

Model M3LU PC CONFIGURATOR (model: M3LUCON)

Users Manual

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1. GETTING STARTED

1.1 HARDWARE REQUIREMENTS

• IBM PC/AT compatible PC; Pentium 120 MHz minimum (Pentium II 266 MHz or higher recommended) Windows 95/98 or Windows NT 4.0 or 2000

24 MB RAM (48 MB for Windows NT4.0 or 2000)

30 MB minimum free hard disk space

15-inch 800x600 Super VGA screen (17-inch 1024x768 Ultra VGA or higher recommended) CD-R/ROM Drive

Serial Port (COM1 or COM2)

• Non-isolated Cable included in the M3CON Configurator Connection Kit package.

1.2 INSTALLING THE M3LUCON

This programming tool is based on Agilent VEE Pro. In order to operate the tool, the user must first install Agilent VEE Pro 6.01 RunTime Version [VEE Pro] and [IO Lib]. If you already have them installed on your PC, skip the installation procedure for them.

- (1) Start up Windows.
- (2) Insert M3LUCON Setup CD-ROM into the CD drive on your PC. The Setup program automatically starts and shows the setup dialog box on the screen.

⚠ If the program does not automatically start, install manually by starting up Disk:\Setup.exe.

 \triangle DO NOT change from the default setting the hard disk drive where the M3LUCON is to be installed.

(3) Choose "VEE Pro."

-> Windows starts the installation program for Agilent VEE Pro 6.01 RunTime. Follow instructions on the screen and click Next or Yes.

-> Click Finish and exit the installation program.

(4) Choose "IO Lib."

-> Windows starts the installation program for Agilent IO Libraries. Follow instructions on the screen and click Next or Yes.

During the process appears two dialog boxes in which you should specify as follows:

"Agilent Libraries – Select type of installation." –> Choose "1. SICL and Agilent VISA Installation." "IO Libraries Configuration" –> Choose "Auto-configure all interfaces."

-> Click Finish and exit the installation program.

- (5) Choose "M3LUCON."
 -> Windows starts the installation program for M3LUCON software. Follow instructions on the
 - screen and click Next. -> Click Finish and exit the installation program.

(6) Click Exit.

Now the M3LUCON program has been installed.

1.3 STARTING UP THE M3LUCON

Connect the model M3LU Universal Transmitter to the PC via the non-isolated cable included in the M3CON package.

Press Start on the task bar and choose M3LUCON from the Program menu.

1.4 M3LU WITH OPTION /B

The M3LU with Option /B is not designed for PC configuration, while the Option /A version is fully programmable on the PC.

When you connect the Option /B version to the PC and start up the M3LUCON program, you can confirm the current setting but these buttons and fields used for configuring the module are greyed out and thus unavailable.

The M3LUCON features available for the Option /B version are: Monitoring, One Step Calibration, DAC Trimming, Fixed Output and ADC Conversion Rate Setting.

2. OPERATING THE M3LUCON PC CONFIGURATOR

Figure 1 shows the initial view of the M3LUCON PC Configurator window. In order to enable the tools shown on the screen, the model M3LU Universal Transmitter must be

connected to the PC via the non-isolated cable provided with the M3CON package.



2.1 CONNECTING THE DEVICE (M3CON)

On the initial view, click [Connect] and the Device Connection menu appears on the screen.

M3LUCON PC Configurator Ver1.00	0				
M3LU	Device Mode	COM THE DIS	Z/S IRG	ORG CFG	
Configurator Monitor	Device Status	BO ADO	SCM AFX	AOS TRM PV	
Device Connection	PV	PV %	Term.	AO	Functions
COMM Port	1000	100	100	20	Connect
		1	80 🗧		Upload
Connect Device	800 -	80 -	1	16	Detailed Info
	-	-			Analog Output
	600	60 -	40 -	-	One Step Cal.
Disconnect Device	1	1	1	12	Trim DAC
	400-	40 -	-	Ī	
		1	0	-	Sensor Gal
				8 -	Sinc Filter
	200 -	20]	-	-	Diagnostics
	1	-	-40	1	
	0-	0		4	Custom TC.
	0	0	-40	4	Custom RTD
	mV	%	degC	mA	Special Curve
Close Device Connection	PV Graph	PV % Graph	Term Graph	AO Graph	1

Figure 2. Device Connection

[COMM Port]Choose COM1 or COM2 that connects to the M3LU.[Connect Device]Connects the device. Once the connection is established, the program
uploads the device's configuration information and automatically calls up
the Sensor Information view. The Device Information view is the base for
various operations to configure the M3LU.[Disconnect Device]Disconnects the currently connected device.[Close Device Connection]Quits the Device Connection view.

2.2 MONITORING TRENDS

Once the device is connected, the Sensor Information menu and the trend monitors appears on the screen. The user can configure various parameters of the M3LU.



Figure 3. Sensor Information

2.2.1 Device Mode

Device Mode summarizes the device's current operation status and communications status with the PC by lamps.

<i>,</i> ,						
[COM] lamp	Blinks with the normal communications condition.					
[TME] lamp	Red light turns on when the device detects the communications time out.					
[Z/S] lamp	Red light turns on when the device is in the DAC Trimming mode.					
[IRG] lamp	Red light turns on when the device is in the Input One Step Calibration mode.					
[ORG] lamp	Red light turns on when the device is in the Output One Step Calibration mode.					
[CFG] lamp	Red light turns on when data changes have been done on the configuration software					
	since it was stored the last time. It turns off once the data has been stored into the					
	nonvolatile memory.					

2.2.2 Device Status

Device Status summarizes the current device status by lamps.

- [BO] lamp Red light turns on with 'Burnout' detected (temperature sensor's wire breakdown or ADC overrange).
- [ADC] lamp Red light turns on with ADC's hardware errors.
- [SCM] lamp Red light turns on with the device's internal communication errors.
- [AFX] lamp Red light turns on when the analog output entered in Fixed Output mode.
- [AOS] lamp Green light turns on when the analog output is diagnosed to be normal. Red light turns on when the output is saturated upscale or downscale.
- [TRM] lamp Green light turns on when the device measures temperature at the terminals. Red light turns on when the device is not able to measure temperature at the terminals; e.g. the CJC temperature sensor is not connected.
- [PV] lamp Green light turns on when the sensor input is in the specified range. Red light turns on when it is out of the range.

2.2.3 Bargraph & Trend Graph

Four bargraphs indicating PV in engineering unit, PV in % of the selected range, the terminal temperature and analog output are available.

The graph scales for the terminal temperature can be modified unlike the PV in engineering unit and analog output of which the scales are automatically determined and fixed according to the selected range.

At the bottom of each bargraph is [Graph] button which opens a trend graph for the item. The example below shows the trend graph for [Term Graph]. Use [Start] and [Stop] buttons to activate/deactivate trending, and click [Close] to quit the graph view.



Figure 4. Trend Graph

2.3 INPUT CONFIGURATION

In Figure 3, the Sensor Information menu on the left shows the basic configuration information of the connected sensor. When you need to change configurations, click the left button for the required item to modify the setting.

[Sensor Type] Specifies the sensor type and number of extension wires. When a new sensor type is chosen, other default settings are automatically selected.

[Sensor Wires] Shows 2-, 3- or 4-wires for the sensor.

[PV Unit] Specifies the engineering unit for the PV for a thermocouple or RTD input. When this setting is changed, other related items such as PV Range, Upper/Lower Limits, PV Minimum Span are automatically shown in the new unit.

[PV Range] Specifies the input range.

[PV Upper/Lower Limit] and [PV Minimum Span] show the usable range information for the selected type of sensor.

2.4 DETAILED INFORMATION

In Figure 3, clicking [Detailed Info] on the right control panel opens the [Detailed Information] menu as shown in Figure 5.

Figure	5.	Detailed	Information
--------	----	----------	-------------

M3LUCON PC Configura	ator Ver1.00					
M3L Configu Moni	.U urator itor	Device Mode	COM THE PC	Z/S IRG	ORG CFG	
Detailed Inf	ormation	PV	PV %	Term.	AO	Functions
PV Damping	0.000	100	100	100	20	Connect
Burnout	Upscale	-	1	80		Upload
CJC Switch	CJC ON	80	80 -	1		Detailed hto
Xfer Function	LINEAR		1		16	Analog Output
Term Unit	degC	- 03	60 -	40		One Step Cal.
Tag No Ta	g No(16 Chars)		-		40	Trim DAC
Serial Number	A	I	1	4	12 -	
Device Type	M3LU-A	40 -	40 -	0	1	Sensor Cal.
Hardware Revision	M3LU_HV01.00		1	1	8-	Sinc Filter
Software Revision	M3LU_FV01.00	20 -	20 -		1	Diagnostics
		-	-	-40		
		0	0		4	Gustom TC.
		25.89	25.86	24.84	8.12	Custom RTD
		degC	%	degC	mA	Special Curve
Close Detailed	Information	PV Graph	PV % Graph	Term Graph	AO Graph	

[PV Damping] Specifies the time constant for the primary input filter. Selectable range is from 0.5 sec. up to 30 sec. When you do not need a filtering, specify '0.'

[Burnout] Specifies either the output should go upscale or downscale in case that a burnout is detected.

[CJC Switch] Enables/disables the cold junction compensation for thermocouple input. When a thermocouple is specified as the input sensor, the CJC Switch is set to ON at default.

[Xfer Function] Enables/disables the Xfer Function, specifying either the output should be linear to the input signal or linearized to a custom curve data.

[Tag] Selecting this function without a pre-defined Special_Curve is defined as Error. You can enter a tag name using up to 16 alphanumerical characters.

[Serial Number], [Hardware Revision] and [Software Revision] are automatically displayed. [Close Detailed Information] Quits the view.

2.5 ANALOG OUTPUT

In Figure 3, clicking [Analog Output] on the right control panel opens the [Analog Output] menu as shown in Figure 6.

Figure 6. Analog Output



The Analog Output menu on the left shows the output type and ranges. When you need to change configurations, click the left button for the required item to modify the setting.

- [Output Type] Specifies either current or voltage type.
- [SW1 Position] Shows the DIP SW configuration (hardware setting) required for the selected output type. Confirm the actual setting.
- [AO Mode] Shows the output mode. 'Normal AO' is usually displayed.
- [Sensor Wires] Shows 2-, 3- or 4-wires for the sensor.
- [AO Unit] Shows the engineering unit for the output signal.
- [Range] Specifies the output range.
- [Upper/Lower Limit] and [Minimum Span]

Show the usable range information for the selected output type.

- [Set AO for current PV output] The output current is held at the current value.
- [Set AO for specified value] You can set a specific value to fix the output.
- [Exit Fixed AO Mode] Cancel the fixed output mode to return the device into normal output mode.
- [Close Analog Output] Quits the view.

2.6 ONE STEP CALIBRATION

In Figure 3, clicking [One Step Cal] on the right control panel opens the One Step Calibration menu as shown in Figure 7.

M-System's 'One Step Calibration' technique realizes automatic input and output ranging with a signal simulator connected to the module's input terminals.

M3LUCON PC Configurator Ver1.00 _ 🗆 🗙 M3LU Device Mode IRG CON TME Z/S 070 Configurator Device Status ADC AFX BO SCM TRM Monitor **One Step Calibration** PV PV % Term. AO Functions 100 -100 20 -100 Input Enter PV Calibration Mode 80 -Lower Cal Upper Cal 80 80 16 Exit PV Calibration Mode Output 40 60 60 Enter AO Calibration Mode 12 Lower Cal. Upper Cal. 40 40 Exit AO Calibration Mode 0 8 20 20 -40 0 0-Δ 25.95 25.95 25.19 8.153 degC degC mA % Close One Step Calibration PV % Graph Term Graph AO Graph PV Graph

Figure 7. One Step Calibration

Input Calibration Mode

Connect the M3LU to a simulator and a multimeter as described in the M3LU instruction manual. Click [Enter PV Calibration Mode] in order to turn the module into the Input Calibration Mode. The Red [IRG] lamp in [Device Mode] panel at the top turns ON while the module is in this mode.

Apply desired 0% and 100% signal levels and click [Lower Cal] and [Upper Cal] buttons respectively so that the input range is automatically set.

Click [Exit PV Calibration Mode] when the calibration is complete.

Output Calibration Mode

Click [Enter AO Calibration Mode] in order to turn the module into the Input Calibration Mode. The Red [ORG] lamp in [Device Mode] panel at the top turns ON while the module is in this mode.

Increase or decrease the simulated input until the output multimeter shows desired 0% and 100% signal levels and click [Lower Cal] and [Upper Cal] buttons respectively so that the output range is automatically set.

Click [Exit AO Calibration Mode] when the calibration is complete.

[Close One Step Calibration] Quits the view.

2.7 DAC TRIMMING

Click [Trim DAC] button to open the Trim DAC view as shown in Figure 8.

Figure 8. Trim DAC

M3LUCON F	M3LUCON PC Configurator Ver1.00						
	M3LU Configura Monitor	tor	Device Mode Device Status	COM THE PC	Z/S IRG SCM AFX	ORG CFG	
	Trim DAC	9	PV	PV %	Term.	AO	Functions
Enter Lo	wer Range 1	rim Mode	100	100	100	20	Connect
Enter Up	per Range T	rim Mode		Ţ	80 -		Upload
Trim by	actual measu	ired value	80 -	80 -	Ţ	16	Detailed Info
Lin +	Lin ++	1 In +++	1	1			Analog Output
00.	opii	op	60 -	60 -	40 -		Trim DAC
Down +	Down ++	Down +++	1	1	1	12 -	
Clea	ar Trim DAC	Data	40 -	40	0-		Sensor Cal.
Zero Offs	et 0.0	000000			1	8	Sinc Filter
Span Ga	Span Gain 1.000000		20 -	20 -			Diagnostics
			0	0	-40	4	Custom TC
				26.58	25.35	8.216	Custom RTD
			degC	%	degC	mA	Special Curve
Close Trim DAC			PV Graph	PV % Graph	Term Graph	AO Graph	

2.7.1 Lower Range DAC Trimming

- (1) Click [Enter Lower Range Trim Mode]. The device outputs a fixed lower range signal level.
- (2) Measure the actual output signal at the receiving instrument to which the device output should be matched.
- (3) Click [Trim by actual measured value] to set the measured value.
- (4) Repeat setting [Trim by actual measured value] until the measured output shows the desired level. Alternately, use [Up] or [Down] buttons. [+], [++] and [+++] have different increments. Deviation from the default value is shown in [Zero Offset].

2.7.2 Lower Range DAC Trimming

- (1) Click [Enter Upper Range Trim Mode]. The device outputs a fixed upper range signal level.
- (2) Measure the actual output current at the receiving instrument to which the device output should be matched.
- (3) Click [Trim by actual measured value] to set the measured value.
- (4) Repeat setting [Trim by actual measured value] until the measured output shows the desired level. Alternately, use [Up] or [Down] buttons. [+], [++] and [+++] have different increments. Deviation from the default value is shown in [Span Gain].

2.7.3 Resetting to the Default

Click [Clear Trim DAC Data] to return the device to the factory default trimming values. [Close Trim DAC] quits the view.

2.8 SENSOR CALIBRATION

The input sensor can be calibrated with Zero and Span: the Zero is represented as offset at the calibration point, while the Span is represented as gain against the zero point. The gain must be set from 0.1 to 10.0.

Calibration points can be specified to any point within the measuring range. The DC current/voltage and thermocouple inputs are calibrated against the measured current/voltage; while the RTD and resistance input are against the measured resistance. Errors caused by extension wire resistance for 2-wire RTDs and by imbalance in that for 3-wire RTDs can be calibrated by the Zero adjustment. Click [Sensor Cal] button to open the Sensor Calibration view as shown in Figure 9.

M3LUCON F	°C Configurator Ver1.0	Q		10 x 0			
	M3LU		Device Mode	COM THE PC	Z/S IRG	ORG CFG	
	Configurator Monitor		Device Status	BO ADO	SCM AFX	AOS TRM PV	
Se	nsor Calibration	n	PV	PV %	Term.	AO	Functions
Rea	d Calibration Da	ta	100	100	100	5	Connect
Clear Se	ensor Calibration	Data	1	-	80		Upload
	ava Calibratian		80 -	80 -		2 -	Detailed Info
	ero Calibration		-	-		İ	Analog Output
9	pan Calibration		60	60 -	40	-	One Step Cal
PV	25.146420	degC				-2	Trim DAC
Zero Point	0.0032	mV	40	40	0		Sensor Cal.
Zero Value	0.0011	mV	1		1	-6	Sinc Filter
Gain	1.0000		20 -	20 -	- 40		Diagnostics
			0	0	-40	-9.974	Gustom TC
				25.21	24.82	-6.176	Custom RTD
			degC	%	degC	V	Special Curve
Close	e Sensor Calibrat	tion	PV Graph	PV % Graph	Term Graph	AO Graph	

Figure 9. Sensor Calibration

The present measured value is indicated in the middle. Refer to this value when calibrating the sensor. It takes several seconds for the calibration result affects the measured value on the display.

Apply the zero calibration point input signal and click [Zero Calibration] to open the field where you can enter the target value. The result is shown in the PV display field. The data before calibration is shown in the Zero Point field, while the data after calibration is shown in the Zero Value field.

Apply the span calibration point input signal and click [Span Calibration] to open the field where you can enter the target value. The result is shown in the PV display field. The gain between the zero point and the span point is shown in the Gain field.

[Read Calibration Data] calls up and display the present calibrated values in these fields. Click [Clear Sensor Calibration Data] to return the device to the factory default status.

Factory Default	
DC and thermocouple inputs	Zero Point = Zero Value = 0mV/0mA
	Gain = 1.0
RTD input	Zero Point = Zero Value = Resistance (Ω) at 0°C
	Gain = 1.0
Resistance input	Zero Point = Zero Value = 0Ω) at 0Ω
	Gain = 1.0
Potentiometer input	Zero Point = Zero Value = 0%
	Gain = 1.0

When the sensor type is changed, the calibration data are reset to these factory default values. [Close Sensor Calibration] quits the view.

2.9 ADC CONVERSION RATE

Click [Sinc Filter] button to open the Sinc Filter view as shown in Figure 10.

ADC' output rate can be selected among 10, 20, 40, 50 and 60 Hz. Choose 10 Hz for better accuracy; choose 50 or 60 Hz for better response time.



[Write Sinc Filter] [Read Additional Status] [Close Diagnostics] Opens the frequency selection buttons. Choose one and click OK. Calls up the current contents of Additional Status. Quits the view.

2.10 DIAGNOSTICS

Click [Diagnostics] button to open the Diagnostics view as shown in Figure 11.

Figure 11. Diagnostics

M3LUCON PC Configurator Ver1.00					
M3LU Configurator	Device Mode	COM THE PC	Z/S IRG	ORG CFG	
Monitor	Device Status	BO ADO	SCM AFX	AOS TRM PV	
Diagnostics	PV	PV %	Term.	AO	Functions
Execute Diagnostics	100	100	100	5	Connect
Read Additional Status	-		80 -		Upload
Master Reset Device	80 -	80 -		2-	Analog Output
Additional Status	- 00	- 03	40		One Step Cal
EEPROM SUM Error (Basic Part)	-		-	-2-	Trim DAG
EEPROM SUM Error (Custom TC Part)	-	+	-		
EEPROM SUM Error (Custom RTD Part)	10]	40]	1	-	
EEPROM SUM Error (Special Curve Part)	40	40	0-	-	Sensor Cal
EEPROM SOM EITOI (Summary)	-	7	1		Sinc Eilter
	20	20	-	-07	
	20	20	4	-	Diagnostics
	-	-	-40		
	0	0		-9.974	Custom TC
	25.02	25.02	24.56	-6.227	Gustom RTD
	degC	%	degC	V	Special Curve
Close Diagnostics	PV Graph	PV % Graph	Term Graph	AO Graph	

Activates the diagnostics program and the results are displayed under the Additional Status. The Additional Status section shows each Additional Status item and its status: green in normal status, while red in error
Calls up the current contents of Additional Status.
Reset and restart the device without actually turning OFF/ON the power supply.
Quits the view.

2.11 CUSTOM TC

The M3LU supports the user-specific thermocouple table function. In order to use a user-specific table, the data in text format must be defined and registered.

The file format is as following.

Define the minimum temperature value in Celsius at Minimum TC Temperature.

Specify the Temperature Steps used in the table, from 1°C to 50°C.

Describe the characteristics data within { }. Data must be entered in mV. Up to 1000 points can be specified.

```
/*****
/*
   Custom TC Table Definition
/*
   Ti=f(Xi) (0<=i<Size)
/*
        Temperature Step (1 to 50 degC)
/*
        -100<=Xi<1000mV
/*
        Xi<Xi+1
/*
        2<=Size<=1000
<- Minimum temperature T0 (°C)
Minimum TC Temperature=0
Step=10
                           <- Temperature step (°C)
{
10.0000
                           <- Voltage value for T0 (mV)
20.0000
                           <- Voltage value for Tmax (mV)
}
```

Once the data file is ready, register the file on the M3LUCON. Click [Custom TC] button to open the Custom TC as shown in Figure 12.

Figure 12. Custom TC

M3LUCON PC Configura	ator Ver1.00	(<u> </u>		and the second second		Sec. 1	
M3L Configu	U		Device Mode	COM THE PC	Z/S IRG	ORG CFG	
Moni	itor		Device Status	BO ADO	SCM AFX	AOS TRM PV	
Custon	n TC		PV	PV %	Term.	AO	Functions
Read table fro	om Devic	e	100	100	100	20	Connect
Write table t	o Device		-		80 -	1	Upload
			80 -	80 -	1	16	Detailed Info
vvrite table	to File		-	1	1	10	Analog Output
Read table t	from File		60 -	60 -	40	1	One Step Cal
Display graph of	f Custom	TC.	Ŧ	Ŧ	2	12	Trim DAC
Custom TC Tab	ole Conte	ents	40 -	40	0		Sensor Cal.
Status	Config	jured					Sinc Filter
Min. Temperature	-273	degC	20 -	20 -		3	Diagnostics
Max. Temperature	726	degC	1		-40		
Temperature Step	1	degC	0_	0		43	Custom TC
Table Size 1000 Max Size			25.57	25.61	24.97	8.09	Gustom RTD
			degC	%	degC	mA	Special Curve
Close Cus	tom TC		PV Graph	PV % Graph	Term Graph	AO Graph	

[Read table from File]	The program uploads a file stored in the PC. When uploaded, the file contents summery is indicated under Custom TC Table Contents. The I/O characteristic data longer than 1000 points are ignored.
[Display graph of TC table]	The I/O characteristics data can be shown in a graph.
[Write table to File]	The program saves the currently displayed I/O characteristics data to a file.
[Write table to Device]	The program downloads the currently displayed I/O characteristics to the M3LU.
	When the downloading is successfully complete, Status under Custom TC table Contents shows 'Configured.' Then the option 'TC Spec (Custom TC)' become available to choose among the Sensor Type selections. If 'TC Spec' has been already selected before this setting is done, you can not download a particular data file.
[Read table from Device]	The program uploads the I/O characteristics cable registered in the M3LU. If there is no file registered, Status under Custom TC table Contents shows 'Non configured.'
[Close Custom TC]	Quits the view.

2.12 CUSTOM RTD

The M3LU supports the user-specific RTD table function. In order to use a user-specific table, the data in text format must be defined and registered.

The file format is as following.

Define the minimum temperature value in Celsius at Minimum RTD Temperature.

Specify the Temperature Step used in the table, from 1°C to 50°C.

Describe the characteristics data within { }. Data must be entered in ohms. Up to 500 points can be specified.

```
/*****
/*
   Custom RTD Table Definition
/*
   Ti=f(Xi) (0<=i<Size)
/*
        Temperature Step (1 to 50 degC)
/*
        -100<=Xi<4000 Ohm
/*
        Xi<Xi+1
/*
        2<=Size<=500
<- Minimum temperature T0 (°C)
Minimum RTD Temperature=0
Step=10
                            <- Temperature step (°C)
{
100.000000
                            <- Resistance value for T0 (\Omega)
200.000000
                            <- Resistance for Tmax (\Omega)
}
```

Once the data file is ready, register the file on the M3LUCON. Click [Custom RTD] button to open the Custom RTD as shown in Figure 13.

Figure 13. Custom RTD

M3LUCON PC Configurator Ver1.00										
M3LU Configurator			Device Mode CON THE PC Z/S IRG ORG CFG							
Monitor			Device Status	BO ADO	SCM AFX	AOS TRM PV				
Custom RTD			PV	PV %	Term.	AO	Functions			
Read table from Device			100	100	100	20	Connect			
Write table to Device				1	80 -	1	Upload			
			80 -	80 -		40	Detailed Info			
Write table to File			-	1	Ŧ	16	Analog Output			
Read table from File			60	60 -	40	Ŧ	One Step Cal,			
Display graph of Custom RTD			1	-		12	Trim DAC			
Custom RTD Table Contents			40	40	0		Sensor Cal			
Status	Config	gured	-	-	1		Sinc Filter			
Min. Temperature	-50	degC	20 -	20 -	4	• =	Diagnostics			
Max. Temperature	960	degC	1	i i	-40	=				
Temperature Step	10	degC	0-	0		4	Custom TC			
Table Size	102	Max Size 500	25.59	25.79	24.95	8.094	Custom RTD			
			degC	%	degC	mA	Special Curve			
Close Custom RTD			PV Graph	PV % Graph	Term Graph	AO Graph				

The program uploads a file stored in the PC. When uploaded, the file con-[Read table from File] tents summery is indicated under Custom RTD table Contents. The I/O characteristic data longer than 500 points are ignored. [Display graph of RTD table] The I/O characteristics data can be shown in a graph. [Write table to File] The program saves the currently displayed I/O characteristics data to a file. [Write table to Device] The program downloads the currently displayed I/O characteristics to the M3LU. When the downloading is successfully complete, Status under Custom RTD table Contents shows 'Configured.' Then the option 'RTD Spec (Custom RTD)' become available to choose among the Sensor Type selections. If 'RTD Spec' has been already selected before this setting is done, you can not download a particular data file. [Read table from Device] The program uploads the I/O characteristics cable registered in the M3LU. If there is no file registered, Status under Custom RTD table Contents shows 'Non configured.' [Close Custom RTD] Quits the view.

2.13 LINEARIZATION TABLE SETTING

The M3LU supports the user-specific linearization table function (Special_Curve). In order to use the Special_Curve, the data in text format must be defined and registered.

The file format is as following.

Describe the characteristics data within { }. Sets of X and Y values must be entered in %. Up to 128 points can be specified.

```
/*
   Linearization Table (Special Curve) Definition
/*
   Yi=f(Xi) (0<=i<Size)
/*
       -15<=X,Y<115
/*
       Xi<Xi+1
/*
       2<=Size<=128
       ******
/*
{
0.000000,
                         <- The minimum X and Y values
         0.000000
1
100.000000, 100.000000
                        <- The maximum X and Y values
}
```

Once the data file is ready, register the file on the M3LUCON. Click [Special Curve] button to open the Special Curve as shown in Figure 14.

Figure 14. Special Curve

M3LUCON PC Configurator Ver1.00											
M3LU Configurator Monitor			Device Mode Device Status								
Special Curve			PV	PV %	Term.	AO	Functions				
Read table from Device			100	100	100	20	Connect				
Write table to Device			1		80 -		Upload				
Write table to File			80 -	80 -	1111	16	Detailed Info				
Read table from File			60 -	60 -	40	1	One Step Cal				
Display graph of Special Curve			-	1		12	Trim DAC				
Special Curve Table Contents			40	40	0		Sensor Cal				
Status	Config	jured			-	8	Sinc Filter				
Minimum Value	0	%	20 -	20 -	7	° -	Diagnostics				
Maxmum Value	100	%	1	1	-40	1					
Table Size	101	Max Size 128	0	0		4	Custom TC				
			25.77	25.79	25.03	8.124	Gustom RTD				
			degC	%	degC	mA	Special Curve				
Close Special Curve			PV Graph	PV % Graph	Term Graph	AO Graph					

[Read table from File] The program uploads a file stored in the PC. When uploaded, the file contents summery is indicated under Special Curve Table Contents. The I/O characteristic data longer than 128 points are ignored. [Display graph of Special Table] The I/O characteristics data can be shown in a graph. [Write table to File] The program saves the currently displayed I/O characteristics data to a file. [Write table to Device] The program downloads the currently displayed I/O characteristics to the M3LU. When the downloading is successfully complete, Status under Special Curve Table Contents shows 'Configured.' Then the option 'Special_Curve' become available to choose among the Xfer Function selections. If 'Special_Curve' has been already selected before this setting is done, you can not download a particular data file. [Read table from Device] The program uploads the I/O characteristics cable registered in the M3LU. If there is no file registered, Status under Special Curve Table Contents shows 'Non configured.' [Close Special Table] Quits the view.



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