# Model M3LU / M3LU2 Universal Transmitter **PC CONFIGURATOR SOFTWARE** Model: M3LUCFG

# **USERS MANUAL**

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# 1. GETTING STARTED

## **1.1. PC REQUIREMENTS**

The following PC performance is required for adequate operation of the M3LUCFG.

PC	IBM PC compatible
OS	Windows 7 (32-bit, 64-bit)
	Windows 10 (32-bit, 64-bit)
	The software may not operate adequately in certain conditions.
CPU/Memory	Must meet the relevant Windows' requirements.
Hard disk	10MB minimum free space
PC configurator cable	Model COP-US (USB) or MCN-CON (RS-232-C)

## 1.2. INSTALLING & DELETING THE PROGRAM

#### INSTALL

The program is provided as compressed archive. Decompress the archive and execute 'setup.msi' to start up the M3LUCFG installer program. Follow instructions on the Windows.

In the M3LUCFG installer program, all the software of the M3CFG series will be installed. If you would like to install only M3LUCFG, change to "X" for other software in the window appeared during the installation as shown below.

B M3CFG R8 Setup	
Custom Setup Select the way you want features to be installed.	
Click the icons in the tree below to change the wa	y features will be installed.
M3CFG M3LUCFG M3LPACFG M3LPACFG M3LPACFG	PC Configurator software for M3L series
X • M3LVCFG X • M3LTCFG M3LCCFG X • M3LDYCFG X • M3LMCFG	This feature requires 1KB on your hard drive. It has 1 of 8 subfeatures selected. The subfeatures require 1169KB on your hard drive.
	Browse
Reset Disk Usage	Back Next Cancel

#### DELETE

Open Control Panel > Add/Remove Programs. Select the "M3CFG Rx" from the program list and click Delete button.

## 1.3. STARTING UP THE M3LUCFG

Connect the model M3LU Universal Transmitter to the PC via the PC configurator cable. Press Start on the task bar and choose M3CFG > M3LUCFG from the Program menu.

## 1.4. OPTION /A & 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 M3LUCFG program, you can confirm the current setting but these buttons and fields used for configuring the module are greyed out and thus unavailable.

The M3LUCFG features available for the Option /B version are: Monitoring, One Step Calibration, DAC Trimming and Fixed Output.

## 1.5. APPLICABLE MODELS OF THE M3LUCFG

The M3LU and M3LU2 are configurable with the M3LUCFG. In this document it is mentioned about the M3LU setting procedure, the same explanation can be also used for the M3LU2.

## 2. MONITOR

## 2.1. STARTING UP

Figure 1 shows the initial window of the M3LUCFG 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 PC configurator cable.

#### Figure 1. Initial Window

M3LUCFG	PC Configura	ator Ver1.1.3										_ <b>_</b> X				
	M3LU		Device Mode	сом	тме	DIP	Z/S	IRG	ORG		CFG					
· ·	Configui Monit		Device Status		во	ADC	SCM	AFX	AOS	TRM	PV					
Se	ensor Infor	mation	PV	-	°V %		Tei	rm.		AO		Functions				
Senso	r type	Millivolt	1000	1	.00		100	) 		20-		Connect				
Sensor	r wires	2 Wires	_		_		80	_		- -		Upload				
PV u	unit	mV	- 800-	8	- 30 —			-		-		Detailed Info				
	Upper	1000.000			_			_		16	16 	Analog Output				
PV range	Lower	0.000	_ 600—	4			40	-				One Step Cal				
PV upp	er limit	1100.000	-	Ì	-		40	-				Trim DAC				
PV low	er limit	-100.000	-		_			_		- 12		Sensor Cal				
PV minim	um span	10.00	400— _	4	40 — _		0			-  -		Sinc Filter				
1		J					U	-		- 8		Diagnostics				
			200—		20 —		_		-		_		-			Custom TC
					_		-4(	_ _ }_		- - -		Custom RTD				
		0 —						8			Special Curve					
		0.00		).00		-40	1.00 _		0.00	)	File					
			mV		%		de			mA		Language				
			PV Graph	PV	% Graph		Term	Graph		AO Gra	ph	Exit				

## 2.2. CONNECTING THE DEVICE

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

M3LUCFG PC Configurator Ver1.1.3										_ <b>_</b> X
M3LU Configurator	Device Mode	сом	тме	DIP	Z/S	IRG	ORG		CFG	
Monitor	Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
Device Connection	PV	F	°V %		Ter	rm.		AO		Functions
COM port	1000	1	.00		100	, 		20		Connect
USB Serial Port (COM2)	_		_		80	_		-		Upload
	- 800-	8	30 —			_		_		Detailed Info
Connect Device	-		_			_		- - 16		Analog Output
	_ 600_	4			40	_	_			One Step Cal
	- 000	, c	- 0		40	_		-		Trim DAC
Disconnect Device	_		_			_				Sensor Cal
	400—	4	40 —		0	_		_		Sinc Filter
					0	_		8 8   4		Diagnostics
	200—	2	20 —			-		-		Custom TC
	_				-40			-		Custom RTD
	0 —		0					4 -		Special Curve
	0.00	_[	).00		- 40	.00 _		0.00		File
	mV		%			gC		mA		Language
Close Device Connection	PV Graph	PV 9	% Graph		Term (	Graph		AO Gra	oh	Exit

#### Figure 2. Device Connection

COM port	Choose an adequately configured COM port to be connected.
Connect Device	Connects the device. Once the connection is established, the program uploads the device's configuration information and automatically opens Sensor Information window. The window is the base for various operations to configure the M3LU.
Disconnect Device	Disconnects the currently connected device.
Close Device Connection	Close the Device Connection window.

## 2.3. 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.

Use [Upload] button to re-load device information e.g. when you replace the module with a new one or when you make changes to M3LU's configuration without using this tool.

M3LUCFO	G PC Configur	ator Ver1.1.2										
	M3LU Configur		Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
	Configu Monit		Device Status		во	ADC	SCM	AFX	AOS	TRM	PV	
S	ensor Infor	mation	PV	l i	PV %		Te	r <b>m.</b>		AO		Functions
Senso	or type	Туре К	100	:	100		100			20 –		Connect
Senso	or wires	2 Wires	_		-		80	_				Upload
PV	unit	degC	80-	8	- 80 —			_		- 16 –		Detailed Info
	Upper	100.000	_		_			_		- _	1	Analog Output
PV range	Lower	0.000	_ 60 _	6	- 60		40	_		- 12 –		One Step Cal
PV up;	, per limit	1370.000	-		-		40	-		-		Trim DAC
PV low	ver limit	-270.000	-					_		-		Sensor Cal
PV minin	num span	20.00	40 — _	4	40 — -		0	-		8 -	1	Sinc Filter
p		J	_				0	_				Diagnostics
			20—		20 —			_		4 –		Custom TC
			_		_		-40			-		Custom RTD
			0 _		0					- 0 —		Special Curve
			31.31	3	1.31		31.	10		6.26		File
			degC		%		de			mA		Language
			PV Graph	PV	% Graph		Term	Graph		AO Gra	ph	Exit

#### Figure 3. Sensor Information

## 2.3.1. DEVICE MODE

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



[COM] lamp	Blinks with the normal communications condition.
[TME] lamp	Red light turns on when the device detects the communications time out.
[DIP]/[PC] lamp	Shows the device's configuration mode: DIP switch or PC. For the M3LU version /B,
	only DIP switch mode is available.
[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.

## 2.3.2. DEVICE STATUS

Device Status summarizes the current device status by lamps.

Device Status	BO ADC	SCM AFX	AOS TRM	PV	
---------------	--------	---------	---------	----	--

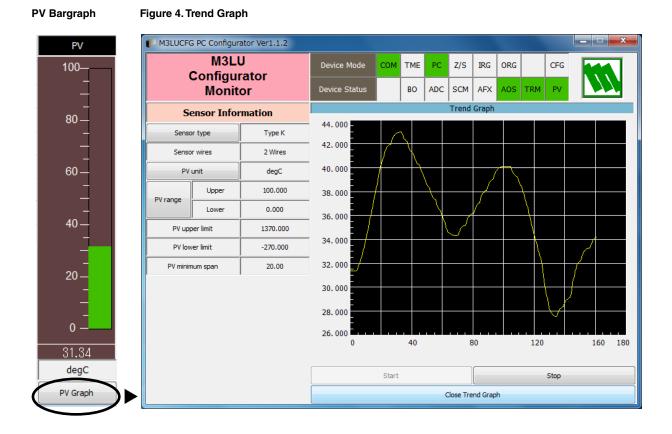
[BO] lamp	Red light turns on with 'Burnout' detected (temperature sensor's wire breakdown or ADC overrange).
[ADC] lamp	Red light turns on with ADC's hardware errors.
[SCM] lamp	Red light turns on with the device's internal communication errors.
[AFX] lamp	Red light turns on when the analog output entered in Fixed AO 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.

#### 2.3.3. BARGRAPH & TREND GRAPH

Four bargraphs indicating PV in engineering unit, PV in % of the selected range, the terminal temperature and analog output in engineering unit are displayed [See Figure 3].

The graph scales for the PV in % and the terminal temperature can be modified while the PV and the analog output in engineering unit of which the scales are automatically determined and fixed according to the selected range. Please note that the terminal temperature may not be correctly displayed if CJM is not connected.

Click [Graph] button at the bottom of each bargraph to open a trend graph for the item as shown in Figure 4. Use [Start] and [Stop] buttons to start/stop recording data, and click [Close Trend Graph] to close the trend graph window.



# 3. CONFIGURATION

## 3.1. INPUT CONFIGURATION

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

Sensor type	The input sensor type c	an be selected from the follo	owing 38 types.						
	DC	Thermocouple	RTD						
	0 to 20 mA	Туре В	Pt100						
	-10 to 10 V	Type E	Pt200						
	Millivolt	Type J	Pt300						
	Potentiometer	Туре К	Pt400						
	POT 4000 ohms	Type N	Pt500						
	POT 2500 ohms	Type R	Pt1000						
	POT 1200 ohms	Type S	Pt50(JIS81)						
	POT 600 ohms	Туре Т	JPt100(JIS89)						
	POT 300 ohms	Туре С	Ni100						
	POT 150 ohms	Type U	Ni120						
	Resistance	Type L	Cu10@25						
	OHM Resistance	Type P	Ni508.4						
		Type PR	NiFe604						
		Custom TC	Custom RTD						
	Click [Sensor type] button to choose the input sensor type and the number of sensor wires								
	Once the sensor setting is done, default values are set in the input range.								
Sensor wires		nsor wires when the sensor	type is Resistance or Thermo-						
	couple.								
	2 Wires								
	3 Wires								
	4 Wires								
PV unit			type. The selected unit type is						
	applied to PV range, upper limit, lower limit, and minimum span values. The unit								
		nly when the sensor type is	Thermocouple or RTD.						
PV range (Upper / Lower)	Specifies input range for								
			e setting. The input range can be						
	also changed on One S								
PV upper limit	Shows the usable range	e information for the selected	d type of sensor.						
PV lower limit									
PV minimum span									

## 3.2. DETAILED INFORMATION

In Figure 3, click [Detailed Info] in Functions menu to the right opens the [Detailed Information] menu as shown in Figure 5.

## Figure 5. Detailed Information

M3LUCFG PC Configur	ator Ver1.1.2										
M3L		Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
Configu Monit		Device Status		во	ADC	SCM	AFX	AOS	TRM	PV	
Detailed Info	ormation	PV	F	°V %		Te	rm.		AO		Functions
PV damping	PV damping 1.000		1	.00		100	, - -		20 –		Connect
Burnout mode	Burnout mode Upscale			_		80	_			$\left  \right $	Upload
CJC switch	CJC switch CJC ON		8	30 —		-			- 16 –		Detailed Info
Transfer function	Transfer function LINEAR		- - 60-				_		-		Analog Output
Term unit	Term unit degC					40			_ 12_		One Step Cal
Tag No.	TAGNO 123	60 — -	_			- -			-		Trim DAC
Serial number	OJ017353	_		_			_		-		Sensor Cal
Device type	M3LU-A	40— —	40 — _			0			8 -		Sinc Filter
Hardware revision	M3LU_HV01.00					U					Diagnostics
Software revision	M3LU_FV01.05	20—	2	20 —			_		4 –		Custom TC
		_		-		-40			-		Custom RTD
				0					- 0 –		Special Curve
		o 31.35	3	1.35		31.	.10 _		6.27		File
				%		degC					Language
Close Detailed I	Close Detailed Information			% Graph		Term	Graph		AO Gra	ph	Exit

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 mode	Specifies the burnout mode from among three choices.
	Upscale
	Downscale
	None
	Click [burnout mode] button to specify either the output should go upscale
	or downscale in case that a wire breakdown is detected.
CJC switch	Specifies the ON/OFF status of the CJC switch.
	CJC OFF
	CJC ON
	Click [CJC switch] button enables (ON) or disables (OFF) the cold junction
	compensation. When the sensor type is Thermocouple, the CJC switch is automatically enabled.
Transfer function	Enable/disable the Transfer function. Choose from among following 3
	types.
	LINEAR
	SQRT
	SPECIAL_CURVE
	Click [Transfer function] button to specify either the output should be linear
	to the input signal or linearized to a custom curve data.

Term unit	The engineering unit for the terminal temperature can be selected from among the following choices. degC degF degR Kelvin Click [Term unit] button to choose the unit type.
Tag No.	You can enter a tag name using up to 16 alphanumerical characters.
Serial number	Automatically displayed.
Device type	
Hardware revision	
Software revision	
Close Detailed Information	Close the window.

## 3.3. ANALOG OUTPUT

In Figure 3, click [Analog Output] in Functions menu to the right opens the [Analog Output] menu as shown in Figure 6.

M3LUCFG PC Configurator Ver1.1.2												_ <b>_</b> X
	M3L Configu		Device Mode	СОМ	тме	PC	Z/S	IRG	ORG		CFG	
	Monit		Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
	Analog Ou	ıtput	PV	PV %			Ter	rm.		AO		Functions
A	D type	0 to 20 mA	100	100			100			20 —		Connect
	4321		_		_		80	_				Upload
SW1	SW1 position ON OFF		80 —	8	- 30 —			-		- 16 –		Detailed Info
AC	AO mode Normal AO		_	_						-		Analog Output
A	AO unit mA		_ 60 _	_ 60			40			- 12—		One Step Cal
	Upper	20.000	-		-		40	_	-			Trim DAC
Range	Lower	0.000	_					_				Sensor Cal
	j per limit	20.000	40 —	40 — _						8		Sinc Filter
	ver limit	0.000	_				0 — _					Diagnostics
			20 —	20					4 –			Custom TC
	Minimum span 1.000		_		1		-40			-		Custom RTD
`	Set AO for current PV output		0 —		0		-40			- 0 —		Special Curve
	Set AO for specified value Exit Fixed AO mode		31.36	<u> </u>	1.36		31.10			6.27		File
	Exit Fixed AO	mode	degC		%		de			mA		Language
C	Close Analog Output		PV Graph	PV	% Graph		Term (	Graph		AO Gra	ph	Exit

## 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.

AO type	Specifies the Analog Output type from among three choices. 0 to 20 mA -2500 to +2500 mV -10 to +10 V Click [AO type] button to specify output type.
SW1 position	Shows DIP SW configuration (hardware setting) required for the selected output type. Confirm actual setting.
AO mode	Shows the output mode. 'Normal AO' is usually displayed.
AO unit	Shows engineering unit for the output signal.
Range (Upper / Lower)	Specifies the output range for 0% and 100%.
Upper limit	Show the usable range information for the selected output type.
Lower limit	
Minimum span	
Set AO for current PV output	The output signal is held at the current value.
Set AO for specified value	You can set a specific value to fix the output in order to perform an output loop simulation test.
Exit Fixed AO mode	Cancels the fixed output mode to return the device into normal output mode.
Close Analog Output	Close the window.

## 3.4. ADC CONVERSION RATE

Click [Sinc Filter] button to open the Sinc Filter window as shown in Figure 7.

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.

M3LUCFG PC Cor	nfigurator Ver1	.1.2										_ <b>_</b> X
	3LU gurator		Device Mode	СОМ	тме	PC	Z/S	IRG	ORG		CFG	
	nitor		Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
Sind	c Filter		PV	PV %			Tei	m.		AO		Functions
Sinc filter	Sinc filter 50 Hz		100	100			100			20 -		Connect
Write	Write sinc filter		_		_		80	_				Upload
			- 80 -	8	30 —			_		- 16 –		Detailed Info
			_	_								Analog Output
			_ 60 _	_ 60			 40			- 12-		One Step Cal
			- 00		- 0	40				- 12		Trim DAC
					_			_			1	Sensor Cal
			40 —	40						8	8 —	Sinc Filter
			-				0	_				Diagnostics
			20 —	2	20 —			_		4 -		Custom TC
			_		_		-40					Custom RTD
			0 —		0_		i.				Special Curve	
			31.34	<u> </u>	1.34		<u></u> হা	31.10 6.27			File	
			degC		%		de		mA			Language
Close 9	Close Sinc Filter		PV Graph	PV 9	% Graph		Term	Graph		AO Gra	ph	Exit

#### Figure 7. Sinc Filter

[Write sinc filter]Opens the frequency selection buttons. Choose one and click OK.[Close Sinc Filter]Close the window.

# 4. ONE STEP CALIBRATION

In Figure 3, click [One Step Cal] on the right control panel opens the One Step Calibration menu as shown in Figure 8. The 'One Step Calibration' technique realizes automatic input and output ranging with a signal simulator connected to the module's input terminals.

## Figure 8. One Step Calibration

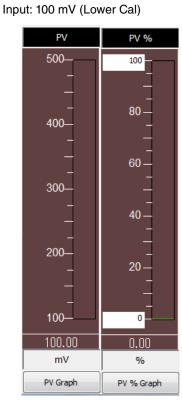
M3LUCFG PC Configurator Ver1.1.2										<b>x</b>
M3LU Confirmenter	Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
Configurator Monitor	Device Status		во	ADC	SCM	AFX	AOS	TRM	PV	
One Step Calibration	PV	PV %			Ter	m.		AO		Functions
Input	100	:	.00		100	) 		20 –		Connect
Enter PV calibration mode			_		- - 80					Upload
Lower Cal Upper Cal	- 80	8	30 —			-		- 16 –		Detailed Info
Exit PV calibration mode		_			-			-		Analog Output
Output	60	4	_ 60 _			-		- 12-		One Step Cal
Enter AO calibration mode	- 00		- 0,	- 40·				- 12		Trim DAC
			_					-		Sensor Cal
Lower Cal Upper Cal	40 —	4	40 —						8 —	Sinc Filter
Exit AO calibration mode		-			0 _			-		Diagnostics
	20 —	_ 20 _			Ē		- 4			Custom TC
	_				-40 -					Custom RTD
	o		0					0		Special Curve
	31.36	3	1.37		31.	1.10		6.27		File
	degC		%		degC					Language
Close One Step Calibration	PV Graph	PV	% Graph		Term (	Graph		AO Gra	ph	Exit

## 4.1. INPUT CALIBRATION MODE

- (1) Connect the M3LU to a simulator as described in the M3LU instruction manual.
- (2) 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.



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



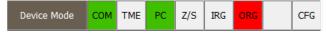
PV % PV 500-100 80 400-60 300 40 200 20 100.37 0 500.00 100.00 mV % PV % Graph PV Graph

Input: 500 mV (Upper Cal)

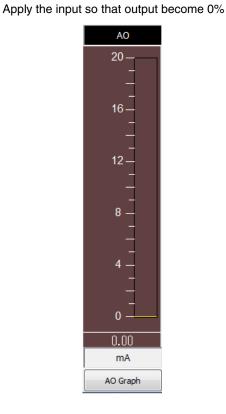
(4) Click [Exit PV calibration mode] when the calibration is complete.

## 4.2. OUTPUT CALIBRATION MODE

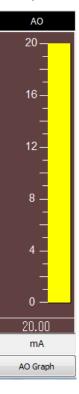
(1) Click [Enter AO calibration mode] in order to turn the module into the output calibration mode. The red [ORG] lamp in [Device Mode] panel at the top turns ON while the module is in this mode.



(2) 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.



Apply the input so that output become 100%



(3) Click [Exit AO calibration mode] when the calibration is complete.

Click [Close One Step Calibration] to close the window.

# 5. INPUT / OUTPUT CALIBRATION

## 5.1. DAC TRIMMING

Click [Trim DAC] button to open the Trim DAC window as shown in Figure 9.

Figure	9. Trim	DAC (e	.a.	Upper	Range	Trim	Mode)
riguic	J. 11111	DHO (C	·.y.	opper	nange		wouc)

💕 M3LUCFG P	C Configura	tor Ver1.1.2										×		
C	M3LU onfigur		Device Mode	СОМ	тме	PC	Z/S	IRG	ORG		CFG			
	Monito		Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV			
	Trim DA	C	PV	PV %			Ter	m.		AO		Functions		
Enter	Enter Lower Range Trim mode		100	100			100			20 –		Connect		
Enter	Enter Upper Range Trim mode				_		80	_				Upload		
Trim b	Trim by actual measured value		_ 80_	{	- 30 —			_		- 16 –		Detailed Info		
Up+	Up+ Up++ Up+++		_	_			_			-		Analog Output		
Down+	Down++	Down+++	_ 60 _	4	_ 60			 40				One Step Cal		
	lear Trim DAC	data	- 00	-			-			12 – -		Trim DAC		
Zero offs	set	0.000000	_	 40					- 8 -		1	Sensor Cal		
Span ga	in	1.000000	40 — _									Sinc Filter		
	1		_		-		0 —					Diagnostics		
			20 —	2	20 —			_		4 -		Custom TC		
			1		1		-40			-		Custom RTD		
			0 —		0_		-40			- 0 —		Special Curve		
			31.43	3	1.43		31.10			6.29		File		
			degC		%		degC							Language
Cl	Close Trim DAC		PV Graph	PV 9	% Graph		Term (	Graph		AO Gra	ph	Exit		

#### 5.1.1. 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]. Lower range value is adjustable within ±15%.

#### 5.1.2. UPPER RANGE DAC TRIMMING

- (1) Click [Enter Upper Range Trim Mode]. The device outputs a fixed upper 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 [Span gain]. Upper range value is adjustable within ±15%.

#### 5.1.3. RESETTING TO THE DEFAULT

Click [Clear Trim DAC data] to return the device to the factory default trimming values. Default values for Zero offset and Span gain are 0.0 and 1.0, respectively.

Click [Close Trim DAC] to close the window.

## 5.2. SENSOR CALIBRATION

The input sensor can be calibrated with Zero and Span: 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 window as shown in Figure 10.

M3LUCFO	PC Configurator Ver1	.1.2										
	M3LU		Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
(	Configurator Monitor		Device Status		во	ADC	SCM	AFX	AOS	TRM	PV	
S	ensor Calibration		PV	PV %			Те	rm.		AO		Functions
	Read calibration data		100	1	100			)		20 –		Connect
Cle	Clear sensor calibration data		-				80	_				Upload
	Zero calibration		_ 80	{						- 16 –		Detailed Info
	Span calibration		_	-			-					Analog Output
PV	32.007580	degC	_ 60 _	_ 60			 40			- 12—		One Step Cal
Zero point	0.0091	mV	-		-		-					Trim DAC
Zero value	0.0369	mV	_		_			_		-		Sensor Cal
Gain	1.0649	<u> </u>	40 —	40 _ 40			0	_		8	8 — -	Sinc Filter
,		,					U	-				Diagnostics
			20 —	2	20 —			_		4 –		Custom TC
					_		-4(					Custom RTD
			0 _		0					- 0 —		Special Curve
			32.01	3	2.01		31.	10		6.40	]	File
			degC		%		degC					Language
Clos	e Sensor Calibrati	PV Graph	PV 9	% Graph		Term	Graph		AO Gra	ph	Exit	

#### Figure 10. 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 zero calibration point input signal and click [Zero calibration] to open the field where you can enter a target value. The result is shown in the PV display field. Data before calibration is shown in the Zero point field, while that after calibration is shown in the Zero value field.

Apply span calibration point input signal and click [Span calibration] to open the field where you can enter a target value. The result is shown in the PV display field. Span point gain against the zero 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 = 0 mV/0 mA, Gain = 1.0
RTD input	Zero point = Zero value = Resistance ( $\Omega$ ) at 0°C, Gain = 1.0
Resistance input	Zero point = Zero value = 0 $\Omega$ , 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.

Click [Close Sensor Calibration] to close the window.

## 6. OFFLINE CONFIGURATION AND READ / WRITE FILES

## 6.1. 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 procedure to use user-specific TC is as follows.

- 1. Create a user-specific table as following steps.
- 2. Click [Custom TC] button to open the Custom TC.
- 3. Click [Read table from file] button to read a characteristics data from a file stored in the PC. When uploaded, the file contents summery is indicated under Custom TC Table Contents. Characteristic data longer than 1000 points are ignored.
- 4. Click [Display custom TC graph] button to show characteristics data in a graph.
- 5. Click [Write table to device] button to download currently displayed characteristics data to the M3LU.
- 6. When downloading is successfully complete, Status under Custom TC Table Contents shows 'Configured.' Then the option 'TC Spec (Custom TC)' becomes available to choose. If 'TC Spec' has been already selected before this setting is done, you can not download a particular data file.
- 7. Click [Read table from device] button to upload characteristics table registered in the M3LU. If there is no file registered, Status under Custom TC Table Contents shows 'Non configured.'
- 8. Click [Close Custom TC] button to close the window.

#### 6.1.1. USER-SPECIFIC TC TABLE

User-specific TC data is defined in the format of texts. The file format is as following.

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

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

Describe 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 <= X(i) <= 1000 mV
/*
/*
    X(i) < X(i+1)
    2<= Size <= 1000
/*
Minimum TC Temperature = 0
                         <-- Minimum temperature T0 (°C)
                         <-- Temperature step (°C)
Step = 10
{
10.0000
                         <-- Voltage value for T0 (mV)
·
20.0000
                         <-- Voltage for Tmax (mV)
}
```

## 6.1.2. CUSTOM TC WINDOW

Click [Custom TC] button to open the Custom TC as shown in Figure 11.

#### Figure 11. Custom TC

M3LUCFG PC Configurator V	/er1.1.2										_ <b>_</b> X
M3LU		Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
Configurato Monitor	or	Device Status		во	ADC	SCM	AFX	AOS	TRM	PV	
Custom TC		PV		PV %		Ter	rm.		AO		Functions
Read table from devic	Read table from device		:	.00		100	, - -		20 –		Connect
Write table to device		_		_		80	_				Upload
Write table to file		_ 80_	{	- 30 —		_	-		- 16 –		Detailed Info
Read table from file		_	- - 60-			- - - 40-			-	1	Analog Output
Display custom TC grap	h	_ 60							_ 12_		One Step Cal
Custom TC Table Co	ntents	-	-			40	-		-		Trim DAC
Status		_				_		-			Sensor Cal
Min temperature	degC	40 — _				<u> </u>			8		8 — —
Max temperature	degC	_				0 — 					Diagnostics
Temperature step	degC	20—		20 —			_		4 –		Custom TC
Table size	Max size			_		-40			-		Custom RTD
	Table size 1000			0					- 0 –		Special Curve
			3	1.96		<u> </u>		31.10 6.39			File
				%		degC					Language
Close Custom T	Close Custom TC			% Graph		Term (	Graph	j	AO Gra	ph	Exit

Read table from device		characteristics table registered in the M3LU. If there is no under Custom TC Table Contents shows 'Non configured.'
Write table to device	The program download	ds currently displayed characteristics to the M3LU.
		successfully complete, Status under Custom TC Table
	Contents shows 'Confi	gured.'
Write table to file	The program saves cu	rrently displayed characteristics data to a file. After reading
	the data from M3LU to	the table in the PC with [Read table from device], save the
	data.	
Read table from file	The program uploads	a file stored in the PC. When uploaded, the file contents
	summery is indicated u	under Custom TC Table Contents.
Display custom TC graph	Characteristics data ca	an be shown in a graph. (figure 12)
Custom TC Table Contents	Show the summary of	Custom TC Table
	Status	Show the status of Custom TC Table.
	Min temperature	Minimum temperature in degC
	Max temperature	Maximum temperature in degC
	Temperature step	Temperature step in degC
	Table size	Defined number of point
Close Custom TC	Close the window.	

## Figure 12. Custom TC graph

M3LUCFG PC Configu	rator Ver1	.1.3												<b>x</b>
M3L Configu	-		Device	e Mode	сом	тме	PC	z/s	IRG	ORG		CFG		
Configu Monit			Device	Status		во	ADC	SCM	AFX	AOS	TRM	PV		
Custom	TC				-		Cust	tom TC	EMF T	able			-	
Read table fro	m device		6.10	450.000	0									
Write table to	device		(mV)	400.000										
Write table	Write table to file Read table from file													
Read table fi	Read table from file Display custom TC graph										$\wedge$			
Display custom				250.000						/				
Custom TC Tab	Custom TC Table Contents			200.000										
Status	Confi	gured	EMF	150.000				4						
Min temperature	-273	degC		100.000										
Max temperature	797	degC				$\square$								
Temperature step	5	degC		50.000										
Table size	May size			0.000	-273			127			527			1000
								Tempe	rature(	degC)				
Close Cust	Close Custom TC							Close	Graph					

## 6.2. 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 procedure to use user-specific RTD is as follows.

- 1. Create a user-specific table as following steps.
- 2. Click [Custom RTD] button to open the Custom RTD.
- 3. Click [Read table from file] button to read a characteristics data from a file stored in the PC. When uploaded, the file contents summery is indicated under Custom RTD Table Contents. Characteristic data longer than 500 points are ignored.
- 4. Click [Display custom RTD graph] button to show characteristics data in a graph.
- 5. Click [Write table to device] button to download currently displayed characteristics data to the M3LU.
- 6. When downloading is successfully complete, Status under Custom RTD Table Contents shows 'Configured.' Then the option 'RTD Spec (Custom RTD)' becomes available to choose. If 'RTD Spec' has been already selected before this setting is done, you can not download a particular data file.
- 7. Click [Read table from device] button to upload characteristics table registered in the M3LU. If there is no file registered, Status under Custom RTD Table Contents shows 'Non configured.'
- 8. Click [Close Custom RTD] button to close the window.

#### 6.2.1. USER-SPECIFIC RTD TABLE

User-specific RTD data is defined in the format of texts. The file format is as following.

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

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

Describe 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)
/*
    0<=Xi<4000 Ohm
    Xi<Xi+1
/*
    2<=Size<=500
/*
Minimum RTD Temperature=0
                         <- Minimum temperature T0 (°C)
Step=10
                         <- Temperature step (°C)
{
                         <- Resistance value for T0 (Ohm)
100.000000
200.000000
                         <- Resistance for Tmax (Ohm)
}
```

## 6.2.2. CUSTOM RTD WINDOW

Click [Custom RTD] button to open the Custom RTD as shown in Figure 13.

M3LUCFG PC Configurator Ver	1.1.2										_ <b>_ x</b>
M3LU Configurator		Device Mode	СОМ	тме	PC	Z/S	IRG	ORG		CFG	
Monitor		Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
Custom RTD		PV	F	PV %		Ter	rm.		AO		Functions
Read table from device		100	1	.00		100			20 –		Connect
Write table to device		_		_		80	_				Upload
Write table to file			{				_		- 16 –		Detailed Info
Read table from file				_			_		-		Analog Output
Display custom RTD graph	splay custom RTD graph		_ 60			40			- 12 –		One Step Cal
Custom RTD Table Con	Display custom RTD graph		-			40	-		- 12		Trim DAC
Status				_			_				Sensor Cal
Min temperature	degC	40-	4	40 —			-		8 –		Sinc Filter
Max temperature	degC	-		-		0	-				Diagnostics
Temperature step	degC	20 -		20 —			_		4		Custom TC
	Max size			_		-40			-		Custom RTD
	500	0 —		0					- 0 —		Special Curve
		31.99		1.99		31.	10 -		6.40		File
		degC		%		de			0.40 mA		Language
Close Custom RTD		PV Graph	PV	% Graph		Term (	Graph		AO Gra	ph	Exit

### Figure 13. Custom RTD

Read table from device		characteristics table registered in the M3LU. If there is no
	file registered, Status u	under Custom RTD Table Contents shows 'Non configured.'
Write table to device	The program download	ds currently displayed characteristics to the M3LU.
	When downloading is	successfully complete, Status under Custom RTD Table
	Contents shows 'Confi	gured.'
Write table to file	The program saves cu	rrently displayed characteristics data to a file. After reading
	the data from M3LU to	the table in the PC with [Read table from device], save the
	data.	
Read table from file	The program uploads	a file stored in the PC. When uploaded, the file contents
	summery is indicated	under Custom RTD Table Contents.
Display custom RTD graph	Characteristics data ca	an be shown in a graph. (figure 14)
Custom RTD Table Contents	Show the summary of	Custom RTD Table
	Status	Show the status of Custom RTD Table.
	Min temperature	Minimum temperature in degC
	Max temperature	Maximum temperature in degC
	Temperature step	Temperature step in degC
	Table size	Defined number of point
Close Custom RTD	Close the window.	

## Figure 14. Custom RTD graph

M3LUCFG PC Configu	rator Ver1.	1.2												<b>x</b>
M3L Configu	-		Device	Mode	сом	тме	PC	Z/S	IRG	ORG		CFG		
Configu Monit			Device	Status		во	ADC	SCM	AFX	AOS	TRM	PV		
Custom	RTD					(	Custom	RTD R	esisten	ice tabl	е			
Read table fro	m device		(0))	450.000										
Write table to	device		(Ohms)	400.000										
Write table	to file			350.000										
Read table fi	Read table from file Display custom RTD graph			300.000							$\nearrow$			
Display custom F				250.000						$\nearrow$				
Custom RTD Tal	Custom RTD Table Contents			200.000					$\checkmark$					
Status	Config	ured	RTD	150.000	, <b>E</b>			$\square$						
Min temperature	-125	degC		100.000			$\square$							
Max temperature	517	degC		50.000										
Temperature step	3	degC		0.000										
Table size	Table size   215			0.000	-125		7	5		27	5		475	600
								Tempe	rature(	degC)				
Close Cust	om RTD							Close	Graph					

## 6.3. LINEARIZATION TABLE

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. Specify "SPECIAL\_CURVE" of [Transfer function] in the Detailed Information window, and then the user-specific transfer function can be used. The procedure to use user-specific transfer function is as follows.

- 1. Create a user-specific linearization table as follows.
- 2. Click [Transfer function] button on the Detailed Information menu and select "LINEAR." (A new transfer function cannot be written when "SPECIAL CURVE" is selected.)
- 3. Click [Special Curve] button to open the Special Curve window.
- 4. Click [Read table from file] button to read a created linearization table. Basic information is shown in the Special Curve Table Contents.
- 5. Click [Display Special Curve graph] button to show characteristics data in a graph.
- 6. Click [Write table to device] button to download currently displayed characteristics data to the M3LU.
- Confirm that status under Special Curve Table Contents shows 'Configured. This means a SPECIAL\_CURVE is registered in the device. If the status under Special Curve Table Contents does not show 'Configured, [Transfer function] can not be set to SPECIAL\_CURVE.
- 8. Click [Transfer function] button on the Detailed Information menu and select "SPECIAL\_CURVE" to enable the new transfer function.

#### 6.3.1. LINEARIZATION TABLE SETTING

For the user-specific linearization table, 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, 0.000000
                         <-- The minimum X and Y values
100.000000, 100.000000
                        <-- The maximum X and Y values
}
```

## 6.3.2. SPECIAL CURVE

Click [Special Curve] button to open the Special Curve as shown in Figure 15.

M3LUCFG PC Configurate	or Ver1.1.2										_ <b>_</b> ×
M3LU Configura	tor	Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG	
Monitor		Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
Special Cur	ve	PV	F	PV %		Ter	m.		AO		Functions
Read table from de	vice	100	1	.00		100	, -		20 –		Connect
Write table to dev	vice	_		_		80	_				Upload
Write table to fil	Write table to file Read table from file isplay Special Curve graph		{	- 30 —		=			- 16 –		Detailed Info
Read table from t	file			_			_		-		Analog Output
Display Special Curve	Display Special Curve graph		6	- 60		 40			- 12 –		One Step Cal
Special Curve Table	e Contents	60 — -		-					-		Trim DAC
Status		_		_			_		-		Sensor Cal
Minimum value	%	40 — -	4	40 — —	0 _				8 –		Sinc Filter
Maximum value	%					U	-				Diagnostics
Table size	Max size	20—	2	20 —			_		4 –		Custom TC
	128			-		-40			-		Custom RTD
		0 —		0		_			- 0 –		Special Curve
		31.96	3	1.96		31.	10 _		6.39		File
		degC		%		de			mA		Language
Close Special (	Curve	PV Graph	PV 9	% Graph		Term (	Graph		AO Gra	ph	Exit

## Figure 15. Special Curve

Read table from device		characteristics table registered in the M3LU. If there is no under Special Curve Table Contents shows 'Non config-
Write table to device	-	ds currently displayed characteristics to the M3LU. successfully complete, Status under Special Curve Table gured.'
Write table to file	The program saves cu	rrently displayed characteristics data to a file.
Read table from file		a file stored in the PC. When uploaded, the file contents under Special Curve Table Contents.
Display Special Curve graph	Characteristics data ca	an be shown in a graph. (figure 16)
Special Curve Table Contents	Show the summary of	Special Curve Table
	Status	Show the status of Special Curve Table.
	Minimum value	Minimum input (x) in %
	Maximum value	Maximum input (x) in %
	Table size	Defined number of point
Close Special Curve	Close the window.	

Figure 16. Special Curve graph

M3LUCFG PC Configu	rator Ver1.	1.2												
M3L Configu			Device	Mode	сом	тме	PC	Z/S	IRG	ORG		CFG		
Configu Monit			Device	Status		во	ADC	SCM	AFX	AOS	TRM	PV		
Special C	Curve						Specia	l Curve	Table	Y=f(x)		_	-	
Read table from	m device		(0/)	110.000	)									
Write table to	device		(%)	90.000							_	4		
Write table	to file													
Read table fr	rom file			70.000					/					
Display Special C	Display Special Curve graph													
Special Curve Ta	Special Curve Table Contents			50.000	) E									
Status	Config	ured	Y=f(x)	30.000			/							
Minimum value	0.00	%												
Maximum value	99.00	%		10.000		,								
Table size	100	Max size 128		- 10, 000	Ĕ									
				- 10, 000	0			40	)			80		110
							;	X(%)						
Close Specia	al Curve							Close	Graph					

## 6.4. FILE MANAGEMENT

The M3LU's configurations can be saved in a file and then read out to be downloaded to multiple modules.

Click [File] button to open the File Management window as shown in Figure 17.

While this window is active, the device connection is severed, therefore the device can be connected and disconnected freely except during Upload or Download operations.

The window is divided in two sections: 'File Configuration' and 'Device Configuration.' 'File Configuration' shows data transfer (Read or Write) between the PC Configurator and the PC, while 'Device Configuration' shows data transfer (Upload or Download) between the configurator and the device.

Click [Exit] to complete the file management operations. The device will remain disconnected and must be 'Connected' to start monitoring.

#### NOTE

- (1) The selected range values are not verified in this view. Please make sure to set them according to the M3LU specifications.
- (2) Custom TC table data, Custom RTD table data and Special Curve Table data are not handled in this window.
- (3) With the Option /B version, [Download] button is invalid. However, it is possible to upload data and save it in a configuration file, or to compare it with other configurations.
- (4) A comment can be entered in 'Description' in the File Configuration section, which is not written in the Device Configuration section. When a setting is uploaded from device, the relevant field in the Device Configuration section shows the device's serial number.

#### Figure 17. File

M3LUCFG PC	Configurator Ver1	.1.2								X
Exit	Page		Read File		Write File			Upload	Downloa	d
EXit	1		Compare	,	All Copy <-	<	>	> All Copy	Compare	•
Prop	erties		File Confi	guration				Device Confi	iguration	
Desc	ription	CHG				<	>			CHG
Tag	No.	CHG				<	>			CHG
Senso	or type	CHG								СНБ
Senso	r wires					<	>			
PV	unit	CHG								CHG
PV uppe	er range	СНБ				<	>			СНБ
PV lowe	er range									
PV da	amping	CHG			Sec	<	>		Sec	CHG
Transfer	r function	CHG				<	>			CHG
Burnou	ut mode	CHG				<	>			CHG
CJC s	switch	CHG				<	>			CHG
Tern	n unit	CHG				<	>			CHG
								-		
AO	type	CHG				<	>			CHG
AO upp	er range	СНБ				<	>			СНБ
AO lowe	er range									

#### 6.4.1. MODIFYING PARAMETERS

Click [CHG] button at the left of each field to modify the parameter. Fields in which the parameter has been changed will be highlighted in light yellow background color. [CHG] buttons placed across multiple fields indicate that these parameters can be modified in single sequence.

When one parameter has been changed, related fields may be also affected. For example, when 'Sensor type' is modified, 'PV range' may be automatically changed.

Parameters can be copied between 'File Configuration' and 'Device Configuration' using [ < ] and [ >] buttons. Copied fields will be highlighted in light yellow background color.

Using [All Copy << ] or [All Copy >> ] buttons enables transferring all parameters between the sections. Copied fields will be highlighted in light yellow background color.

M3LUCFG PC	Configurator Ver1	.1.2							X
Exit	Page		Read File	Write File			Upload	Download	ł
Exit	1		Compare	All Copy <	<	>	>> All Copy	Compare	
Prop	erties		File Configu	ration			Device Conf	iguration	
Desc	ription	CHG	0J0173	53	<	>	OJ017	353	СНС
Tag	) No.	CHG	TAG TES	5T1	<	>	TAGNO	)123	CHG
Senso	or type	CHG	Type I	к			Pt10	0	СНG
Senso	or wires		2 Wire	<	>	3 Wir	Crito		
PV	unit	CHG	degC			deg	С	СНС	
PV upp	er range	СНБ	500.000	degC	<		100.000	degC	СНG
PV low	er range	ChG	0.000	degC		>	0.000	degC	CHG
PV da	amping	CHG	1.000	Sec	<	>	1.000	Sec	CHG
Transfe	r function	CHG	LINEA	R	<	>	LINE	AR	CHG
Burno	ut mode	CHG	Upscal	e	<	>	Upsca	ale	СНС
CJC	switch	CHG	נזכ סו	N	<	>	CJC (	ИС	СНС
Terr	n unit	СНБ	degF		<	>	deg	с	СНG
						)[		1	
AO	type	CHG	-10 to 1	<	>	0 to 20	) mA	СНС	
AO upp	er range	CHG	5.000	v		<b>\</b>	20.000	mA	СНС
AO low	er range	Chia	1.000	V	- <	í.	0.000	mA	- CHG

#### Figure 18. Parameters Modified

### 6.4.2. TRANSFERRING DATA TO/FROM DEVICE

Click [Upload] button to connect to the device, to read out its configuration data and to show it in 'Device Configuration' section on the screen (Figure 19). All background colors are back to the initial state.

'Description' indicates the serial number of the product, which cannot be modified or copied from 'File Configuration' section.

Click [Download] button to connect and write the configuration data in 'Device Configuration' fields to the device.

If an error occurs and downloading is stopped during the process, erred data field is highlighted in med pale red background color.

When the downloading is successfully complete, the configuration data is automatically uploaded and the background color returns to the initial state.

#### Figure 19. Data Uploaded, first page

M3LUCFG PC	Configurator Ver1	.1.2									
Exit	Page		Read File		Write File			Upload	Dow	nload	
Exit	1		Compare		All Copy <	<	>	>> All Copy	Compare		
Prop	perties		File Confi	iguratio	n			Device Con	nfiguration		
Desc	cription	CHG				<	>	OJ013	7353	CHG	
Tag	g No.	CHG				<	>	TAGN	0123	CHG	
	or type or wires	СНG				<	>	Тур 2 W		СНС	
PV	/ unit	СНС	IG degC					СНС			
PV upp	er range							100.000	100.000 deg0		
PV low	er range	CHG				<	>	0.000	deg	CHG	
PV d	amping	CHG			Sec	<	>	1.000	Se	c CHG	
Transfe	er function	CHG				<	>	LINE	EAR	CHG	
Burno	ut mode	CHG				<	>	Upso	cale	CHG	
CJC	switch	CHG				<	>	CJC	ON	CHG	
Ten	m unit	CHG				<	>	de	gC	CHG	
AO	type	CHG				<	>	0 to 2	0 mA	СНС	
AO upp	per range	CHG				<	>	20.000	m/	CHG	
AO low	ver range							0.000	m		

#### 6.4.3. READING/WRITING FILES

Click [Read File] button to read the configuration data from a specified file and to show it in 'File Configuration' section on the screen (Figure 20). All background colors are back to the initial state.

Click [Write File] button to write the configuration data in 'File Configuration' section to a specified file.

A comment (max. 64 alphanumeric characters) can be entered in 'Description' in File Configuration section, which is saved in a configuration file. It cannot be written in the device. When a setting is uploaded from device, the relevant field in Device Configuration shows the device's serial number.

Exit	Page		Read File	Write Fi	e		Upload	Download	ł
EXIL	1		Compare	All Copy	<<	>	>> All Copy	Compare	
Pro	operties		File Configu	uration			Device Configurat	Configuration	
De	scription	CHG	OJ0173	353	<	>	OJ017353		CH
Т	ag No.	CHG	TAG TE	ST1	<	>	TAGNO123		СН
Sen	sor type	СНБ	Туре	к			Туре К		Сно
Sen	sor wires		2 Wires <				2 Wires		
F	'V unit	CHG	deg	с			degC		СН
PV up	per range	СНБ	500.000	degC	_ <	<b>_</b> >	100.000	degC	СН
PV lo	wer range		0.000	degC		Ĺ	0.000	degC	
PV	damping	CHG	1.000	Sec	<	) >	1.000	Sec	СН
Trans	fer function	CHG	LINEA	AR	<	>	LINEAR		СН
Burn	out mode	CHG	Downs	cale	<	>	Upscale		СН
CJ	C switch	CHG	CJC C	ОМ	<	>	CJC ON		СН
Te	rm unit	CHG	deg	с	<	>	degC		СН
	2 h	СНБ	-10 to 10 V				0 to 20 mA		Сн
	O type				-				
AO u	oper range	CHG	5.000	V	- <	>	20.000	mA	СНС
AO lo	wer range		1.000	V			0.000	mA	

#### Figure 20. File Read Out

#### 6.4.4. COMPARING FILE TO DEVICE

You can compare the configuration data in 'File Configuration' fields and 'Device Configuration' fields.

Click [Compare] button in 'Device Configuration' fields to compare its data to those in 'File Configuration' fields. Deviations will be highlighted in med pale red background color.

Click [Compare] button in 'File Configuration' fields to compare its data to those in 'Device Configuration' fields. Deviations will be highlighted in med pale red background color.

💕 M3LUCFG PC	Configurator Ver1	.1.2							X	
Exit	Page		Read File	Write File	2		Upload	Downloa	d	
EXIL	1		Compare All Copy <<			>	-> All Copy	Compare		
Prop	erties		File Config	uration			Device Configuration			
Desc	ription	CHG	OJ0173	353	<	>	OJ0173	353	CHG	
Tag	No.	CHG	TAG TE	ST1	<	>	TAGNO	123	CHG	
Senso	or type		Туре			Туре	к			
Senso	r wires	CHG	2 Wir	es	<	>	2 Wire	- CHG		
PV	unit	СНС	deg			deg	с	СНС		
PV uppe	er range		500.000	degC			100.000	degC	- сна	
PV lowe	er range	CHG	0.000	degC	<	>	0.000	degC	CHG	
PV da	amping	CHG	1.000	Sec	<	>	1.000 S		CHG	
Transfer	r function	CHG	LINEAR		<	>	LINEAR		CHG	
Burnou	ut mode	CHG	Downs	cale	<	>	Upsca	ale	CHG	
CJC s	switch	CHG	CJC C	ОМ	<	>	CJC 0	ОМ	CHG	
Tern	n unit	CHG	degi	с	<	>	deg(	с	CHG	
			10 10				0 1- 20			
AO	type	CHG	-10 to 1	10 V			0 to 20	MA	CHG	
AO upp	er range	CHG	5.000	V	. <	>	20.000	mA	СНС	
AO low	er range		1.000	V			0.000	mA		

#### Figure 21. Parameters Compared

#### 6.4.5. OPERATION EXAMPLE BY FILE MANAGEMENT

Operation procedure to change the configuration of the device with file management.

(1) Click [Read File] button to read the configuration data from a specified file

	Page		Read File	Wri	te File			Upload	Downlo	ad		
Exit	1		Compare	All Copy <<			>	> All Copy	Compare			
Pr	operties		File Configuration					Device O	onfiguration			
Description		CHG	03017353			<	>			СН		
Tag No.		CHG	TAG TEST1			<	>			СНО		
Sensor type		CHG	Type K							- сно		
Sensor wires			2 Wires			<	>					
PV unit		CHG	degC							СНС		
PV up	PV upper range		PV upper range		1000.000	000 degC		<				сно
PV lo	wer range	CHG	0.000	de	gC					Chi		
PV	damping	CHG	0.000	Se	ic 🛛	<	>		Sec	СНО		
Trans	fer function	CHG	LIN	AR		<	>			СНО		
Burr	out mode	CHG	Ups	cale		<	>			СН		
C)	C switch	CHG	CIC	ON		<	>			СНС		
Т	rm unit	CHG	de	gC		<				СНО		
A	AO type CHG 0 to		0 to 2	0 mA		<	>			СНО		
AO u	oper range	CHG	20.000	m	A	<	,			_ сно		
AO lo	wer range	CHG	4.000		A		-			- une		

(2) Click [Upload] button to connect to the device, to read out its configuration data.

Exit	Page	][	Read File	Write File			Upload	Downloa	d	
Exit	1		Compare	All Copy <<			> Al Copy	Compare		
Pro	perties		File Configurati	ration Device Configuration						
Description		CHG	03017353		<	>	OJ017	353	СН	
Tag No.		CHG	TAG TESTI	<	>	TAGNO	СН			
			(							
Sens	sor type	CHG	Туре К			Туре	e K	СН		
Sensor wires			2 Wires			>	2 Wi			
P	V unit	CHG	G degC				deg	C	СН	
PV upp	PV upper range		1000.000	degC			500.000	degC	0	
PV lov	ver range	CHG	0.000	degC	<	>	0.000	degC	- CH	
PV c	damping	CHG	0.000	Sec	<	>	1.000	Sec	СН	
Transf	er function	CHG	LINEAR		<	>	LINE	AR	СН	
Burne	out mode	CHG	Upscale		<	>	Upscale		СН	
010	switch	CHG	CJC ON		<	>	CIC	ON	СН	
Ter	rm unit	CHG	degC		<	>	deg	C	СН	
AC	0 type	CHG	0 to 20 mA		<	>	0 to 20	0 mA	СН	
AO up	per range	СНБ	20.000	mA			20.000	mA		
AO los	AO lower range		4.000	mA	<	>	0.000	mA	— сна	

(3) Click [Compare] button in 'File Configuration' fields to compare the data in the file and the data in the device. Deviations will be highlighted in med pale red background color.

Exit	Page		Read File		Write File			Upload	Download		
EXIL	1		Compare		All Copy <<			> All Copy	Compare		
Pro	perties		File Confi	guration	n			Device Con	figuration		
Des	cription	CHG	0301	7353		<	>	> 0J017353		CH	
Та	g No.	CHG	TAG TEST1			<	>	TAGN0123			
Sensor type		CHG	Туре К					Тур	еK	сн	
Sensor wires			2 Wires		<	>	2 Wi				
P	/ unit	CHG	degC				deg	gC	СН		
PV upper range		СНБ	1000.000		degC			500.000	degC	- сна	
PV low	er range	CHG	0.000	degC		<	>	0.000	degC		
PV d	amping	CHG	0.000		Sec	<	$\rightarrow$	1.000 Se		Сн	
Transfe	r function	CHG	LINE	EAR		<		LINE	EAR	СН	
Burno	ut mode	CHG	Upsi	cale		<	>	Upso	ale	СН	
cic	switch	CHG	CIC	ON		<	$\rightarrow$	CIC	ON	Сн	
Ter	m unit	CHG	de	gC		<	>	deç	pC	СН	
AC	type	CHG	0 to 2	0 mA		<	>	0 to 2	0 mA	сн	
AO up	per range	СНБ	20.000		mA			20.000	mA	а	
AO lower range		CHG	4.000		mA	<	>	0.000	mA	CH	

(4) Parameter can be copied from 'File Configuration' to 'Device Configuration' using [>] button. Copied fields will be highlighted in light yellow background color.

Exit	Page		Read File		Write File			Upload	Download		
EXIL	1		Compare	All Copy <<				> All Copy	Compare		
Pn	operties		File Confi	iguration				Device Config	juration		
De	scription	CHG	0301	7353		<	>	OJ0173	53	СН	
т	ag No.	CHG	TAG 1	TEST1		<	>	TAGNO1	123	СН	
			-								
Ser	nsor type	CHG	Туре К					Type I	ĸ	CH	
Sen	isor wires		2 Wires		<	>	2 Wires				
F	9V unit	CHG	de	egC				degC		Ch	
PV up	oper range	СНБ	1000.000		degC	<	,	1000.000	degC	- CHI	
PV lo	wer range	- cho	0.000 degC			Ĺ	0.000	degC			
PV	damping	CHG	0.000		Sec	<	>	0.000	Sec	СН	
Trans	fer function	CHG	LIN	EAR		<	>	LINEA	R	CH	
Burn	nout mode	CHG	Ups	cale		<	>	Upscal	e	CH	
c	C switch	CHG	CIC	ON		<	>	CIC OI	N	СН	
Te	erm unit	CHG	de	gC		<		degC		СН	
A	.0 type	CHG	0 to 2	20 mA		<	>	0 to 20 i	mA	СН	
AO u	pper range		20.000		mA			20.000	mA		
AO lo	wer range	- CHG	4,000		mA	<	>	0.000	mA	Ch	

(5) Click [CHG] button at the left of each field to modify the parameter. Fields in which the parameter has been changed will be highlighted in light yellow background color.

M3LUCFG PC	Configurator Ver:	1.1.2							غارها ا	1 ×
Exit	Page		Read File		Write File			Upload	Downloa	8
Lint	1		Compare	All Copy <<			>	> All Copy	Compare	
Prop	erties		File Config	guration				Device Configura	ation	
Desc	ription	CHG	03017	7353		<	>	OJ017353		СНО
Tag	g No.	CHG	TAG T	EST1		<	>	TAGNO123	1	СНО
								ſ		
Sensi	or type	CHG	Type K					Type K		СНО
Sensor wires		Chia	2 Wires			<	>	2 Wires	Che	
PV	PV unit		degC					degC		СНО
PV upp	upper range		1000.000		degC	<	,	1000.000	degC	СНО
PV low	er range	CHG	0.000		degC	Ù	Ĺ	0.000	degC	Che
PV d	amping	CHG	0.000		Sec	<	>	0.000	Sec	СНО
Transfe	r function	CHG	LINE	AR		<	>	LINEAR		СНО
Burno	ut mode	CHG	Upsc	ale		<	>	Upscale		СНО
C3C	switch	CHG	CIC	ON		<	>	CJC OFF		СНО
Ten	m unit	CHG	deg	C		<	>	degC		CHG
			-							
AO	type	CHG	0 to 2	0 mA		<	>	0 to 20 m/		CHO
AO upp	er range	СНБ	20.000		mA	<	,	20.000	mA	~
AO low	AO lower range		4.000		mA		-	0.000	mA	— сно

(6) Click [Download] button to write the configuration data in 'Device Configuration' fields to the connected device. When the downloading is successfully complete, the configuration data is automatically uploaded and the background color returns to the initial state.

Exit	Page		Read File	Write File			Upload	Download		
Exit	1		Compare	All Copy <	<	;	> All Copy	Compare		
Pro	operties		File Config	uration			Device Configu	ration		
De	scription	CHG	OJ017	353	<	>	03017353		CHG	
т	ag No.	CHG	TAG TE	ST1	<	>	TAGNO123		СНО	
Sen	sor type	СНБ	Туре	к			Туре К		СНБ	
Sensor wires		CHG	2 Wires		<	>	2 Wires	CHG		
F	'V unit	CHG	deg	с			degC		СНО	
PV up	PV upper range		1000.000	degC	<	>	1000.000	degC	СНО	
PV lo	wer range	CHG	0.000	degC			0.000	degC	Che	
PV	damping	CHG	0.000	Sec	<	>	0.000	Sec	СНО	
Transt	fer function	CHG	LINE	AR	<	>	LINEAR		СНО	
Burn	out mode	CHG	Upsca	ile	<	>	Upscale		СНО	
CJ	C switch	CHG	CJC (	DN	<	>	CJC OFF		СНО	
Te	rm unit	CHG	deg	с	<	>	degC		CHG	
AO type		СНБ	0 to 20	mA	<	>	0 to 20 n	1A	СНО	
AO u	oper range	СНБ	20.000	mA			20.000	mA		
AO lo	AO upper range AO lower range		4.000	mA	<	>	0.000 mA		CHG	

# 7. DIAGNOSTICS

Click [Diagnostics] button to open the Diagnostics window as shown in Figure 22.

## Figure 22. Diagnostics

M3LUCFG PC Configurator Ver1.1.2										_ <b>_</b> X
M3LU Configurator	Device Mode	СОМ	тме	PC	Z/S	IRG	ORG		CFG	
Monitor	Device Status		BO	ADC	SCM	AFX	AOS	TRM	PV	
Diagnostics	PV	-	°V %		Ter	rm.		AO		Functions
Execute diagnostics	1000	1	.00		100	, - -		20 –		Connect
Read additional status	_		_		80	_				Upload
Master reset device	_ 800_	8	- 30 —			-		- 16 –		Detailed Info
Additional Status	_		_			_		-		Analog Output
EEPROM SUM error (Basic)	_ 600—		- 00		40	_		- 12 –		One Step Cal
EEPROM SUM error (Custom TC)	-000	- 00			40			12-		Trim DAC
EEPROM SUM error (Custom RTD)	-		_			_				Sensor Cal
EEPROM SUM error (Special Curve)	400		40					- 8 –		
EEPROM SUM error (Summary)			-		0	-				Sinc Filter
EEPROM hardware error	-		_		v	-				Diagnostics
	200—		20 —			_		4 -		Custom TC
			_		-40			-		Custom RTD
	0 —		0					- 0 —		Special Curve
	0.97	(	). 10		31.	10		0.02		File
	degC		%		de			mA		Language
Close Diagnostics	PV Graph	PV	% Graph		Term (	Graph		AO Gra	ph	Exit

Execute di	agnostics	Activates a diagnostics program and results are displayed in Ad- ditional Status.
Read addi	tional status	Reads current contents of Additional Status from the device.
Master res	et device	Reset and restart the device without actually turning OFF/ON the power supply.
Additional	EEPROM SUM error (Basic)	Status is displayed: green in normal status, while red in error.
Status	EEPROM SUM error (Custom TC)	
	EEPROM SUM error (Custom RTD)	
	EEPROM SUM error (Special Curve)	
	EEPROM SUM error (Summary)	
	EEPROM SUM hardware error	
Close Diag	gnostics	Close the window.

# 8. LANGUAGE

Click [Language] button to open the Language window as shown in Figure 23. The user can select the display language of the M3LUCFG.

W3LUCFG PC Configurator Ver1.1.2										×		
M3LU Configurator	Device Mode	сом	тме	PC	Z/S	IRG	ORG		CFG			
Monitor	Device Status		во	ADC	SCM	AFX	AOS	TRM	PV			
Language	PV	F	°V %		Ter	m.		AO		Functions		
Select language English	1000	:	.00		100	) 		20-		Connect		
· · · · · · · · · · · · · · · · · · ·			_		- - 80-					Upload		
	_ 800_	{	- 30 —			-		- 16 –		Detailed Info		
						_		-		Analog Output		
	_ 600_	- 60 -			40			_ 12_		One Step Cal		
	-							- 12		Trim DAC		
			_			_				-		Sensor Cal
	400	40—						8 —		Sinc Filter		
	_	-		0		_		-		Diagnostics		
	200—		20 —			_		4 -		Custom TC		
	_		_		-40			-		Custom RTD		
	o							- 0 —		Special Curve		
	1.02		). 10		31.	10 _	4	0.02		File		
	degC		%			gC		mA		Language		
Close Language	PV Graph	PV	% Graph		Term (	Graph		AO Gra	ph	Exit		

#### Figure 23. Language

Click [Select language] to select the available language. The selected language is shown on the screen immediately. English is available in each language version of Windows, while Windows in your PC must support other language in order to display it.

Click [Close Language] to close the window.