

# **Toho FP Series** Operation Manual

Toho Technology Corporation.

# 1. Top Level Menu



- Scan: Set, select a recipe and a sequence, and measure
- Calibration: Adjust including step height calibration and others
- Configuration: Set including password and others
- Database File Manager: Import, export and delete data and recipe
- Stress: Stress measurement.
- GEM+SECS: Not used.
- Diagnostics Tools: Not used.
- Log Off: Log off Profiler by (SHIFT + double click)

#### 1.1. Scan

Scan Recipe         Scan Recipe Name:         ELLE C           Scan Data         Pecipe Name         Type         Length         Speed         Force         Creation Date           Junce Recipe         Etupe G         20         1000         50         5         02/20/02         15:28           Dillo4         2D         500         50         2         06/13/00         13:32           Dillo5         2D         1000         100         4         08/23/01         13:25           Dillo6         2D         1001         10         0.5         66/08/00         18:25           Dillo6         2D         1000         100         1         06/08/00         18:26           Dillo7         2D         200         20         1         06/08/00         18:26           Dillo9         2D         1000         5         0.5         9/15/01         9/24           Dill12         2D         500         5         2         10/3/01         10/24           Dill13         2D         500         5         2         10/3/01         10/24           Dill13         2D         500         5         2         10/3/01         10/24 </th <th>lit <u>S</u>ubstrate <u>V</u>acuum</th> <th>Host Window Help</th> <th>, ) •</th> <th>2D 3D</th> <th></th> <th></th> <th></th> <th></th>	lit <u>S</u> ubstrate <u>V</u> acuum	Host Window Help	, ) •	2D 3D				
Scan Data         Recipe Name         Type         Length (um)         Speed (um/s)         Force (mg)         Creation Date           equence Recipe         D1103         2D         2000         100         4         08/23/01         13:02           D1104         2D         500         5         2         06/19/00         13:38           D1105         2D         500         5         2         06/08/00         18:25           D1106         2D         1000         10         0.5         06/08/00         18:25           D1107         2D         500         5         2         06/14/00         09:23           D1107         2D         200         201         06/08/00         18:26           D1108         2D         200         20         1         06/08/00         18:26           D1110         2D         200         20         1         06/08/00         18:26           D1110         2D         500         5         2/0/02         10/30/01         10:41           D1112         2D         5000         5         2/0/02         15:37         11           R26         2D         300         50         <	Scan Recipe		Scan Reci	pe Name:	BLUE_	6		
Scan Data         ELUE         G         2D         1000         50         S         02/20/02         15:28           D1103         2D         2000         100         4         08/23/01         13:02           D1104         2D         500         50         2         06/19/00         13:38           D1105         2D         100         10         0.5         06/08/00         18:25           D1107         2D         500         50         2         106/08/00         18:26           D1109         2D         1000         100         1         06/08/00         18:26           D1109         2D         1000         100         1         06/08/00         18:26           D1110         2D         200         20         1         06/08/00         18:24           D1111         2D         100         5         0.5         09/15/01         09:24           D1112         2D         500         50         2         06/19/00         17:22           GREEN_G         2D         611         50         5         02/20/02         15:37           IN         2D         500         50         5 </th <th></th> <th>Recipe Name</th> <th>Туре</th> <th>Length (um)</th> <th>Speed (um/s)</th> <th>Force (mg)</th> <th>Creation Date</th> <th></th>		Recipe Name	Туре	Length (um)	Speed (um/s)	Force (mg)	Creation Date	
equence Recipe         D1103         2D         2000         100         4         08/23/01         13:02           D1104         2D         500         50         2         06/19/00         13:38           D1105         2D         500         5         2         06/08/00         18:25           D1106         2D         100         10         0.5         06/08/00         18:25           D1107         2D         50         2         1         06/08/00         18:26           D1109         2D         1000         100         1         06/08/00         18:26           D1110         2D         200         20         1         06/08/00         18:26           D1109         2D         1000         100         1         06/08/00         18:24           D1111         2D         500         50         2         10/30/01         10:41           D1112         2D         500         50         2         06/19/00         17:22           GREEEN_G         2D         300         50         5         02/20/02         15:37           LIN         2D         300         50         5         0	Scan Data	BLUE G	2D	1000	50	5	02/20/02 15:28	
equence Recipe         Dillo         2D         500         50         2         06/19/00         13:38           bl105         2D         500         5         2         06/08/00         18:25           Dillo6         2D         100         10         0.5         6/08/00         18:25           Dillo7         2D         50         2         1         06/08/00         18:25           Dillo8         2D         25         1         2         06/14/00         09:23           Dillo9         2D         1000         100         1         06/08/00         18:26           Dillo9         2D         1000         10         1         06/08/00         18:26           Dill12         2D         500         5         2         10/30/01         10:41           Dill12         2D         500         5         2         06/19/00         17:22           GREEN_G         2D         50000         1000         5         01/29/02         15:22           R130         2D         50000         50         5         10/20/02         15:22           R65         2D         300         50         5 <t< td=""><td></td><td>D1103</td><td>2D</td><td>2000</td><td>100</td><td>4</td><td>08/23/01 13:02</td><td></td></t<>		D1103	2D	2000	100	4	08/23/01 13:02	
Sequence Recipe       D1105       2D       500       5       2       06/08/00       18:25         D1106       2D       100       10       0.5       06/08/00       18:26         D1107       2D       50       2       1       06/08/00       18:26         D1109       2D       1000       100       1       06/08/00       18:26         D1109       2D       1000       100       1       06/08/00       18:24         D1110       2D       200       20       1       06/08/00       18:24         D1111       2D       100       5       0.5       09/15/01       09:24         D11112       2D       500       5       2       06/09/00       17:22         GREEN_G       2D       611       50       5       02/20/02       15:37         LIN       2D       300       50       2       02/20/02       15:37         R26       2D       300       50       5       02/20/02       15:33         TIME       2D       1000       100       5       02/20/02       14:54         R26       2D       300       50       3       01/30/		D1104	2D	500	50	2	06/19/00 13:38	
Sequence Recipe       D1106       2D       100       10       0.5       06/08/00       18:25         D1107       2D       50       2       1       06/08/00       18:26         D1109       2D       1000       100       1       06/08/00       18:26         D1110       2D       200       20       1       06/08/00       18:26         D1110       2D       200       20       1       06/08/00       18:26         D1111       2D       100       5       0.5       09/15/01       09:24         D1112       2D       500       5       02/20/02       15:37         INN       2D       5000       1000       5       01/29/02       15:22         R130       2D       300       50       2       02/20/02       15:37         R26       2D       300       50       5       02/20/02		D1105	2D	500	5	2	06/08/00 18:25	
Bigguence Recipe       D1107       2D       50       2       1       06/08/00       18:26         D1108       2D       25       1       2       06/14/00       09:23         D1109       2D       1000       100       1       06/08/00       18:26         D1110       2D       200       20       1       06/08/00       18:26         D1110       2D       200       20       1       06/08/00       18:24         D1111       2D       100       5       0.5       09/15/01       09:24         D1112       2D       500       50       2       10/30/01       10:41         D1113       2D       5000       5       02/20/02       15:37         R130       2D       300       50       2       02/20/02       15:11         R26       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       5       02/20/02       14:54         RED_G       2D       500       5       02/20/02       14:54         RED_G       2D       500       5       02/20/02       14:533         TIME1		D1106	2D	100	10	0.5	06/08/00 18:25	
Sequence Recipe       D1108       2D       25       1       2       06/14/00       09:23         D1109       2D       1000       100       1       06/08/00       18:24         D1110       2D       200       20       1       06/08/00       18:24         D1111       2D       100       5       0.5       09/15/01       09:23         Sequence Data       D1111       2D       100       5       0.5       09/15/01       09:24         D1112       2D       500       5       2       10/30/01       10:41       101:12         D1113       2D       500       5       2       06/19/00       17:22         GREEN_G       2D       611       50       5       02/20/02       15:27         INN       2D       300       50       2       02/20/02       15:11         R26       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       50       3       01/30/02       08:49         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       <		D1107	2D	50	2	1	06/08/00 18:26	
D1109       2D       1000       100       1       06/08/00       18:26         D1110       2D       200       20       1       06/08/00       18:24         D1111       2D       100       5       0.5       09/15/01       09:24         D1112       2D       500       50       2       10/30/01       10:41         D1113       2D       500       5       2       06/19/00       17:22         GREEN_G       2D       611       50       5       02/20/02       15:37         LIN       2D       5000       50       2       02/20/02       15:37         R100       2D       300       50       2       02/20/02       15:37         R26       2D       300       50       2       02/20/02       15:37         R26       2D       300       50       5       02/20/02       15:33         TIME1       2D       1000       100       5       02/20/02       14:54         R26       2D       300       50       3       01/30/02       08:49         XY1       2D       300       50       3       01/30/02       08:49 <td></td> <td>D1108</td> <td>2D</td> <td>25</td> <td>1</td> <td>2</td> <td>06/14/00 09:23</td> <td></td>		D1108	2D	25	1	2	06/14/00 09:23	
Sequence Data         D1110         2D         200         20         1         06/08/00         18:24           D111         2D         100         5         0.5         09/15/01         09:24           D1112         2D         500         50         2         10/30/01         10:41           D1113         2D         500         5         2         06/19/00         17:22           GREEN_G         2D         611         50         5         02/20/02         15:37           LIN         2D         50000         1000         5         01/12/01         12:22           R130         2D         300         50         2         02/20/02         15:22           R65         2D         300         50         5         02/20/02         14:54           RED_G         2D         1000         100         5         02/20/02         15:33           TIME1         2D         1000         100         5         02/20/02         09:31           XY1         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         01/30/02	equence Recipe	D1109	2D	1000	100	1	06/08/00 18:26	
Sequence Data         D1111         2D         100         5         0.5         09/15/01         09:24           D1112         2D         500         50         2         10/30/01         10:41           D1113         2D         500         5         2         06/19/00         17:22           GREEN_G         2D         611         50         5         02/20/02         15:37           LIN         2D         5000         1000         5         01/29/02         15:11           R26         2D         300         50         2         02/20/02         14:54           R65         2D         300         50         5         02/20/02         14:54           RED_G         2D         500         5         02/20/02         14:54           RED_G         2D         1000         100         5         02/20/02         15:33           TIME1         2D         300         50         3         01/30/02         08:49           XY1         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         01/30/02         08:49		D1110	2D	200	20	1	06/08/00 18:24	
Sequence Data         D1112         2D         500         50         2         10/30/01         10:41           D1113         2D         500         5         2         06/19/00         17:22           GREEN_G         2D         611         50         5         02/20/02         15:37           LIN         2D         5000         50         2         02/20/02         15:37           R26         2D         300         50         2         02/20/02         15:11           R26         2D         300         50         5         02/20/02         14:54           RED_G         2D         500         5         02/20/02         14:54           RED_G         2D         1000         1005         5         02/20/02         14:54           XY1         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         01/30/02         08:49           XY3         2D         300         50         3         01/30/02         08:49		D1111	2D	100	5	0.5	09/15/01 09:24	
Sequence Data         D1113         2D         500         5         2         06/19/00         17:22           IIN         2D         5000         1000         5         02/20/02         15:37           IIN         2D         300         50         2         02/20/02         15:22           R130         2D         300         50         2         02/20/02         15:11           R26         2D         300         50         5         10/11/01         12:32           R65         2D         300         50         5         02/20/02         15:33           TIME1         2D         1000         100         5         02/20/02         19:33           XY1         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         02/10/00         08:49           XY4         2D         300         50         3         01/30/02         08:49		D1112	2D	500	50	2	10/30/01 10:41	
Sequence Data         GREEN_G         2D         611         50         5         02/20/02         15:37           LIN         2D         5000         1000         5         01/29/02         15:22           R130         2D         300         50         2         02/20/02         15:11           R26         2D         300         50         5         10/11/01         12:32           R65         2D         300         50         5         02/20/02         14:54           RED_G         2D         500         5         02/20/02         14:54           XY1         2D         300         50         3         01/30/02         08:49           XY1         2D         300         50         3         01/30/02         08:49           XY2         2D         300         50         3         01/30/02         08:49           XY4         2D         300         50         3         01/30/02         08:49           XY4         2D         300         50         3         01/30/02         08:49		D1113	2D	500	5	2	06/19/00 17:22	
LIN       2D       50000       1000       5       01/29/02       15:22         R130       2D       300       50       2       02/20/02       15:11         R26       2D       300       50       5       10/11/01       12:32         R65       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       5       02/20/02       14:54         RED_G       2D       500       5       02/20/02       14:54         TIME1       2D       1000       100       5       02/20/02       19:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       01/30/02       08:49         XY4       2D       300       50       3       01/30/02       08:49	Sequence Data	GREEN_G	2D	611	50	5	02/20/02 15:37	
R130       2D       300       50       2       02/20/02       15:11         R26       2D       300       50       5       10/11/01       12:32         R65       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       50       5       02/20/02       15:33         TIME1       2D       1000       100       5       02/20/02       09:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49		LIN	2D	50000	1000	5	01/29/02 15:22	
R26       2D       300       50       5       10/11/01       12:32         R65       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       50       5       02/20/02       15:33         TIME1       2D       1000       100       5       02/20/02       09:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       02/10/00       08:49         XY3       2D       300       50       3       01/30/02       08:49		R130	2D	300	50	2	02/20/02 15:11	
R65       2D       300       50       5       02/20/02       14:54         RED_G       2D       500       50       5       02/20/02       15:33         TIME1       2D       1000       100       5       02/20/02       9:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       01/30/02       08:49         XY4       2D       300       50       3       01/30/02       08:49		R26	2D	300	50	5	10/11/01 12:32	
RED_G       2D       500       50       5       02/20/02       15:33         TIME1       2D       1000       50       3       02/20/02       09:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49		R65	2D	300	50	5	02/20/02 14:54	
TIME1       2D       1000       100       5       02/20/02       09:31         XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49         Print       Yiew/Modify       START       XY View		RED_G	2D	500	50	5	02/20/02 15:33	
XY1       2D       300       50       3       01/30/02       08:49         XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49         Print		TIME1	2D	1000	100	5	02/20/02 09:31	
XY2       2D       300       50       3       01/30/02       08:49         XY3       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49         Print		XY1	2D	300	50	3	01/30/02 08:49	
XY3       2D       300       50       3       02/10/00       08:16         XY4       2D       300       50       3       01/30/02       08:49         Print       Yiew/Modify         START       XY View		XY2	2D	300	50	3	01/30/02 08:49	
XY4         2D         300         50         3         01/30/02         08:49           Print         Yiew/Modify         START         XY View		XY3	2D	300	50	3	02/10/00 08:16	
<u>Print</u> <u>View/Modify</u> START XY View		XY4	2D	300	50	3	01/30/02 08:49	
Print View/Modify START XY View								
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Print View/Modify START XY View								
				Print	View	/Modify	START	XY View
					_	-		

#### Select Scan Recipe

Use Scan Recipe to measure samples. Determine how to move on the stage during measurement with Scan Recipe. You can set such parameters as scan length, scan speed, stylus forth and so on. The parameters includes those associated with scan data such as cursor position.

Print	Print a recipe selected.
<u>V</u> iew/Modify	Display a recipe selected
START	Measure with the selected recipe.
XY View 🛞 🔊	Load and display a sample for review.

# 1.2. Selecting Scan Data

Catalog - [SCAN DATA]							
<u>F</u> ile <u>E</u> dit <u>S</u> ubstrate <u>V</u> acuum	<u>H</u> ost <u>W</u> indow Help						
	🚑 START 🛞 😷	2D 3D	]				
Scan Recipe							
			Scan	Data Name:			
	Scan Data Path:		Scan Data	Recipe ID	Length (um)	No.of Points	Creation Date
Scan Data	SCAN DATA						
Sequence Recipe							
Sequence Data							
	Drive:						
	<b>C</b> :	•					
		Thumbnails	Revie	w			
SCAN DATA CATALOG							

This is the area the data measured with a scan recipe is stored. You can review the data here.

<u>R</u>eview

Display scan data selected.

🕫 Catalog - [SEQUENCE R	ECIPE]			
<u>F</u> ile <u>E</u> dit <u>S</u> ubstrate <u>V</u> acuun	n <u>H</u> ost <u>W</u> indow Help			
	📑 START 💮	) 🕀 2D 3D		
Scan Recipe		Sequence Becine Name:	31300	
	Sequence	Created By	Creation Date	
Scan Data				
Juli Dala	R130C		02/20/02 15:12	
	R65C		02/20/02 14:55	
	R65LB		01/30/02 11:10	
	R65RB		02/02/02 10:23	
Sequence Recipe	R65RT		02/02/02 11:55	
Sequence frecipe	T2 TEST		02/20/02 14:18 01/23/02 14:48	
	TEST1		02/20/02 11:51	
	TIME		02/20/02 10:26	
Seguence Data	XY25		02/20/02 10:03	
		Print	View/Modify 9	TART
	1			

#### 1.3. Selecting Sequence Recipe

SEQUENCE RECIPE CATALOG

Multiple points on a sample can be automatically measured using FP20 sequence program. Sequence programs consist of and are a combination of recipes for each measurement point and measurement axis. Automated measurement of multiple points helps improve system performance.

<u>P</u>rint

Print sequence selected.

 $\underline{V}iew/Modify$ 

Display sequence selected.

START

Start Sequence selected.

×

		a			
File Edit Substrate Vacuum	Host Window Help				<u> </u>
		A 20 30			
Scan Recipe			Sequence Data:	11 01	
	Sequence Path:	Sequence Data Sets	Sequence ID	No. of Slots	Creation Date
Scan Data Sequence Recipe Sequence Data	SEQUENCE	11 01 DDD LODID0001 LOTID000 LOTID003 LOTID003 LOTID051 LOTID551 LOTID782 TEMP	TEST1 R65C TEST1 TEST1 TEST1 TEST1 TEST1 TEST1 TEST1 TEST1 TEST1 XY25	1 1 3 1 1 3 3 1 1 1 1 1 N Recover	02/20/02 11:17:24 02/20/02 14:50:18 02/20/02 11:49:30 02/18/02 16:47:16 02/18/02 15:52:08 02/15/02 19:38:24 02/18/02 09:04:30 02/18/02 09:23:06 02/15/02 19:22:16 02/15/02 13:13:44 02/20/02 16:17:28
	100				
BEQUENCE DATA CATA	LOG				

# 1.4. Selecting Sequence Data

This is the area where the data measured with sequence data is stored. You can review the data here.

<u>R</u>eview

Display the sequence data to be selected.

#### 1.5. Measurement Screen

<i>1</i> 1733	each	n Sca	an Lengt	h																	X
Viev	v <u>M</u> o	ove	<u>D</u> irection	Actions	<u>S</u> ubst	rate	⊻acuu	m S <u>t</u> ylu:	s <u>H</u> el	lp			_								
SL	ow	MED	FAST		Ļ	+		• [ •	<u>) (</u>	$\overline{\mathbf{f}}$		FOCUS	ZOOM IN	ZOOM Out	STAF	य 🗲	-][	MAN .OAD			
									1		T		1	1							
Re	ques	sted	. Stylı	ıs Forc	æ: 2	. 00(	0 mg							Мо Х: У: Ø: Zo	om:	XY ر 0 ر 0 0.00 c	um um leg 4		ОК	Саг	ncel
IS	can L	enat	h: 1000	Um																	

Either click the XY View button or select XY View in the menu bar, and then the XY View in the above will appear.



Catalog - [SCAN RECIPE Edit <u>P</u> PTransfer <u>W</u> indo	] wHelp						
		→ 0←	2D 3	D			
Scan Recipe		Scan Beci	ne Name <sup>.</sup>	<b>R65</b>			
	Recipe Name	Туре	Length (um)	Speed (um/s)	Force (mg)	Creation Date	
Scan Data	D1103 D1104 D1105 D1106 D1107 D1108	2D 2D 2D 2D 2D 2D 2D	2000 500 500 100 50 25	100 50 5 10 2 1	4 2 0.5 1 2	08/23/01 13:02 06/19/00 13:38 06/08/00 18:25 06/08/00 18:25 06/08/00 18:26 06/14/00 09:23	
Sequence Recipe	D1109 D1110 D1111 D1112 D1113 GREEN G	2D 2D 2D 2D 2D 2D 2D	1000 200 100 500 500 611	100 20 5 50 5 50	1 0.5 2 5	06/08/00 18:26 06/08/00 18:24 09/15/01 09:24 10/30/01 10:41 06/19/00 17:22 02/20/02 15:37	
Sequence Data	LIN R130 R26 R65 RFD G	2D 2D 2D 2D 2D	50000 300 300 <u>300</u> 500	1000 50 50 50 50	5 2 5 5	01/29/02 15:22 02/20/02 15:11 10/11/01 12:32 02/20/02 14:54 02/20/02 15:33	
	TIME1 XY1 XY2 XY3 XY4	2D 2D 2D 2D 2D 2D	1000 300 300 300 300 300	100 50 50 50 50 50	5 3 3 3	02/20/02 09:31 01/30/02 08:49 01/30/02 08:49 02/10/00 08:16 01/30/02 08:49	_
		2D	300	50	3	01/30/02 08:50	
	<u>D</u> elete		<u>P</u> rint	View	/Modify	<u>E</u> xport	Import
	<u> </u>						

#### 1.6. Database File Manager

It is possible to import, export, and/or delete the recipes and data selected. You can also check the data measured.



Open the recipe or data selected.

#### 1.7. Loading and Unloading

👼 Catalog - [SEQUENCE RECI	IPE]	Online/Local 🛛 🗵
<u>File Edit Substrate Vacuu</u>	um <u>H</u> ost <u>W</u> indow Help	Handler
<u>M</u> anual Load	STARI 🕀 🕀 2D 3D	
Scar <u>Init Handler</u> SMIF Load/Unios	Sequence Recipe Name:	<u>*</u>
Sca		
Sequence Recipe Sequence Data		
	Print View/Modify STABT	 
SEQUENCE RECIPE CAT	TALOG	

Go to Scan, and select Substrate and Load/Unload in the menu bar.

Load Substrate	X
Src. Cass.: Slot:	CASSETTE #1
Glass Thickness:	Glass Name #1 💌
OK	Cancel

Once the stage moves to load/unload position of the substrate, the window above will appear. Then, enter a cassette number and a substrate layer you want to load. Press "OK." Follow the similar procedure in unloading. 2. Scan Recipe

Recipes are a list of measurement conditions.

Scan Parameter Setting form is displayed in the main window. Setting of scan parameters. Setting screen is divided into the following 3 (three).

- 2DScan
- Stylus
- Vertical Range

Catalog - [SCAN RECIP	PE] uum Host Window Help				Online/Local X
Dio Earc Saparaco Tac		2D 3D			
Scan Recipe	Scan Recipe Nam	ue:			
Court Data	Recipe Name	Type Length(um)	Speed(um/s) Force	e(mg) Creation Date	
Sequence Recipe					
Sequence Data					
	E	vint <u>View/Modif</u>	y START	XY View	
SCAN RECIPE CATALOG					Empty

#### 2.1. 2D Scan

-2D Scan		
Scan Length [µm] :	<u>500</u>	Scan Time: Individual Trace [sec] : 7 Total [hour:min.:sec.] : 0 : 0 : 7
Scan Speed [µm/s] : Sampling Rate [Hz] :	100 <b>±</b> 200 <b>±</b>	No. of Data Points : 1,000
Multi-Scan Average : Scan Direction:		

• Scan Length

Values from 1um to 90mm can be set as Scan Length, while values of 8mm or longer should have 400 um/s or higher scan speed. Either click the text box and enter an appropriate value or select a best value in the drop-down list. Teaching is also available.

• Scan Speed

Select a scan speed from the preset values. Configurable scan speeds are as follows: 1, 2, 5, 10, 20, 50, 100, 400, 1000, 2000, 5000, 10000, and 25000 (um/s)

# • Sampling Rate

Select a sampling rate, which is a data point number collected per second. Configurable sampling rates are as follows:

50, 100, 200, and 500Hz (in case of scan speed of 1um/s)

50, 100, 200, 500, and 1000Hz (in case of scan speed of other than 1 um/s)

#### • Multi Scan Average

Repeat Max. 10 times of scans and calculate the average of the data, so that low repeatability due to stage drift can be compensated.

#### Scan Direction

Either way of scan direction, from right to left or from left to right, can be set. Click an arrow showing the desired direction.

# • Scan Time (Total)

This is the total number of hours needed for data collection in a recipe measurement.

# • No. of Data Points

This is the number of data points for 1 scan.

#### • Point Interval

This is the distance between consecutive data points within 1 scan.

#### 2.2. Stylus

Stylus		
Stylus Force [mg] :	5	
Contact Speed :	3 🛓	

# • Stylus Force

Stylus Force shows a downward force from stylus that touches the top surface of a sample during measurement. The force can be set from 0.5mg to 15mg. (Default value: 5mg)

Stylus Force needs to be set higher to maintain contact pressure of stylus on the sample surface, when scan speed is set quicker.

It is recommended that stylus force should be set lower when a soft sample is measured with small radius stylus. Generally, stylus force when set high will be less affected by ambient environment noise.

# • Contact Speed

Contact Speed is a parameter to represent fall velocity when a stylus drops down and touch the substrate. Select a value from 1 fastest to 10 lowest. It is recommended that value 1 or 2 would be desirable for aluminum or photo-resist measurement, and that value 1 to 3 would be desirable for stylus radius smaller than 5um.

#### 2.3. Vertical Ranging

Vertical Ranging	
Range/Resolution	<u> </u>
Profile Type :	<u>-∿</u>

# • Profile Type

Click the drop button to select one appropriate profile type of the followings.

(Please note only when 131um Range is selected, a profile type can be selected.)

⁻∽ Center:

Select this type unless big peak or valleys are not measured.

# □ Peak Bias:

Select this type when a big peak or its vicinity of 65um or higher is measured.

# └ Valley Bias:

Select this type when a big peak or valley or its vicinity of 65um or higher/deeper is measured.

Range/Resolution

This is a vertical ranging of microhead. $26um (\pm 13um)$ Resolution: 0.015625Å $131um (\pm 65.5um)$ Resolution: 0.357Å

# 2.4. Feature Detection

Setting Feature Detection will enable to automatically detect a specific profile. This will result in higher throughput and consistent measurement.

🐻 Recipe Editor - ***UNTITLED*** - [Feature Detection]				
<u>R</u> ecipe <u>O</u> ptions	Substrate <u>V</u> acuum <u>W</u> ir	ndow Help		
Scan Parameter Definition				
	Feature Detection-			
Feature Detection	Feature:	None		
Filters Cursors	Feature Number: 1			
General Parameters	Slope Threshold :	10		
Roughness Waviness	Plateau Threshold : 10			
Bearing Ratio Cutting Depth	Min. Plateau Width : 10			
High Spot Count Peak Count				

#### 2.4.1. Feature

None

Either specifying a Feature of the sample detected or disabling this Feature Detection is possible.

None	
Up Edge	
Up Base	
Down Euge Down Base	
Convex	
Concave	
None	Disable
Up Edge	Rising
Up Base	Rising
Down Edge	Decayi
Down Base	Decayi
Convex	凸
Concave	Ш

Disables Feature detection Rising Edge Rising Base Decaying Edge Decaying Base 凸

# 2.4.2. Feature Number

When multiple edges are detected with one scan, this Feature Number helps select a specific edge to be detected. All the edges detected during a scan will have consecutive numbers 1 to N.

#### 2.4.3. Slope Threshold

This is for edge detection. Enter large figure when step height is high enough compared to surface roughness or noise, but enter little number when it is just slightly higher. Number, 0 through 50, is accepted. Default value is 5.0 for step height and 1.0 for apex and applicable for the measurement 200Å or higher.

# 2.4.4. Plateau/Apex Threshold

This is for edge position determination. Enter the same value as Slope Threshold in case of edge and enter very little number in case of apex. Default value is 5.0 for step height and 0.0 for apex and applicable for the measurement of 200Å or higher.

#### 2.4.5. Minimum Plateau Width

This defines the horizontal length of minimum plateau between the rising edge and the decaying edge. This will eliminate possible error in identifying projections as a step height. Enter a wider value than the noise peak and try to enter little number which is smaller than the actual step height value. The scope of area is 0.005um to 1000.0um.

#### 2.5. Filter/Cursors

This chapter is composed of 2 sections:

- Data Filter by software and
- Cursor position setting



#### 2.5.1. Filter Option

Either one of these can be selected:

Gausian:	Profiler Software for Windows
RC:	Software for DOS

2.5.2. Noise Filter (Short Wavelength Cutoff)

This is used to cut out short wavelength component from measurement data.

 $2.5.3. \ {\rm Noise \ Filter} \ ({\rm Long \ Wavelength \ Cutoff})$ 

This is used to cut out long wavelength component or wave undulation from measurement data.

# 2.6. Cursors

Data Analysis Window uses two pairs of cursors. The positions specified by leveling cursors X1 and X2 will be a tracing basis. Surface parameter is calculated between measurement cursors X1 and X2.



# 2.6.1. Relative to Feature Detected

Set cursors' position in every measurement attempt.

# 2.6.2. Fit and Level

With Fit and Level function, you can measure by cutting out one circular arc component from trace data.

#### **General Parameters**

Surface Analysis Parameters are registered in the General Parameters form. You can either enable or disable each parameter, and calculation result of surface analysis parameters set to be "enabled" are displayed.

General Parameters				
Normal Trace				
🗖 Step Height (StpHt)				
Total Ind. Runout (TIR)				
🗖 Average Height (Avg)				
🗖 Slope				
🗖 Radius (Rad)				
Area of Peaks (Area+)				
Area of Valleys (Area-)				
🔲 Total Area (Area)				
Profile Length (ProfL)				
Distance to Edge (Edge)				
☐ Step Width (StpWt)				

#### • Step Height (StpHt)

Difference in height between step bottom and its top.

# • Total Indicator Runout (TIR)

Difference in height between the highest point and the lowest of the measurement cursors

• Average Height (Avg) Average height

# • Slope

To be calculated based on horizontal distance and vertical displacement between right and left measurement cussors

#### • Radius (Rad)

To calculate radius of curvature on the basis of a portion of curve of the profile

• Area of Peaks (Area+)

Area of Peaks calculated on the basis of profile centerline

• Area of Valleys (Area-)

Area of Valleys calculated on the basis of profile center line

#### • Total Area (Area)

Total of both values of Area of Peaks and Area of Valleys

#### • Profile Length (ProfL)

Profile Length when a profile is extended into line

#### • Distance to Edge (Edge)

Distance between scan start position and the first UP or DOWN Edge of a profile

• Step Width (StpWt) Distance between the first UP and the following DOWN of a profile

- 3. How to Create Scan Recipe
- 3.1. Double-click on Scan.



# 3.2. Click on Scan Recipe.

Catalog - [SCAN RECIPE] Ovline/Local X							
Elle Edit Substrate Yacuum Host Window Help							
	🎒 START 🛞 😷	2D 31	D				
Scan Recipe	Scan Recipe Nan	ne:		_			
	Recipe Name	Type	Length(um)	Speed(um/s)	Force(mg)	Creation Date	
Scan Data							
Sequence Becine							
Sequence Data							
	I	Brint	∐iew/Modify	ST.	ART	XV View	
SCAN RECIPE CATALOG	De c	,					Empty

# 3.3. Click on View/Modify.

💼 Recipe Editor - R65 - [Scan Parameters]				
<u>R</u> ecipe <u>O</u> ptions	s <u>W</u> indow Help			
Scan Parameter	20 Scan			
Feature Detection Filters	Scan Length [µm]: 500 Individual Trace [sec]: 7 Ieach Scan Second [µm /s]: 100 ↓			
General Parameters	Scan Speed [µm/s]: 100 Sampling Rate [Hz]: 200 Multi-Scan Average : 1 Multi-Scan Average : 1			
Roughness Waviness	Scan Direction:			
Bearing Ratio Cutting Depth	Stylus Stylus Force (ma):			
High Spot Count	Contact Speed : 3			
	Vertical Ranging Range/Resolution Profile Type : -℃ ▼			

# 3.4. Set Scan Parameters.

# Example:

💼 Recipe Editor - **UNTITLED** - [Scan Parameters]				
<u>R</u> ecipe <u>O</u> ptions	s <u>W</u> indow Help			
Scan				
Parameter	2D Scan			
Feature Detection	Scan Length [μm] : 300 Individual Trace [sec] : 9			
Filters Cursors	Scan Speed [μm/s] : 50 No. of Data Points : 300			
General Parameters	Sampling Rate [Hz] : 50 → Point Interval [µm] : 1			
Roughness Waviness	Scan Direction:			
Bearing Ratio Cutting Depth	Stylus			
High Spot Count	Contact Speed : 3			
	Vertical Ranging			
	Profile Type :			

# • Scan Length:

You can choose and set Scan Length from 1um to 90mm (however, 8mm or longer length is only for scan speed 400um/s or quicker). Either enter an appropriate value by clicking the text box or select on of the values from the drop-down menu. You can also teach.

• Scan Speed: Select a Scan Speed from preset values.

# • Sampling Rate:

Select a Sample Rate, data point quantity collected per second.

• Multi Scan Average: Calculate the average of max. 10 scan data.

# • Scan Direction:

You can choose Scan Direction, right to left or left to right.

# • Scan Time (Total):

Total time required for data collection by recipe measurement

- No. of Data Points: Data quantity collected by 1 scan
- Point Interval: Distance between consecutive data points in 1 scan

# • Stylus Force:

This is downward Force applied to Stylus. (0.5mg - 15mg)

# • Contact Speed:

This is Fall Velocity at which speed the stylus contacts a substrate. Select a value from 1 to 10.

# • Range/Resolution:

This is vertical range of microhead  $\{26um (\pm 13um), 131um (\pm 65.5um)\}$ 

• Profile Type: Profile Type can be selected only for 131umRange.

Recipe     Options     Window     Help       Scan     Parameter     E     E     E       Feature Detection
Scan Parameter Feature Detection
Feature Detection
Easture
Detection Feature: Up Edge
Filters         Feature Number:         1
General Parameters Slope Threshold : 10
Roughness         Plateau Threshold :         10
Bearing Ratio Cutting Depth         Min. Plateau Width :         10
High Spot Count

3.5. Select Feature Detection to select Up Edge in Feature.

Recipe Editor	- **LINTTTLED** - [Filters+Cursors]			
Recipe Options	Window Help			
Scan				
	Fileis			
Feature Detection	Filter Option: Gaussian Filte 👤			
Filters Cursors	Noise Filter (Short Wavelength Cutoff):			
General Parameters	Waviness Filter (Long Wavelength Cutoff):			
Roughness Waviness	Cursors X1 X2			
Bearing Ratio Cutting Depth	Left Measurement: 10 50			
High Spot Count	Right Measurement: 450 490			
	Left Level: 10 50			
	Right Level: 450 490			
	<ul> <li>Relative to Feature Detected</li> <li>Fit and Level</li> </ul>			

3.6. Select Filters Cursors and check Relative to Feature Detected

📷 Recipe Editor	- **UNTITLED** - [General Parameters]		
<u>R</u> ecipe <u>O</u> ptions	s <u>W</u> indow Help		
Scan			
Parameter	General Parameters		
Feature	Normal Trace		
Detection	🔀 Step Height (StpHt)		
Filters Cursors	Total Ind. Runout (TIR)		
General	Average Height (Avg)		
Parameters	🗖 Slope		
Roughness	🗖 Radius (Rad)		
# 4111633	Area of Peaks (Area+)		
Bearing Ratio Cutting Depth	Area of Valleys (Area-)		
High Spot	🗖 Total Area (Area)		
Count	Profile Length (ProfL)		
	Distance to Edge (Edge)		
	☐ Step Width (StpWt)		

# 3.7. Select General Parameters and check Step Height

# 3.8. Save Recipe



3.9. Select XYView to measure a sample. The blue line in the XYView screen is the measurement position.

Yew Wore Decide Actions Subtrate Yacum Style Heb         stop with inst t + + + + + + + + + + + + + + + + + +	🛲 Teach Scan Length	Online/Local X
scow web rst       ↑       ↓       <	<u>V</u> iew Move Direction Actions Substrate Vacuum Stylus Help	
Mode: XY Requested Stylus Force: 5.000 mg DSF Stylus Force: 5.000 mg Cons: 0 Cons: 0 Con	SLOW MED FAST $\uparrow$ $\downarrow$ $\leftarrow$ $\rightarrow$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\overset{\text{ELEV}}{=}$ $\overset{\text{FOCUS}}{=}$ $\overset{\text{ZOOM}}{=}$ $\overset$	RT 🔶 MAN SCAN SRCH SCLEN
Scan Length: 1000 um Vacuum	Requested Stylus Force: 5.000 mg DSF Stylus Force: 5.000 mg	Mode: XY X: 0 un Y: 0 un Z: 0 un T: 0.00 deg Zoom: 0 OK Cancel
recom	Scan Length: 1000 um	Vacuum

#### 3.10. Adjust level cursors and measurement cursors .

Click the LEVEL button on the menu to adjust LEVEL.

Click the LEVEL button again to adjust Measurement.



3.11. Select Recalc With Unzoomed Level Cursors in Operations on the Menu. (Cursor position is now reflected upon the recipe.)



3.12. Select Edit Recipe in Recipe on the Menu to return to Recipe Editor.

<u>R</u> ecipe	Options	Substrate		
New		Ctrl+N		
Oper	n	Ctrl+O		
Save		Ctrl+S		
Save	As	e		
XY-Vi	ew			
Theta View				
Start	Scan			
Analy	/sis	I		
Diagr	nostic	þ		
Info.		Ctrl+I		
Print		Ctrl+P		
Exit				

3.13. Save and store the cursor position in the Recipe.

📷 Recipe Editor	- TEST -	Filters+Curs	ors]			
Recipe Options	: <u>W</u> indo	w Help				
<u>N</u> ew C	Strl+N	CÊ 🖪		†20	139	
<u>O</u> pen C	>trl+O			·	H	
<u>S</u> ave C	≎trl+S					
Save <u>A</u> s		Option:		Gauss	ian Filte	Ŧ
Diagnostic				,		
Info C	≎trl+I	Filter				
<u>P</u> rint C	>trl+P	t Wavelength (	Cutoff):	Defau	lt	Ŧ
E <u>x</u> it		noon Filtor				
Parameters	(Lon	g Wavelength (	Cutoff):	Off		Ŧ
Roughness Waviness	Curso	rs	×1		X2	
Bearing Ratio Cutting Depth	Left	Measurement:	-	100		-20
High Spot Count	Righ	t Measurement:	]	20		100
	Left	Level:	]	-80		-40
	Righ	t Level:	<u> </u>	140		180
		Relative to Feat "it and Level	ure Detected			

#### 4. Sequence Recipe

Multiple points of a sample can be automatically measured with the sequence program. The sequence program consists of a combination of recipe at each measurement point and measurement axis. Automated measurement of multiple points helps improve productivity of the system.

Sequence Measurement Function:

- Capable of combining multiple measurement points and recipes
- Setting reference point to compensate X, Y, and  $\theta$  between substrate (Deskew)
- Settable manual or automated (pattern recognition) deskew
- Pattern search function for the case where there is no deskew pattern within the camera view. (Pattern recognition option)
- Multiple analysis mode which enables to analyze one scan by using multiple recipes.
- Teaching of a reference point for a measurement point and deskew, including rotation angle.
- Automatic display, print and save of all the statistics of measurement points and/or raw data.

4.1. Sequence Edit Window

This is to create and edit sequence programs and also to set various sequence options.

4.1.1. Double-click the scan icon in the top-level menu to open the sequence recipe catalog window.

🕫 Catalog – [SEQUENCE	RECIPE]				×
<u>F</u> ile <u>E</u> dit <u>S</u> ubstrate	<u>V</u> acuum <u>H</u> ost <u>W</u> indow	Help			
	🚑 START 🛞	🕀 2D 31	)		
			_		<b></b>
Scan Recipe	Seque	nce Recipe Name: 🗌			
	Sequence	Created By	Creation Date		
Com Data					
Scan Data					
Comment Design					
Sequence hecipe					
Sequence Data					
		Print	View/Modify	START	
					-
SEQUENCE RECIPE	CATALOG				

4.1.2. Click "View/Modify" in the bottom of the sequence recipe list, or double-click an entry of the list to call so that the sequence edit window will appear.

Sequence Editor - **UNTITLED**					×
Sequence Edit Substrate Vacuum Help					
Scan Recipe Catalog:	Loc Recipe	Х	Y	T.	
TEST	Video Calibration	3.00	2.00		
<u>A</u> dd >>	Base Angle 1 TEST	NOI USED	-1000	5	
Charge >>>					
<u>Criange //</u>					
Edit Recipe					
Pitch Copy					
- Options					
🗖 Semi-Automatic Mode					
Mode: No Deskew					
If Fail:					
Data Handler					
Sort Sort is inactive					
	Ieach Edit X,Y,Thet	a) Multi Analysi	Tes	st	
REATENAL DECIDE CATATOO					

4.1.3. SEQUENCE RECIPE CATALOG

4.1.4. Menu Bar: Sequence Edit Substrate Vacuum Help

This is to retrieve and save sequences; copy and delete recipes in the list; load/unload substrates; and set vacuum on/off.



Opening of New file and Sequence file, Save, Print and Sequence Start are available.

- Recipe Catalog : Recipe catalog for recipe selection and control button for sequence creation.
- Option Section : Setting of sequence options.
- Sequence List : List of sequence linked with measurement coordinates and recipes.

#### 4.1.6. Menu Bar

Sequence				
<u>N</u> ew Open Save Save <u>A</u> s	Ctrl+N Ctrl+O Ctrl+S			
Start <u>R</u> epeat		<u>E</u> dit Cu <u>t</u> Copy	Ctrl+X Ctrl+C	Substrate <u>M</u> anual Load
Print Auto Print Options	Ctrl+P	<u>P</u> aste <u>D</u> elete	Ctrl+V Del	<u>L</u> oad/Unload Init Handler
E <u>x</u> it		<u>D</u> eskew Stage Mapping (	Convert	SMIF Load/Unload Init SMIF

Manual Load : Move a stage to a manual load position and return it to its original position.

Load/Unload : Load/Unload a substrate if the handler option is available.

Init Handler : Initialize a handler if the handler option is available.

# 4.1.7. Tool Bar

|--|

New	: Load a new default sequence.
Open	: Open the file open dialog box.
Save	: Save a current sequence.
Print	: Print

Start : Star measurement with a current sequence.

# 4.2. Recipe Catalog

This is a list box showing recipes to choose from.

Scan Recipe Catalog:

TEST	
TEST2	<u></u> dd >>]
	<u>C</u> hange >>
	Edit Recipe
	Pitch Copy

- Add: Add a recipe to the sequence list.
- Change: Change a recipe in the sequence list for a selected recipe.
- Edit Recipe: Open the scan recipe editor.

# • Pitch Copy:

Add a recipe in to a sequence list by setting offset  $\boldsymbol{X}$  and  $\boldsymbol{Y}$  and repeat count.

Pitch Copy	×
Offset X Offset Y Repeat Count	10 10 10
ОК	Cancel

Loc	Recipe	Х	Y	T.
Video	o Calibration	3.00	2.00	
Base	Angle	NOT USED		
1	TEST	0	0	0.
2	TEST	10	10	0.
3	TEST	20	20	0.
4	TEST	30	30	0.
5	TEST	40	40	0.
6	TEST	50	50	0.
7	TEST	60	60	0.
8	TEST	70	70	0.
9	TEST	80	80	0.
10	TEST	90	90	0.
11	TEST	100	100	0.
				I

#### 4.3. Option Section

This is to select a sequence mode and set data options for sequence measurement and a handler options. Also, it is to select the semi automatic mode.



#### 4.3.1. Semi Automatic Mode

The semi automatic mode measurement displays trace data after each measurement, then start a next measurement. Data can be confirmed each time. Before a succeeding measurement, remeasuring is also available, if required, by changing a current measurement point.

#### 4.3.2. Mode



#### 4.3.3. Fail Option

This is to select an option in the case where the pattern recognition function cannot recognize a deskew point correctly.

- Proceed Measurement : Continue sequence.
- Skip, No Measurement : Quit measuring of a relevant substrate.
- Retry Pat.Rec.Manually : Move to a manual deskew.
- Cancel Sequence : Cancel sequence. Need to restart to remeasure.

#### 4.4. Data Option

Data Options	×
Save Options	Export Options
⊙ None	⊙ None   ⊙ ASCII File
C Statistics	O Statistics O Binary File
C Trace Data	C Trace Data
O Use Lot ID	C Use Lot ID
🖸 Use Name:	🛈 Use Name:
	and use lot ID for statistics name
Path	
Use Operator ID	🗖 Use Operator ID
	Print Options
	🗖 Enable Auto Print
	Print:
	Details
OK	Cancel

- None : Unable to save, export, or print data.
- Statistics : Save, export, or print statistics data of configured parameters and/or recipe ID.
- Trace Data : Save, export, or print statistics data of configured parameters, recipe ID and/or measurement data.
- Use Lot ID: Save as lot ID.
- Use Name : Save as a set name. Set path (directory).

- Use Operator ID: Use operator ID.
- ASCII File: Export data in unformatted ASCII (TXT file).
- Binary File: Export data in binary format (special file for binary format).
- Overwrite: Overwrite an existing file when saving a new file as the same name as the exiting file.

# 4.5. Sequence List

Loc Recipe		X	Y	Theta
Video Calibr Base Angle	ation NOT	2.54 2 USED	. 4 4	
1 _OFF300	)	0	0	0.00
<u>T</u> each	Edit X,Y,Theta	Multi Ana	ysis	Test

<u>I</u>each...

Determine a measurement point by actually checking a substrate.

Edit X,Y,Theta...

Determine a measurement point by numerical values.

Enter X,Y,Theta	×I
X: Y: Theta: 0	
OK Cancel	

4.6. Multi Analysis : Multi Analysis (Multiple Analysis Function)

Multiple data analysis function enables to re-analyze the data under another recipe condition by using the firstly-scanned data.

Multiple data analysis function makes measurement time shorter in the cases below.

- To measure two height differences with only one scan and each needs its own cursor setting.
- To measure under different filter setting.
- To measure with different analysis parameters on a recipe.



In this case, measure with "XY1"scan recipe, and then analyze the "XY2" data by using the data from the first scan.

\*A recipe for analysis, "XY2" in this example, must have the same measurement length, measurement speed, stylus pressure, sampling rate, contact speed and range as those of a measurement recipe, "XY1" in this example.

5. Sequence Recipe Creation

Sequence measurement needs the followings.

- Sample (Substrate to measure)
- At least one recipe
- 5.1. Sequence Creation (Sample Measurement without Deskew)
- 5.1.1. Select "View/Modify" from the sequence menu to display the sequence edit window.

🐻 Catalog - [SEQUENCE	RECIPE]	
<u>File E</u> dit <u>S</u> ubstrate <u>V</u> ac	uum <u>H</u> ost <u>W</u> indow Help	
	🞒 START 🛞 😷 2D 3D	
Scan Recipe	Sequence Recipe Name:	
1	Sequence Name Create By	Creation Date
Scan Data	150 CENTER R130C R26C	04/05/31 - 16:13:51 04/06/01 - 12:59:23 04/05/28 - 19:33:43 04/06/05 - 09:28:21
	R26C1788 R26LB	04/06/01 - 13:21:56 04/06/01 - 13:47:26
Sequence Recipe	R26LB178 R26LT R26LT178	04/06/01 - 13:53:20 04/06/01 - 14:25:13 04/06/01 - 14:30:16
Sequence Data	R26RB178 R26RT R26RT	04/06/01 - 13:29:35 04/06/01 - 13:38:05 04/06/01 - 14:03:58 04/06/01 - 14:03:58
	XY15	04/06/01 - 14:43:59
	Print View/Modify START	· _

5.1.2. Go to "New" in the sequence menu so that "Video Calibration" and "Base Angle" appears in the right of the sequence list. "Video Calibration" must be conducted again when its zoom ratio is changed. Base Angle: Use when measuring with substrate angle set tat  $90^{\circ}$ , etc.

Sequence Editor - **UNTITLED**			
<u>S</u> equence <u>E</u> dit Substrate <u>V</u> acuum Help			
D 😂 🖬 🎒 START			
Scan Recipe Catalog:	Loc Recipe	X Y	Theta
9264A2	Video Calibration	2.27 2.33	
9264A3 D1103	Base Angle	NOT USED	
D1104			
D1106			
D1108 Edit Recipe			
D110			
D1111 D1112			
KAWA2			
MIN			
R130 R26			
R27 Pitch Copy			
Options			
🔲 Semi-Automatic Mode			
Mode: No Deskew			
If Fail:			
Data. Handler.			
	I		
Sort Sort is inactive			
	Each Edit >	(Y,Theta Multi An	alysis Test

5.1.3. Select a recipe in the recipe catalog list box and either click "Add" or press [Enter] The selected recipe name is now in Location 1 of the sequence list.

Sequence Editor - **UNTITLED**		
<u>S</u> equence <u>E</u> dit Substrate <u>V</u> acuum Help		
🗋 🗃 🗐 🥌 START		
Scan Recipe Catalog:	Loc Recipe X Y	Theta
D1106	Video Calibration 2.27 2.33	
D1108 Add >>	Base Angle NOT USED	
D1109	1 R26 NOT DEFINED	
D1111 <u>Change &gt;&gt;</u>		
D1113 Edit Recipe		
KAWAI KAWA2		
KAWA3 MIN		
R130		
R27		
SODICK R		
TESTI TEST342		
XY1 Pitch Copy		
Options		
Semi-Automatic Mode		
Mode: No Deskew		
If Fail		
Data Handler		
Sort Sort is inactive	,	
	Teach Edit XYTheta Multi Ana	lucic Test
		1000

5.1.4. Add another recipe to the sequence list in the same procedure as above. [Ctrl+C] to copy and [Ctrl+V] to paste are also available.

5.1.5. Either double-click the line of Location 1 in the sequence list or click the "Teach" button on the line so that the teach location window (XY View) shown below appears.



- 5.1.6. In the teach location window, the blue array over cross hairs shows scan length and scan direction used in the recipe. Using the following procedures assign a scan start position which is shown on the center of the cross hairs.
- 5.1.7. Click either the array button in the tool bar to move a stage or the screen in the right of the video window showing the stage position.
- 5.1.8. When it comes near a measurement position, click "Focus" to start focusing.
- 5.1.9. When a measurement position is within the camera field, click the video window to assign a scan start position.



5.1.10. Either click "OK" or press [Enter] to return to the sequence edit window. The XY coordinate of the position assigned by the cross hairs is shown in the right of the recipe of Location 1.

Sequence Editor - **UNTITLED**					
<u>S</u> equence <u>E</u> dit Substrate <u>V</u> acuum Help					
D 🗃 🖪 🎒 START					
Scan Recipe Catalog:	Loc Recipe	X	Y	Theta	
9264A2	Video Calibration	2.27	2.33		_
D1103 Add >>	Base Angle	NOT USED			
D1104	1 R26	15677	5978	0.00	
D1106 <u>Change &gt;&gt;</u>					
D1108 Edit Recipe					
D1109					
D1111 D1112					
KAWA2					
KAWA3 MIN					
R130					
R27 Pitch Copy					
Options					
🕞 Semi-Automatic Mode					
Mode: No Deskew					
If Fail:					
Data Handler					
Sort Sort is inactive					
	Teach Edit 3	KY,Theta	Multi Ana	lysis Te	st

5.1.11. Teaching for other position follows the same procedures as above.

Sequence Editor - **UNTITLED**			
<u>S</u> equence <u>E</u> dit Substrate <u>V</u> acuum Help			
🗋 😂 🖃 🎒 START			
Scan Recipe Catalog:	Loc Recipe	х ү	Theta
9264A2	Video Calibration	2.27 2.33	
D1103 Add >>	Base Angle	NOT USED	
D1104	1 R26	15677 5978	0.00
D1106 <u>C</u> hange >>	2 R26	-21044 21010	0.00
D1107	3 R26	21054 -20104	0.00
D1109	4 R26	10104 -15054	0.00
Dilli Dilli Dilli Dilli KAWA1 KAWA2 KAWA2 KAWA2 R30 R37 Pitch Copy R37 Pitch Copy R37 Pitch Copy R37 Pitch Copy R37 Pitch Copy R37 Dilli R30 R37 Dilli Fail Data Handler Sort is inactive	Ieach Edit X'	Y,Theta Multi Ana	<b>Iysis</b> Test

Sequer	nce Ed	itor - SEQ1	
Sequence	Edit	Substrate	Vacuur
New		Ctrl-	+N
Open		Ctrl-	+0  =
Save		Ctrl-	+5
Save As			
Start			ŀ
Repeat			l l
Info			
Print		Ctrl-	+P
Auto Pri	nt Opt	ions	ŀ
Exit			

5.1.12. Select "Save As" from the sequence menu to save a created sequence.

5.1.13. Select "Start Sequence" from the sequence menu or click "Start" in the tool bar to start measurement.

Sequenc	e Edito	r – **UNTII	LED	
<u>S</u> equence	<u>E</u> dit	Substrate	⊻a	
<u>N</u> ew Open Save Save <u>A</u> s.		Ctrl+N Ctrl+O Ctrl+S		
<u>S</u> tart <u>R</u> epeat				
Info				Sequence Editor - TEST S
<u>P</u> rint A <u>u</u> to Prir	nt Optic	Ctrl+P ons		Sequence Edit Substrate Vacuum H
E <u>×</u> it				

When measurement is completed, the stage will return to the initial position and the scan trace window will appear.

Analysis												×
Ele Irace Operations Window Help												
R26	- LEV	EL STATS	3									
📕 Scan Data: Slot #	#0, Site #1						The seque	nce Param	eter Data			
Recipe: R26	Level:		7				Lot: R26C	Lot: R26C Sequence: R26C				
Speed: 50 µm/sec	Meas:		_	1			Up:		н	ecipe: R26		
Direction ->	4.00.00						Deskew	Sample	Stat	Analyze	Height	
Repeats: 1	r.oopin											
Force: 5 mg								Cassette	Mean		9219.3 Å	
Curronno							II		S. D.		13.0 A	
Left Right	8900A								Min	_	9192.5 A	
Meas -45.02 10.98									Bande		3233.2 A	
Delta -14.02 46.98									riange		94.7 8	
Level -37.02 117.0	7800Å						None	Slot 0	Mean	Inc	9219.3 Å	
Detta -13.02 140.0									S. D.		13.0 Å	
									Min		9192.5 Å	
Ref: 100.0	6700Å								Max		9235.2 Å	
E Height: 2.0 A	0100A								Range		42.7 A	
St Height: 9222.0 A							Mana	Cl-t-0				
Width: 58.50 um							None	SIDE U		Ino	0220 0 X	
TIR: 9281.9 Å	5600Å		╫┾┼┼				1 I.	Site 2		Inc	9223.9 Å	
								Site 3		Inc	9231.4 Å	
Cass ID:								Site 4		Inc	9235.2 Å	
R26C	4500Å							Site 5		Inc	9206.9 Å	
Seq ID: R26C								Site 6		Inc	9224.2 Å	
Rcp ID: R26								Site 7		Inc	9230.2 Å	
Slot: U								Site 8		Inc	9211.1 Å	
Sile. 1	3400A						II	Site 9		Inc	9192.5 A	
								Site IU		Inc	9216.7 A	
	2300Å				_ <b> </b>							
	12004											
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#### 5.2. Sequence Creation with Multi Analysis (Multiple Analysis Function)

Multiple data analysis function enables to re-analyze data under another recipe condition by using firstly-scanned data.

Multiple data analysis function makes measurement time shorter in the following cases.

- To measure two height differences with only one scan and each needs its own cursor setting.
- To measure under different filter setting.
- To measure with different analysis parameters on a recipe.
- 5.2.1. Create a scan recipe for analysis. This scan recipe must have the same measurement length, measurement speed, stylus pressure, sampling rate, contact speed and range as those of the measurement recipe. To change the content of the recipe, re-set parameters and cursor position and save the new recipe as another name.

5.2.2. Open a sequence recipe to add a created recipe to the sequence list. Set a measurement position. Add a recipe with different parameters and cursor position again. This recipe does not need measurement position setting. Instead, click "Multi Analysis" to make analysis parameters of the recipe start analysis. (In the following case, two sets of data can be analyzed by only one measurement.) The "Multi Analysis" button is not available at the point when the first recipe is entered.



5.2.3. Click "Start" to start measuring a sample. When a box appears to save a sequence recipe, enter a name to save it and start measurement.

5.2.4. When measurement is completed, data will be shown. In order to see each recipe data, click a array key in the drop-down box and click a relevant recipe name. Select "Save Data" from the "File" menu to save data.

