Model B3HU2 Universal Transmitter

PC CONFIGURATOR SOFTWARE Model: B3HU2CFG

Users Manual



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1. INSTALLING THE B3HU2CFG

1.1. PC REQUIREMENTS

The following PC performance is required for adequate operation of the B3HU2CFG.

PC	IBI	M PC compatible
OS	Wi	ndows 7 (32-bit / 64-bit)
	Wi	ndows 8.1 (32-bit / 64-bit)
	Wi	ndows 10 (32-bit / 64-bit)
	Th	e software may not operate adequately in certain conditions.
CPU	Μι	ist meet the relevant Windows' requirements.
Memory	Μι	ist meet the relevant Windows' requirements.
Network p	oort CC	DM port (RS-232-C) or USB port
One of the dedica	ated cables as listed b	elow is also required to connect the device to the PC.
Port	PC	Configurator Cable Model No.
RS-232-C	; HA	ART Modem Cable
USB	CC)P-HU

1.2. INSTALLING & DELETING THE PROGRAM

INSTALL

The program is provided as compressed archive delivered by M-System. Decompress the archive and execute 'setup.exe' to start up the B3HU2CFG installer program. Follow instructions on the Windows.

DELETE

Open Control Panel > Add/Remove Program. Select the B3HU2CFG from the program list and click Delete button.

1.3. STARTING UP THE B3HU2CFG

Open Program > M-SYSTEM > Configurator > B3HU2CFG to start up the B3HU2CFG. In order to use this program, the B3HU2 must be connected via a HART modem.

2. OPERATING THE B3HU2CFG PC CONFIGURATOR

Figure 1 shows the initial view of the B3HU2CFG PC Configurator window.

In order to enable the tools shown on the screen, the model B3HU2 Universal Temperature Transmitter must be connected to the PC via a HART modem.

B3HU2CFG PC Configurator Ver1.0.8												
	B3HU Configu	l2 rator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
	Monit	or	Device Status	MAL	CFG			AFX	AOS	NPV	PV	
Device Information			PV	F	PV %		Ter	rm.		AO		Functions
Sens	or type	Millivolt	1000-	100			100)		20		Connect
Sensor	serial no.	0	-				- 80-			- -		Diagnostics
Measure	ment type	Single	800—	{	30 —		-			- - 10		Detailed Device Info
Sensor wires		2 Wires	-		_			_		-01		Analog Output
PV	unit	mV	- 600—	- 60-			40	_				Trim DAC
PV rapide	Upper	1000			_			- - -		- 12 -		Sensor Cal
FVTalige	Lower	0	- 400	,	- 10					_		Custom TC
PV up	per limit	1100	- 400				0	_		-		Custom RTD
PV lov	ver limit	-100			_		-			8 -		Calib RTD
PV minir	num span	10	200		20 — —			-		- -		
PV da	amping	0			_		-4(-		Burst Mode
Burnout detection		OFF	0 —		0					4	i	Polling Address
CJC mode		CJC OFF	0.00).00		-40	.00		0.00)	File
Transfe	r function	LINEAR	mV		%		de	gC		mA		Language
			PV Graph	PV	% Graph	n L	Term	Graph		AO Gra	ph	Exit

Figure 1. Initial View

2.1 CONNECTING THE DEVICE (B3HU2)

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

Figure 2. Device Connection

B3HU2CFG PC Configurator Ver1.0.10										
B3HU2 Configurator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor	Device Status	MAL	CFG	CLD		AFX		NPV	PV	
Device Connection	PV	F	v %		Ter	m.		AO		Functions
COM port	1000	100			100			20		Connect
Communications Port (COM1)	_		_		80	_		-		Diagnostics
	800—	8	30 —			_		- 16		Detailed Device Info
Polling address 0	_		_			_		- 10 -		Analog Output
	- 600—	6	- 30		4N	-		-		Trim DAC
			_			-		- 17		Sensor Cal
Search device						_		- 12		Custom TC
	400	2	10 — —			-				Custom RTD
Connect device			-		U	_		8_		Calib RTD
Connect Bavics	200—	2	20 —			_				Special Curve
			_		-40	-		-		Burst Mode
Disconnect device	o		0					4		Polling Address
			1 00 _		-40	<u></u>		 		File
	mV		%		de		mA		Language	
Close Device Connection	PV Graph	PV 4	% Graph		Term	Graph		AO Gra	ph	Exit

[Polling address]	Specify the polling address of the device to be connected.						
[Search device]	Searches the connected devices among the ones whose polling address is already set.						
[Connect device]	Connects the device of which polling address is specified in the Device Address. Once the connection is established, the program uploads the device's configuration information and automatically calls up the Device Information view. The Device Information view is the base for various operations to configure the B3HU2.						
[Disconnect device]	Disconnects the currently connected device.						
[Close Device Connection]	Quits the Device Connection view.						

2.2 MONITORING TRENDS

Once the device is connected, the Device Information menu and the trend monitors appears on the screen. The user can configure various parameters of the B3HU2.

🗊 B3HU2CFG PC Configurator Ver1.0.8												
	B3HU Configue	2 rator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
	Monit	or	Device Status	MAL	CFG	CLD) AFX A		AOS	NPV	PV	
Device Information		PV	PV %			Ter	m.		AO		Functions	
Senso	or type	Туре К	500	1	.00		100			20		Connect
Sensor :	serial no.	0	_		_		- - 80 -			-		Diagnostics
Measure	ment type	Single	- 400	8	- 30 —			_		-		Detailed Device Info
Sensor wires		2 Wires		_				_		16		Analog Output
PV	unit	degC		ĥ	_ 30 _		<i>∕</i> 10	_		-		Trim DAC
	Upper	500	-		-		40	-		12_ 		Sensor Cal
PV range	Lower	0	-					-				Custom TC
PV upp	, per limit	1372	200	40-		п	-				Custom RTD	
PV low	ver limit	-180	_				U	U — _		- - 8		Calib RTD
PV minin	num span	50	100—	2	20 —			_				Special Curve
PV da	mping	0	_		_		-40			-		Burst Mode
Burnout	detection	ON	0		0					4		Polling Address
	mode	CJC ON	318.79	6	3.76		24.	24.84		14.20		File
Transfer	function	LINEAR	degC		%		degC			mA		Language
		J	PV Graph	PV <	% Graph		Term		AO Gra	ph	Exit	

Figure 3. Device Information

2.2.1 Communication Status

[Comm Status] summarizes the current communications status by lamps showing the communication status byte contents in the HART commands.

[COM] lamp	Blinks with the normal communications condition.
[PE] lamp	Red light turns on when the device detects Parity Error.
[OVE] lamp	Red light turns on when the device detects Overrun Error.
[FE] lamp	Red light turns on when the device detects Framing Error.
[SME] lamp	Red light turns on when the device detects Sum Check Error.
[BOE] lamp	Red light turns on when the device detects Buffer Over Flow Error.
[TME] lamp	Red light turns on when the device detects the communications time out.

2.2.2 Device Status

[Device Status] summarizes the current device status by lamps showing the device status byte contents in the HART commands.

[MAL] lamp	Red light turns on when malfunction(s) occur(s) in the device.
[CFG] lamp	Red light turns on when the device configuration is modified. This lamp can be turned off by [Reset configuration change flag] in the Diagnostics view.
[CLD] lamp	Always off.
[AFX] lamp	Red light turns on when the analog output entered in Fixed Output mode.
[AOS] lamp	Green light turns on when the analog output is diagnosed to be normal. Red light turns on when the output is saturated upscale or downscale.
[NPV] lamp	Always off.
[PV] lamp	Green light turns on when the sensor input is in the specified range. Red light turns on when it is out of the range.

2.2.3 Bargraph & Trend Graph

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

The graph scales can be modified except for the PV 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. The example below shows the trend graph for [Term Graph]. Use [Start] and [Stop] buttons to activate/deactivate trending, and click [Close Trend Graph] button to quit the graph view.



Figure 4. Trend Graph

2.3 DEVICE CONFIGURATION

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

[Sensor type]	Specifies the sensor type and number of extension wires. When a new sensor type is chosen, other default settings are automatically selected.
[Sensor serial no.]	Specifies a serial number for the sensor.
[PV unit]	Specifies the engineering unit for the PV. When this setting is changed, other related items such as [PV range], Upper/Lower Limits, PV Minimum Span are automatically shown in the new unit.
[Burnout detection]	Enables/disables the burnout function.
[CJC mode]	Enables/disables the cold junction compensation for thermocouple input. When the sensor type is not a thermocouple, this function is not available
[Transfer Function]	Enables/disables the Transfer Function, specifying either the output should be linear to the input signal or linearized to a custom curve data. Selecting this function without a pre-defined Special_Curve is defined as Error.

2.4 DEVICE DETAIL INFORMATION

In Figure 3, clicking [Detailed Device Info] button opens the [Detailed Device Information] menu as shown in Figure 5.

B3HU2CFG PC Configurator Ver1.0.8												
B3 Confi	HU2 Turator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME		
Mo	nitor	Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV		
Detailed Devi	Detailed Device Information		F	PV %		Ter	m.		AO		Functions	
Manufacture	M-System CO	500		.00		100		IC	20		Connect	
Device type	B3HU2	-		_		80	_		- -		Diagnostics	
Device identification	1002	- 400—	1	30 —			-		-		Detailed Device Info	
HART protocol revision	1 7			_			_		16		Analog Output	
Device revision	1		ĥ	- 30		40	_		-		Trim DAC	
Hardware revision	0	-				40	_	12			Sensor Cal	
Software revision	1 (1.0.15)	_		_					12-		Custom TC	
Final assembly number	0	200—	2	40 — -		o			- - -		Custom RTD	
Tag	SAMPLE 1										Calib RTD	
Descriptor	SAMPLE DESCRIPT	100—	20 -				_				Special Curve	
Date code	2014/02/06			_	11	-40					Burst Mode	
Long Tag BEHU2	Sample 1 Long Tag	0		0					4		Polling Address	
Message H			6	3 78		24	92		1/1 2	1	File	
		degC	%			degC			mA		Language	
Close Detailed D	evice Information	PV Graph	PV <	% Graph		Term	Graph		AO Gra	ph	Exit	

Figure 5. Detailed Device Information

The menu shows the following items: Manufacturer, Device type, Device identification, HART protocol revision, Device revision, Hardware revision, Software revision, Final assembly number, Tag, Descriptor, Date code, Long Tag and Message.

[Tag] You can enter a tag name and descriptor name. Date is automatically set at the data modified date.

[Long Tag] You can set a long tag.

[Message] You can enter a memo in this area.

[Close Detailed Device Information] Quits the view.

2.5 DIAGNOSTICS

Click [Diagnostics] button to open the Diagnostics view as shown in Figure 6.

Figure 6. Diagnostics

B3HU2CFG PC Configurator Ver1.0.8													
B3HU2 Copfigurator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME				
Monitor	Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV				
Diagnostics	PV	F	∾ %		Ter	·m.		AO		Functions			
Execute diagnostics	500	1	.00		100)	IC	20		Connect			
Read additional status	_		_		80	_		- - -]	Diagnostics			
Reset configuration changed flag	_ 400—	6				-				Detailed Device Info			
Additional Status	_		_			_		- 16 -		Analog Output			
EEPROM Error	200	G			40	-			-	Trim DAC			
Flash ROM Error	-		- 0,		40	_		-		Sensor Cal			
ADC Error	_					_	12-		Custom TC				
PV Out of Range	200—	4	40 —			-		_		Custom RTD			
Sensor1 Burnout	_		_		0	-							
	_		-			-		8 –					
	100—	2	20 —			-				Special Curve			
	1				-40			-		Burst Mode			
					-40			- 4		Polling Address			
	0		<u> </u>			Q							
	318.93	6	3.79		24.	94		14.2	1	File			
	degC		%		de	gC		mΑ		Language			
Close Diagnostics	PV Graph	PV 9	‰ Grap⊦		Term	Graph		AO Gra	ph	Exit			

[Execute diagnostics]

Activates the diagnostics program and the results are displayed under the Additional Status.

The Additional Status section shows each Additional Status item and its status: green in normal status, while red in error.

[Read additional status] Calls up the current contents of Additional Status.

[Reset configuration changed flag] Turns off the CFG lamp in Device Status.

[Close Diagnostics] Quits the view.

2.6 FIXED ANALOG OUTPUT

Click [Analog Output] button to open the Analog Output view as shown in Figure 7.

Figure 7. Analog Output

B3HU2CFG PC Configurator Ver1.0.8												
	B3HU2 Configurator			сом	PE	OVE	FE	SME BOE T		TME		
	Monitor		Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV	
Analog Output			PV	F	∾ %		Ter	m.		AO		Functions
Se	et AO for current PV output		500		.00		100)	IC	20		Connect
:	Set AO for specified value		_		_		80	_		-		Diagnostics
	Exit fixed AO mode		400—	{	 30 —			-				Detailed Device Info
					_							Analog Output
	AO saturation			20		40	-				Trim DAC	
High	21.5	mA			- UL		40	_				Sensor Cal
Low	3.8	mA						_		12- -		Custom TC
			200	2	40							Custom RTD
	AO burnout		-		_		-		Calib RTD			
Burnout	23	mA	- 100-		_ 20 _			Ξ		- 8		Special Curve
										- - -		Burst Mode
							-40		\ _	-		Polling Address
				0								
		318.95	6	3.78		24.	96		14.2	1	File	
<i>G</i>		degC		%		de	gC		mA		Language	
Cl	ose Analog Output		PV Graph	PV S	% Grap⊢		Term	Graph		AO Gra	ph	Exit

[Set AO for current PV output] [Set AO for specified value] [Exit fixed AO mode] The output current is held at the current value.

You can set a specific value to fix the output.

Cancel the fixed output mode to return the device into normal output mode. It is recommended to fix the analog output signal while those parameters affecting the output signal are configured, and then to reset the device to normal mode after the setting is done.

[AO saturation] Sets the limit of analog output proportional to the PV.

[AO burnout] Sets the analog output value at burnout.

[Close Analog Output] Quits the view.

2.7 DAC TRIMMING

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

Figure 8. Trim DAC

B3HU2CFG PC Configurator Ver1.0.8										
B3HU2 Configurator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor	Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV	
Trim DAC	PV	F	∾ %		Ter	·m.		AO		Functions
Enter 4mA trim mode	500	1	.00		100)	IC	20		Connect
Enter 20mA trim mode	_		_		80	-		- - -		Diagnostics
Trim by actual measured value	- 400-	6	- 30 —			-				Detailed Device Info
Clear trim DAC data			_			_		- 16 -		Analog Output
		۱ ۱			40	-				Trim DAC
	-		-		40	_				Sensor Cal
						-	12-			Custom TC
	200—	2	40 — _			-		-	-	Custom RTD
	-		-		0	-		-		Calib RTD
	100-		 20			_		0 - -		Special Curve
	_				-40			-		Burst Mode
	n _	_	0	1	-10	7		4		Polling Address
	210.00				0.4		1	14.0		
	deaC %				24. de	94 qC		14.2 mA	J	
Close Trim DAC	PV Graph	PV <	% Graph		Term	Graph		AO Gra	ph	Exit

2.7.1 Enter 4mA Trim Mode

- (1) Click [Enter 4mA trim mode] button. The device outputs a fixed 4mA signal.
- (2) Measure the actual output current at the receiving instrument to which the device output should be matched.
- (3) Click [Trim by actual measured value] button to set the measured value. The actual value can be set from 3.8mA up to 4.2mA.
- (4) Repeat setting [Trim by actual measured value] until the measured output shows 4mA.

2.7.2 Enter 20mA Trim Mode

- (1) Click [Enter 20mA trim mode] button. The device outputs a fixed 20mA signal.
- (2) Measure the actual output current at the receiving instrument to which the device output should be matched.
- (3) Click [Trim by actual measured value] button to set the measured value. The actual value can be set from 19.8mA up to 20.2mA.
- (4) Repeat setting [Trim by actual measured value] until the measured output shows 20mA.

2.7.3 Resetting to the Default

Click [Clear trim DAC data] button to return the device to the factory default trimming values.

[Close Trim DAC] button quits the view.

2.8 SENSOR CALIBRATION

The input sensor can be calibrated.

Calibration points can be specified to any point within the measuring range. The mV and thermocouple inputs are calibrated against the measured voltage; while the resistance and RTD input is against the measured resistance. Errors caused by extension wire resistance for 2-wire RTDs and by imbalance in that for 3-wire RTDs can be calibrated by the Zero adjustment.

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

Figure 9. Sensor Calibration

🗊 взни2с	FG PC Configurator	Ver1.0.8										
	B3HU2 Configurator		Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor			Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV	
s	ensor Calibration		PV	PV %			Ter	m.		AO		Functions
	Select sensor		500		.00		100		IC	20		Connect
	Calibrating Sensor1		_		_		80	_		- - -		Diagnostics
	Read calibration data		400—		30 —			-	Τ_	-		Detailed Device Info
d	ear sensor calibration data				_			_		- 16 -		Analog Output
	Zero calibration		- 300—	6	- 60		4N	_		- 		Trim DAC
	Span calibration							_		- 12_		Sensor Cal
PV	318.980286	degC	-		-			-		-		Custom TC
Zero point	0.0000	mV	200-				n	-		-		Custom RTD
Zero value	0.0000	m∀						=		- - 8		Calib RTD
Gain	1.0000		100	2	20 — _			_				Special Curve
		1	-		-	10	-40			-		Burst Mode
		0							4		Polling Address	
			318.98	6	3.80		25.	00		14.2	1	File
			degC		%		de	gC		mA		Language
Clos	e Sensor Calibrati	on	PV Graph	PV 4	% Graph		Term	Graph		AO Gra	ph	Exit

The present measured value is indicated in [PV]. Refer to this value when calibrating the sensor. It takes approx. 5 seconds for the calibration result affects the measured value on the display.

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

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

[Read calibration data] calls up and display the present calibrated Zero point, Zero value and Gain.

Click [Clear Sensor Calibration Data] button to return the device to the factory default status.

2.9 CUSTOM TC

The B3HU2 supports the user-specific thermocouple table function. In order to use a user-specific table, the data in text format must be defined and registered.

The file format is as following.

Define the minimum temperature value in Celsius at Minimum TC Temperature (in °C, -300 to 5000, integer).

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

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

/*	Custom ⁻	TC Table Definition	
/*	Ti=f(Xi)	(0<=i <size)< td=""><td></td></size)<>	
/*	Temp	perature Step (1 to 50 c	degC)
/*	-10<=	=X(i)<=100mV	
/*	X(i)<	X(i+1)	
/*	2<=5	Size<=512	
/**	*******	******	*****
Mi	nimum TC	CTemperature=0	<- Minimum temperature T0 (-300 to 5000°C, integer)
Ste	ep=5		<- Temperature step (1 to 50°C, integer)
{			
-8.	2568		<- Voltage value for T0 (-10 to 100mV, decimal point available)
:			
75	.3333		<- Voltage value for Tmax (-10 to 100mV, decimal point available)
}			
N I -			

Note: Each line must not be followed by characters such as space, etc.

Once the data file is ready, register the file on the B3HU2.

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

Figure 10. Custom TC

伊 B3HU2CFG PC Con	figurator	Ver1.0.8										
B3HU Configu	B3HU2 Configurator		Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor			Device Status	MAL	CFG	CLD		AOS	NPV	ΡV		
Custom	TC		PV	F	∾ %		Ter	m.		AO		Functions
Read table fro	m device		500		.00		100			20		Connect
Write table to) device		-		_		80	_		- - -		Diagnostics
Write table	to file		- 400—	8	- 30 —			_		-		Detailed Device Info
Read table fi	rom file				_					- 16 -		Analog Output
Display Custom	TC graph		300-	- 60 -			- - 40-			-		Trim DAC
Custom TC Tab	le Conte	ents	- 11				-			- 12		Sensor Cal
Min temperature	-273	degC	-		-			-		-		Custom TC
Max temperature	2282	degC	200-		+U -		n			-		Custom RTD
Temperature step	5	degC						-	8 –			Calib RTD
Table size	512	Max size	100—	2	20 —		_					Special Curve
512		512			-	11	-40					Burst Mode
		0		0					4		Polling Address	
				63.79			25.02			14.2	1	File
					%		de	gC		mA		Language
Close Cust	om TC		PV Graph	PV 4	% Graph		Term	Graph		AO Gra	ph	Exit

[Read table from file]	The program uploads a file stored in the PC. When uploaded, the file contents summery is indicated under Custom TC Table Contents. The I/O characteristic data longer than 1000 points are ignored.
[Display Custom TC graph]	The I/O characteristics data can be shown in a graph.
[Write table to file]	The program saves the currently displayed I/O characteristics data to a file.
[Write table to device]	The program downloads the currently displayed I/O characteristics to the B3HU2. If 'TC Spec' has been already selected before this setting is done, you can not download a particular data file.
[Read table from device]	The program uploads the I/O characteristics cable registered in the B3HU2. The values of 2 points are written as factory default.
[Close Custom TC]	Quits the view.

2.10 CUSTOM RTD

The B3HU2 supports the user-specific RTD table function. In order to use a user-specific table, the data in text format must be defined and registered.

The file format is as following.

Define the minimum temperature value in Celsius at Minimum RTD Temperature (in °C, -300 to 5000, integer).

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

Describe the characteristics data within { }. Data must be entered in ohms (0 to 4000 ohms). Up to 512 points can be specified.

/* Custom RTD Table Definition	
/* Ti=f(Xi) (0<=i <size)< td=""><td></td></size)<>	
/* Temperature Step (1 to 50 c	degC)
/* 0 <x(i)<=4000 ohms<="" td=""><td></td></x(i)<=4000>	
/* X(i) <x(i+1)< td=""><td></td></x(i+1)<>	
/* 2<=Size<=512	
/**************************************	*********
Minimum RTD Temperature=-200	<- Minimum temperature T0 (-300 to 5000°C, integer)
Step=10	<- Temperature step (°C)
{	
12.3456	<- Resistance value for T0 (0 to 4000 ohms, decimal point available)
:	
777.7777	<- Resistance for Tmax (0 to 4000 ohms, decimal point available)
}	

Note: Each line must not be followed by characters such as space, etc.

Once the data file is ready, register the file on the B3HU2.

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

Figure 11. Custom RTD

伊 B3HU2CFG PC Con	figurator	Ver1.0.8										
B3HU2 Configurator			Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor			Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV	
Custom	RTD		PV	F	∾ %		Ter	m.		AO		Functions
Read table fro	m device		500		.00		100		IC	20		Connect
Write table to	o device		_		_		80	_		- -		Diagnostics
Write table	to file		- 400—	8	- 30 —			_		-		Detailed Device Info
Read table fi	rom file				_					16		Analog Output
Display Custom I	RTD graph		- 300_				- - 40_			-		Trim DAC
Custom RTD Tak	ole Conte	ents	-		-		40	-		- - 10		Sensor Cal
Min temperature	-50	degC	-		-			-		- 12		Custom TC
Max temperature	1725	degC	200-	2	+U -		n	-		-		Custom RTD
Temperature step	5	degC					0	-	8 -			Calib RTD
Table size	356	Max size	100—		20 —							Special Curve
	512					11	-40					Burst Mode
			0							4		Polling Address
				63.80			25.04			14.2	1	File
					%		de		mA		Language	
Close Custo	om RTD		PV Graph	PV 4	% Graph		Term	Graph		AO Gra	ph	Exit

[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. The I/O characteristic data longer than 500 points are ignored.
[Display Custom RTD graph] The I/O characteristics data can be shown in a graph.
[Write table to file]	The program saves the currently displayed I/O characteristics data to a file.
[Write table to device]	The program downloads the currently displayed I/O characteristics to the B3HU2. If 'RTD Spec' has been already selected before this setting is done, you can not download a particular data file.
[Read table from device]	The program uploads the I/O characteristics cable registered in the B3HU2. The values of 2 points are written as factory default.
[Close Custom RTD]	Quits the view.

2.11 CALIBRATED RTD SETTING

RTD table of B3HU2 can be specified with Callendar-Van Dusen approximation formula.

Click [Calib RTD] button to open Calibrated RTD view, in which you can set the RTD table. Then the data stored in the device are shown (see Figure 12). When you choose [Calibrated RTD] in [Sensor type] in Figure 3, these data are available.

🕖 B3HU2CFG F	PC Configurator	Ver1.0.9										
Cor	B3HU2		Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor			Device Status	MAL CFG CLE				AFX	AOS	NPV	PV	
Calibrated RTD		PV	PV %			Ter	rm.		AO		Functions	
A	0.0039083		1000-		.00		100)	IC	20		Connect
В	-5.775e-007				_		80	_		- -		Diagnostics
с	-4.18301e-012		800	{	 30			_		-		Detailed Device Info
RO	100				_			_		- 16		Analog Output
Sensor lower limit	-200	degC		1			<u>ار</u>	-		-		Trim DAC
Sensor upper limit	850	degC		-			-			- - 10		Sensor Cal
Callendar-	, Van Dusen Coefficient	t	- 400	_			-		- 12		Custom TC	
			-	2	40 — —			-		- -		Custom RTD
			-		_		U	-		- g		Calib RTD
				:	20 —			_		- 0		Special Curve
			- 0 -		_	-1	-41			- - -		Burst Mode
			-100 -	-	0					4		Polling Address
				11.00			25	22 -		5.82		File
				%			degC		32 3.02 gC mA			Language
Close (Calibrated RTD)	PV Graph	PV 4	% Graph		Term	Graph		AO Gra	ph	Exit

Figure 12. Calibrated RTD

Click [Callender-Van Dusen Coefficient] button in order to set coefficients.

Callender-Van Dusen formula:

 $T < 0^{\circ}C: \quad R_{T} = R_{0} \left\{ 1 + AT + BT^{2} - (T - 100) \ CT^{3} \right\}$

 $T >= 0^{\circ}C$: $R_{T} = R_{0} (1 + AT + BT^{2})$

Click [Close Calibrated RTD] button to quit the view.

2.12 LINEARIZATION TABLE SETTING

The B3HU2 supports the user-specific linearization table function (Special_Curve). In order to use the Special_Curve, the data in text format must be defined and registered.

The file format is as following.

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

```
/* Linearization Table (Special Curve) Definition
  Yi=f(Xi) (0<=i<Size)
/*
/*
     -15<=X(i),Y(i)<=115%
/*
     X(i) < X(i+1)
/*
     2<=Size<=128
{
-10.56,-8.1234 <-- The minimum X and Y values (-15 to 115%, decimal point available)
:
100.00,96.5432 <-- The maximum X and Y values (-15 to 115%, decimal point available)
}
```

 $\ensuremath{\textit{Note}}\xspace$ Each line must not be followed by characters such as space, etc.

Once the data file is ready, register the file on the B3HU2.

Click [Special Curve] button to open the Special Curve as shown in Figure 13.

B3HU2CFG PC Con	figurator	Ver1.0.8										
B3HU Configu	B3HU2 Configurator		Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor			Device Status	MAL	CFG	CLD		AOS	NPV	PV		
Special C	Curve		PV	F	°V %		Ter	m.		AO		Functions
Read table fro	m device		500		.00		100	' -	IC	20		Connect
Write table to	o device		_		_		80	_		-		Diagnostics
Write table	to file		- 400—	{				-		-		Detailed Device Info
Read table fi	rom file		-	-				_		16		Analog Output
Display Special C	urve graph		200	- 60 -			40	-		-		Trim DAC
Special Curve Ta	able Cont	tents	- 300		- 00		40	_				Sensor Cal
Minimum value	-14.5	%	-					-		- 12		Custom TC
Maximum value	112.95	%	200	2	40 — _			-		- - -		Custom RTD
Table size	126	Max size	-		-		U	-		- 0		Calib RTD
	120	128	100—	:	20 —			_		-		Special Curve
					_		-40			- - -		Burst Mode
										4		Polling Address
					3 80		25	<u> </u>		14-2		File
					%		degC		2 14.21			Language
Close Speci	al Curve		PV Graph	PV 4	% Graph	n	Term	Graph		AO Gra	ph	Exit

Figure 13. Special Curve

[Read table from file]	The program uploads a file stored in the PC. When uploaded, the file contents summery is indicated under Special Curve Table Contents.							
[Display Special Curve grap	h] The I/O characteristics data can be shown in a graph.							
[Write table to file]	The program saves the currently displayed I/O characteristics data to a file.							
[Write table to device]	The program downloads the currently displayed I/O characteristics to the B3HU2. When the downloading is successfully complete, Status under Special Curve Table Contents shows 'Configured.' Then the option 'Special_Curve' become available to choose among the Transfer Function selections. If 'Special_Curve' has been already selected before this setting is done, you can not download a particular data file.							
[Read table from device] The program uploads the I/O characteristics cable registered in the B3HU2. In of file registered, Status under Special Curve Table Contents shows 'Non cor								
[Close Special Curve]	Quits the view.							

2.13 BURST MODE

Click [Burst Mode] button to open the Burst Mode Control view as shown in Figure 14. B3HU2CFG is compatible with HART 6 burst mode.

B3HU2CFG PC Configurator Ver1.0.8										
B3HU2 Configurator	Comm Status	сом	PE	OVE	FE		SME	BOE	TME	
Monitor	Device Status	MAL	CFG	CLD		AFX	AOS	NPV	ΡV	
Burst Mode Control	PV	F	v %		Ter	rm.		AO		Functions
Response Message in Burst Mode	500	1	.00		100	, 	Г	20		Connect
CMD1: PV CMD2: Loop Current Percent			_			-		-		Diagnostics
CMD2: coop current, Percent CMD3: Dynamic Variable, Loop Current	- 400-	4			80	-		-		Detailed Device Info
Burst Mode OFF	-					_		- 16 		Analog Output
Burst Mode ON			- 30 -		40	_		-		Trim DAC
	-	, í	-		40	_	12 -			Sensor Cal
			_			_				Custom TC
	200—	4	40 —			-		-		Custom RTD
			_		0					Calib RTD
	- 100—		_ 20 _			-		8		Special Curve
	-		-					-		Burst Mode
					-40	PEL				Polling Address
	0 —		0					4		
	319.04	63.81			25.	.10	14.21		1	File
degC					degC			mΑ		Language
Close Burst Mode Control	PV Graph	PV 4	% Grap⊦		Term	Graph		AO Gra	ph	Exit

Figure 14. Burst Mode Control

Choose a command in [Response Message in Burst Mode].

[Burst Mode ON] Enables the burst mode as specified in the menu.

[Burst Mode OFF] Disables the burst mode.

[Close Burst Mode Control] Quits the Burst Mode Control view.

2.14 POLLING ADDRESS

Click [Polling Address] button to open the Device Address view as shown in Figure 15.

B3HU2CFG PC Configurator Ver1.0.8											
B3 Confi	HU2 Jurator	Comm Status	COM PE OVE		OVE	FE	FE		SME BOE -		
Moi	Device Status	MAL	CFG	CLD		AFX	AOS	NPV	PV		
Polling	Address	PV	F	PV %		Ter	rm.		AO		Functions
Polling address	0	500		.00		100	100		20		Connect
Number of preambles	5	_	_			80	_		- - -		Diagnostics
Write poll	Write polling address			30 —		-					Detailed Device Info
				_			_		- 16		Analog Output
		-				- - 40_					Trim DAC
		- 300				40			-		Sensor Cal
						_			12-		Custom TC
		200—	40 — - -								Custom RTD
		-				0		-		Calib RTD	
		- 100-		- 20 —			3		- 8 -		Special Curve
				_					-		Burst Mode
		<u> </u>				-40	7	. –	-		Polling Address
		U —		0					4		
		319.09	6	3.81		25.10			14.2	1	File
		degC	%			degC			mΑ		Language
Close Polli	ing Address	PV Graph	PV ⁴	% Graph	n	Term	Graph		AO Gra	ph	Exit

Figure 15. Device Address

[Polling Address]	Shows the polling address of currently connected device.
[Number of preambles]	Shows the required number of preambles for HART communications. Cannot be changed. $% \left({{\left({{{\left({{{\left({{{\left({{{\left({{{c}}} \right)}} \right.}\right.}\right.}} \right)}_{0,2}} \right)}_{0,2}} \right)} \right)$
[Write polling address]	Write to the device a new polling address. Selectable addresses are from 0 to 63. The device operates in multi-drop mode when addresses other than 0 is selected. The output current is fixed to $4mA$.
[Close Polling Address]	Quits the Device Address view.

2.15 FILE MANAGEMENT

The B3HU2'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 view as shown in Figure 16.

While this view is active, the device is disconnected.

The view is separated in two areas: '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 B3HU2 device.

The B3HU2CFG's configuration views consist of two pages. Click [Page] button to switch between pages. The second page appears as follows (Figure 17).

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

Note:

The validity of the selected range values is not verified in this view. Please make sure to set them according to the described specifications. Also values read from files are not verified.

Custom TC, Custom RTD or Linearization Table data are not handled in this view but in each specific function view.

Figure 16. File, 1st Page

B3HU2CFG PC Configurator Ver1.0.8													
5.	Page		Read File		Write File			Upload		Downloa	d		
Exit	1		Compare		All Copy <	<		>> All Copy	Compare		•		
Prop	erties		File Confi	iguratio	n		Device Configuration						
Ta	ig	СНБ				<	>				СНБ		
Descr	iptor	СНБ				<	>				СНБ		
Da	te	СНБ				<	>				СНБ		
Long	Tag	СНБ				<	>			СНБ			
Mess	age	СНБ				<					СНБ		
Device ide	ntification	CHG		<		>				CHG			
Sensor	r type												
Measurem	nent type	CHG				<	>				СНБ		
Sensor	wires												
PV ر	unit	СНБ									СНБ		
PV uppe	r range	auc				<	>						
PV lowe	r range	Спа											
PV da	mping	СНБ			Sec	<	>			Sec	СНБ		
Transfer	function	СНБ				<	>				СНБ		
Burnout o	letection	CHG				<	>				СНБ		

Figure 17. File, 2nd Page

🗊 B3HU2CFG I	B3HU2CFG PC Configurator Ver1.0.8												
Evit	Page		Read File		Write File			Upload	Download		I		
EXIL	2		Compare		All Copy <<			>> All Copy	Compare				
Prop	erties		File Confi	iguratio	n		Device Configuration						
CJC mode CHG					<	>		СНБ					
Sensor s	serial No.	СНБ					>	СН					
Final asser	nbly number	СНБ	<				>	Снд					
Í.			, 					,					
AO burn	out value	СНБ			mA	<	>			mA	СНБ		
AO saturatio	on high value	СНБ			mA	<	>			mA	СНБ		
AO saturati	on low value	СНБ			mA	<	>			mA	СНБ		

2.15.1 TRANSFERRING DATA TO/FROM DEVICE

Click [Upload] button to connect to the B3HU2 device, to read out its configuration data and to show it in [Device Configuration] area on the screen (Figure 18).

Click [Download] button to connect and write the configuration data in [Device Configuration] area to the B3HU2 device.

Connection to the device is automatically severed after each uploading or downloading, to allow it removed.

Note:

[Device identification] is an identifier inherent to each device. It cannot be changed or downloaded to a device.

Figure 18. Data Uploaded

IV B3HU2CFG PC Configurator Ver1.0.8													
Evilt	Page		Read File		Write File)	Upload	Download		ł		
EXIC	1		Compare		All Copy <<			>> All Copy		Compare			
Prop	erties		File Conf	iguratio	n								
Ta	ag	СНБ		<			>	SAMPLE 1			СНБ		
Desci	riptor	СНБ			<		>	SAMPLE DESCRIPT			СНБ		
Da	ite	СНБ				<	>	2014/0	02/06		СНБ		
Long Tag					<	>	BEHU2 Sampl	СНБ					
Message CHG								VORLD !!		СНБ			
Device identification CHG					<	>	100)2		CHG			
Senso	r type							Туре К					
Measuren	nent type	CHG		<			>	Single			СНБ		
Senso	r wires							2 Wires					
PV	unit	СНБ						deç	gС		СНБ		
PV uppe	r range	CHC				<	>	500		degC			
PV lowe	r range	Спа						0		degC			
PV da	mping	СНБ			Sec	<	>	0		Sec	СНБ		
Transfer	function	СНБ			<		>	LINEAR			СНБ		
Burnout (detection	CHG				<	>	10	N		СНБ		

2.15.2 READING/WRITING FILES

Click [Read File] button to read the configuration data from a specified file and to show it in [File Configuration] area on the screen (Figure 19).

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

B3HU2CFG PC Configurator Ver1.0.8													
Evit	Page		Read File		Write File	•		Upload		Downloa	d		
EXIL	1		Compare		All Copy <	<		>> All Copy		Compare			
Prop	erties		File Confi	iguration			Device Configuration						
Ta	ag	СНБ	SAMPI	LE 1		<	>			СНБ			
Desc	riptor	СНБ	SAMPLE D	ESCRIF	т	<	>				СНБ		
Da	Date CHG 2014/			02/06		<	>				СНБ		
Long Tag CHG BEHU2 S			BEHU2 Sample	e 1 Long	Tag	<	>				CHG		
Mes	sage	СНБ	HELLO W	IORLD !!		<	>				СНБ		
Device ide	ntification	CHG	100)2		<	>				CHG		
Senso	r type		Туре К				>						
Measuren	nent type	CHG	Single			<					СНБ		
Sensor	r wires		2 Wi										
PV	unit	СНБ	deg	gС							СНБ		
PV uppe	r range	auc	500		degC	<	>						
PV lowe	r range	Спа	0		degC								
PV da	mping	СНБ	0		Sec	<	>			Sec	СНБ		
Transfer	function	СНБ	SPECIAL_CURVE			<	>				СНБ		
Burnout (detection	СНБ	OF	F		<	>				СНБ		

Figure 19. File Read Out

2.15.3 MODIFYING PARAMETERS

Click [CHG] button at the side of each field to modify the parameter. The field 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.

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 areas. Copied fields will be highlighted in light yellow background color.

[Date] is automatically set to the day when [Tag] and/or [Descriptor] are changed. [Date] can be modifiable.

Only capital letters and figures used as [Tag], [Descriptor] and [Message] Small letters will be automatically converted to capital letters.

[Device identification] is an identifier inherent to each device. It cannot be copied from [File Configuration] to [Device Configuration] area.

B3HU2CFG PC Configurator Ver1.0.8													
Euth	Page		Read File		Write File	•		Upload		Download	t		
Exit	1		Compare		All Copy <<			>> All Copy		Compare			
Properties			File Configuration					Device Configuration					
Ta	ag	СНБ	SAMPI	LE 2		<	>	SAMP	LE 1		СНБ		
Desci	riptor	СНБ	SAMPLE D	ESCRIP	т	<	>	SAMPLE D	ESCRI	РТ	СНБ		
Da	ite	СНБ	2014/0	02/10		<	>	2014/0	02/06		СНБ		
Long Tag CHG BEHU2 S			BEHU2 Sample	e 1 Long	Tag	<	>	BEHU2 Sample 1 Long Tag			СНБ		
Mes	sage	CHG HELLO W				<	>	TEST			СНБ		
Device ide	Device identification CHG 100			12		<	>	100)2		CHG		
Senso	r type		Туре	еK		>	Туре К			СНБ			
Measuren	nent type	CHG	ig Single				<	Single					
Senso	r wires		2 Wi	res				2 Wires					
PV	unit	СНБ	deg	gС				deç	gС		СНБ		
PV uppe	r range	auc	600		degC	<	>	600		degC	CUC .		
PV lowe	r range		-200		degC			-200		degC			
PV da	mping	СНБ	0 Sec		Sec	<	>	0		Sec	СНБ		
Transfer	function	СНБ	SPECIAL_CURVE			<	>	SPECIAL_CURVE			СНБ		
Burnout	detection	СНБ	OF	F		<	>	> or			СНБ		
			,					,					

Figure 20. Parameters Modified

2.15.4 COMPARING FILE TO DEVICE

You can compare the configuration data in [File Configuration] area and [Device Configuration] area.

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

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

B3HU2CFG PC Configurator Ver1.0.8												
Evit	Page		Read File		Write File	•		Upload	Download			
EXIL	1		Compare	All Copy <<			;	>> All Copy	Compare		,	
Prop	erties		File Confi	guratio	n		Device Configuration					
Ta	ig	СНБ	SAMPL	.E 1		<	>	SAMPI	.E 2		СНБ	
Descr	iptor	СНБ	SAMPLE DI	ESCRIF	νт	<	>	SAMPLE D	ESCRI	PT	СНБ	
Da	te	СНБ	2014/0	2/06		<	>	2014/0)2/06		СНБ	
Long	Tag	ag CHG BEHU2 Sampl			Tag	<	>	BEHU2 Sample	≥ 1 Long	Tag	СНБ	
Mess	age	СНБ	HELLO W	ORLD !!		<	>	HELLO WORLD !!			СНБ	
Device ide	ntification	СНБ	100	12		<	>	100)02		CHG	
Senso	r type		Туре	уре К				Туре К				
Measuren	ent type	CHG	Sing	le		<	>	Single			СНБ	
Sensor	' wires		2 Wi	ires				2 Wires				
PV t	unit	СНБ	deg	jC				deg	JC		СНБ	
PV uppe	r range	auc	500		degC	<	>	600		degC		
PV lowe	r range	Cha	0		degC			-200		degC		
PV da	mping	СНБ	0	0		<	>	0		Sec	СНБ	
Transfer	function	СНБ	SPECIAL_		≣	<	>	LINEAR			СНБ	
Burnout o	letection	СНБ	OF	F		<	>	40	N		СНБ	

Figure 21. Parameters Compared