

Communication Command Reference Manual

LZM-100 / LZM-110

REVISION 7

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Chapter 1. Introduction

1.1 Splicer Software

The software version of the splicer is shown on the {Maintenance Info} page in the [MAINTENANCE] menu. Refer to Figure 1-1.

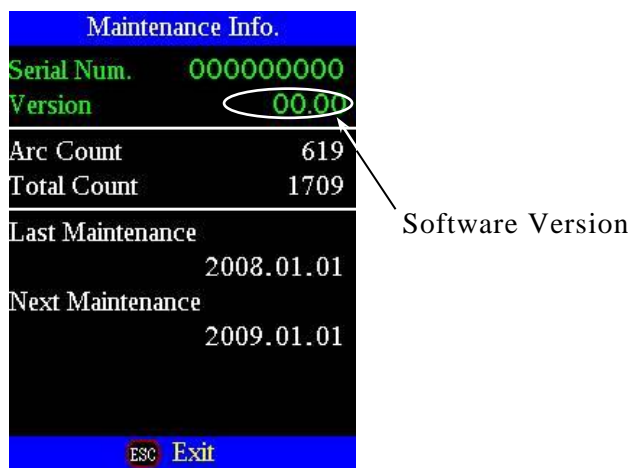


Figure 1-1: Confirmation of Splicer Software Version

1.2 Communication Settings

1.2.1 Cable

USB

Series A – Series mini-B cable is provided.

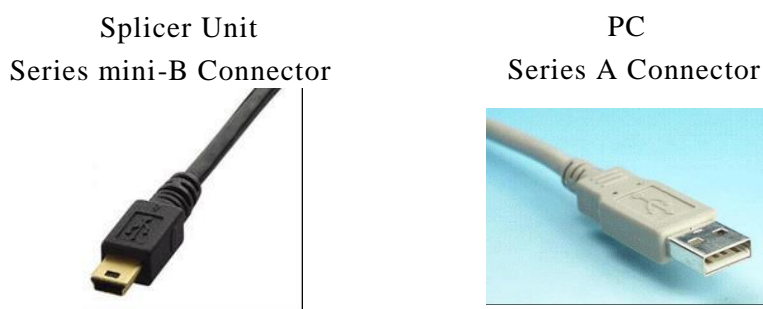


Figure 1-2: USB Cable

1.3 Communication API

The USB API class included in UsbFsm100Server.dll is used for communication between PC and the splicer. See the document "UsbFsm100Server_Manual(*).pdf" for detailed information.

1.4 Responses from the Splicer

When the splicer receives a command, the splicer will return requested data or Acknowledge (ACK) or Negative Acknowledge (NAK). Fujikura uses hexadecimal 06 for ACK and hexadecimal 15 for NAK.

Table 1-1: ACK, NAK

Name	Ctrl char	Dec	Hex	Char
Acknowledge	Ctrl-F	6	06	ACK
Negative Acknowledge	Ctrl-U	21	15	NAK

1.5 Command Types

There are five types of communication commands. Refer to Table 1-2

Table 1-2: Command Types

Function		Beginning of command	Example
1	Keypad	\$	\$RESET
2	Uploading Values of Parameters	#	#SPLMODE
3	Downloading Values of Parameters	%	%ALN
4	Retrieving Status or Splice Data	=	=INF SERNUM
5	Command for Starting Splicer Function	&	&EST

Any command that does not correspond with one of the above formats will be seen as an illegal command. The splicer will respond to all illegal command with **NAK**.

Chapter 2. Simulating Keypad

2.1 General Description of Keypad Command

Commands starting with \$ have the same function as pressing a key on the keypad. The splicer will always accept these commands, regardless of the state it is in.

For example, at {READY} state, pressing the keys <SET>, <RESET>, <HEAT>, <XY>, <ARC>, <HELP>, or <MENU> will change the state of splicer. For instance, if the operator presses the <SET> key, the splicer will start to splice. On the other hand, if the operator pressed the <EXIT> key at the {READY} state, the splicer will not change the state.

2.2 Keypad Command List

The keypad command list is as follows. The format is: '\$' with the keypad identifier code (e.g. \$SET). Table 2-1 shows the list of keypad identifier code and corresponding functions.

Table 2-1: Keypad Function Commands

Keypad Identifier Code	Function
SET	Equivalent of pressing the <SET> key Refer to Figure 2-1
RESET	Equivalent of pressing the <RESET> key Use splicer status retrieving command if it is necessary to confirm that reset function has completed. See Chapter 5.2 "Splicer Information"
HEAT	Equivalent of pressing the <HEAT> key
ARC	Equivalent of pressing the <ARC> key <i>Sending this command during the lasing process will stop laser output</i>
XY	Equivalent of pressing the <XY> key
HELP	Equivalent of pressing the <HELP> key
ESC	Equivalent of pressing the <ESC> key
MENU	Equivalent of pressing the <MENU> key
ENT	Equivalent of pressing the <ENT> key
UP	Equivalent of pressing the <UP> key
DOWN	Equivalent of pressing the <DOWN> key
LEFT	Equivalent of pressing the <LEFT> key
RIGHT	Equivalent of pressing the <RIGHT> key

The splicer will send **ACK** if the splicer receives any of the above commands, regardless of whether the command changes the state of the splicer or not. If the format of the command is incorrect, the splicer will send **NAK** to the PC.

2.3 Locking the Keypad

\$LOCK commands lock the keypad(s). If all of keypads are locked, the splicer responds only to PC commands. These commands are acceptable in any state, and can always lock the keypad(s). The splicer returns ACK if the command is accepted. Refer to Table 2-2.

Table 2-2: Keypad locking

Command	Function
\$LOCK	Locks all of keypads
\$LOCK <i>key identifier 1</i> <i>key identifier 2 ...</i>	Locks specified keypad(s).

2.4 Unlocking the Keypad

\$UNLOCK command unlocks all of keypads so the splicer will accept commands from either the PC or the keypad. This command is acceptable in any state, and will always unlock the splicer keypad. The splicer will respond with ACK if the command is accepted.

Table 2-3: Keypad unlocking

Command	Function
\$UNLOCK	Unlocks the splicer keypad

2.5 Reset splicer without motor reset

\$STOP command immediately stops current running process and makes the splicer state to READY state without motor reset. This command is acceptable while any process is running. The splicer returns ACK if the command is accepted.

Table 2-4: Reset splicer with no motor reset

Command	Function
\$STOP	Stops current process and make splicer go back to READY state without motor reset.

2.6 Reset splicer with reset of theta motors

\$RESETTH command immediately stops current running process and makes the splicer state to READY state with reset of the theta motors. This command is acceptable while any process is running. The splicer returns ACK if the command is accepted.

Table 2-5: Reset splicer with no motor reset except the theta motor

Command	Function
\$RESETTH	Stops current process and make splicer go back to READY state with reset of the theta motors.

2.7 Reset splicer with all of motors

\$RESETALL command immediately stops current running process and reset all of motors no matter what setting is applied for the [Clamp Action] and [Stage Positions at Start] in the current splice mode. The splicer goes to READY state after all of motors are reset. This command is acceptable while any process is running. The splicer returns ACK if the command is accepted.

Table 2-6: Reset splicer and all of motors

Command	Function
\$RESETALL	Stops current process and make splicer go back to READY state with reset of all of motors.

2.8 Splice Operation and Error

After pressing the <SET> key or sending the **\$SET** command in READY state, the splicer will start to splice. If the splice process has completed without an error, the LCD monitor will display {FINISH}. Current status of the splicer can be retrieved by sending the Splicer Status Retrieving command (See Chapter 5.4 "Status of the Splicer"). Refer to Table 2-7 and Figure 2-1. Figure 2-1 shows the flow of sending **\$SET**.

Table 2-7: Response of Splicer Status Retrieving command

Timing	Prerequisite	Response
PAUSE1	Type2 Error occurs	ERRPAUSE1
	No Error	NOPAUSE1
PAUSETHETA	Type2 Error occurs	ERRPAUSETH
	No Error	NOPAUSETH
PAUSE2	Type2 Error occurs	ERRPAUSE2
	No Error	NOPAUSE2
FINISH	Type2 Error occurs	ERRFIN
	No Error	NOFIN
PAUSE in Special Function	-	PAUSESF
Splicer Working	-	BUSY
READY	-	IDLE
{MAIN MENU}	Using a function in Main Menu	ANOTHER
Always	Type1 Error occurs	ER- error name

As described above, if an error occurs, an error message is shown on the LCD monitor. Error messages are classified in two types.

2.8.1 Type1 Error (Fatal Errors)

A type 1 error is an error that will stop the splicing process. If the splicer encounters a fatal error, the operator must press <RESET> or send \$RESET command from PC to restart the splicing process again.

When a type 1 error occurs, the splicing process stops and an error message will be shown immediately. PC can retrieve the error name using Function Result Retrieving command.

Table 2-8: Type 1 Errors

Error Message Shown on LCD	Result may be retrieved
Too Long Fiber	ER-TOOLONG : <i>fiber</i>*
Bad Fiber Position	ER-BADFIBERPOS : <i>fiber</i>
Too Dark	ER-TOODARK : <i>view</i>**
Camera Trouble	ER-CAMERA : <i>view</i>
Fiber Too Dusty	ER-TOODUSTY : <i>view</i>
Motor Overrun	ER-MTROVERRUN : <i>motor</i>
Motor Trouble	ER-MTRTROUBLE : <i>motor</i>
Close Cover	ER-CVRCLOSE
Cover Opened	ER-CVROPEN
Laser Too Left	ER-ARCLEFT
Laser Too Right	ER-ARCRIGHT
Laser Too Weak	ER-ARCWEAK
Laser Too Strong	ER-ARCSTRONG
Temperature Sensor NG	ER-SENSORNG
Fiber Separated	ER-SEPARATE
Fiber Data Not Installed	ER-NOFIBERDATA
No Arc Calibration Data	ER-NOARCCALDATA
Communication Error	ER-COMMUNICATION
Cleave Angle Error at Power Calibration Function	ER-CLVARCCALIB: <i>fiber</i>
Cleave Shape Error at Power Calibration Function	ER-SHAPEARCCALIB: <i>fiber</i>
Internal Error	ER-INTERNAL

Note: * "*fiber*" is L (left fiber), R (right fiber) or LR (both L and R). Otherwise, blank may be applied if it is not certain which side is the cause of the error.

** "*view*" is X (x view), Y (y view) or XY (both X and Y)

*** "*motor*" is X, Y, FX, FY, ZL, ZR, TL, TR, VAL, VAR, VBL, VBR, CL, CR, HL, HR, ELP, ELN

2.8.2 Type2 Error (Non Fatal Errors)

Type2 errors are the errors that do not terminate the splicing process. The splicer can be configured to allow the operator to override the error and continue splicing by pressing <SET>. Error messages are shown at {PAUSE1}, {PAUSE2}, or {FINISH}.

If a type2 error occurs during splicing, the splicer pauses. In this case, “ERRPAUSE1” or “ERRPAUSE2” or “ERRFIN” can be retrieved as the response of the function result retrieving command. The error name can be retrieved by using the “=ERR” command. For a complete listing of error codes, please refer to Table 5-6 in Section 5.3.

Table 2-9: Type 2 Error

Large Cleave Angle	Core Angle Error
Too Thin Fiber	Too Fat Fiber
High Estimated Loss	Bubble
Taper Thin	Cleave Shape Error
Hot Spot Found	Different Fiber
Not Reached to the Target	High Estimated Crosstalk

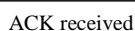


Figure 2-1: Flow of Automated Splicing

Chapter 3. Sending Parameters

3.1 General Description of the Functions

Commands starting with **#** are used to send parameter settings from the PC to the splicer. These commands are acceptable only during the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, and {FINISH} states. If the splicer is in any other state, it will send **NAK** to the PC. Also, if the commands are not formatted correctly, the splicer will send **NAK**.

3.2 Selecting Splice Mode

To change the current splice mode to one of the 300 available splice modes, use the command format **#SMODE-number**. Table 3-1 shows the command to change the splice mode.

Table 3-1: Command for Selecting Splice Modes

Format	#SMODE-number number: mode number (1-300)
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

3.3 Sending Splice Parameters

3.3.1 Normal Splice Parameters

Table 3-2 and Table 3-3 show the commands to send splice parameters.

Table 3-2: Format for Sending Splice Parameters

Format	<p>Format 1: #SPL-number / identifier1=value1 (/ identifier2 = value2 / identifier3..</p> <p>Format 2: #SPL identifier1=value1 (/ identifier2 = value2 / identifier3..</p> <p>number : Mode number (1 – 300). Current mode is used if this option is omitted. identifier : Parameter Identifier value : Input value</p>
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: parameter is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Modifying is not allowed for the specified parameter in the selected Edit Mode.

NOTE:

Splicer resets all of parameters of designated splice mode by factory default values in case the splicer receives the assignment expression for “Fiber Type”.

Therefore, “Fiber Type” assignment must be preceding another assignment when multiple parameter assignments are required.

Table 3-3: Identifier Code List for Normal Splice Parameters

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Fundamental Setting	Fiber Type	FIBERTYPE	Refer to Appendix A
Fundamental Setting	Mode Title 1	MODETITLE1	11 characters (Max)
Fundamental Setting	Mode Title 2	MODETITLE2	15 characters (Max)

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Fundamental Setting	Operating Mode	OPERATINGMODE	FULL, BASIC, SHAPING
Fundamental Setting	Auto Stuff Control	AUTOSTUFFCTRL	ON, OFF
Fundamental Setting	V Height Shift	VHEIGHTSHIFT	-200 to 100 Step 1
Fundamental Setting	Calibration Method	ARCCALIBRATION METHOD	STD, SP, NC
Fundamental Setting	Auto Calibration	AUTOARC CALIBRATION	OFF, 1 to 300
Fundamental Setting	Laser Center Compensation	ARCCENTER COMPENSATION	ON, OFF
Fundamental Setting	Fiber Type Compare	FIBERTYPECOMPARE	OFF, IGNORELR, JUDGELR
Fundamental Setting	Fiber Data L	FIBERDATA L	NOTSELECTED, 1 to 300
Fundamental Setting	Fiber Data R	FIBERDATA R	NOTSELECTED, 1 to 300
Fundamental Setting	Proof Test	PROOFTEST	OFF, 100 to 10000 Step 100
Fundamental Setting	Splice Before Shaping	SPLICEBEFORE SHAPING	YES, NO
Fundamental Setting	Clamp Action	CLAMPACTION	AUTO, FIXED
Fundamental Setting	Optical Zoom	OPTICALZOOM	AUTO, ZOOMIN, ZOOMOUT
Fundamental Setting	Camera Window Size	CAMERA WINDOWSIZE	AUTO, 1X, 2X, 3X

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Stage Positions at Start	Initial Sweep Position	INITIALPOSSWP	(100) NA ----- (110M,110P) CENTER, L-5000 to L-1 or R-5000 to R-1 Step 1 ----- (110M+,110P+) CENTER, L-18000 to L-1 or R-18000 to R-1 Step 1 '0' can be used instead of CENTER
Stage Positions at Start	Except Z Stages	EXCEPTZSTAGES	PREDEFINED, KEEP
Stage Positions at Start	Z Stages	ZSTAGES	PREDEFINED, KEEP
Left Fiber Information	Clamp At	LCLAMPAT	AUTO, CLAD, CLAD2, COATING
Left Fiber Information	Coating Diameter	LCOATINGDIAMETER	1 to 2300 Step 1
Left Fiber Information	Clad Diameter	LCLADDIAMETER	1 to 2300 Step 1
Left Fiber Information	Clad Diameter2	LCLADDIAMETER2	1 to 2300 Step 1
Left Fiber Information	Core Diameter	LCOREDIAMETER	0.1 to 2300.0 Step 0.1
Left Fiber Information	MFD	LMFD	1.0 to 500.0 Step 0.1
Left Fiber Information	Cleave Length	LCLEAVELENGTH	3MM to 180MM

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Right Fiber Information	Clamp At	RCLAMPAT	AUTO, CLAD, CLAD2, COATING
Right Fiber Information	Coating Diameter	RCOATINGDIAMETER	1 to 2300 Step 1
Right Fiber Information	Clad Diameter	RCLADDIAMETER	1 to 2300 Step 1
Left Fiber Information	Clad Diameter2	RCLADDIAMETER2	1 to 2300 Step 1
Right Fiber Information	Core Diameter	RCOREDIAMETER	0.1 to 2300.0 Step 0.1
Right Fiber Information	MFD	RMFD	1.0 to 500.0 Step 0.1
Right Fiber Information	Cleave Length	RCLEAVELENGTH	3MM to 180MM
Gapsetting	Gapset	GAPSET	MANUAL, SPLICING, L, R
Gapsetting	Cleaning Power NC or calibrated power for STD or SP	CLEANINGARC POWERABS	0 bit to 1023 bit Step 1
Gapsetting	Cleaning Power Relative part of STD or SP	CLEANINGARC POWERREL	-1000bit to +1000bit Step 1
Gapsetting	Cleaning Time	CLEANINGARCTIME	OFF or 5 to 60000 Step 5
Gapsetting	Gap	GAP	1 to 500 Step 1

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Gapsetting	Gapset Position	GAPSETPOSITION	CENTER, L-1000 to L-1 or R-1000 to R-1 Step 1 '0' can be used instead of CENTER
Gapsetting	Gap Measurement	GAPMEASUREMENT	MINMAX, MINMIN, MINAVE, AVEAVE, AVEMAX, MAXMAX
Theta Align	Angle Offset	ANGLEOFFSET	0.00 to 360.00 Step 0.01
Theta Align Left	Alignment Method	LALIGNMENT METHOD	OFF, PAS, EV, P-METER
Theta Align Left	Mode PAS	LALIGNMODEPAS	PANDA, IPA,B1500T, ANGLE, ECC, MANUAL
Theta Align Left	Mode EV	LALIGNMODEEV	AUTO,MANUAL, PANDA,BOWTIE
Theta Align Left	Mode PM	LALIGNMODEPM	MAX, MIN, MANUAL
Theta Align Left	Correction Angle	LCORRECTION ANGLE	-360.00 to 360.00 Step 0.01
Theta Align Left	Mode PM	LALIGNMODEPM	MAX, MIN, MANUAL
Theta Align Right	Alignment Method	RALIGNMENT METHOD	OFF, PAS, EV, P-METER
Theta Align Right	Mode PAS	RALIGNMODEPAS	PANDA, IPA, B1500T ANGLE, ECC, MANUAL

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Theta Align Right	Mode EV	RALIGNMODEEV	AUTO, MANUAL, PANDA, BOWTIE
Theta Align Right	Mode PM	RALIGNMODEPM	MAX, MIN, MANUAL
Theta Align Right	Correction Angle	RCORRECTION ANGLE	-360.00 to 360.00 Step 0.01
IPA Settings	Rotation Step Angle	IPAROTATIONSTEP ANGLE	1, 2, 3, 4, 5, 6, 8, 10
IPA Settings	Total Rotation Angle	IPATOTALROTATION ANGLE	180, 360
IPA Settings Left	Method	LIPAMETHOD	AUTO, DIFF, SAME
IPA Settings Left	Reference Model	LIPAREFERENCE MODEL	ID number(16 figures)
IPA Settings Left	Focus L	LIPAFOCUSTARGET	OFF, AUTO, 0.01 to 0.80
IPA Settings Right	Method	RIPAMETHOD	AUTO, DIFF
IPA Settings Right	Reference Model	RIPAREFERENCE MODEL	ID number(16 figures)

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
IPA Settings Right	Focus R	RIPAFOCUSTARGET	OFF, AUTO, 0.01 to 0.80
XY Align	Alignment Method	XYALIGNMENT METHOD	OFF, PAS, EV, P-METER
XY Align	Alignment Mode for PAS	XYALIGNMODEPAS	CORE, CLAD, AUTO, MANUAL
XY Align	Alignment Mode for EV	XYALIGNMODE EV	CORE
XY Align	Alignment Mode for Power Meter	XYALIGNMODE PMETER	MAX, MIN, MANUAL
XY Align	Pause for P-Meter	PAUSEFORPMETER	ON, OFF
XY Align	Gap At Alignment	GAPATALIGNMENT	SAME, 1 to 500
XY Align	ECF	ECF	OFF or 0.01 to 0.60 Step 0.01
XY Align	Attenuation	ATTENUATION	ON, OFF
XY Align	Unit Of Align Target	UNITOFALIGN TARGET	UM, DB, DBM
XY Align	XY Individually	XYINDIVIDUALLY	ON, OFF

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
XY Align	Align Target [um]	XYALIGNTARGETUM	0.0 to 25.0 Step 0.1
XY Align	Align Target [dB]	XYALIGNTARGETDB	0.0 to 25.0 Step 0.1
XY Align	Align Target [dBm]	XYALIGNTARGET DBM	-99.9 to 99.9 Step 0.1
XY Align	XY Individually	XYINDIVIDUALLY	ON, OFF
XY Align	Offset Direction X	OFFSETDIRECTIONX	UP, DOWN
XY Align	X Align Target	XALIGNTARGET	0.0 um to 25.0 um Step 0.1
XY Align	Offset Direction Y	OFFSETDIRECTIONY	UP, DOWN
XY Align	Y Align Target	TARGETVALUEY	0.0 um to 25.0 um Step 0.1
Focus	Focus LX (Focus L)	FOCUSLX	AUTO or 0.10 to 0.50 Step 0.01
Focus	Focus LY	FOCUSLY	AUTO or 0.10 to 0.50 Step 0.01
Focus	Focus RX (Focus R)	FOCUSRX	AUTO or 0.10 to 0.50 Step 0.01

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Focus	Focus RY	FOCUSRY	AUTO or 0.10 to 0.50 Step 0.01
Prefuse & Overlap	Prefuse Power NC or calibrated power for STD or SP	PREFUSEPOWERABS	0 bit to 1023 bit Step 1
Prefuse & Overlap	Prefuse Power Relative part of STD or SP	PREFUSEPOWERREL	-1000bit to +1000bit Step 1
Prefuse & Overlap	Prefuse Time	PREFUSETIME	— 10000 to 60000 Step 5
Prefuse & Overlap	Prefuse On Time	PREFUSEONTIME	5 to 60000 Step 5
Prefuse & Overlap	Prefuse Off Time	PREFUSEOFTIME	OFF or 5 to 60000 Step 5
Prefuse & Overlap	Overlap	OVERLAP	OFF or 0 to 1000 Step 1
Prefuse & Overlap	Stuff Speed	STUFFSPEED	0.00 to 1.00 Step 0.01
Main Lasing	Main Lasing Power NC or calibrated power for STD or SP	MAINARCPowerABS	0 bit to 1023 bit Step 1
Main Lasing	Main Lasing Power Relative part of STD or SP	MAINARCPowerREL	-1000bit to +1000bit Step 1
Main Lasing	Main Lasing Time	MAINARCTIME	0 to 9000000 Step 1
Main Lasing	Auto Time Comp (By Ecc)	MAINARCTIME COMPBYECC	ON, OFF

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Tapering	Taper	TAPER	ON, OFF
Tapering	Taper Wait	TAPERWAIT	0 to 30000 Step 10
Tapering	Taper Speed	TAPERSPEED	0.01 to 1.00 Step 0.01
Tapering	Taper Length	TAPERLENGTH	0 to 100 Step 1
Estimation	Loss Estimation Method	LOSSESTIMATION METHOD	OFF, NEW, OLD, P-METER
Estimation	Axis Offset	AXISOFFSET MEASURE	OFF, CORE, CLAD
Estimation	Core Deformation	COREDEFORMATION	ON, OFF
Estimation	MFD Mismatch Measure	MFDMISMATCH MEASURE	OFF, WSI, CSI
Estimation	Minimum Loss	MINIMUMLOSS	OFF or 0.00 to 2.50 Step 0.01
Estimation	Wave Length	WAVELENGTH	780 to 1650 Step 1
Estimation	Core Deformation Coef	COREDEFORMATION COEF	0.10 to 10.00 Step 0.01
Estimation	MFD Mismatch Offset	MFDMISMATCH OFFSET	0.0 to 100.0 Step 0.1
Estimation	MFD Mismatch Sensitivity	MFDMISMATCH SENSITIVITY	0.01 to 10.00 Step 0.01
Estimation	Mode for Old Method	ESTMODEFOR OLDMETHOD	CLAD, CORE, COREFINE

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Estimation	Core Step Coef	CORESTEPCOEF	OFF or 1 to 50000 Step 1
Estimation	Core Curve Coef	CORECURVECOEF	OFF or 1 to 50000 Step 1
Estimation	MFD Mismatch	OLDMFDMISMATCH	OFF or 1 to 50000 Step 1
Estimation	Crosstalk Estimation Method	CROSSTALK ESTMETHOD	OFF, PAS, IPA, P-METER
Estimation	Crosstalk Estimation Mode	CROSSTALK ESTMODE	DEGCT, DEGPOR
Estimation	Ref. PER	REFPER	-50 to -1 Step 1 [dB]
Re-lasing	Re-lasing Power NC or calibrated power for STD or SP	REARCPowerABS	0 bit to 1023 bit Step 1
Re-lasing	Re-lasing Power Relative part of STD or SP	REARCPowerREL	-1000bit to +1000bit Step 1
Re-lasing	Re-lasing Time	REARCTIME	0 to 60000 Step 1 [ms]
Re-lasing	On Time	REARCONTIME	5 to 60000 Step 5 [ms]
Re-lasing	Off Time	REARCOFFTIME	OFF or 5 to 60000 Step 5
Error Limit Threshold	Cleave Angle Limit	CLEAVELIMIT	OFF or 0.1 to 10.0 Step 0.1

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Error Limit Threshold	Cleave Shape Sensitivity	CLEAVESHAPE SENSITIVITY	OFF, ROUGH, NORMAL, FINE
Error Limit Threshold	Fiber Angle Limit	FIBERANGLELIMIT	OFF or 0.1 to 10.0 Step 0.1
Error Limit Threshold	Loss Limit	LOSSLIMIT	OFF or 0.01 to 2.50 Step 0.01
Error Limit Threshold	Crosstalk Limit [deg]	CROSSTALKLIMIT	OFF or 0.1 to 25.0 Step 0.1
Error Limit Threshold	Angle Offset Limit [deg]	ANGLEOFFSETLIMIT	OFF or 0.1 to 25.0 Step 0.1
Error Limit Threshold	Laser Center Offset Limit	ARCCENTER OFFSETLIMIT	OFF or 1 to 100
Error Limit Threshold	Bubble Sensitivity	BUBBLE SENSITIVITY	OFF or STANDARD or -90 to 100 Step 10
Error Limit Threshold	Fat Error Sensitivity	FATSENSITIVITY	OFF or STANDARD or -90 to 100 Step 10
Error Limit Threshold	Thin Error Sensitivity	THINSENSITIVITY	OFF or STANDARD or -90 to 100 Step 10
Error Limit Threshold	Hot Spot Sensitivity	HOTSPOT SENSITIVITY	OFF or STANDARD or -90 to 100 Step 10

3.3.2 Special Function Parameters

Table 3-4 and Table 3-5 show the commands to input Special Function parameters. Normal and Special Function parameter assignment expressions (identifier = value and SFnn-identifier = value) can be merge into one command string.

Table 3-4: Format for Sending Special Function Parameters

Format	<p>Format 1: #SPL-number / SFnn- identifier1=value1 (/ SFnn- identifier2 = value2 / SFnn- identifier3...</p> <p>Format 2: #SPL SFnn- identifier1=value1 (/ SFnn- identifier2 = value2 / SFnn- identifier3...</p> <p>number : Mode number (1 – 300). Current mode is used if this option is omitted. nn : Special Function Number (1-10) identifier : Parameter Identifier value : Input value</p>
Response of the Splicer	<p>Successful ACK</p> <p>Unsuccessful NAK Reason1: Illegal format Reason2: Parameter code is wrong Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Modification is not allowed for the specified parameter in the selected Edit Mode.</p>

Table 3-5: Identifier Code List for Special Function Parameters

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Preceding Action	Action	PRECEDINGACTION	NONE, PAUSE
Motor1	Motor Type	MOTOR1MOTORTYPE	OFF, ZL, ZR, X, Y, TL, TR
Motor1	Direction	MOTOR1DIRECTION	FORWARD, REVERSE *1
Motor1	Start Time	MOTOR1STARTTIME	0 to 9000000 Step 5 [ms]

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Motor1	Finish Time	MOTOR1FINISHTIME	0 to 9000000 Step 5 [ms]
Motor1	Initial Speed	MOTOR1INITIAL SPEED	0.001 to 1.000 Step 0.001
Motor1	Acceleration	MOTOR1 ACCELERATION	-0.01000000 to 0.01000000 Step 0.00000001
Motor2	Motor Type	MOTOR2MOTORTYPE	OFF, ZL, ZR, X, Y, TL, TR
Motor2	Direction	MOTOR2DIRECTION	FORWARD, REVERSE *1
Motor2	Start Time	MOTOR2STARTTIME	0 to 9000000 Step 5 [ms]
Motor2	Finish Time	MOTOR2FINISHTIME	0 to 9000000 Step 5 [ms]
Motor2	Initial Speed	MOTOR2INITIAL SPEED	0.001 to 1.000 Step 0.001
Motor2	Acceleration	MOTOR2 ACCELERATION	-0.01000000 to 0.01000000 Step 0.00000001
Motor3	Motor Type	MOTOR3MOTORTYPE	OFF, ZL, ZR, X, Y, TL, TR
Motor3	Direction	MOTOR3DIRECTION	FORWARD, REVERSE *1
Motor3	Start Time	MOTOR3STARTTIME	0 to 9000000 Step 5 [ms]
Motor3	Finish Time	MOTOR3FINISHTIME	0 to 9000000 Step 5 [ms]

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Motor3	Initial Speed	MOTOR3INITIAL SPEED	0.001 to 1.000 Step 0.001
Motor3	Acceleration	MOTOR3 ACCELERATION	-0.01000000 to 0.01000000 Step 0. 00000001
Motor4	Motor Type	MOTOR4MOTORTYPE	OFF, ZL, ZR, X, Y, TL, TR
Motor4	Direction	MOTOR4DIRECTION	FORWARD, REVERSE *1
Motor4	Start Time	MOTOR4STARTTIME	0 to 9000000 Step 5 [ms]
Motor4	Finish Time	MOTOR4FINISHTIME	0 to 9000000 Step 5 [ms]
Motor4	Initial Speed	MOTOR4INITIAL SPEED	0.001 to 1.000 Step 0.001
Motor4	Acceleration	MOTOR4 ACCELERATION	-0.01000000 to 0.01000000 Step 0. 00000001
Lasing	Lasing Power NC or calibrated power for STD or SP	ARCPOWERABS	0 bit to 1023 bit Step 1
Lasing	Lasing Power Relative part of STD or SP	ARCPOWERREL	-1000bit to +1000bit Step 1
Lasing	Start Time	ARCSTARTTIME	0 to 9000000 Step 5 [ms]
Lasing	Finish Time	ARCFINISHTIME	0 to 9000000 Step 5 [ms]
Target	Measurement Method	MEASUREMETHOD	OFF, LOSSEST, P-METER, AXISOFS, DIAMETER

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Target	Measurement Mode of Loss Estimation	MEASUREMODE LOSSEST	CLAD, CORE
Target	Measurement Mode of Power Meter	MEASUREMODE PMETER	DBM, DB
Target	Measurement Mode of Axis Offset	MEASUREMODE AXISOFS	CLAD, CORE
Target	Measurement Mode of Diameter	MEASUREMODE DIAMETER	AVERAGE, MAX, MIN
Target	Upper Limit Loss Estimation [dB]	UPPERLIMIT LOSSEST	0.0 to 30.0 Step 0.1
Target	Lower Limit Loss Estimation [dB]	LOWERLIMIT LOSSEST	0.0 to 30.0 Step 0.1
Target	Upper Limit Power Meter [dB]	UPPERLIMIT PMETERDB	-99.9 to 99.9 Step 0.1
Target	Lower Limit Power Meter [dB]	LOWERLIMIT PMETERDB	-99.9 to 99.9 Step 0.1
Target	Upper Limit Power Meter [dBm]	UPPERLIMIT PMETERDBM	-99.9 to 99.9 Step 0.1
Target	Lower Limit Power Meter [dBm]	LOWERLIMIT PMETERDBM	-99.9 to 99.9 Step 0.1
Target	Upper Limit Axis Offset	UPPERLIMIT AXISOFS	0.0 to 1150.0 Step 0.1
Target	Lower Limit Axis Offset	LOWERLIMIT AXISOFS	0.0 to 1150.0 Step 0.1

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Target	Upper Limit Diameter	UPPERLIMIT DIAMETER	0.0 to 2300.0 Step 0.1
Target	Lower Limit Diameter	LOWERLIMIT DIAMETER	0.0 to 2300.0 Step 0.1
Next Action	Action	NEXTACTION WHENOFF	FINISH, NEXTSTEP, REPEAT, ERROR, PAUSE, JUMP
Next Action	Step Increment	INCWHENOFF	-9 to 9 Step 1
Next Action	Value < L	BELOWTHRESHOLD	FINISH, NEXTSTEP, REPEAT, ERROR, PAUSE, JUMP
Next Action	Value L to U	INRANGE	FINISH, NEXTSTEP, REPEAT, ERROR, PAUSE, JUMP
Next Action	Value > U	ABOVETHRESHOLD	FINISH, NEXTSTEP, REPEAT, ERROR, PAUSE, JUMP
Next Action	Repeat Limit	REPEATLIMIT	INFINITY, 0 to 1000 step 1
Next Action	(Jump) Repeat Limit	JUMPREPEATLIMIT	INFINITY, 1 to 255 step 1
Next Action	(Value < L) Step Increment	INCIFBELOW	-9 to 9 Step 1
Next Action	(Value within L to U) Step Increment	INCIFWITHIN	-9 to 9 Step 1
Next Action	(Value > U) Step Increment	INCIFABOVE	-9 to 9 Step 1

*1 : FORWARD equals DOWN and REVERSE equals UP if the parameter is for X or Y motor.

3.3.3 Restoring Image of Splice Mode Parameters

Commands for transferring binary image of splice mode parameters are prepared in order to shorten the time of backup and restoring splice mode data.

These commands can also be used for copying splice mode data from one splicer to another splicer.

The table below shows the command for restoring image of splice mode parameters. The binary data used in this function can be retrieved by the command at Chapter 4.3.2 "Backup Image of Splice Mode Parameters".

Table 3-6: Command for Restoring Image of Splice Mode Parameters

Format	#SPLH- number number: Splice mode number (1 – 300) {Binary Image Data: 4100 bytes} The binary data must be sent after ACK for the command is received NOTE: ACK or NAK is returned for each of the command and binary data image.
Response of the Splicer	Successful ACK <hr/> Unsuccessful NAK Reason1: Illegal format Reason2: number is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

3.4 Sending Utility Parameters

Table 3-7 and Table 3-8 show the commands to input [UTILITY] parameters.

Table 3-7: Format for Inputting Utility Parameters

Format	Format 1: #UTY identifier1=value1 (/ identifier2 = value2 / identifier3... identifier : Parameter Identifier value : Input value
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: parameter is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Modifying is not allowed for the specified parameter in the selected Edit Mode.

Table 3-8: Utility Parameter Inputs

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Splice Menu	Pause1	SPLPAUSE1	ON, OFF
Splice Menu	Pause After Theta Align	SPLPAUSEAFTER THETAALIGN	ON, OFF
Splice Menu	Pause2	SPLPAUSE2	ON, OFF
Splice Menu	Auto Start	SPLAUTOSTART	ON, OFF
Splice Menu	Splice Memory Comment	SPLICEMEMORY COMMENT	15 characters (Max)
Ignore Error	Cleave Angle	IGNANGLE	ENABLE, DISABLE
Ignore Error	Cleave Shape	IGNSHAPE	ENABLE, DISABLE
Ignore Error	Fiber Angle	IGNFIBERANGLE	ENABLE, DISABLE
Ignore Error	Loss	IGNLOSS	ENABLE, DISABLE
Ignore Error	Crosstalk	IGNCROSSTALK	ENABLE, DISABLE
Ignore Error	Laser Center	IGNLASERCENTER	ENABLE, DISABLE

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Ignore Error	Fiber Separated	IGNSEPARATE	ENABLE, DISABLE
Ignore Error	Estimation Failure	IGNESTIMATE	ENABLE, DISABLE
Ignore Error	Bubble	IGNBUBBLE	ENABLE, DISABLE
Ignore Error	Fat	IGNFAT	ENABLE, DISABLE
Ignore Error	Thin	IGNTHIN	ENABLE, DISABLE
Ignore Error	Hot Spot	IGNHOTSPOT	ENABLE, DISABLE
Display Setting	Gapset (Main Screen Image Layout)	SCR-GAPSET-M-L	*1
Display Setting	Gapset (Main Screen Image When Not Split)	SCR-GAPSET-M-S	*2
Display Setting	Gapset (Main Screen Top Side When Split)	SCR-GAPSET-M-T	OFF, LIVEX
Display Setting	Gapset (Main Screen Bottom Side When Split)	SCR-GAPSET-M-B	OFF, LIVEY
Display Setting	Gapset (Sub Screen Image Layout)	SCR-GAPSET-S-L	*1
Display Setting	Gapset (Sub Screen Image When Not Split)	SCR-GAPSET-S-S	*2
Display Setting	Gapset (Sub Screen Top Side When Split)	SCR-GAPSET-S-T	OFF, LIVEX
Display Setting	Gapset (Sub Screen Bottom Side When Split)	SCR-GAPSET-S-B	OFF, LIVEY
Display Setting	Theta Align (Main Screen Image Layout)	SCR-TALIGN-M-L	*1
Display Setting	Theta Align (Main Screen Image When Not Split)	SCR-TALIGN-M-S	*2
Display Setting	Theta Align (Main Screen Top Side When Split)	SCR-TALIGN-M-T	*3
Display Setting	Theta Align (Main Screen Bottom Side When Split)	SCR-TALIGN-M-B	*4
Display Setting	Theta Align (Sub Screen Image Layout)	SCR-TALIGN-S-L	*1
Display Setting	Theta Align (Sub Screen Image When Not Split)	SCR-TALIGN-S-S	*2

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Display Setting	Theta Align (Sub Screen Top Side When Split)	SCR- TALIGN -S-T	*3
Display Setting	Theta Align (Sub Screen Bottom Side When Split)	SCR- TALIGN -S-B	*4
Display Setting	XY Align (Main Screen Image Layout)	SCR- XYALIGN-M-L	*1
Display Setting	XY Align (Main Screen Image When Not Split)	SCR- XYALIGN -M-S	*2
Display Setting	XY Align (Main Screen Top Side When Split)	SCR- XYALIGN -M-T	*3
Display Setting	XY Align (Main Screen Bottom Side When Split)	SCR- XYALIGN -M-B	*4
Display Setting	XY Align (Sub Screen Image Layout)	SCR- XYALIGN -S-L	*1
Display Setting	XY Align (Sub Screen Image When Not Split)	SCR- XYALIGN -S-S	*2
Display Setting	XY Align (Sub Screen Top Side When Split)	SCR- XYALIGN -S-T	*3
Display Setting	XY Align (Sub Screen Bottom Side When Split)	SCR- XYALIGN -S-B	*4
Display Setting	Lasing (Main Screen Image Layout)	SCR-LASING-M-L	*1
Display Setting	Lasing (Main Screen Image When Not Split)	SCR- LASING -M-S	*2
Display Setting	Lasing (Main Screen Top Side When Split)	SCR- LASING -M-T	*5
Display Setting	Lasing (Main Screen Bottom Side When Split)	SCR- LASING -M-B	*6
Display Setting	Lasing (Sub Screen Image Layout)	SCR- LASING -S-L	*1
Display Setting	Lasing (Sub Screen Image When Not Split)	SCR- LASING -S-S	*2
Display Setting	Lasing (Sub Screen Top Side When Split)	SCR- LASING -S-T	*5
Display Setting	Lasing (Sub Screen Bottom Side When Split)	SCR- LASING -S-B	*6
Display Setting	Special Function (Main Screen Image Layout)	SCR-SPCFUNC-M-L	*1

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Display Setting	Special Function (Main Screen Image When Not Split)	SCR- SPCFUNC -M-S	*2
Display Setting	Special Function (Main Screen Top Side When Split)	SCR- SPCFUNC -M-T	*5
Display Setting	Special Function (Main Screen Bottom Side When Split)	SCR- SPCFUNC -M-B	*6
Display Setting	Special Function (Sub Screen Image Layout)	SCR- SPCFUNC -S-L	*1
Display Setting	Special Function (Sub Screen Image When Not Split)	SCR- SPCFUNC -S-S	*2
Display Setting	Special Function (Sub Screen Top Side When Split)	SCR- SPCFUNC -S-T	*5
Display Setting	Special Function (Sub Screen Bottom Side When Split)	SCR- SPCFUNC -S-B	*6
Display Setting	Estimating (Main Screen Image Layout)	SCR-ESTIM-M-L	*1
Display Setting	Estimating (Main Screen Image When Not Split)	SCR- ESTIM -M-S	*2
Display Setting	Estimating (Main Screen Top Side When Split)	SCR- ESTIM -M-T	*5
Display Setting	Estimating (Main Screen Bottom Side When Split)	SCR- ESTIM -M-B	*6
Display Setting	Estimating (Sub Screen Image Layout)	SCR- ESTIM -S-L	*1
Display Setting	Estimating (Sub Screen Image When Not Split)	SCR- ESTIM -S-S	*2
Display Setting	Estimating (Sub Screen Top Side When Split)	SCR- ESTIM -S-T	*5
Display Setting	Estimating (Sub Screen Bottom Side When Split)	SCR- ESTIM -S-B	*6
Display Setting	Pause1 (Main Screen Image Layout)	SCR-PAUSE1- <i>n</i> -M-L	*1 *15
Display Setting	Pause1 (Main Screen Image When Not Split)	SCR-PAUSE1- <i>n</i> -M-S	*7 *15
Display Setting	Pause1 (Main Screen Top Side When Split)	SCR-PAUSE1- <i>n</i> -M-T	*8 *15
Display Setting	Pause1 (Main Screen Bottom Side When Split)	SCR-PAUSE1- <i>n</i> -M-B	*9 *15

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Display Setting	Pause1 (Sub Screen Image Layout)	SCR-PAUSE1- <i>n</i> -S-L	*1 *15
Display Setting	Pause1 (Sub Screen Image When Not Split)	SCR-PAUSE1- <i>n</i> -S-S	*7 *15
Display Setting	Pause1 (Sub Screen Top Side When Split)	SCR-PAUSE1- <i>n</i> -S-T	*8 *15
Display Setting	Pause1 (Sub Screen Bottom Side When Split)	SCR-PAUSE1- <i>n</i> -S-B	*9 *15
Display Setting	Pause Theta (Main Screen Image Layout)	SCR-PAUSET- <i>n</i> -M-L	*1 *15
Display Setting	Pause Theta (Main Screen Image When Not Split)	SCR-PAUSET- <i>n</i> -M-S	*7 *15
Display Setting	Pause Theta (Main Screen Top Side When Split)	SCR-PAUSET- <i>n</i> -M-T	*8 *15
Display Setting	Pause Theta (Main Screen Bottom Side When Split)	SCR-PAUSET- <i>n</i> -M-B	*9 *15
Display Setting	Pause Theta (Sub Screen Image Layout)	SCR-PAUSET- <i>n</i> -S-L	*1 *15
Display Setting	Pause Theta (Sub Screen Image When Not Split)	SCR-PAUSET- <i>n</i> -S-S	*7 *15
Display Setting	Pause Theta (Sub Screen Top Side When Split)	SCR-PAUSET- <i>n</i> -S-T	*8 *15
Display Setting	Pause Theta (Sub Screen Bottom Side When Split)	SCR-PAUSET- <i>n</i> -S-B	*9 *15
Display Setting	Pause2 (Main Screen Image Layout)	SCR-PAUSE2- <i>n</i> -M-L	*1 *16
Display Setting	Pause2 (Main Screen Image When Not Split)	SCR- PAUSE2- <i>n</i> -M-S	*7 *16
Display Setting	Pause2 (Main Screen Top Side When Split)	SCR- PAUSE2- <i>n</i> -M-T	*10 *16
Display Setting	Pause2 (Main Screen Bottom Side When Split)	SCR- PAUSE2- <i>n</i> -M-B	*11 *16
Display Setting	Pause2 (Sub Screen Image Layout)	SCR-PAUSE2- <i>n</i> -S-L	*1 *16
Display Setting	Pause2 (Sub Screen Image When Not Split)	SCR- PAUSE2- <i>n</i> -S-S	*7 *16
Display Setting	Pause2 (Sub Screen Top Side When Split)	SCR- PAUSE2- <i>n</i> -S-T	*10 *16

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Display Setting	Pause2 (Sub Screen Bottom Side When Split)	SCR- PAUSE2- <i>n</i> -S-B	*11 *16
Display Setting	Finish (Main Screen Image Layout)	SCR-FINISH- <i>n</i> -M-L	*1 *17
Display Setting	Finish (Main Screen Image When Not Split)	SCR-FINISH- <i>n</i> -M-S	*12 *17
Display Setting	Finish (Main Screen Top Side When Split)	SCR-FINISH- <i>n</i> -M-T	*13 *17
Display Setting	Finish (Main Screen Bottom Side When Split)	SCR-FINISH- <i>n</i> -M-B	*14 *17
Display Setting	Finish (Sub Screen Image Layout)	SCR-FINISH- <i>n</i> -S-L	*1 *17
Display Setting	Finish (Sub Screen Image When Not Split)	SCR-FINISH- <i>n</i> -S-S	*12 *17
Display Setting	Finish (Sub Screen Top Side When Split)	SCR-FINISH- <i>n</i> -S-T	*13 *17
Display Setting	Finish (Sub Screen Bottom Side When Split)	SCR-FINISH- <i>n</i> -S-B	*14 *17
Splice Settings Others	Auto Fiber Forward	SPLAUTOFORWARD	ON, OFF
Splice Settings Others	Realign After Pause	SPLREALIGNAFTER PAUSE	ON, OFF
Splice Settings Others	Max Num. of Re-lasing	SPLMAXRELASING COUNT	INFINITY or 0 to 10
Maintenance Laser Power Calibration	Cleave Limit	CALIBRATION CLEAVELIMIT	OFF or 1 to 10.0 Step 0.1
Maintenance Laser Power Calibration	Max Num of Tests	CALIBRATION MAXNUMOFTTEST	INFINITY or 1 to 10 Step 1
Maintenance Data For Laser Recharge	Last Recharge	LASTRECHARGE	20100101 to 20991231
Basic Settings	Language	LANGUAGE	ENGLISH or JAPANESE
Basic Settings	Buzzer Volume	BUZZERVOLUME	OFF or 0 to 10 Step 1

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Basic Settings	Monitor Position	MONITORPOSITION	AUTO, FRONT, BACK
Basic Settings	LCD Brightness	LCDBRIGHTNESS	10 to 100 Step 5
Basic Settings	Laser Power Unit	LASERPOWERUNIT	BIT
Basic Settings	Caution to Auto Stuff OFF	CAUTIONAUTOSTUFF	WHITE or YELLOW
Basic Settings	Password	PASSWORD	9 characters (Max)
GPIB	Instrument	INSTRUMENT	Refer to Appendix C
GPIB	Address Instrument	ADDRESS INSTRUMENT	1 to 22 Step 1
GPIB	Address Splicer	ADDRESSSPLICER	1 to 22 Step 1
Power On Option	Opening Title1	OPENTITLE1	15 characters (Max)
Power On Option	Opening Title2	OPENTITLE2	15 characters (Max)
Power On Option	Arc Calibration	OPENPOWER CALIBRATION	ON, OFF
Power On Option	Dust Check	OPENDUSTCHECK	ON, OFF
Power On Option	Password Boot Lock From	OPENPASSWORD BOOTLOCKFROM	20130101 to 20991231 (YYYYMMDD)
Ready Display	Splice Mode	SPLICEMODEDISPLAY	ON, OFF
Ready Display	Additional Data 1	ADDITIONALDATA1	OFF, CLEAVELIMIT, PROOFTEST, CALENDAR, IRRADIATIONCOUNT
Ready Display	Additional Data 2	ADDITIONALDATA2	OFF, CLEAVELIMIT, PROOFTEST, CALENDAR, IRRADIATIONCOUNT
Ready Display	Additional Data 3	ADDITIONAL DATA3	OFF, CLEAVELIMIT, PROOFTEST, CALENDAR, IRRADIATIONCOUNT
Short Cut	Enter	SHORTCUTENT	*18
Short Cut	Esc	SHORTCUTESC	*18

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Turn-Off Time	Monitor	POWERSAVEMONITOR	OFF or 10 to 1000 Step 10
Turn-Off Time	Splicer	POWERSAVESPLICER	OFF or 1 to 500 Step 1
Warming Up LZM-110 only	Automatic Warming	AUTOMATICWARMING	ON, OFF
Menu Lock	Splice Mode Edit	LOCKEDITSMODE	ENABLE, DISABLE
Menu Lock	Splice Mode Select	LOCKSELECTSMODE	ENABLE, DISABLE
Menu Lock	Splice Memory Clear	LOCKCLEAR RESULTMEMORY	ENABLE, DISABLE
Menu Lock	Splice Settings Ignore Splicing Error	LOCKIGNOREERROR	ENABLE, DISABLE
Menu Lock	Splice Settings Display Settings	LOCKDISPLAYSETTINGS	ENABLE, DISABLE
Menu Lock	Splice Settings Others	LOCKSPLICESSETTINGS OTHERS	ENABLE, DISABLE
Menu Lock	Maintenance Settings Electrode Alarm	LOCKELECTRODE ALARM	ENABLE, DISABLE
Menu Lock	Maintenance Settings Calibration Param.	LOCKCALIBRATION PARAM	ENABLE, DISABLE
Menu Lock	Maintenance Settings Maintenance Date	LOCKMTNDATE	ENABLE, DISABLE
Menu Lock	Machine Settings Basic Settings	LOCKMACHINEBASIC	ENABLE, DISABLE
Menu Lock	Machine Settings GPIB	LOCKGPIB	ENABLE, DISABLE
Menu Lock	Machine Settings Turn Off Time	LOCKTURNOFFTIME	ENABLE, DISABLE
Menu Lock	Machine Settings Power On Option	LOCKPOWERONOPTION	ENABLE, DISABLE
Menu Lock	Machine Settings Ready Display	LOCKREADYDISPLAY	ENABLE, DISABLE
Menu Lock	Machine Settings Short Cut	LOCKSHORTCUT	ENABLE, DISABLE
Menu Lock	Fiber Data Learning Fiber Type Compare	LOCKFIBERTYPE COMPARE	ENABLE, DISABLE
Menu Lock	Fiber Data Learning Auto Calibration	LOCKAUTO CALIBRATION	ENABLE, DISABLE

Group	Parameter Title	Parameter Identifier Code	Acceptable Values (Range)
Menu Lock	Fiber Data Learning IPA Data	LOCKIPADATA	ENABLE, DISABLE
Menu Lock	Maintenance Menu Power Calibration	LOCKPOWER CALIBRATION	ENABLE, DISABLE
Menu Lock	Maintenance Menu SP Power Calibration	LOCKSPPOWER CALIBRATION	ENABLE, DISABLE
Menu Lock	Maintenance Menu Warming Up	LOCKWARMINGUP	ENABLE, DISABLE
Menu Lock	Maintenance Menu Shipping	LOCKSHIPPING	ENABLE, DISABLE
Menu Lock	Maintenance Menu V-Groove Cleaning	LOCKVGROOVE CLEANING	ENABLE, DISABLE
Menu Lock	Maintenance Menu Diagnostic Test	LOCKDIAGTEST	ENABLE, DISABLE
Menu Lock	Maintenance Menu Dust Check	LOCKDUSTCHECK	ENABLE, DISABLE
Menu Lock	Maintenance Menu Motor Drive	LOCKMOTORDRIVE	ENABLE, DISABLE
Menu Lock	Maintenance Menu Parameter Initialize	LOCKPARAMETER INITIALIZE	ENABLE, DISABLE

*1: FULL, UPDOWN

*2: OFF, LIVEX, LIVEY, SPLICERSETTINGS

*3: OFF, LIVEX, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA

*4: OFF, LIVEY, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA

*5: OFF, LIVEX, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET

*6: OFF, LIVEY, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET

*7: OFF, LIVEX, ENDVIEWL, ENDVIEWR, LIVEY, PAUSEX, PAUSEY, SPLICERSETTINGS

*8: OFF, LIVEX, ENDVIEWL, PAUSEX, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA

*9: OFF, LIVEY, ENDVIEWR, PAUSEY, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA

*10: OFF, LIVEX, ENDVIEWL, PAUSEX, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET

*11: OFF, LIVEY, ENDVIEWR, PAUSEY, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET

*12: OFF, LIVEX, LIVEY, ENDVIEWL, ENDVIEWR, PAUSEX, PAUSEY, FINISHX, FINISHY, WSIX, WSIY, SPLICERSETTINGS

*13: OFF, LIVEX, ENDVIEWL, PAUSEX, FINISHX, WSIX, SPLICEERROR, CLVANG, FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET, ESTIMATION, LASERINFO

*14: OFF, LIVEY, ENDVIEWR, PAUSEY, FINISHY, WSIY, SPLICEERROR, CLVANG,

FBRANG, CLVFBRANG, FIBERDATA, AXISOFFSET, ESTIMATION, LASERINFO

*15: ***n*** is page number. From 1 to 3

*16: ***n*** is page number. From 1 to 4

*17: ***n*** is page number. From 1 to 5

*18: OFF, SELECTSMODE, SPLSETTING, MTNSETTING, MACHINESETTING,
MNULOCKSETTING, FTYPECOMPARE, IPADATA, POWERCALIB_NRM,
POWERCALIB_SP, WARMINGUP, SHIPPING, VGROOVECLEAN, ELECTRODE,
DIAGTEST, DUSTCHECK, MTRDRIVE, INITIALIZE, MTNINFO

Table 3-9: Monitor Screen Configuration

Single(Full) View	Value	Split View	Value
BLANK	OFF	BLANK	OFF
X View Live Image	LIVEX	X View Live Image	LIVEX
Y View Live Image	LIVEY	Y View Live Image	LIVEY
X View Image at Pause	PAUSEX	X View Image at Pause	PAUSEX
Y View Image at Pause	PAUSEY	Y View Image at Pause	PAUSEY
X WSI	WSIX	Cleave Angle Data in detail	CLVANG
Y WSI	WSIY	Fiber Angle in detail	FBRANG
X View Image at Finish	FINISHX	Cleave & Fiber Angle	CLVFBANG
Y View Image at Finish	FINISHY	Fiber Data	FIBERDATA
Fiber Data	FIBERDATA	Axis Offset in detail	AXISOFFSET
Splicer Settings	SPLICERSETTINGS	X WSI	WSIX
		Y WSI	WSIY
		X View Image at Finish	FINISHX
		Y View Image at Finish	FINISHY
		Splice Error	SPLICEERROR
		Splicer Settings	SPLICERSETTINGS
		Estimated Loss in detail	ESTIMATION
		Laser Information	LASERINFO

3.5 Sending a Comment after Splicing

Use "#UTY|SPLICEMEMORYCOMMENT" command written in Table 3-10 at page 43

Chapter 4. Retrieving Parameters

4.1 General Description of the Functions

Commands starting with % are used to retrieve current parameter settings from the splicer. These commands are acceptable only at the {READY}, {PAUSE1}, {PAUSE2}, and {FINISH} states. If the splicer is in any other state, it will send NAK to the PC. Also, if the format of the command is incorrect, the splicer will send NAK.

The format of retrieve commands is similar to that of the input or # commands. Table 4-1 shows the format of % or retrieve commands.

4.2 Retrieving Current Splice Mode Number

To retrieve the current splice mode of the splicer, use the command format **%SMODE**.

Table 4-1: Command for Retrieving the Current Splice Mode

Format	%SMODE
Response of the Splicer	Command Accepted Mode Number
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

4.3 Retrieving Splice Parameters

4.3.1 Retrieving Splice Mode Parameters by normal format

Table 4-2 shows the commands to retrieve splice parameters of current splice mode. If designated parameter code is not included in the current splice mode, the response will be NAK. Both of normal splice parameters and special function parameters can be applied for parameter list. For a full listing of parameter identifier codes, find the Table 3-3 and Table 3-5.

Table 4-2: Format for Retrieving Splice Parameters

Format	%SPL- number %SPL- number / identifier1 (identifier2 ...) %SPL %SPL / identifier1 (identifier2 ...) number : Mode Number (1-300). Current mode is used if omitted. identifier Parameter Identifier. All of parameters are retrieved if identifier is omitted.
Response of the Splicer	Command Accepted Identifier1 = value1 (identifier2 = value2 ...) In case parameter code exists and current or designated splice mode does not have parameter value, return text will be identifier code only as following sample. Identifier1 identifier2 = value2 identifier3 identifier1 and identifier3 do not have value .
	Command Not Accepted NAK Reason1: Illegal format Reason2: parameter is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Parameter is not included in the current splice mode

4.3.2 Backup Image of Splice Mode Parameters

The table below shows the command for backup binary image of splice mode parameters.

The binary data retrieved by this function is used in the command at Chapter 3.3.3 "Restoring Image of Splice Mode Parameters".

Table 4-3: Command for Restoring Binary Image of Splice Mode Parameters

Format	%SPLH- number number: Splice mode number (1 – 300).
Response of the Splicer	Successful {Binary Image Data: 8196 bytes}
	Unsuccessful NAK (1 byte binary = 21) Reason1: Illegal format Reason2: number is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

4.4 Retrieving Utility Parameters

Table 4-4 shows the commands to retrieve [UTILITY] menu parameters. For a full listing of commands to retrieve [UTILITY] parameters, find the corresponding input command from Table 3-7, replacing # with %.

Table 4-4: Format for Retrieving Utility Parameters

Format	%UTY %UTY identifier1 (/ identifier2 ...) identifier : Parameter Identifier. All of parameters are retrieved if no identifier is designated.
Response of the Splicer	Command Accepted Identifier1 = value1 (/ identifier2 = value2 ...) In case parameter code exists and current or designated splice mode does not have parameter value, return text will be identifier code only as following sample. Identifier1 / identifier2 = value2 / identifier3 identifier1 and identifier3 do not have value .
	Command Not Accepted NAK Reason1: Illegal format Reason2: parameter is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Modifying is not allowed for the specified parameter in the selected Edit Mode.

Chapter 5. Retrieving Status & Result of Functions

5.1 General Description

Commands starting with = are used to retrieve splicer status information and a kind of result data, such as splice result data. These commands are acceptable only at the {READY}, {PAUSE1}, {PAUSE2}, or {FINISH} states. If the splicer is in any other state, it will send NAK to the PC. Also, if the format of the command is incorrect, the splicer will send NAK.

5.2 Splicer Information

Table 5-1 and Table 5-2 show the commands to retrieve status data.

Table 5-1: Format for Retrieving Splicer Information

Format	=INF / <i>identifier1</i> (<i>identifier2</i> ...)
Response of the Splicer	Successful <i>Identifier1 = value1 (identifier2 = value2 ...)</i>
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

Table 5-2: Command List to Retrieve Splicer Information

Identifier	Function Response of the Splicer	
MODELNAME	Splicer Model Name e.g. >> MODELNAME=LZM-100	
FIRMVER	Firmware Version e.g. Ver.01.08 >> FIRMVER=01.08	
OPTIONS	List of equipped option devices. If there are multiple items, comma separates the items. Left Theta Motor : ROTL Left Theta Motor : ROTR Endview System : ENDV e.g. Right theta motor and endview system are equipped. >> OPTIONS=ROTL,ENDV	
SERNUM	Serial Number e.g. No.00175 >> SERNUM=00175	
DATE	Date e.g. 14:35 of March 22, 2010 >>> DATE=201003221435	
ARCCOUNT	Irradiation Count e.g. 176 >> ARCCOUNT=176	
TARCCOUNT	Total Irradiation Count e.g. 9812 >> TARCCOUNT=9812	
ARCCOUNTFROMAC	Irradiation count after last calibration e.g. 512 >> ARCCOUNTFROMAC =512	
STATE	Status of Splicer in terms of splicing	
	State	Response of the Splicer
	READY	STATE=READY Ready displayed on screen (at READY state).
	GAPSET	STATE=GAPSET
	PAUSE1	STATE=PAUSE1
	ALIGN (THETA STAGE)	STATE=ALIGNTH
	PAUSE THETA	STATE=PAUSETH
	ALIGN	STATE=ALIGN
	PAUSE2	STATE=PAUSE2
	LASING, ESTIMATE	STATE=ARCEST
	FINISH	STATE=FINISH
	RESET	STATE=RESET
	ERROR	STATE=ERROR
	MENU	STATE=MENU Splicer displays a menu and not ready to accept any splicing command.

Identifier	Function Response of the Splicer
COVER	Top Cover Status e.g. >> COVER=OPEN or COVER=CLOSED
MONITORPOS	Current Monitor Position e.g. >> MONITORPOS=FRONTSIDE or MONITORPOS=BACKSIDE
OPTZOOM	Status of optical zoom OPTZOOM=ZOOMIN or OPTZOOM=ZOOMOUT
TEMPC	Sensor Value of Temperature e.g. 25.0 [deg Celsius] >> TEMPC=25.0
TEMPF	Sensor Value of Temperature e.g. 80.0 [deg Fahrenheit] >> TEMPF=80.0
STDARCPower	Calibrated reference of lasing power This parameter value appears in lasing power parameters as STD[<i>value</i>] e.g. >> STDARCPower=650 BIT

5.3 Splice Result Data and Errors

Table 5-3 and Table 5-4 show the commands to retrieve resultant data from the last splice. Table 5-5 and Table 5-6 show the commands to determine the existence of type 2 errors. For more information of type 2 errors, please refer to section 2.8.

Table 5-3: Format for Retrieving Splice Result Data

Format	=DAT =DAT identifier1 (identifier2 ...) =DATH =DATH identifier1 (identifier2 ...)
Response of the Splicer	Command Accepted identifier1=value1 identifier2 = value2 identifier3... (Refer to Table 5-4 for detail.)
	Number of decimal places for Cleave Angle, Fiber Angle, Gap, Core Offset and Clad Offset DAT : first decimal place (n.n) DATH : second decimal place (n.nn)
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

Table 5-4: Item Identifier List to Retrieve Splice Result Data

Identifier	Function	Response from the Splicer
ESTLOSS	Total sum of Estimated Losses (or the value read from Power Meter)	ESTLOSS=n.nn n.nn: Splice Loss (terminated at equal if not measured)
ESTOFFSETLOSS	Estimated loss from core or cladding axis offset	ESTOFFSETLOSS=n.nn n.nn: Splice Loss (terminated at equal if not measured)
ESTDEFORMLOSS	Estimated loss from core deformation	ESTDEFORMLOSS=n.nn n.nn: Splice Loss (terminated at equal if not measured)
ESTMFDLOSS	Estimated loss from MFD mismatch	ESTMFDLOSS=n.nn n.nn: Splice Loss (terminated at equal if not measured)
ESTMINLOSS	Minimum loss setting	ESTMINLOSS=n.nn n.nn: Splice Loss (terminated at equal if not measured)
PRMDEFORM	Deformation factor for calculating loss	PRMDEFORM=n.n n.n: Factor Value (terminated at equal if not measured)
PRMINDEXDIF	Index difference factor for calculating loss	PRMINDEXDIF=n.n n.n: Factor Value (terminated at equal if not measured)

Identifier	Function	Response from the Splicer
PRMOFFSET	Core or cladding axis offset factor for calculating loss	PRMOFFSET=n.n n.n: Factor Value (terminated at equal if not measured)
PRMCORESTEP	Core step factor for calculating loss	PRMCORESTEP=n.n n.n: Factor Value (terminated at equal if not measured)
PRMCORECURVE	Core curve factor for calculating loss	PRMCORECURVE=n.n n.n: Factor Value (terminated at equal if not measured)
GAP	Measured Gap	GAP=n.n or n.nn n.n or n.nn: Gap between edge of left fiber and that of right fiber. (terminated at equal if not measured)
CLVANGLEL	Cleave Angle Left	CLVANGLEL=n.n or n.nn n.n or n.nn: Cleave angle (terminated at equal if not measured)
CLVANGLER	Cleave Angle Right	CLVANGLER=n.n or n.nn n.n or n.nn: Cleave angle (terminated at equal if not measured)
FIBERANGBEFORE	Fiber angle before splice	FIBERANGBEFORE=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
FIBERANGBEFOREL	Fiber angle of left fiber before splice	FIBERANGBEFOREL=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
FIBERANGBEFORER	Fiber angle of right fiber before splice	FIBERANGBEFORER=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
FIBERANGAFTER	Fiber angle after splice	FIBERANGAFTER=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
FIBERANGAFTERL	Fiber angle of left fiber after splice	FIBERANGAFTERL=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
FIBERANGAFTERR	Fiber angle of right fiber after splice	FIBERANGAFTERR=n.n or n.nn n.n or n.nn: Core angle (terminated at equal if not measured)
CLADOFBSBEFORE	Clad Offset before splice	CLADOFBSBEFORE=n.n or n.nn n.n: Clad offset (terminated at equal if not measured)
CLADOFBSAFTER	Clad Offset after splice	CLADOFBSAFTER=n.n or n.nn n.n: Clad offset (terminated at equal if not measured)
COREOFBSBEFORE	Core Offset before splice	COREOFBSBEFORE=n.n or n.nn n.n: Core offset (terminated at equal if not measured)
COREOFBSAFTER	Core Offset after splice	COREOFBSAFTER=n.n or n.nn n.n: Core offset (terminated at equal if not measured)
CROSSTALKPERDEG	Estimated Crosstalk or PER [deg]	CROSSTALKPERDEG=n.n n.n: Crosstalk or PER (terminated at equal if not measured)

Identifier	Function	Response from the Splicer
CROSSTALKPERDB	Estimated Crosstalk or PER [dB/dBm] (or the value read from Power Meter)	CROSSTALKPERDB=n.n n.n: Crosstalk or PER (terminated at equal if not measured)

Table 5-5 Format for Determining Type 2 Error Occurrence

Format	=ERR
Response of the Splicer	Command Accepted ERR= error1, error2, error3... If there are multiple errors, errors are listed using ',' delimiter. e.g. No Error: "ERR=" Loss Error and Bubble Error: "ERR=LOSS,BUBBLE"
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

Table 5-6 Error Titles included in Type 2 Error

Error Title	Description
CLVANGLEL	Cleave Angle Error of Left Fiber
CLVANGLER	Cleave Angle Error of Right Fiber
CLVSHAPEL	Cleave Shape Error of Left Fiber
CLVSHAPER	Cleave Shape Error of Right Fiber
FIBERANGLE	Fiber Angle Error
LOSS	Loss Error
CROSSTALK	Angle Offset Error(Crosstalk Error)
ARCLEFT	Laser Too Left
ARCRIGHT	Laser Too Right
SEPARATE	Fiber Separated Error
ESTIMATION	Estimation Failure Error
BUBBLE	Bubble Error
FAT	Fat Error
THIN	Thin Error
HOTSPOT	Hot Spot Found
DIFFIBERL	Different Fiber Error of Left Fiber
DIFFIBERR	Different Fiber Error of Right Fiber
TAPER	Too Tapering Fiber
OUTOFTARGET	The result is out of the target range

5.4 Status of the Splicer

Table 5-7 Format for Retrieving Splicer Status and Result

Format	=FUNCSTAT
Response of the Splicer	Command Accepted IDLE Splicer is in ready state (Function has not started or interrupted). Status The status value depends on the function. See Table 2-7 to find the response values for the functions of the splicer.
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is too busy to reply Reason3: Splicer cannot respond because of communication error.

5.5 Function Result

Table 5-8 Format for Retrieving Result of Functions

Format	=FUNCRES Triggering command
Response of the Splicer	Command Accepted Result The result of the function that <i>Triggering command</i> invoked. The result value depends on the function. See Chapter 6 to find the response values for the functions of the splicer.
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is too busy to reply Reason3: Splicer cannot respond because of communication error.

5.6 Splice Result Memory Data

5.6.1 Retrieving Total Count of Splice Result Data in the Non-Volatile Memory

Table 5-9 shows the command to retrieve total count of splice result data existing in the non-volatile memory.

Table 5-9: Format for Retrieving the Number of Memory

Format	=MEMCOUNT
Response of the Splicer	Command Accepted MEMCOUNT = Data Count
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.6.2 Retrieving the Location of the Latest Splice Data

Table 5-10 shows the command to retrieve the location of the latest splice result data existing in the non-volatile memory.

Table 5-10: Format for retrieving the position of the latest splice result data

Format	=MEMLATEST
Response of the Splicer	Command Accepted MEMLATEST = <i>Position Number</i>
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.6.3 Retrieving Splice Data in the Memory

Table 5-11 shows the commands to retrieve splice data stored in non-volatile memory. Detailed splice mode information cannot be retrieved by this command.

Table 5-11: Format for Retrieving Memory Data

Format	=MEM- <i>number</i> number: memory position number (from 1 to 2000)
Response of the Splicer	Command Accepted <i>Identifier1 = value1 / identifier2 = value2 ...</i>
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

Table 5-12: Parameter Identifier List of Memory Data

Identifier	Function
DATE	Date of Splicing
COMMENT	Comment
ESTLOSS	Total sum of estimated losses (or the value read from Power Meter)
ESTOFFSETLOSS	Estimated loss from core or cladding axis offset
ESTDEFORMLOSS	Estimated loss from core deformation
ESTMFDLOSS	Estimated loss from MFD mismatch
ESTMINLOSS	Minimum loss setting
CROSSTALKPERDEG	Estimated Crosstalk or PER [deg]
CROSSTALKPERDB	Estimated Crosstalk or PER [dB/dBm] (or the value read from Power Meter)
CLVANGLEL	Cleave Angle Left
CLVANGLER	Cleave Angle R
FIBERANGLE	Fiber Angle
GAP	Measured Gap
COREOFSATER	Core Offset
CLADOFSATER	Cladding Offset
ERR	<p>Type 2 Error Information</p> <p>Error name lists are as below:</p> <p>CLVANGLEL CLVANGLER CLVSHAPEL CLVSHAPER FIBERANGLE LOSS FAT THIN BUBBLE DIFFIBERL DIFFIBERR HOTSPOT TAPER OUTOFTARGET CROSSTALK SEPARATE ESTIMATE</p> <p>If there are multiple errors, errors are listed using ‘,’ delimiter. e.g. No Error: “ERR=” Loss Error and Bubble Error: “ERR=LOSS,BUBBLE”</p>
FIBERTYPE	Fiber Type of the splice mode selected at last
MODETITLE1	Mode Title 1 of the splice mode selected at last
MODETITLE2	Mode Title 2 of the splice mode selected at last
IMAGENUMBER	<p>ID Number of related camera image saved in non-volatile memory. 0 is applied for the ID Number if there is no related image.</p>

5.6.4 Retrieving the Splice Parameters of a Splice Data

Table 5-11 shows the commands to retrieve the splice parameters in the splice result memory data.

Table 5-13: Format for Retrieving Splice Parameters in Splice Memory Data

Format	=MEMSPL- <i>number</i> =MEMSPL- <i>number</i> / <i>identifier1</i> (<i>identifier2</i> ...) <i>number</i> : memory position number (1-2000). <i>identifier</i> : Parameter Identifier. All of parameters are retrieved if identifier is omitted.
Response of the Splicer	Command Accepted <i>Identifier1 = value1 (identifier2 = value2 ...)</i> See Chapter 4.3.1 "Retrieving Splice Mode Parameters by normal format" in order to refer the identifiers for splice parameters
	Command Not Accepted NAK Reason1: Illegal format Reason2: parameter is illegal Reason3: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason4: Parameter is not included in the current splice mode

5.7 Retrieving Camera Image Saved in Non Volatile Memory

5.7.1 Retrieving the Information of the saved camera image

Table 5-14 shows the command to retrieve the information of image data that was saved by user at Camera Image menu or Error menu.

Table 5-14 Command for retrieving the information of these image data in storage

Format	=SIMGINF – <i>number</i> <i>number</i> : Storage position number from 1 to 100
Response of the Splicer	Command Accepted In case there is no error when saved. DATE=yyyyMMddhhmmss In case Type 1 Error was occurred when saved. DATE=yyyyMMddhhmmss / ERROR1=error title In case Type 2 Error was occurred when saved. DATE=yyyyMMddhhmmss / ERROR2 =error list 1(error list 2, ...) In case there is no data. NONE DATE: date of save ERROR1: Title of error 1 if the error was occurred. ERROR2: List of error 2 if the error(s) occurred.
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.7.2 Retrieving Saved Camera Image in Non Volatile Memory

Table 5-15 shows the command to retrieve the image data that was saved by user at Camera Image menu or Error menu.

The class method function “ReceiveBinary()” has to be used for data retrieving.

Table 5-15 Command for retrieving the image data in storage

Format	=SIMG - number - view <i>number</i> : Storage position number from 1 to 100 <i>view</i> : View of image X: X view image Y: Y view image
Response of the Splicer	Command Accepted <i>The data format is a kind of Bitmap</i> Camera Image data (binary bitmap data) * Brightness data format for pixel is 8 bits grayscale * 240 x 320 pixels
	Command Not Accepted NAK (1 byte binary = 21) Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.8 Retrieving Image Data

Table 5-16 shows the command to retrieve live image data or the image data that was saved during last splice

The class method function "ReceiveBinary()" has to be used for data retrieving.

Table 5-16 Command for retrieving the image data

Format	=IMG-type-X X Image that was saved during last splice (QVGA res.) =IMG-type-Y Y Image that was saved during last splice (QVGA res.) =IMGH-type-X X Image that was saved during last splice (VGA res.) =IMGH-type-Y Y Image that was saved during last splice (VGA res.) <i>type</i> : image identifier PREARC: Before Arc Discharge WSI : During Arc Discharge (Warm Image) CLD : After Arc Discharge LIVE :Live Image
Response of the Splicer	Command Accepted <i>The data format is a kind of Bitmap</i> Camera Image data (binary bitmap data) * Brightness data format for pixel is 8 bits grayscale * 240 x 320 pixels for QVGA, 480 x 640 pixels for VGA resolution
	Command Not Accepted <i>NAK (1 byte binary = 21)</i> Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.9 Retrieving One Line Data from Live Camera Image

Table 5-17 shows the command to retrieve one line data from live camera image.

Table 5-17 Command for retrieving one line data from live camera image

Format	<p>=IMGLINE-view-direction-position (QVGA resolution) =IMGLINEH-view-direction-position (VGA resolution) =IMGLINENC-view-direction-position (QVGA resolution) =IMGLINEHNC-view-direction-position (VGA resolution)</p> <p><i>view</i> : View of image X or Y (X view image or Y view image) <i>direction</i> : Direction of line V or H (Vertical or Horizontal) <i>position</i> : Position of line</p> <p>In case H is selected for the direction:</p> <ul style="list-style-type: none">• From 0 to 319(IMGLINE and IMGLINENC) or 639(IMGLINEH and IMGLINEHNC) if the camera window size is not 3x• From 0 to 239(IMGLINE and IMGLINENC) or 479(IMGLINEH and IMGLINEHNC) if the camera window size is 3x <p>In case V is selected for the direction:</p> <ul style="list-style-type: none">• From 0 to 239(IMGLINE and IMGLINENC) or 479(IMGLINEH and IMGLINEHNC) in case the camera window size is not 3x• From 0 to 177(IMGLINE and IMGLINENC) or 355(IMGLINEH and IMGLINEHNC) in case the camera window size is 3x <p>*Top left is the coordinate origin of the image.</p> <p>e.g. =IMGLINE-X-V-200</p>																									
Response of the Splicer	<p>Command Accepted</p> <p>Command = value0,value1, value 2,..., value{data points – 1}</p> <p>LZM-100 sends series of brightness data in the internal image buffer along the line. The data format is 8 bits grayscale. LZM-100 captures live camera image into the internal image buffer at the same time when the IMGLINE or IMGLINEH is received. On the other hand LZM-100 does not capture image when IMGLINENC or IMGLINEHNC is used. Refer to the section 6.29 to see the related command "&CAPTURE".</p> <table><tr><td colspan="5">Data Points</td></tr><tr><td>Camera Win Size</td><td colspan="2">Not 3x</td><td colspan="2">3x</td></tr><tr><td>Direction</td><td>V</td><td>H</td><td>V</td><td>H</td></tr><tr><td>IMGLINE(NC)</td><td>320</td><td>240</td><td>240</td><td>178</td></tr><tr><td>IMGLINEH(NC)</td><td>640</td><td>480</td><td>480</td><td>356</td></tr></table> <p>Command Not Accepted</p> <p>NAK</p> <p>Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.</p>	Data Points					Camera Win Size	Not 3x		3x		Direction	V	H	V	H	IMGLINE(NC)	320	240	240	178	IMGLINEH(NC)	640	480	480	356
Data Points																										
Camera Win Size	Not 3x		3x																							
Direction	V	H	V	H																						
IMGLINE(NC)	320	240	240	178																						
IMGLINEH(NC)	640	480	480	356																						

5.10 Retrieving Size of Camera Image

Table 5-18 shows the command to retrieve the size of camera image.

Table 5-18 Command to retrieve the size of camera image

Format	=IMGSIZE-view <i>view</i> : View of image X: (X view image) Y: (Y view image) e.g. =IMGSIZE-Y
Response of the Splicer	Command Accepted V= value*1 H = value*2 *1 : Vertical Length of Camera Image [um] *2 : Horizontal Length of Camera Image [um]
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.11 Retrieving Camera Window Size Mode

Table 5-19 shows the command to retrieve current camera window size mode.

Table 5-19 Command to retrieve current camera window size mode

Format	=IMGSIZEMODE
Response of the Splicer	Command Accepted X= mode number*1 Y = mode number*2 *1 : Mode number for X image *2 : Mode number for Y image
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.12 Retrieving Current Magnification of Digital Zoom

Table 5-20 shows the command to retrieve current magnification of digital zoom in ratio. This digital zoom function is used only for display.

Table 5-20 Retrieving current magnification of digital zoom

Format	=DSPMAG
Response of the Splicer	Command Accepted $V = \text{magnification} * 1 \mid H = \text{magnification} * 2$ *1 : Magnification for vertical direction in percentage (50 to 1600) *2 : Magnification for horizontal direction in percentage (50 to 1600)
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

5.13 Retrieving the TL/TR rotating angle / Z Sweep Stage position

Table 5-21 shows the command to retrieve the TL/TR rotating angle / ZL / ZR/ sweep stage position.

Table 5-21 Format for retrieving the TL/TR rotating angle /ZL/ZR/sweep stage position

Format	=MTR TL	Angle of TL motor
	=MTR TR	Angle of TR motor
	=MTR ZSWP	Distance from reset position of ZSWP motor
	=MTR X	Distance from reset position of X motor
	=MTR Y	Distance from reset position of Y motor
	=MTR ZL	Distance from reset position of ZL motor
	=MTR ZR	Distance from reset position of ZR motor
Response of the Splicer	Command Accepted TL = n.n TR = n.n ZSWP = n.n X = n.n Y = n.n ZL = n.n ZR = n.n n.n = degree or moving amount(um) e.g. 110.2 >>> 110.2 um e.g. -1.8 >>> -1.8 degree	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.	

Chapter 6. Command for Starting Splicer Functions

6.1 Function

Commands starting with '&' are used to start the functions of the splicer. '&' commands are acceptable only at the {READY}, {PAUSE1}, {PAUSE2}, or {FINISH} states. If the splicer is in any other state, the splicer will send NAK to the PC. The splicer also sends NAK if the format of the command is incorrect.

6.2 Clear Memory

Table 6-1 shows the format of the command that clears splice data in the non-volatile memory.

Table 6-1: Command to clear splice data in non-volatile memory

Format	&MEMCLEAR &MEMCLEAR-<i>number from</i> - <i>number to</i> If option is omitted, all of existing splice data in memory will be cleared number from: Start number number to: End number
Function	Clear all or partial data in non-volatile memory
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.

6.3 Clear Lasing Time

Table 6-2 shows the format of the command that clears the lasing time from Gas Filling.

Table 6-2: Command to Clear Lasing Time

Format	&ACC
Function	Clear lasing time from gas filling
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.

6.4 Set Calendar

Table 6-3 shows the format of the command that sets the calendar.

Table 6-3: Command to Set Calendar

Format	&SCA-year month day hour minute second year: 2000-2099 month: 01-12 day: 01-31 hour: 00-23 minute: 00-59 second: 00-59 e.g. &SCA-20100925143512 Set to Sep.25,2010 14:35:12
Function	Set Calendar
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.

6.5 LED Check

Table 6-4 shows the format of the command that performs the LED check.

Table 6-4: Command to Perform the LED Brightness Adjustment

Format	&LEDCHK
Function	LED Check
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. WAITKEY Waiting a key input to continue LEDCHK:OK The function has completed without error ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

6.6 Dust Check

Table 6-5 shows the format of the command that performs the dust check. Before executing this command, remove fibers from the splicer. It takes about 1 or 2 minutes to finish stabilizing.

Table 6-5: Command to Perform the Dust Check

Format	&DSTCHK	
Function	Dust Check	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY WAITKEY DSTCHK:OK DSTCHK:X DSTCHK:Y DSTCHK:XY ER - ... NAK	The function has not started or cancelled The function is running. Waiting a key input to continue Result is OK (There is no dust) Dust is found only X image. Dust is found only Y image Dust is found both X and Y image Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

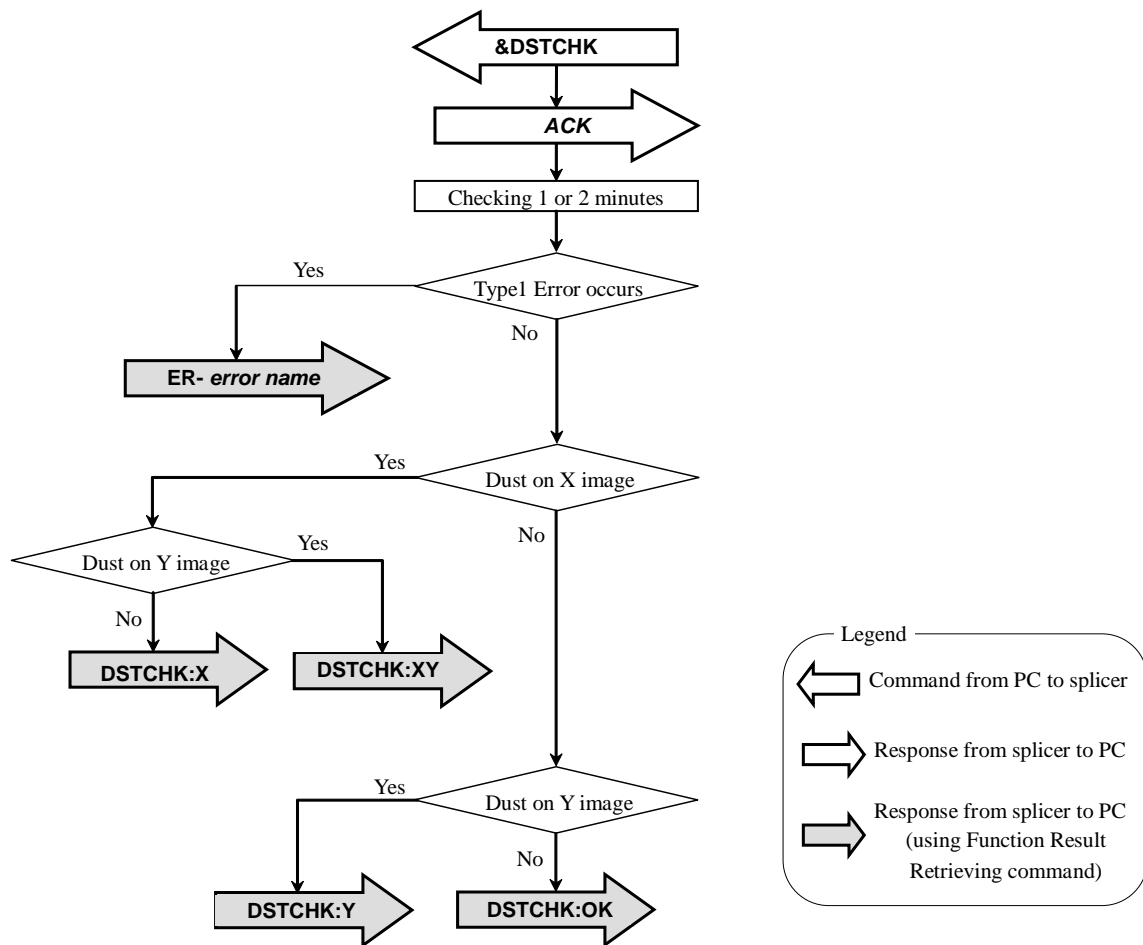


Figure 6-1: Flow of Dust Check

6.7 Motor Check

Table 6-6 shows the format of the command to perform motor check.

Table 6-6: Command to Perform Motor Check

Format	&MTRCHK	
Function	Motor Check	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY WAITKEY MTRCHK:OK MTRCHK:NG ER - ... NAK	The function has not started or cancelled The function is running. Waiting a key input to continue The result is OK The result is NG Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

6.8 Laser Power Calibration

Table 6-7 shows the format of the command that performs laser power calibration. This calibration takes about 1 or 2 minutes.

Table 6-7: Command to Perform Power Calibration

Format	&ARCCAL	
Function	Power Calibration	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state. Reason3: Arc Calibration Method setting is not STD or SP.	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY WAITKEY ARCCAL:OK ARCCAL:TESTAGAIN ARCCAL:EC ER - ... NAK	The function has not started or cancelled The function is running. Waiting a key input to continue Arc Calibration finished without error One more test is required Cleave Angle Error occurs during calibration Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

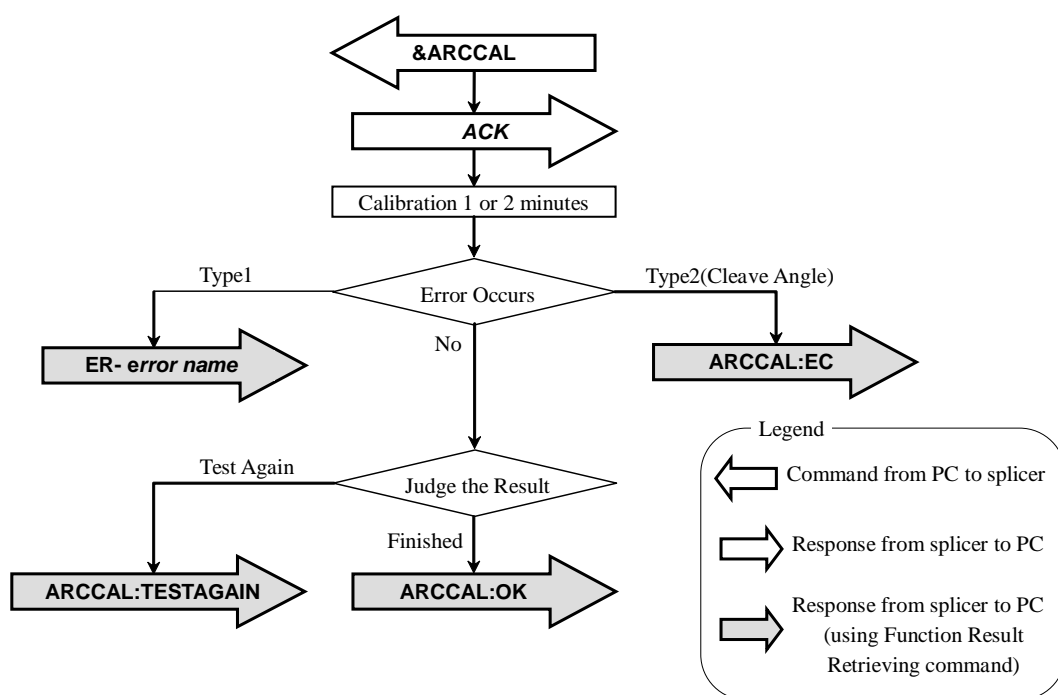


Figure 6-2: Flow of Arc Calibration

6.9 V-Groove Cleaning

Table 6-8 shows the format of the command that sets up V-Groove Cleaning.

Table 6-8: Command to Perform V-Groove Cleaning

Format	&VGRVCL	
Function	Arc Calibration	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY} state.	
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. WAITKEY Waiting a key input to continue ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply	

6.10 Buzzer Control

Table 6-9 shows the command to control buzzer.

Table 6-9: Buzzer Control Command

Format	&BUZ- time time : 1 to 20000 [ms]
Function	Beep the buzzer of splicer
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. BUZ:OK The function has completed NAK Splicer is too busy to reply

6.11 Shut Down

Table 6-10 shows the command to shut down the splicer.

Table 6-10: Shut Down Command

Format	&SHT
Function	Start shutting down the splicer
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state.

6.12 Initialize Parameters

6.12.1 Splice Parameters

Table 6-11 shows the command to initialize splice parameters. This command initializes all splice parameters (splice mode numbers 1 to 300) and all splice database parameters. It takes several seconds to finish initializing.

After executing, do not forget to press the <RESET> keypad or send **\$RESET** to load the data into the splicer's working memory.

Table 6-11: Initialize Splice Parameters

Format	&SMI
Function	Initialize splice parameters
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason3: Mismatch of the power meter addresses.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. OK The function has completed NG Initialization failed NAK Splicer is too busy to reply

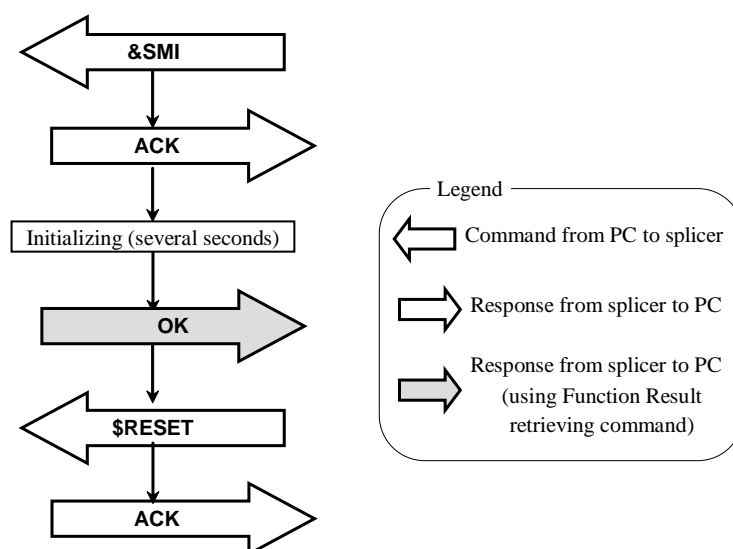


Figure 6-3: Command Example of Splice Mode Initialize

6.12.2 Utility Parameters

Table 6-12 shows the command to initialize utility parameters. This command initializes all utility parameters, power saving parameters, and configurations parameters.

After executing, do not forget to press the <RESET> keypad or send **\$RESET**.

Table 6-12: Initialize Utility Parameters

Format	&UTI	
Function	Initialize utility parameters	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason3: Mismatch of the power meter addresses.	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED	The function has not started or cancelled
	BUSY	The function is running.
	OK	The function has completed
	NG	Initialization failed
	NAK	Splicer is too busy to reply

6.13 Erase Characters from Screen

Table 6-13 shows the command to erase graphics and characters from screen.

Table 6-13: Command to erase graphic and characters from screen

Format	&DSPOFF
Function	Erase graphic and characters from screen
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.14 Display Characters on Screen

Table 6-14 shows the command to display characters on screen.

Table 6-14: Command to display graphics and characters

Format	&DSPON
Function	Display graphic and characters on screen
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.15 Real Time Motor and Laser Output Control

ZL, ZR, Sweep, X, Y, Theta L and Theta R motors can be driven independently using this command. Laser output also can be controlled by this function.

Table 6-15 shows the command to move motors by designating pulse or angle.

Table 6-15: Real Time Motor and Arc Control

Format	<p>&MTRARC STOP &MTRARC <u>t1,d1,s1</u> (/ <u>t2,d2,s2</u> / <u>t3,d3,s3</u> / <u>t4,d4,s4</u> / <u>t5,d5,s5</u>)</p> <p>If "&MTRARC STOP" command is applied, all of motors and laser output started by &MTRARC command stop immediately.</p> <p>"&MTRARC <u>t1,d1,s1</u> ..." format should be used in order to start/stop motors or laser. Description for options for MTRARC command is as follows,</p> <p>t: Motor Type or Laser to be controlled ARC, ZL, ZR, X, Y, TL, TR, ZSWP *ARC is for laser, TL is Theta L and TR is Theta R ZSWP is for LZM-110 series.</p> <p>In case any motor is applied for t: d: Distance[um] for X, Y, ZL, ZR,ZSWP -1800000.0 to 1800000.0, Step 0.1 Angle[deg] for TL and TR -500000.0 to 500000.0, Step 0.1</p> <ul style="list-style-type: none"> ▪ Resolution is not guaranteed. ▪ Motor stops if 0 is applied. ▪ If blank is set while designated motor is moving, current distance setting and internal information of traveled distance are kept without change. <p>s: Motor Speed [um/ms] (0.01 to 1.00) or [deg/ms] (0.01 to 0.05) From 0.01 to 0.05 for X and Y [um/ms] From 0.01 to 1.00 for ZL,ZR [um/ms] From 0.01 to 0.05 for TL and TR [deg/ms]</p> <ul style="list-style-type: none"> ▪ If "0" is applied for d option, this option can be omitted. <p>In case ARC is applied for t: d: Duration [msec] from 0 to 300000</p> <ul style="list-style-type: none"> ▪ Laser output stops if 0 is applied. ▪ If blank is set while laser output is ongoing, current duration setting and status of timer are kept without change.
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	<p>s: Lasing Power (Bit) from 1BIT to 1023BIT</p> <ul style="list-style-type: none"> ▪ If "0" is applied for d option, this option can be omitted. <p>e.g. &MTRARC ZR,1500,0.5 ZL,2000,0.7 &MTRARC ARC,2000,250BIT TR,1500,0.02 &MTRARC STOP</p> <p>Note1: Up to 4 motors can be controlled simultaneously. Note2: Splicer accepts only "&MTRARC", "&BRTPRF", "&SHUTTER", "&EXPOSURE", "&DSPMAG", "&IMGSIZEMODE", "&CAPTURE", "IMGLINExxx", "=MTR" and "\$RESET" commands while any motor or lasing is controlled by this command.</p>
Response of the Splicer	<p>Command Accepted ACK</p>
	<p>Command Not Accepted NAK</p> <p>Reason1: Illegal format Reason2: Option value is out of range Reason3: Count of active motors will exceed 4 if command is accepted Reason4: Splicer is not in the {READY}, {PASUE1}, {PAUSE THETA}, {PAUSE 2} or {FINISH} state.</p>
	<p>Response for FUNCTION RESULT RETRIEVING COMMAND</p> <p>CANCELLED The function has not started or cancelled BUSY The function is running. MTRARC:DONE The function has completed without error ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply</p>

6.16 Move up/down clamps

Table 6-16 shows the command to move up/down clamps.

Table 6-16: Command to move up/down clamps

Format	&CLAMP- <i>direction</i> &CLAMP- <i>direction</i> – <i>side</i>
Function	<p>Moving up clamp(s) to releasing fiber(s) or moving down clamp(s) to clamp fiber(s)</p> <p><i>direction</i>: Direction to move the clamp(s)</p> <p>U (Move up clamp to release fiber) D (Move down clamp to clamp fiber)</p> <p><i>side</i>: Left or right side of clamp to be moved</p> <p>L (Left Clamp) R (Right Clamp)</p> <p>If "<i>side</i>" option is omitted, both of left and right clamp are moved.</p> <p>e.g. &CLAMP-U &CLAMP-D &CLAMP-U-L</p>
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. CLAMP:DONE The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

6.17 Release and Re-clamp fibers

Table 6-17 shows the command to release and re-clamp fibers

Table 6-17 Command to Release and Re-clamp Fibers

Format	&RECLAMP &RECLAMP- <i>side</i>
Function	Releasing and Re-clamping Fibers <i>side</i> : Left or right side of clamp to be moved L (Left Clamp) R (Right Clamp) e.g. &RECLAMP &RECLAMP-R
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. RECLAMP:DONE The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

6.18 LED Brightness Adjustment

Table 6-18 shows the format of the command that performs LED brightness adjustment.

Table 6-18: Command to Perform LED Brightness Adjustment

Format	&ADJLED	
Function	Adjusting LED Brightness	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. ADJLED:OK The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply	

6.19 Turn On/Off LEDs

Table 6-19 shows the format of the command to turn on/off LEDs.

Table 6-19: Command to turn on/off LEDs.

Format	&LED state	
Function	Turn on/off LEDs. <i>state</i> : LEDs are changed to the instructed state ON: (Turn on the LED) OFF: (Turn off the LED) If the LEDs are in the same state as instructed by the state option, command is accepted but ignored. e.g. &LED ON &LED OFF	
	Command Accepted ACK	
Response of the Splicer	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is too busy to reply Reason3: Splicer cannot respond because of communication error.	

6.20 Cleaning By Lasing

Table 6-20 shows the format of the command that performs cleaning by lasing.

Table 6-20: Command to Perform Cleaning Arc

Format	&CARC	
Function	Cleaning fiber by lasing	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED	The function has not started or cancelled
	BUSY	The function is running
	CARC:OK	The function has completed
	ER - ...	Type1 Error (Refer to 2.8.1).
	NAK	Splicer is too busy to reply

6.21 Focus Position Adjustment

Table 6-21 shows the format of the command that performs focus position adjustment.

Table 6-21: Command to Perform Focus Position Adjustment

Format	&ADJFCS	
Function	Adjusting Focus Position	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY ADJFCS:OK ER - ... NAK	The function has not started or cancelled The function is running. The function has completed Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

6.22 Axis Offset Measuring

Table 6-22 shows the format of the command that performs axis offset measuring.

Table 6-22: Command to Perform Axis Offset Measuring

Format	&AXIS	
Function	Measuring Axis Offsets	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY VALUE=x cladding offset, y cladding offset, x core offset, y core offset [um] ER - ... NAK	The function has not started or cancelled The function is running. Axis Offset. Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

6.23 Gap Measuring

Table 6-23 shows the format of the command that performs gap measuring.

Table 6-23: Command to Perform Gap Measuring

Format	&MESGAP	
Function	Measuring Gap	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY VALUE = gap ER - ... NAK	The function has not started or cancelled The function is running Measured Gap Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

6.24 Cladding Diameter Measuring

Table 6-24 shows the format of the command to perform cladding diameter measuring for unprocessed fiber.

Table 6-24: Command to Perform Cladding Diameter Measuring

Format	&DIAMETER	
Function	Measuring Cladding Diameter of Unprocessed Fiber	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED BUSY VALUE= cladding diameter left [um], cladding diameter right [um] VALUE= cladding diameter [um] ER - ... NAK	The function has not started or cancelled The function is running. Measured Cladding Diameter. In case fiber loaded on both side and not spliced yet. Measured Cladding Diameter. In case fiber loaded on only one side or already spliced. Type1 Error (Refer to 2.8.1). Splicer is too busy to reply

6.25 Cladding Diameter Profile Measuring

Table 6-25 shows the format of the command to perform cladding diameter profile measuring.

Table 6-25: Command to Perform Cladding Diameter Profile Measuring

Format	&DIAPRF &DIAPRF STEP= value
Function	Measuring Cladding Diameter Profile. STEP: increment of horizontal position where diameter is measured From 2 to 100 [um] e.g. &DIAPRF &DIAPRF STEP=20
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. POS(MIN,MAX,STEP)= MINIMUM POS*, MAXIMUM POS*, STEP X=xdia_{MIN}** , xdia_{MIN+STEP}, ..., xdia_{MAX} Y=ydia_{MIN}*** , ydia_{MIN+STEP}, ..., ydia_{MAX} Measured Cladding Diameter Profile Data ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

pos : Longitudinal position that increments left to right in [um]. Zero means that the position is at the center of the camera image.

xdia_{pos} : Measured diameter value at pos in X camera image [um]

ydia_{pos} : Measured diameter value at pos in Y camera image [um]

6.26 Tracing Fiber Shape

Table 6-26 shows the format of the command to trace the fiber shape.

Table 6-26: Command to Trace the Fiber Shape

Format	&FBRTRC &FBRTRC STEP= value
Function	Tracing Fiber Shape STEP: increment of horizontal position where shape is measured From 2 to 100 [um] e.g. &FBRTRC &FBRTRC STEP=4
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. POS(MIN,MAX,STEP)= MINIMUM POS*, MAXIMUM POS*, STEP X=x lower_{MIN**}, x upper_{MIN**}, x lower_{MIN+STEP}, x upper_{MIN+STEP} ..., x lower_{MAX}, x upper_{MAX} Y=y lower_{MIN**}, y upper_{MIN**}, y lower_{MIN+STEP}, y upper_{MIN+STEP} ..., y lower_{MAX}, y upper_{MAX} Measured Fiber Shape Data ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

pos :Longitudinal position that increments left to right in [um]. Zero means that the position is at the center of the camera image.

lower_{pos} : Measured vertical position of the lower end of fiber at pos in X or Y camera image [um]

upper_{pos} : Measured vertical position of the upper end of fiber at pos in X or Y camera image [um]

6.27 Brightest Point Profile

Table 6-27 shows the format of the command to measure the profile of brightest points on fiber.

Table 6-27: Command to Trace the Fiber Shape

Format	&BRTPRF &BRTPRF STEP= <i>step value</i> AVE= <i>averaging length</i>
Function	<p>Measure the profile of the brightest points on fiber. Data is measured only with Y camera image.</p> <p>STEP: increment of horizontal position where brightness is measured From 2 to 100 [μm]. 5μm is applied if omitted.</p> <p>AVE: averaging length of brightness along vertical scan line From 5 to 2500 [μm]. 5μm is applied if omitted.</p> <p>e.g. &BRTPRF &BRTPRF STEP=4 AVE=125</p>
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. POS(MIN,MAX,STEP)= MINIMUM POS*, MAXIMUM POS*, STEP X=x brightness_{MIN**}, x position_{MIN**}, x centroid_{MIN**} x brightness_{MIN+STEP}, x position_{MIN+STEP}, x centroid_{MIN+STEP} ..., x brightness_{MAX}, x position_{MAX}, x centroid_{MAX} Y=y brightness_{MIN}, y position_{MIN}, y centroid_{MIN} y brightness_{MIN+STEP}, y position_{MIN+STEP}, y centroid_{MIN+STEP} ..., y brightness_{MAX}, y position_{MAX}, y centroid_{MAX} Measured Fiber Shape Data ** brightness : highest averaged brightness in the same vertical scan line at the position ** position : center position of the averaging length where the highest averaged brightness was obtained. ** centroid : centroid (weighted center) position in the averaging length where the highest averaged brightness was obtained. ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

6.28 Magnification of Digital Zoom for Display

Table 6-28 shows the command to set the magnification of digital zoom for display.

Table 6-28: Command to set the magnification of digital zoom

Format	&DSPMAG &DSPMAG=<i>magnification</i>
Function	Set digital zoom magnification magnification: Magnification ratio of digital zoom in percentage. Default magnification is set if this option is omitted. From 50 to 1600
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.29 Storing Live Camera Images into the Image Buffer

Table 6-29 shows the command to set displaying magnification of camera images.

Table 6-29: Command to capture and store live images into the image buffer

Format	&CAPTURE
Function	Capture and store live images into the image buffer The image buffer is used to keep captured live camera images temporarily. Since the buffer is used by almost functions that have image processing, captured data must be retrieved by “IMGLINENC” or “IMGLINEHNC” command before performing such functions.
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.30 Camera Window Size for Raw Image

Table 6-30 shows the command to set the mode of the camera window size for raw camera image.

Table 6-30: Command to set the mode of the camera window size

Format	&IMGSIZEMODE &IMGSIZEMODE X= mode Y= mode
Function	Set the raw camera image size mode mode: Mode number. 1, 2 or 3 can be applied. Default mode setting of current splice mode is applied if this option is omitted. 1 -> Apply 480x640 area of camera for 480x640 raw image so the magnification is high. 2 -> Apply 960x1280 area of camera for 480x640 raw image so the magnification is medium. 3 -> Apply 1440x1920 area of camera for 480x640 raw image so the magnification is low. In this mode, only 356 x480 is available for image processing. e.g. &IMGSIZEMODE &IMGSIZEMODE X=3 Y=3
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.31 Optical Zoom

Table 6-31 shows the command to move the optical zoom units

Table 6-31: Command to zoom in or zoom out

Format	&OPTZOOM=action
Function	Zoom in or zoom out action: ZOOMIN or ZOOMOUT
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.32 Open / Close Beam Shutter

Table 6-32 shows the command to open or close the beam shutter.

Table 6-32: Command to open or close the beam shutter

Format	&SHUTTER=action
Function	Open or close the beam shutter action: OPEN or CLOSE
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.

6.33 Setting Exposure Time of Camera

Table 6-33 shows the command to set exposure time of camera.

Table 6-33: Command to set exposure time of camera

Format	&EXPOSURE &EXPOSURE= ratio
Function	Set exposure time of camera ratio: exposure time ratio compare to standard exposure time in percentage (from 0.1 to 200.0) 100.0 is used if this option is omitted.
Response of the Splicer	Successful ACK
	Unsuccessful NAK Reason1: Illegal format Reason2: Splicer is too busy to reply Reason3: Splicer cannot respond because of communication error.

6.34 Cleaved Angle Measuring

Table 6-34 shows the format of the command to perform cleaved angle measuring.

Table 6-34: Command to Perform Cleaved Angle Measuring

Format	&CLVANG	
Function	Measuring Cleaved Angle of Fiber End Edge	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. VALUE= cleaved angle left [deg], cleaved angle right [deg] Measured Cleaved Angle. The result for the side that fiber is not loaded is set to 1000.0.	
	ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply	

6.35 Gapset

Table 6-35 shows the format of the command to perform gapset.

Table 6-35: Command to Perform Gapset

Format	&GAPSET &GAPSET GAP=<i>amount</i> amount : gap amount [um] *If this option is omitted, gap setting of current splice mode is applied. e.g. &GAPSET &GAPSET GAP=30
Function	Perform Gapset
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. GAPSET:OK The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

6.36 X/Y Position Alignment

Table 6-36 shows the format of the command to perform X/Y position alignment. Focus Position Adjustment must be performed in advance or splicing status must be in {PAUSE1}, {PAUSE THETA} or {PAUSE2}.

Table 6-36: Command to Perform X/Y Position Alignment

Format	&XYALIGN (METHOD=method X=x_amount Y=y_amount)
Function	<p>Aligning X/Y Position</p> <p>METHOD: Alignment method of XY alignment CORE, CLAD, PMETER, SINGLE* (CLAD is applied if omitted) * Splicer aligns single fiber lying across V grooves.</p> <p>X: Offset amount after alignment at X -200.0 to 200.0 STEP 0.1 [um]. 0 is applied if omitted.</p> <p>Y: Offset amount after alignment at Y -200.0 to 200.0 STEP 0.1 [um]. 0 is applied if omitted.</p> <p>e.g. &XYALIGN &XYALIGN Y=5.0 &XYALIGN METHOD=CORE &XYALIGN METHOD=CORE X=10.1 &XYALIGN METHOD=CLAD X=+15.2 Y=-20.3 &XYALIGN METHOD=PMETER X=-25.4 Y=30.5</p>
Response of the Splicer	<p>Command Accepted ACK</p>
	<p>Command Not Accepted NAK</p> <p>Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state</p>
	<p>Response for FUNCTION RESULT RETRIEVING COMMAND</p> <p>CANCELLED The function has not started or cancelled BUSY The function is running XYALIGN:OK The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply</p>

6.37 Theta Alignment

Table 6-37 shows the format of the command to perform theta alignment according to the current splice mode settings. Focus Position Adjustment must be performed in advance or splicing status must be in {PAUSE1}, {PAUSE THETA} or {PAUSE2}.

Table 6-37: Command to Perform Theta Alignment

Format	& ALGNTHETA e.g. &ALGNTHETA	
Function	Aligning Theta Position	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2} or {FINISH} state	
	Response for FUNCTION RESULT RETRIEVING COMMAND	
	CANCELLED	The function has not started or cancelled
	BUSY	The function is running.
	ALGNTHETA:OK	The function has completed
	ER - ...	Type1 Error (Refer to 2.8.1).
	NAK	Splicer is too busy to reply

6.38 Estimating Splice Loss

Table 6-38 shows the format of the command to perform the estimation of splice loss.

Table 6-38: Command to Perform Estimation of Splice Loss

Format	&EST
Function	Estimating splice loss
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {FINISH} state.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has canceled or not started BUSY The function is running. VALUE= splice loss Estimated splice loss [dB]
	ER - ... Type1 Error (Refer to 2.8.1).
	NAK Splicer is too busy to reply

6.39 Estimating Polarization Extinction Ratio or Crosstalk

Table 6-39 shows the format of the command to estimate of PER (Polarization Extinction Ratio) or Crosstalk.

Table 6-39: Command to estimate the PER or Crosstalk

Format	&THETAEST
Function	Estimating PER or Crosstalk
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {FINISH} state.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has canceled or not started BUSY The function is running. VALUE= PER or Crosstalk [dB], PER or Crosstalk [deg] Estimated PER or Crosstalk [dB or deg]
	ER - ... Type1 Error (Refer to 2.8.1).
	NAK Splicer is too busy to reply

6.40 Re-lasing

Table 6-40 shows the format of the command to perform re-lasing.

Table 6-40: Command to Perform Re-lasing

Format	&REARC	
Function	Performing Re-lasing	
Response of the Splicer	Command Accepted ACK	
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {FINISH} state.	
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has canceled or not started BUSY The function is running. OK The function has completed ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply	

6.41 Reading power from a power meter via GPIB

Table 6-41 and Table 6-42 show the command to read power meter via GPIB. Setting of the GPIB communication should be set with “Configurations” in “Utility Menu”.

Connection diagram among splicer, power meter and PC is shown as Figure 6-4.

Table 6-41 Command to initialize GPIB settings

Format	&GPIBINIT
Function	Initialize GPIB setting
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason3: Mismatch of the power meter addresses. Reason4: Power meter is not connected.

Table 6-42: Command for reading power meter

Format	&GPIBREAD
Function	Read power meter output
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state. Reason3: Mismatch of the power meter addresses. Reason4: Power meter is not connected.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running. VALUE= power meter output The function has completed. Returns measured power / loss. ER - ... Type1 Error (Refer to 2.8.1). NAK Splicer is too busy to reply

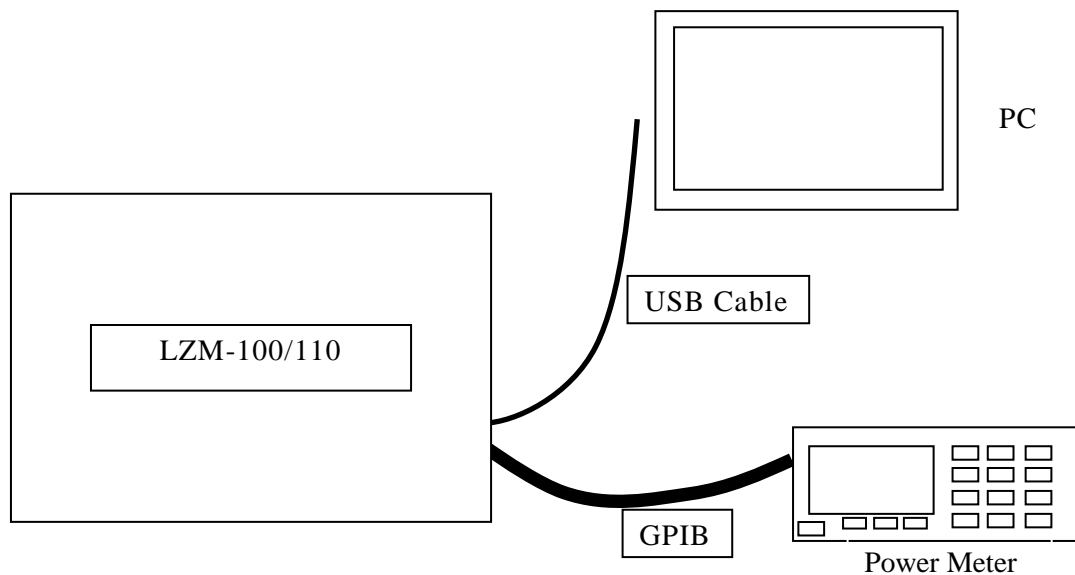


Figure 6-4: Connection diagram

6.42 Start / Stop Warming Up Mode

Table 6-43 shows the command to start / stop Warming Mode.
The Command is for LZM-110 only.

Table 6-43: Command to start / stop Warming up mode

Format	&WARMINGUP-action action: ON or OFF
Function	ON : Start warming up mode When the wind protector opens, the splicer ignores the command. OFF : Stop warming up mode
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: Splicer is not at the {READY}, {PAUSE1}, {PAUSE THETA}, {PAUSE2}, or {FINISH} state.
	Response for FUNCTION RESULT RETRIEVING COMMAND CANCELLED The function has not started or cancelled BUSY The function is running.
	WARMINGUP:DONE The function has completed

Chapter 7. Others

7.1 Commands for power meter alignment without using GPIB port

With the commands introduced in this chapter, the splicer can perform an X/Y or θ alignment function using data from an optical power meter through a PC, as shown in Figure 7-2. Table 7-1 shows the command to send the current power meter value to the splicer.

The command is available when the value of [Machine Settings]-[External Instrument] is [USB] and the value of [θ Alignment] or [XY Alignment] of [Splice Mode] is [P-Meter].

Figure 7-1 shows a flow to perform alignment using the =FUNCSTAT command shown in the chapter 5.4 and the #LIGHTPWR command shown in Table 7-1. Refer to the following description about the flow in detail:

1. During the splicing process, you can obtain the current status of the splicer with the =FUNCSTAT command. Refer to chapter 5.4, chapter 2.8, Table 2-8 and Figure 2-1.
2. When the splicer is ready to receive a power meter value, the splicer replies PMWAITINGDATA as the answer of =FUNCSTAT command. In this case, send the power meter value to the splicer with #LIGHTPWR command.
3. The splicer moves some motors according to the received power meter value. Then the process returns to the previous step unless the alignment completes. The splicer performs the next step after the alignment completes. If the answer of =FUNCSTAT is neither BUSY nor PMWAITINGDATA, that means either an error has occurred or the next step has completed.

Table 7-1: Command to send the power meter value

Format	#LIGHTPWR=***
Function	Send power meter value to the splicer
Response of the Splicer	Command Accepted ACK
	Command Not Accepted NAK Reason1: Illegal format Reason2: The splicer is not ready to receive a new value

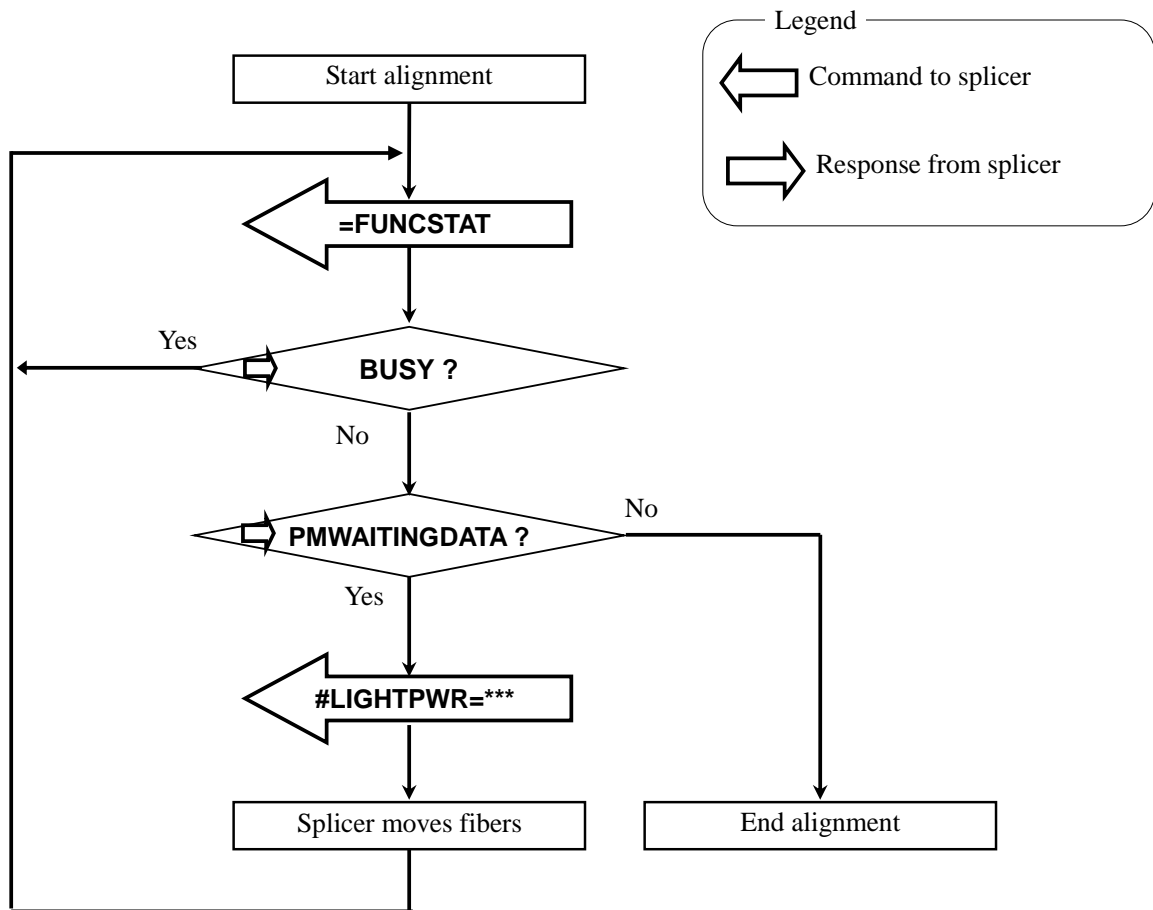


Figure 7-1: Flow of Power Meter Alignment by USB

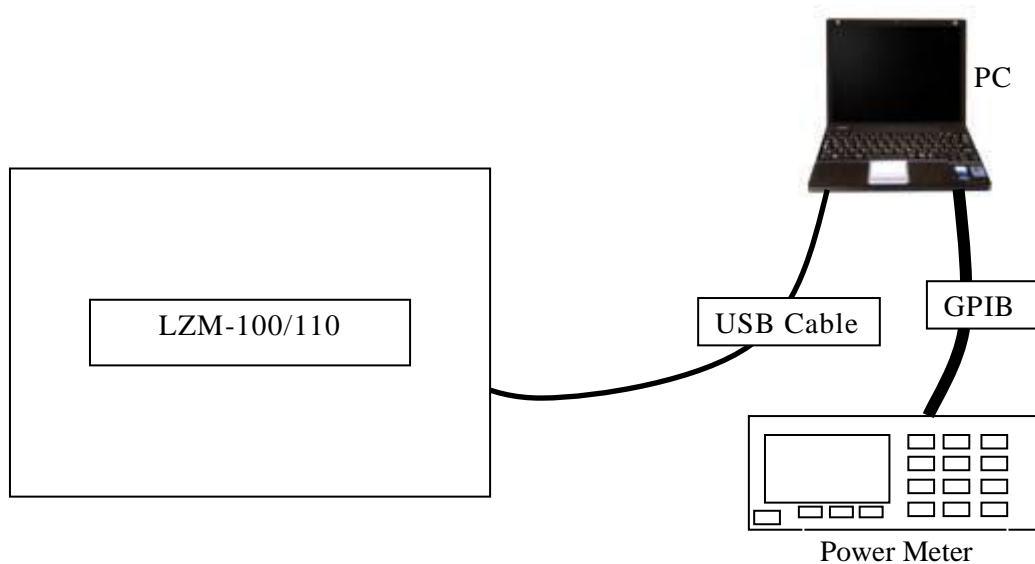


Figure 7-2: Connection diagram

Appendix

Appendix A : Fiber Type List

BLANK	SM080
PMAUTO1	SM80-SM125
PMAUTO2	MM-MM
PMAUTO3	SM250
PMAUTO4	SM400
PMAUTO5	HI980
PMAUTO6	HI10
PMAUTO7	LEAF
PMAUTO8	MT
PANDA1	RS
PANDA2	XL
PANDA3	RCH
PANDA4	FR
PANDA5	WD
PANDA6	TR
PANDA7	HI980-SM
PMETERALIGN	HI98-HI10
PANDA-SM1	HI10-SM
PANDA-SM2	HI10F-SM
BASIC1STD	HI10F-HI10
BASIC2STD	MP-SM
BASIC3STD	MP98-HI98
BASIC4STD	MP98-HI10
BASIC5STD	HE98-SM
BASIC1SP	LEAF-SM
BASIC2SP	LEAF-RS
BASIC3SP	LEAF-XL
BASIC4SP	MT-RS
BASIC5SP	RS-SM
SM125-1	RS-XL
SM125-2	XL-SM
	FR-SM
	FR-LF
	WD-SM
	TR-SM

Appendix B : GPIB Instruments List

GPIB NONE GPIB AGILENT 8154 A GPIB AGILENT 8154 B GPIB ANDO 2140 A GPIB ANDO 2140 B GPIB ADVANTEST 8221 A GPIB ADVANTEST 8221 B GPIB NEWPORT 2832C A GPIB NEWPORT 2832C B GPIB ANRITSU 9810 A GPIB ANRITSU 9810 B GPIB ILX 8200 GPIB UDT 370
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