Model M3LR RTD Transmitter **PC CONFIGURATOR SOFTWARE** Model: M3LRCFG

USERS MANUAL

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1. GETTING STARTED

1.1. PC REQUIREMENTS

The following PC performance is required for adequate operation of the M3LRCFG.

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 M3LRCFG installer program. Follow instructions on the Windows.

In the M3LRCFG installer program, all the software of the M3CFG series will be installed. If you would like to install only M3LRCFG, change to "X" for other software in the window appeared during the installation as shown below.

岗 M3CFG R8 Setup	
Custom Setup Select the way you want features to be installed.	
Click the icons in the tree below to change the way	y features will be installed.
M3LUCFG M3LUCFG M3LPACFG M3LRCFG	PC Configurator software for M3L series
M3LVCFG M3LTCFG M3LLCCFG M3LLCCFG M3LDYCFG M3LMCFG	This feature requires 1KB on your hard drive. It has 1 of 8 subfeatures selected. The subfeatures require 1173KB 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 M3LRCFG

Connect the model M3LR RTD Transmitter to the PC via the PC configurator cable. Press Start on the task bar and choose M3CFG > M3LRCFG from the Program menu.

1.4. OPTION /A & OPTION /B

The M3LR with Option /B is not designed for PC configuration but only for monitoring on the PC, while the Option /A version is fully programmable.

OPTION /B

When you connect the Option /B version to the PC and start up the M3LRCFG program, you can confirm the current setting but these buttons and fields used for configuring the module are greyed out and thus unavailable.

The M3LRCFG features available for the Option /B version are: monitoring, One Step Calibration, zero/span, loop test output and diagnostics.

OPTION /A

The Option /A version is fully programmable including the following: input sensor type, PV unit, and PV range, analog output type, range and custom RTD table.

This version of the M3LR can be programmed and calibrated even when the configuration mode switch (DIP switch SW2-8) is set to DIP SW mode, however, once the power supply to the M3LR is turned off and on, it restarts based on DIP switch configurations. It must be started up with the SW2-8 turned on so that it reads its EEPROM contents regardless of other DIP switch configurations.

2. MONITOR

2.1. STARTING UP

Figure 1 shows the initial window of the M3LRCFG PC Configurator window.

In order to enable the tools shown on the screen, the model M3LR RTD Transmitter must be connected to the PC via the PC configurator cable.

Figure 1. Initial Window

M3LRCFG PC Configurator Ver1.0.7																			
	M3LF		Device Mode	сом		DIP	Z/S	IRG	ORG		CFG								
, i	Configui Monit		Device Status		во	ADC		AFX	AOS		PV								
Se	ensor Infor	mation	PV	F	PV %		AO	%		AO		Functions							
Senso	r type	Pt100	1000	1	100		100	, 	1	20-		Connect							
Senso	r wires	2 Wires	_		_			-		- - -		Upload							
PV t	unit	degC	- 800—	8	- 30 —		80	-		-		Detailed Info							
	Upper	1000.000			_								-				16		Analog Output
PV range	Lower	0.000	_ 600_	6	- 60		60			-		One Step Cal							
PV upp	er limit	1100.000	-	Ì	-			-		- 12-		Trim DAC							
PV low	er limit	0.000	_					-		- 12									
PV minim	um span	4.00	400— _	40 — _			40 <u>-</u>					Sensor Cal							
				_						- - - 8		Diagnostics							
			200—		20 —		20	-		-		Custom RTD							
			_		_			_		- - -									
			0 —		_ 		(,		8 - - - - - - - - - - - - - - - - - - -									
			0.00	0.00			0.00					File							
			degC	%			%				0.00 mA			Language					
			PV Graph	PV	% Graph	1	AO %	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.

M3LRCFG PC Configurator Ver1.0.7										x								
M3LR Configurator	Device Mode	сом		DIP	Z/S	IRG	ORG		CFG									
Monitor	Device Status		BO	ADC		AFX	AOS		PV									
Device Connection	PV	F	°V %		AO	%		AO		Functions								
COM port	1000	1	100		100	· 	1	20		Connect								
USB Serial Port (COM2)						1		_		Upload								
	800—	8	30 —		80	_		-		Detailed Info								
Connect Device			_			-		16_ 	6_ _	Analog Output								
	-	600-60-			60 <u>-</u>			_		One Step Cal								
	600-							-		Trim DAC								
Disconnect Device	_		_			_		- 										
	400—	4	40 —		40	-		-		Sensor Cal								
	-						8 -			Diagnostics								
	200—	2	20_		20					Custom RTD								
	 		-		- - -		- 				- - -		-					
	0 —		0		(-	4 –										
	0.00	().00		0.1	00		0.00		File								
	degC		%		9	6		mA		Language								
Close Device Connection	PV Graph	PV	% Graph	n [AO %	Graph		AO Graj	ph	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 M3LR.
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 M3LR.

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 M3LR's configuration without using this tool.

M3LRCF0	M3LRCFG PC Configurator Ver1.0.7													
	M3LF Configu		Device Mode	СОМ		PC	Z/S	IRG	ORG		CFG			
	Monit		Device Status		во	ADC		AFX	AOS		PV			
S	ensor Infor	rmation	PV	F	PV %		AO	%		AO		Functions		
Senso	or type	Ni508.4	200	1	100		100	<u> </u>	1	20 –		Connect		
Senso	or wires	2 Wires	-		_			_		_		Upload		
PV	unit	degC	-	8	30 _		80	_		- 16 –		Detailed Info		
	Upper	200.000			_					-	1	Analog Output		
PV range	Lower	-50.000		(- 60		_ 60			_ 12_		One Step Cal		
PV upp	per limit	200.000	-		_			_		_		Trim DAC		
PV low	ver limit	-50.000	-				_ 40 _			_				
PV minin	num span	20.00	_	-	40 — —		40	_		8 – -	<u>i</u>	Sensor Cal		
		,	3					_				Diagnostics		
			0 _		20 —		20	-		4		Custom RTD		
			1		_			_		-				
			0 0 -50		0		0	,		- 0 -				
				34.46			34.46		34.46		16 6.89			File
		degC	%			%					Language			
			PV Graph	PV	% Graph	n][AO %	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.

Device Mode	сом	PC	z/s	IRG	ORG	CFG
		or				
Device Mode	сом	DIP	z/s	IRG	ORG	CFG

[COM] lamp	Blinks with the normal communications condition.
[DIP]/[PC] lamp	Shows the device's configuration mode: DIP switch or PC. For the M3LR 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		во	ADC		AFX	AOS		ΡV	
---------------	--	----	-----	--	-----	-----	--	----	--

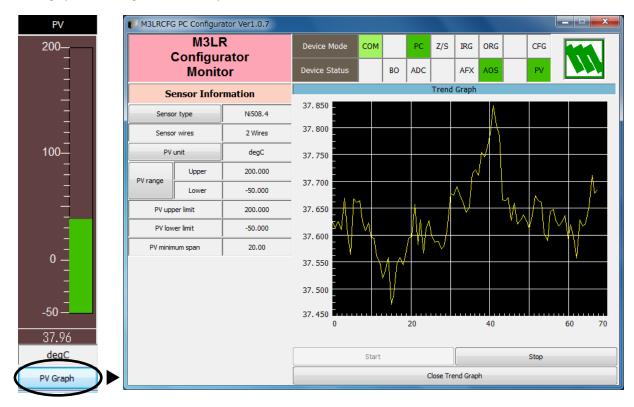
[BO] lamp	Red light turns on with 'Input error' detected (ADC overrange or underrange).
[ADC] lamp	Red light turns on with ADC's hardware errors.
[AFX] lamp	Red light turns on when the analog output entered in Fixed AO mode.
[AOS] lamp	Green light turns on when the analog output is diagnosed to be normal. Red light turns on when the output is saturated upscale or downscale.
[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 (degC, degF or Kelvin), PV in % of the selected range, analog output in % which is calculated from PV in % by transfer function and analog output in engineering unit are available.

The graph scales for the PV in % and the analog output in % can be modified unlike the PV and the analog output in engineering unit 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. Use [Start] and [Stop] buttons to start/stop recording data, and click [Close Trend Graph] to close the graph window.



PV Bargraph Figure 4. Trend Graph

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.

S	ensor Infor	mation
Senso	or type	Ni508.4
Senso	r wires	2 Wires
PV	unit	degC
PV range	Upper	200.000
FVTange	Lower	-50.000
PV upp	oer limit	200.000
PV low	ver limit	-50.000
PV minin	num span	20.00

Sensor type The input sensor type can be selected from the following 14 types.	
Pt100	
Pt200	
Pt300	
Pt400	
Pt500	
Pt1000	
Pt50(JIS81)	
JPt100(JIS89)	
Ni100	
Ni120	
Ni508.4	
NiFe604	
Cu10@25	
Custom RTD	
Click [Sensor type] button to choose the input sensor type and the number of	sensor
wires.	
Choose with SW2-4, 2-5, 2-6, 2-7 in DIP SW mode.	
Sensor wires The number of wires can be selected from the following three types.	
2 Wires	
3 Wires	
4 Wires	
Choose with SW3-3, 3-4 in DIP SW mode.	
PV unit PV and the terminal temperature in engineering unit are displayed. Choose f	rom
among this three choices.	
degC	
degF	
Kelvin	
Click [PV unit] button to choose unit type.	
PV range (Upper / Lower) Specifies input temperature range for 0% and 100%.	
Click the left button opens a dialog box to change the setting. The input temp	erature
range can be also changed on One Step Calibration mode.	
PV upper limit Shows the usable range information for the selected type of sensor.	
PV lower limit	

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

M3LRCFG PC C	Configur	ator Ver1.0.7										
	M3LI		Device Mode	сом		PC	Z/S	IRG	ORG		CFG	
	lonit	rator or	Device Status		во	ADC		AFX	AOS		PV	
Detaile	ed Info	ormation	PV	F	°V %		AO	%		AO		Functions
PV damping		0.500	200	1	.00		100			20 –		Connect
Burnout mode	2	None	-		-			-				Upload
Transfer functi	on	LINEAR		- 80 —			80	-		- 16 –		Detailed Info
Wire resistance		1.000	-	_						-		Analog Output
Tag No.		SAMPLE 123	100—	_ 60			_ 60			- 12—		One Step Cal
Serial number	r	<u> </u>		-			-			- ''		Trim DAC
Device type		M3LR/A		_				_		- - 8 -		
Hardware revis	ion	M3LR HV01.01		40 — _			40 — -		-0			Sensor Cal
Software revisi	ion	M3LR FV02.01	-					-				Diagnostics
1		,	0 _	2	20 —		20	-		4 –		Custom RTD
			1		_			_		-		
			-50 —		0		C	,		- 0 —		
			39.11	3	5.64		35.	64		7.13		File
			degC		%		9			mA		Language
Close Det	ailed I	nformation	PV Graph	PV 9	% Graph		AO %	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.
Transfer function	Input-to-output transfer function is fixed at "LINEAR" and unchangeable.
Wire resistance	Click [Wire resistance] to specify the wire resistance value of the input
	sensor. The wire resistance value is used for two-wire RTD to compen-
	sate errors caused by wire resistance. Instead, errors can be calibrated
	using [Sensor Cal] Zero Calibration, but this setting will be automatically
	reset when you have changed the sensor type or the number of wires.
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.

M3LRCF	M3LRCFG PC Configurator Ver1.0.7											
	M3LF Configu		Device Mode	СОМ		PC	Z/S	IRG	ORG		CFG	
	Monit		Device Status		BO	ADC	AFX		AOS		PV	
	Analog Ou	ıtput	PV	-	PV %		AO	%		AO		Functions
AC	AO type 0 to 20 mA		200	1	.00		100	,		20 –		Connect
	4321		-		_			-				Upload
SW1	SW1 position OFF		-	8	 30		80	_		- 16 –		Detailed Info
AO	mode	Normal AO		_						-	1	Analog Output
A	D unit mA		 100—	_ 60 _			_ 60 _			- 12 –		One Step Cal
	Upper	20.000	-	_				-				Trim DAC
Range	Lower	0.000								-		
Upp	er limit	20.000		40 — -			40 — -			8 – -		Sensor Cal
Low	ver limit	0.000	3									Diagnostics
Minim	um span	1.000	0		20 —		20	-		4		Custom RTD
s	et AO for current	PV output	1		-			_		_		
	Set AO for specified value		-50 —		0		(0		- 0		
	Exit Fixed AO	mode	39.29	3	5.72		35.	72		7.14		File
			degC		%		9			mA		Language
C	lose Analog	Output	PV Graph	PV	% Graph		AO %	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.

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

M3LRCFG PC Configurat	or Ver1.0.7										- • ×
M3LR		Device Mode	сом		PC	Z/S	IRG	ORG		CFG	
Configura Monito		Device Status		во	ADC	AFX /		AOS		PV	
One Step Calib	One Step Calibration		PV %			AO	%		AO		Functions
Input	Input		100			100			20 –		Connect
Enter PV calibration	n mode	-	_				_		_		Upload
Lower Cal	Upper Cal	_	8	30 —		80	-		- 16 –		Detailed Info
Exit PV calibration	mode	-		_			_		-	1	Analog Output
Output			- 60			_ 60			- 12 –		One Step Cal
Enter AO calibration	mode	100	-			-			-		Trim DAC
Lower Cal	Upper Cal	_					_			1	
		_	4	40 —		40	_		8		Sensor Cal
Exit AO calibration	mode	0		-			_				Diagnostics
		0 _	2	 20		20	_		4 -		Custom RTD
		1					_		-		
		-50 —		0_		(_		- 0 —		
											File
		39.27 degC	3	5.71 %		<u>35</u> . 9			7.14 mA		Language
Close One Step Ca	alibration	PV Graph	PV 9	% Graph		AO %	-		AO Gra	ph	Exit

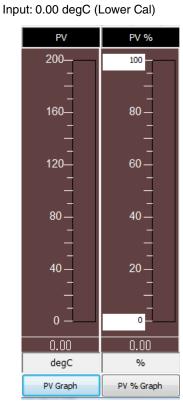
Figure 7. One Step Calibration

4.1. INPUT CALIBRATION MODE

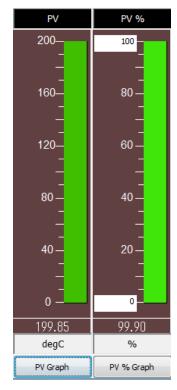
- (1) Connect the M3LR to a simulator as described in the M3LR instruction manual.
- (2) Click [Enter PV calibration mode] in order to turn the module into the input calibration mode. The red [IRG] lamp in [Device Mode] panel at the top turns ON while the module is in this mode.



(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.



Input: 200.00 degC (Upper Cal)



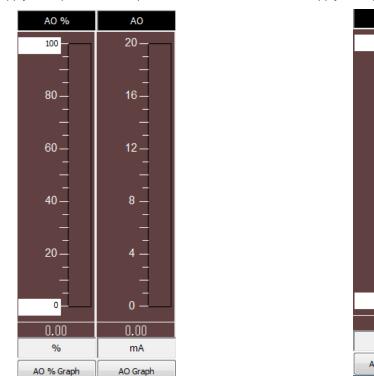
(4) Click [Exit PV calibration mode] when the calibration is complete.

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.

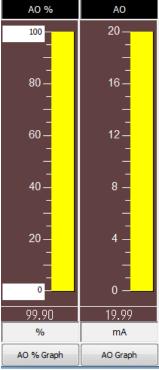


(2) Increase or decrease the simulated input until the output multimeter shows desired 0% and 100% signal levels and click [Lower Cal] and [Upper Cal] buttons respectively so that the output range is automatically set.



Apply the input so that output become 0%

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 8.

Figure 8. Trim DAC (e.g. Upper Range Trim Mode)

M3LRCFG P	C Configura	ator Ver1.0.7										
	M3LF		Device Mode	сом		PC	Z/S	IRG	ORG		CFG	
LC	onfigur Monito		Device Status		во	ADC		AFX	AOS		PV	
	Trim DA	C	PV	F	°V %		AO	%		AO		Functions
Enter	Lower Range	Trim mode	200	1	.00		100)		20 –		Connect
Enter	Enter Upper Range Trim mode		_		_			_				Upload
Trim by	Trim by actual measured value		_ 160—	{			80	_		- 16 –		Detailed Info
Up+	Up++	Up+++			_			_		-		Analog Output
Down+	Down++	Down+++	_ 120—		_ 60		60	-		- 12 –		One Step Cal
	lear Trim DAC	data	-					-		-		Trim DAC
Zero offs	set	0.000000			_			_		-		
Span ga	iin	0.410000	80— _	4	40 — —		40	-		8 –		Sensor Cal
1					_			_				Diagnostics
			40 —		20 —		20	-		4 –		Custom RTD
			1		_			_		-		
			0 _		0		C	,		- 0 —		
			36.60	1	8.30		100	.00 _		20.0		File
			degC		%		9			mA		Language
Cl	ose Trim	DAC	PV Graph	PV	% Graph		AO %	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 (0.0 for both Zero offset and Span gain).

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 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 calibration is applied to measured resistance. Therefore by using the Zero calibration, you can compensate errors caused by 2-wire RTD's wire resistance or 3-wire RTD's resistance unbalance.

However, this calibration value is automatically reset when sensor type or number of wires are changed.

Click [Sensor Cal] button to open the Sensor Calibration window as shown in Figure 9.

Figure 9. Sensor Calibration

M3LRCF0	G PC Configurator Ver1.	.0.7										_ _ ×
	M3LR Configurator		Device Mode	сом		PC	Z/S	IRG	ORG		CFG	
	Configurator Monitor		Device Status		во	ADC		AFX	AOS		PV	
S	Sensor Calibration		PV		PV %		AO	%		AO		Functions
	Read calibration data		200		.00		100	,	1	20 –		Connect
CI	Clear sensor calibration data		_		_			-				Upload
	Zero calibration		 160	{			80	-		- 16 –		Detailed Info
	Span calibration				_		_			-	1	Analog Output
PV	36.478176	degC	_ 120—	4	_ 60		60	_		- 12 –		One Step Cal
Zero point	597.3374	Ohms	-	Ì	-		00	-		-		Trim DAC
Zero value	597.1219	Ohms			_			_		-		
Gain	1.0000		80 — _	4	40 — —		40	-		8 –	1	Sensor Cal
ľ		1										Diagnostics
			40 —		20 —		20	_		4 –		Custom RTD
					_			_		-		
			0		- 0		C	-		- 0 —		
			36.48	1	8.24		18.	24		3.65		File
			degC		%		%	6		mA		Language
Clos	e Sensor Calibrati	on	PV Graph	PV	% Graph		AO %	Graph		AO Gra	ph	Exit

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 settings are: Zero Point = Zero Value = Resistance (ohms) at 0°C, 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 RTD

The M3LR supports calibrated RTD and user-specific RTD table functions. In order to use these functions, RTD's characteristics data must be defined and registered.

CALIBRATED RTD

Callendar-Van Dusen approximation formula as shown below is used.

 $\begin{array}{ll} \mathsf{Rt} = \mathsf{R0}^* \ (1 + \mathsf{A}^*\mathsf{T} + \mathsf{V}^*\mathsf{T}^*2 + (\mathsf{T} - 100)^*\mathsf{C}^*\mathsf{T}^*3) (\text{if } \mathsf{T} \geq \mathsf{0}, \, \mathsf{C} = \mathsf{0}) \\ & \text{where } \mathsf{Rt} & : \; \mathsf{Resistance at } \mathsf{T}^\circ\mathsf{C} \ (\mathsf{ohms}) \\ & \mathsf{R0} & : \; \mathsf{Resistance at } \mathsf{0}^\circ\mathsf{C} \ (\mathsf{ohms}) \\ & \mathsf{T} & : \; \mathsf{Temperature } \ (^\circ\mathsf{C}) \\ & \mathsf{A}, \, \mathsf{B}, \, \mathsf{C} & : \; \mathsf{Coefficient} \end{array}$

Calibrate the RTD and determine the coefficients A, B, C and R0.

Click [Write calibrated RTD] button and enter these values to automatically create a sensor characteristic data.

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. If the number of points of the characteristic data exceeds 300. Excessive data is ignored.

Instead, by clicking [Read table from device], RTD's characteristics data approximated using the Callendar-Van Dusen formula can be automatically created.

- 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 M3LR.
- 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 M3LR. 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.

6.1.1. 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 300 points can be specified.

```
/* Custom RTD Table Definition
/* Ti = f(Xi) ( 0 <= i < Size )
    Temperature Step (1 to 50 degC)
/*
    0 <= X(i) <= 30000 Ohm
/*
/*
    X(i) < X(i+1)
    2<= Size <= 300
/*
Minimum RTD Temperature = 0
                              <-- Minimum temperature T0 (°C)
                         <-- Temperature step (°C)
Step = 10
{
100.0000
                         <-- Resistance value for T0 (\Omega)
:
200.0000
                         <-- Resistance for Tmax (\Omega)
}
```

6.1.2. CUSTOM RTD WINDOW

Click [Custom RTD] button to open the Custom RTD as shown in Figure 10.

M3LRCFG PC Configurator Ver	r1.0.7										X
M3LR Configurator		Device Mode	сом		PC	Z/S	IRG	ORG		CFG	
Monitor		Device Status		BO	ADC		AFX	AOS		PV	
Custom RTD		PV	F	PV %		AO	%		AO		Functions
Write calibrated RTD	Write calibrated RTD		:	100		100	, 	1	20 –		Connect
Read table from device	Read table from device			_			_				Upload
Write table to device		_ 160—	_ 80_			80			- 16 –		Detailed Info
Write table to file	Write table to file			_		-			-		Analog Output
Read table from file		_ 120—		_ 60 _		_ 60			- 12 –		One Step Cal
Display Custom RTD graph		-	-			_			- 12		Trim DAC
Custom RTD Table Con	itents	_	-							i l	
Status		80—	4	40 —		40			8 –		Sensor Cal
		_		_			_			-	Diagnostics
Min temperature	degC	_ 40		_ 20		20			- 4 _		Custom RTD
Max temperature	degC	-	ľ.			20	-				
Temperature step	degC						-		_		
Table size	Max size 300	0 —		0		C)		0 -		
		36.49	1	8.24		18.	24		3.65	i	File
		degC		%		9	6		mA		Language
Close Custom RTI)	PV Graph	PV	% Graph		AO %	Graph		AO Gra	ph	Exit

Figure 10. Custom RTD

Write calibrated RTD		A, B, C and R0 defined by Callendar-Van Dusen approximatically create approximated RTD's characteristic data.					
Read table from device		characteristics table registered in the M3LR. If there is no under Custom RTD Table Contents shows 'Non configured.'					
Write table to device	The program downloa	ds currently displayed characteristics to the M3LR. successfully complete, Status under Custom RTD Table					
Write table to file		rrently displayed characteristics data to a file. After reading the table in the PC with [Read table from device], save the					
Read table from file		a file stored in the PC. When uploaded, the file contents under Custom RTD Table Contents.					
Display Custom RTD graph	Characteristics data ca	an be shown in a graph. (figure 11)					
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 11. Custom RTD graph: Temperature characteristics data of Pt 200 set by [Write calibrated RTD]

M3LRCFG PC Configu														
Configu			Device	e Mode	СОМ		PC	Z/S	IRG	ORG		CFG		
Monit			Device	Status		BO	ADC		AFX	AOS		PV		
Custom	RTD					(Custom	RTD R	esisten	ce table				
Write calibrat	ed RTD			450.000										
Read table fro	n device		(Ohms)	400.000	-									
Write table to	device			350.000								/		
Write table	to file			300.000							$ \rightarrow $			
Read table fr	Read table from file			250.000										
Display Custom F	RTD graph			200.000	-									
Custom RTD Tal	le Conte	nts	RTD	150.000										
Status	Config	ured												
Min temperature	-200	degC		100.000										
Max temperature	850	degC		50.000	-									
Temperature step	emperature step 5 degC			0.000	-200			200			6	00	100(
Table size	Table size 211 Max size 300													
					Temperature(degC)									
Close Custo								Close						

6.2. FILE MANAGEMENT

The M3LR'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 12.

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) Validity of the selected range values is not verified in this window. Please make sure to set them according to the described specifications.
- (2) Calibrated RTD parameters are handled in this window while Custom RTD table data is not.
- (3) With the Option /B version, Download is unavailable. However, Upload is possible to save a configuration file, or to compare with other configurations.
- (4) A comment 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.
- (5) It is unavailable to write the calibration data ([DAC Trim], [Sensor Trim]), which is read from configuration, to the device.

Figure 12. File

Exit	Page		Read File	Write File			Upload	Download	ł
Exit	1		Compare	All Copy <	<)	>> All Copy	Compare	
Proj	perties		File Confi	iguration			Device Conf	iguration	
Des	cription	CHG			<	>			СНО
Ta	g No.	CHG			<	>			СНО
)[1		·
	or type or wires	- CHG			<	>			CHG
P۱	/ unit	СНС							СНС
PV upp	er range	сна			<	>			СНО
PV low	er range								Chie
PV d	amping	СНС		Sec	<	>		Sec	СНС
Burno	ut mode	СНG			<	>			СНО
Wire r	esistance	CHG		Ohms	<	>		Ohms	СНС
AC	type	CHG			<	>			СНС
AO up	per range	- СНБ			<	>			СНО
AO lov	ver range						ļ		

6.2.1. 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.

Exit	Page		Read File	Write File			Upload	Download	ł
EXIL	1		Compare	All Copy <	<	>	> All Copy	Compare	
Prop	erties		File Confi	iguration			Device Config	juration	
Desc	ription	CHG	XI021	3000	<	>			СН
Tag) No.	CHG	SAMPL	_E123	<	>	SAMPLE	123	СН
									·
Senso	or type	- CHG	Ni50	08.4			Ni508.	4	СН
Senso	or wires		2 W	/ires	<	>	2 Wire	S	
PV	unit	CHG	de	gC			degF		СН
PV upp	er range	СНС	200.000	degC	<		400.000	degF	СН
PV low	er range		0.000	degC			30.000	degF	
PV da	amping	CHG	0.500	Sec	<	>	0.500	Sec	СН
Burno	ut mode	CHG	Upse	cale	<	>	None		СН
Wire re	sistance	CHG	5.000	Ohms	<	>	1.000	Ohms	Сн
		СНБ	-10 to	10.1/	<		0 to 20	m 4	Сн
AU	type		-10 00	10 0			0 10 201		
AO upp	er range	- CHG	5.000	V	<	>	20.000	mA	СН
AO low	er range		1.000	v			0.000	mA	

Figure 13. Parameters Modified

6.2.2. 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 14). 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 14. Data Uploaded, first page

Exit	Page		Read File	Write File			Upload	Download	ł
Exit	1		Compare	All Copy <	<	>	> All Copy	Compare	
Prop	perties		File Confi	iguration			Device Conf	iguration	
Desc	cription	CHG			<	>			СНО
Та	g No.	CHG			<	>	SAMPLE	123	СНС
					·				·
Sens	or type	- СНБ					Ni508	3.4	CHG
Sens	or wires				<	>	2 Wir	es	
P٧	/ unit	CHG					deg	с	СНО
PV upp	PV unit PV upper range						200.000	degC	
PV low	er range	- CHG			<	>	-50.000	degC	CHG
PV d	amping	CHG		Sec	<	>	0.000	Sec	СНС
Burno	ut mode	CHG		·	<	>	Non	e	СНО
Wire re	esistance	СНС		Ohms	<	>	1.000	Ohms	СНО
					·		1		
AO	type	CHG			<	>	0 to 20	mA	CHG
AO upp	per range	- СНG					20.000	mA	СНО
AO lov	ver range	CHG			<	>	4.000	mA	CHG

The M3LRCFG's configuration window consist of two pages. Click [Page] button to switch between pages. The second page appears as follows (Figure 15).

Exit	Page		Read File	Write File			Upload	Download	
EXIL	2		Compare	All Copy <	<	>>	> All Copy	Compare	
Pro	perties		File Conf	figuration			Device Config	guration	
Callendar-	Van Dusen R0	СНС		Ohms	<	>	100.000	Ohms	C
Callendar	-Van Dusen A	СНС			<	>	3.90800E	-003	Cł
Callendar	-Van Dusen B	СНС			<	>	-5.77500E	E-007	Cł
Callendar	-Van Dusen C	CHG			<	>	-4.18300E	5-012	C
CVD u	ıpper limit			degC			850	degC	
CVD k	ower limit	- CHG		degC	<	> -	-200	degC	Cł

Figure 15. Data Uploaded, second page.

This page shows Calibrated RTD data. When downloading is performed with a calibrated RTD data file set, the table data is automatically overwritten. If you do not want to use Calibrated RTD, the fields must be blank. In order to delete data in these fields, set 0 ohm to Callendar-Van Dusen R0. All other fields are automatically reset to blank by this setting. When blank fields are downloaded, the Calibrated RTD data is set to Unused, thus creates no calibration data.

Figure 16. Device fields with no Callandar-Van Dusen R0 data.

M3LRCFG PC	Configurator Ver1	0.7									×
Exit	Page		Read File		Write File			Upload		Download	
Exit	2		Compare		All Copy <-	<	>	>> All Copy		Compare	
Prop	erties		File Confi	iguration	n			Device Cor	nfigurati	on	
Callendar-Va	an Dusen R0	CHG	100.000		Ohms	<	>			Ohms	CHG
Callendar-V	'an Dusen A	CHG	3.9080	0E-003	}	<	>				СНС
Callendar-V	/an Dusen B	CHG	-5.7750	0E-007	7	<	>				CHG
Callendar-V	'an Dusen C	CHG	-4.1830	0E-012	2	<	>				CHG
CVD up	per limit	СНБ	850		degC	<				degC	СНБ
CVD lov	wer limit	Cild	-200		degC		Ĺ			degC	Cild

6.2.3. 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 17). 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.

Figure 17. File Read Out

Exit	Page		Read File	Write File			Upload	Download	
Exit	1		Compare	All Copy <	<		>> All Copy	Compare	
Pr	operties		File Confi	guration			Device Con	figuration	
De	scription	CHG	XI021	3000	<) >			CHG
т	ag No.	CHG	SAMPL	.E123	<	>			CHG
							, N		_
Ser	nsor type	- СНG	Ni50	8.4					СНБ
Sen	sor wires		2 W	ires	<	>			ChG
F	V unit	CHG	de	рС					CHG
PV up	oper range	СНБ	200.000	degC	<	>			СНG
PV lo	wer range	Chia	0.000	degC		Ĺ			Cho
PV	damping	CHG	0.500	Sec	<	>		Sec	CHG
Burr	nout mode	CHG	Nor	ne	<	>			CHG
Wire	resistance	CHG	5.000	Ohms	<) >		Ohms	СНС
			·)		
A	O type	CHG	0 to 2	0 mA	<	>			CHG
AO u	pper range	- сна	20.000	mA					СНG
AO lo	ower range	CHG	4.000	mA	<	>			CHG

6.2.4. 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.

Figure 18. Parameters Compared

Exit	Page		Read File	Write File	•		Upload	Downloa	d
EXIL	1		Compare	All Copy <	<	>	> All Copy	Compare	e
Pro	operties		File Confi	guration			Device Cont	figuration	
Des	scription	СНС	XI021	3000	<	>			СН
Ta	ag No.	СНС	SAMPL	E123	<	>	SAMPL	E123	СН
Sen	sor type	— снд	Ni50	8.4			Ni508	8.4	- сно
Sen	sor wires		2 W	ires	<	>	2 Wi	res	
Р	V unit	СНС	deg	gC			deg	βC	СН
PV up	per range	СНБ	200.000	degC			200.000	degC	- сно
PV lov	wer range		0.000	degC	<	>	-50.000	degC	
PV	damping	CHG	0.500	Sec	<	>	0.000	Sec	СН
Burn	out mode	CHG	Nor	ne	<	>	Non	ie	СН
Wire	resistance	CHG	5.000	Ohms	<	>	1.000	Ohms	СН
A	D type	СНС	0 to 2	0 mA	<	>	0 to 20	0 mA	СН
AO up	oper range	— снд	20.000	mA	<	>	20.000	mA	- сн
AO lo	wer range	cho	4.000	mA		<i></i>	0.000	mA	Chi

6.2.5. 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

Exit	Page		Read File	Write File			Upload	Download	
LAIL	1		Compare	All Copy <	<	>	> All Copy	Compare	
Pr	operties		File Confi	guration			Device Co	nfiguration	
De	scription	CHG	XI021	3000	<	>			CHO
т	ag No.	CHG	SAMPL	E123	<	>			СН
Ser	isor type		NISO	8.4					
Sen	sor wires	- CHG	2 W	ires	<	>			CHI
F	PV unit	CHG	de	рC					СН
PV up	oper range	СНБ	200.000	degC	<				СН
PV lo	wer range	Child	0.000	degC		Ĺ			
PV	damping	CHG	0.500	Sec	<	>		Sec	СН
Burr	iout mode	CHG	Nor	пе	<	>			CH
Wire	resistance	CHG	5.000	Ohms	<	>		Ohms	СН
A	O type	CHG	0 to 2	0 mA	<	>			СН
AO u	pper range		20.000	mA					
AO lo	wer range	- CHG	4.000	mA	<	>			CHI

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

Exit	Page		Read File	Write Fi	e		Upload	Downloa	d
	1		Compare	All Copy	<<	,	> All Copy	Compare	2
Pro	perties		File Confi	iguration			Device Cor	nfiguration	
Des	cription	CHG	XI021	3000	<	>			0
Та	ıg No.	CHG	SAMPL	E123	<) >	SAMP	LE123	0
			(
Sen	sor type	- CHG	Ni50	18.4	_		NISC)8.4	- 01
Sens	ior wires		2 W	ires	<	>	2 W	fires	
P	V unit	CHG	de	gC			de	gC	o
PV up	per range	CHG	200.000	degC		,	200.000	degC	
PV los	ver range	- CHG	0.000	degC	-		0.000	degC	0
PV o	gniqmet	CHG	0.500	Sec	<	>	0.000	Sec	O
Burn	out mode	CHG	No	ne	<) >	No	ne	0
Wire r	esistance	CHG	5.000	Ohms	<) >	5.000	Ohms	0
					-		1		
AC	0 type	CHG	0 to 2	:0 mA	<	>	0 to 2	0 mA	0
AO up	per range	CHG	20.000	mA	- <	>	20.000	mA	
AO lo	wer range	chia	4.000	mA	-		0.000	mA	G

(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			Jpload	Download	1
LAN	1		Compare	All Copy <	<) >>>	All Copy	Compare	
Pr	operties		File Conf	iguration			Device Config	uration	
De	scription	CHG	XI021	3000	<	>			CH
т	ag No.	CHG	SAMP	LE123	<	>	SAMPLE1	23	0
Ser	nsor type		NI5)8.4			N/508.4	4	
Sen	isor wires	- CHG	2 W	/ires	<	>	2 Wire	s	C+
F	PV unit	CHG	de	gC			degC		СН
PV up	oper range	СНБ	200.000	degC			200.000	degC	Сн
PV lo	wer range		0.000	degC	<		0.000	degC	
PV	damping	CHG	0.500	Sec	<		0.000	Sec	Сн
Burn	nout mode	CHG	No	ne	<		None		Сн
Wire	resistance	CHG	5.000	Ohms	<	>	5.000	Ohms	СН
A	O type	CHG	0 to 2	0 mA	<	>	0 to 20 r	mA	СН
AO u	pper range		20.000	mA			20.000	mA	
AO k	ower range	CHG	4.000	mA	<		0.000	mA	0

(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 Fil	e		Upload	Downloa	d
Long	1		Compare	All Copy «	~)[;	>> All Copy	Compare	
Pro	perties		File Confi	guration			Device Conf	iguration	
Des	cription	CHG	XI021	3000	<	>			C
Та	ig No.	CHG	SAMPL	.E123	<	>	SAMPLE	123	C
Sens	or type	CHG	Ni50	18.4			NISOE	1.4	- 0
Sens	or wires		2 W	ires	<	>	2 Wir	es	
P	/ unit	CHG	de	gC			deg	с	Cł
PV up	per range	СНБ	200.000	degC			200.000	degC	
PV lov	ier range	- CHG	0.000	degC	<	>	0.000	degC	
PV c	lamping	CHG	0.500	Sec	<	>	0.500	Sec	C
Burns	out mode	CHG	No	ne	<	>	Non	e	C
Wire r	esistance	CHG	5.000	Ohms	<	>	5.000	Ohms	Cł
							DI .		
AC) type	CHG	0 to 2	0 mA	<	>	0 to 20	mA	0
AO up	per range	СНБ	20.000	mA		,	20.000	mA	- 0
AO los	ver range	CHG	4.000	mA	- <	^	4.000	mA	C.

(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.

Exit	Page		Read File	Write File	•		Upload	Download	ł
	1		Compare	All Copy <	<	>	> All Copy	Compare	
Pro	perties		File Confi	iguration			Device Con	figuration	
Des	cription	CHG	XI021	3000	<	>			CH
Та	g No.	CHG	SAMPI	LE123	<	>	SAMPLE T	AG NAME	CH
Sens	or type	CHG	NiSC)8.4			Ni50	8.4	0
Sens	or wires	cho	2 W	/ires	<	>	2 W	ires	
P	/ unit	CHG	de	gC			de	эC	CH
PV upp	ber range	СНБ	200.000	degC		>	200.000	degC	
PV low	ier range	- CHG	0.000	degC			0.000	degC	
PV d	lamping	CHG	0.500	Sec	<	>	0.500	Sec	CH
Burns	ut mode	CHG	No	ne	<	>	Nor	пе	Ch
Wire n	esistance	CHG	5.000	Ohms	<	>	5.000	Ohms	CH
AC	type	CHG	0 to 2	20 mA	<	>	0 to 2	0 mA	CH
AO up	per range	СНБ	20.000	mA			20.000	mA	CH
AO lov	ver range	CHG	4.000	mA	1	>	4.000	mA	CF

(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			
1			Compare	All Copy <	<) ,	> All Copy	Compare			
Properties			File Config	guration	Device Configuration						
Description Tag No.		CHG	XI021	<	>			CHG			
		CHG	SAMPL	<	>	> SAMPLE TAG NAME					
Sensor type			Ni50	8.4			N508.4				
Sensor type		CHG	2 W	<	,	2 Wires					
PV unit		СНС	dec			degC					
PV upper range			200.000	degC			200.000	degC	_		
PV lower range		- CHG	0.000	degC	<	>	0.000	degC	CHG		
PV damping		CHG	0.500 Sec		<	>	0.500 Sec		СН		
Burnout mode		CHG	None		<	>	None		СН		
Wire resistance		CHG	5.000	Ohms	<	>	5.000	Ohms	СН		
			, 		<		,	,			
AO type		CHG	0 to 2	0 to 20 mA		>	0 to 20 mA		CH		
AO upper range AO lower range		СНС	20.000	mA			20.000	mA	СНС		
		CHG	4.000	mA	<	>	4.000 m		- Сно		

7. DIAGNOSTICS

Click [Diagnostics] button to open the Diagnostics window as shown in Figure 19.

Figure 19. Diagnostics

M3LRCFG PC Configurator Ver1.0.7									_ _ X	
M3LR Configurator	Device Mode	СОМ		PC	Z/S	IRG	ORG		CFG	
Monitor	Device Status		BO	ADC		AFX	AOS		PV	
Diagnostics	PV	PV %			AO %			AO		Functions
Execute diagnostics	200	100			100		٦	20 -		Connect
Read additional status	_				_			- -		Upload
Master reset device	 160	80			80 			- 		Detailed Info
Additional Status	_									Analog Output
EEPROM SUM error (Basic)	_ 120—							_		One Step Cal
EEPROM SUM error (Calibration Data)	- 120-							-	i I	Trim DAC
EEPROM SUM error (Custom RTD)	-							12		
EEPROM SUM error (Summary)	80 —							-	:	Sensor Cal
EEPROM hardware error	-								1	
								8 -		Diagnostics
	40 —									Custom RTD
	_		_					-		
	o _		_					4 -		
	0 —		0		0)	-	4 –		
	40.21	2	0.11		20.	11		7.22		File
	degC	%			%			mA		Language
Close Diagnostics	PV Graph	PV	% Graph		AO %	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	set 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 (Calibration data)							
	EEPROM SUM error (Special Curve)							
	EEPROM SUM error (Summary)							
	EEPROM SUM hardware error							
Close Diagnostics		Close the window.						

8. LANGUAGE

Click [Language] button to open the Language window as shown in Figure 20. The user can select the display language of the M3LRCFG.

M3LRCFG PC Configurator Ver1.0.7									_ _ x	
M3LR Configurator	Device Mode	сом		PC	Z/S I		ORG	ORG		
Monitor	Device Status		BO	ADC		AFX	AOS		PV	
Language	PV	PV %			AO %			AO		Functions
Select language English	200	100			100			20 -		Connect
	_	80			80			- - -		Upload
	_ 160—							16		Detailed Info
	_									Analog Output
	_ 120—								-	One Step Cal
	-							- - 12-		Trim DAC
	_							12		
	80 — _							-		Sensor Cal
	_							- - - 8 -		Diagnostics
	40 -				20			-		Custom RTD
	_				_			-		
	0 —	20.10						- - 4 -		
	40.20				20.10			7.22		File
	degC	%			%		0 7.22 mA			Language
Close Language	PV Graph	PV % Graph			AO % Graph			AO Gra	ph	Exit

Figure 20. 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.