of the alignment bridge, rodless cylinder, and bridge position detection sensor.

carrier Term used for cassette or FOUP.

caution On the equipment, a user will see caution labels like the ones below:



The symbol displayed below is used to signify a caution notice within this manual.

Caution notices are used when the hazard posed to equipment or personnel is minor. Examples of minor hazards to personnel include skin irritation, non-ionizing exposure to radiation, minor cuts, etc. Examples of minor hazards to equipment include burned connectors, chemical spills within the equipment, etc. Within manuals, you will see caution notices within line delimited paragraphs containing a caution graphic like the one used in this paragraph.

chuck unit Comprised of the main chuck, which wafers are placed upon for testing, X and Y servo packs, and q and Z stepping motors. These motors allow the chuck to move in X, Y, Z, and theta directions during testing.

contact check Checks the position at which the probes make contact with the wafer.

control map Contains the testing and skip area data that will be used during testing. A map may be created on the PC or on the prober itself.

Cu Copper.

danger The symbol displayed below is used to signify a danger notice within this manual.

⚠ DANGER

Danger notices are used when the hazard posed to equipment or personnel is catastrophic and/or severe. Examples of severe hazards posed to personnel include extensive burns, eye damage, loss of limb, bone damage, etc., or death. Examples of catastrophic hazards posed to equipment include loss of the entire tool, loss of the FAB, systems within the tool destroyed, etc. Within manuals, you will see danger notices within line delimited paragraphs containing a danger graphic like the one used in this paragraph.

DP Dew Point.

EMO Emergency Machine Off. Located on front and back of prober.

error An error situation is one where the prober requires the user to initialize or perform some other corrective action to enable the prober to function properly.

ESD Electrical Static Discharge.

floppy drive Loads or copies wafer, operational, and prober parameters to and from floppy disks. Located near bottom front of stage next to the motor drive unit.

FOUP Front Opening Unified Pod; used for loading wafer boats.

GFCI Ground Fault Circuit Interrupter.

hazard signs See Danger, Warning, and Caution.

hazardous energy Energy of 20 Joules or more, or an available continuous power level of 240 VA or more, at a potential of 2V or more.

head plate The top cover of the prober; the probe card is attached to it and the tester rests on top of it. Four cap screws, which hold the head plate in place, are located on top of it.

hot chuck monitor Displays the current temperature of the chuck top, the set temperature, and the temperature control status. Located directly above the touch screen panel.

interlock Interlocks are activated when a cover is not completely closed or is opened during probing. When activated, an interlock cuts the power supply to stage and/or loader motors stopping their movement and preventing injury.

IPA Isopropyl Alcohol. (Ch3)2CHOH. A volatile flammable liquid secondary alcohol made by hydration of propylene by means of sulfuric acid. Used as a solvent and as a source of rubbing alcohol. Often mixed with water for dilution.

keyboard Displayed upon the touch screen; resembles PC keyboard.

kPa Kilo (thousand) Pascals. 1 kPa is equal to 1,000 (103) Pascals or 0.145 psi (pounds per square inch).

LED Light Emitting Diode. A specially designed semiconductor p-n junction that, when forward biased, emits incoherent optical radiation. In some applications, these devices are used in place of light bulbs as indicators. In other applications, LEDs are paired with photodiodes to provide electrical feedback to an input circuit. In such applications, the light is typically in the infrared spectrum and not visible.

LM guide Linear Motion Guide; a V-groove type rail located on either side of the X stage and Y stage that ensures motion is parallel to the ball screw drive. The mapping arm is operated by a rodless cylinder. Term is used interchangeably with linear way.

loader unit Removes wafers from their FOUPs and loads them onto the stage. Comprised of the FOUP and arm unit.

loader Z axis stepping motor Five-phase stepping motor with four ball splines.

lock out device Located on the back of the prober, this device stops power flow to the prober when activated. Utilized during maintenance work on the prober to ensure safety.

MAGIC Pattern matching method.

main controller Stores the computer boards which control various prober functions.

MPa Mega (million) Pascals. 1 MPa is equal to 1,000,000 (106) Pascals or 145.04 psi (pounds per square inch).

MSDS Material Safety Data Sheet. A published specification that provides details on a particular chemical or chemical compound. FABs have these sheets on-hand for all chemicals used within the facility.

NFB Non-Fused Breaker. This is another term for circuit breaker.

numeric keypad Displayed on the touch screen; resembles standard ten key touch pad.

PBET Performance-based equipment training.

PCB Printed Circuit Board; located in the bottom, rear of loader.

PCI Probe Card Inspection.

photodiode A specially designed p-n junction that exhibits alterations in conductance in response to photons.

PMI Probe Mark Inspection.

pogo pin ring Gold ring on the top of the prober that locks down the test head.

PTPA Probe-to-Pad Alignment.

OCR Optical Character Recognition.

RDP Robin Duling Protocol.

RTWM Real-Time Wafer Map.

running test Selection in the Adjustments Menu. Runs every major process of the prober in a demonstration mode (e.g., no wafers are actually probed). Allows for a visual and general inspection of the prober to ensure that it is operating normally.

SACC Semi-Automatic Card Changer.

SACC cover lock Locks for lifting and lowering the tray and moving inside the prober.

SEMI hot work level SEMI has defined four Hot Work Levels to indicate the type and severity of electrical hazards that are present to personnel while working on a particular piece of equipment. The following is a description of each Hot Work Level:

- Type 1
  Equipment is fully de-energized (electrically cold). This includes all uninterrupted power supplies.
- Type 2
  Equipment is energized. Live circuits are covered or insulated. Work is performed at a remote location to preclude accidental shock.
- Type 3
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Potential exposures are less than 30 VRMS, 42.2 volts peak, 240 volt-amps, and 20 Joules. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.
- Type 4
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Voltage potentials are higher than 30 VRMS, 42.2 volts peak, 240 volt-amps, 20 Joules, or radio frequency (rf) energy is present. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.

side loader tray Holds individual wafers and polishes wafers.

stage unit Properly aligns wafers for probing, and then transfers them to the main chuck for testing. Comprised of the chuck and bridge units.

stage vacuum sensors Sensors are grouped together on the front of the X stage next to the vacuum sensor grouping.

touch screen The main Graphic User Interface (GUI) for the tool located on the far left if the prober. The touch screen provides feedback information of the prober and accepts command inputs from the user to control and program the prober's operation.

VME Virsa Modular European. This is a busing standard.

VT log Visual Terminal Code Log.

WAPP Wide Area Polish Plate.

WC Tungsten Carbide.

W PC Tungsten Probe Card.

warning The symbol displayed below is used to signify a warning notice within this manual.

Warning notices are used when the hazard posed to equipment or personnel is moderate. Examples of moderate hazards to personnel include electrical shock, strains/sprains, less extensive burns, etc. Examples of moderate hazards to equipment include major component loss, utility lines becoming contaminated, broken wires, etc. Within manuals, you will see warning notices within line delimited paragraphs containing a warning graphic like the one used in this paragraph.

XY stage unit Moves the chuck in the X and Y directions. Comprised of the solenoid box, X axis servo motor, and Y axis servo motor.

Z axis stepping motor Two-phase stepping motor that moves the chuck top in Z axis direction.

Index

A

Acceleration Codes, table........................ 394
alignment
Align Wafer Setup Menu, graphic........ 111
operation parameters.......................... 204
Results Display Menu, graphic............ 111
Results Menu, graphic.......................... 82

B

BIN
parameters... 210
BIN data
color selection..................................... 434
group input.. 431

C

Camera Menu, graphic.................... 119, 313
cassette
performing indexer registration............ 386
chapter descriptions................................ 32
color selection, BIN data....................... 434
contact check
changing parameters............................ 301
overview, graphic................................. 112
Wafer File Check Contact Menu, graphic
.... 113
Contact Position Offset Selection Menu, graphic......................... 119, 123, 313, 317
contacting TEL... 35
control map
File Load Menu, graphic....................... 128
loading caution...................................... 54
Creating a Setup File - Advanced, chapter... 249
Creating a Setup File - Basic, chapter..... 49

D

document numbers, defined.................... 33

E

edge correction
entering.. 56

F

File Load Menu, graphic......................... 361
flat orientation
Designation, graphic.............................. 54
floppy disk
inserting, graphic................................. 353
format, text... 34

G

GPIB
communication parameters.................. 414
parameters... 240

I

indexing
indexer registration.............................. 386
setting the units................................... 217

L

loader
parameters... 218
lockout/tagout
performing... 43
releasing.. 46

M

Machine Setup, chapter.......................... 405
menu
BIN Data Group Input.......................... 431
GPIB Parameters................................. 414
Group Color Selection.......................... 434
Hardware Settings (Yes/No)................ 409
Needle Information................................ 62
Set Date/Time...................................... 408
Testing Control.................................... 422
TTL Parameters................................... 425

N

needle tip
modifying positions.............................. 291
notice to reader.. 33
numeric subscripts, description............. 34

O

objective of this manual........................... 32
offices, sales and service........................ 35
operation
parameters.. 202
parameters:modifying.......................... 273
ordering documentation........................... 39
organization of manual............................ 31

P

pads
performing individual pad training......... 264
PMI positions....................................... 251
parameters
Alignment Operation............................ 204
Basic Wafer Settings............................ 146
BIN Input Operations........................... 210
Bump Alignment.................................. 195
Buzzer.. 214
Card/Wafer Blow Operation................. 215
cassette type.. 222
changing probe card............................ 289
Consecutive Fail.................................. 148
consecutive fail:Menu.......................... 232
contact check:changing....................... 301
contact correction at high temperature 197
Contact Count Calculation................... 229
Enable Loader Operation..................... 223
entering basic wafer............................... 54
GPIB.. 240
GPIB:communication........................... 414
Hot Chuck.. 196
Hot Chucl On/Off.................................. 242
Inspection.. 259
Lamp Control....................................... 236
Loader Transfer.................................... 218
Machine Number.................................. 213
Map File... 235
Operation... 202
operation:modifying.............................. 273
Printer.. 237
Probe Alignment.................................. 226
Probe Card Inspection................. 188, 234
Probe Mark Inspection......................... 162
sample wafer....................................... 231
Select Probe Area................................ 169
Select Skip Area.................................. 171
Stage Control....................................... 194
Stage Movement Limit......................... 233
Temp Control Operating Conditions.... 246
Test Menu.. 224
Unload Flat Position............................. 220
wafer, overview.................................... 144
Z Axis... 230
passwords
entering and changing................. 398, 400
PCI
manual prober inspection of needles...342
PMI
checking/disabling the area................. 269
criteria.. 250, 251
entering the area.................................. 266
pad positions....................................... 251
PCI on needle tip if PMI fails................ 342
probe alignment
parameters... 226
probe area
Probe Area Check/Change Menu (Wafer Map), graphic................................... 132
Probe Area Setting Menu (Wafer Map), graphic... 130
Probe Area Setting, graphic................. 131
Probe Area Transfer Menu (Wafer Map), graphic... 134
Select Probe Area Menu, graphic........ 130
probe card
changing parameters........................... 289
entering parameters:parameters:entering probe card.. 59
procedure times, defined......................... 33
PTPA
position corrections...................... 118, 310

R

reference die
input menu (wafer map), graphic......... 127
Revising Data and Inputting, Example, graphic.. 50, 51

S

safety
signal word panels................................ 34
sales offices, listing................................ 35
Series Input, Example, graphic................ 50
service offices, listing.............................. 35
setup file
chapter.. 249
End Setup Menu, graphic.................... 142
Setup Menu (Ex.: After performing a contact check), graphic................................. 141
skip area
Check/Disable Skip Areas Menu (Wafer Map), graphic.................................. 139
deleting... 140
Select Skip Area Menu, graphic........... 139
Skip Area Check/Change Menu (Wafer Map), graphic.................................. 140
Skip Area Setting Menu (Wafer Map), graphic.. 136
Software Utilities, chapter...................... 319
software version....................................... 33

T

text formatting, description..................... 34
training
individual pads.................................... 264
TTL
using the interface parameters menu. . 427
typographical conventions...................... 34

W

wafer
alignment:data, entering........................ 84
alignment:main components.................. 84
alignment:re-entering data.................. 297
file:changing basic parameters............ 281
file:changing specific parameters......... 283
file:Check Contact Menu, graphic........ 113
file:creating:new files from existing files 275
file:creating:revising and inputting method 51
file:creating:series input method............ 50
file:editing existing data................ 279, 285
file:methods for creating........................ 50
Name Keyboard, graphic....................... 53
parameters:entering basic..................... 54
wafer parameters, overview.................. 144

X

XY Offset Display Menu, graphic................................ 120, 314, 317
XY offsets....................................... 118, 310
XY Theta Offset Amount Display Menu, graphic.. 122, 316

Z

Z axis
parameters... 230
Z position
Setting Menu, graphic.................. 125, 312

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9	Removed chapter, Safety. Added chapter, Hazard Control.	2005-03-18
8	Converted from SGML to XML, from TEA DTD v2 to the GTP DTD v1, and added revised content per TEL-AT.	2003-07-23
7	Corresponds to system software version Rzz02-R014.05.	2004-01-23
6	Standard revision.	2003-07-31
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4	Corresponds to system software version Rzz00-R012.15.	2001-08-24
3	Addition of Dual Port, Single Port and Wide Loader specifications	2001-02-19
2	Corresponds to system software version Rzz00-R012.13.	2000-11-13
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