

Field Communication Software CommStaff Model: CFS100

Instruction Manual (Advanced Temperature Transmitter Edition)



Yamatake Corporation

NOTICE

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Instruction Manuals

Safety-related precautions, general operating procedures, and other general information related to CommStaff can be found in the Common Edition manual (No. CM2-CFS100-2001). For information on the operation of a device used with CommStaff, consult the manual for that particular device.

The Common Edition manual for CommStaff, as well as the manuals for individual devices, are included in electronic form (as PDF files) on the CommStaff installation CD-ROM

Devices Covered by This Manual

This manual pertains to ThermoPLUS Smart Temperature Transmitter with the model number pattern ATT6 □ / 7 □.

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Chapter 1. Overview

1-1. Introduction

CommStaff is a tool for communicating with Yamatake smart field devices (DSTJ and others) that enables configuration of device settings. It is a software product that operates on Windows PCs. CommStaff communicates with Yamatake smart field devices using a USB interface connected to a Windows PC, which is then connected by communications cable to the USB port of a device.

CommStaff supports Yamatake's proprietary SFN/DE communication protocol *2 as well as the HART communication protocol.

*1. HART is a registered trademark of the HART Communication Foundation.

*2. DE output is not supported.

This manual describes how to use the Advanced Temperature Transmitter (ATT) version of CommStaff. For information on the specifications common to all types of devices and information on how to install CommStaff, please refer to the main CommStaff Operation Manual. *Before reading this manual, make sure to read the main CommStaff Operation Manual thoroughly.*

1-2. Important Notes

- When changing connected devices
CommStaff continues communicating with the device when displaying dynamic values, such as pressure, so that it can continuously update these values. If you remove the communications cable to change the device during this communication, an error will occur.

Exit CommStaff before detaching the communications cable from the device, and then start CommStaff again after connecting the communications cable to the new device.
- For details on common problems, refer to CM2-CFS100-2001, *Field Communication Software: CommStaff Model: CFS100 (Common Edition) User's Manual*.

1-3. Supported Versions

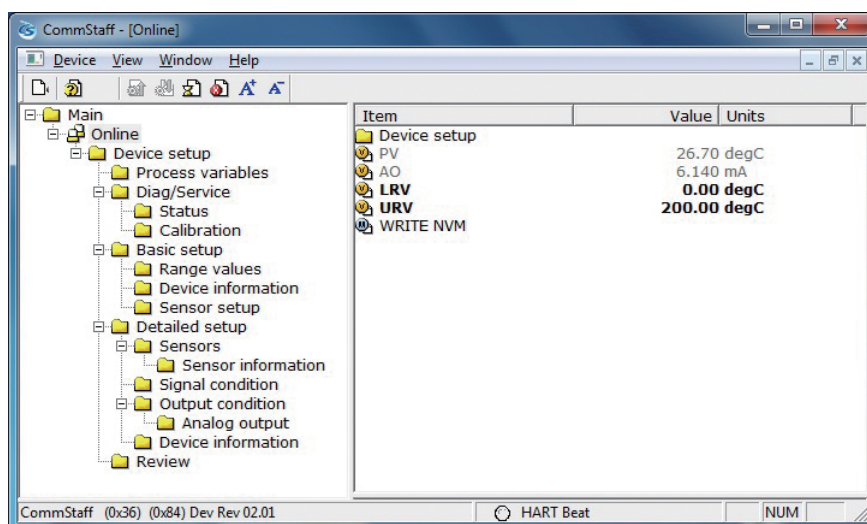
CommStaff version 1.1 supports the ATT with SFN communications version 3.5 or later.

Chapter 2. Configuration

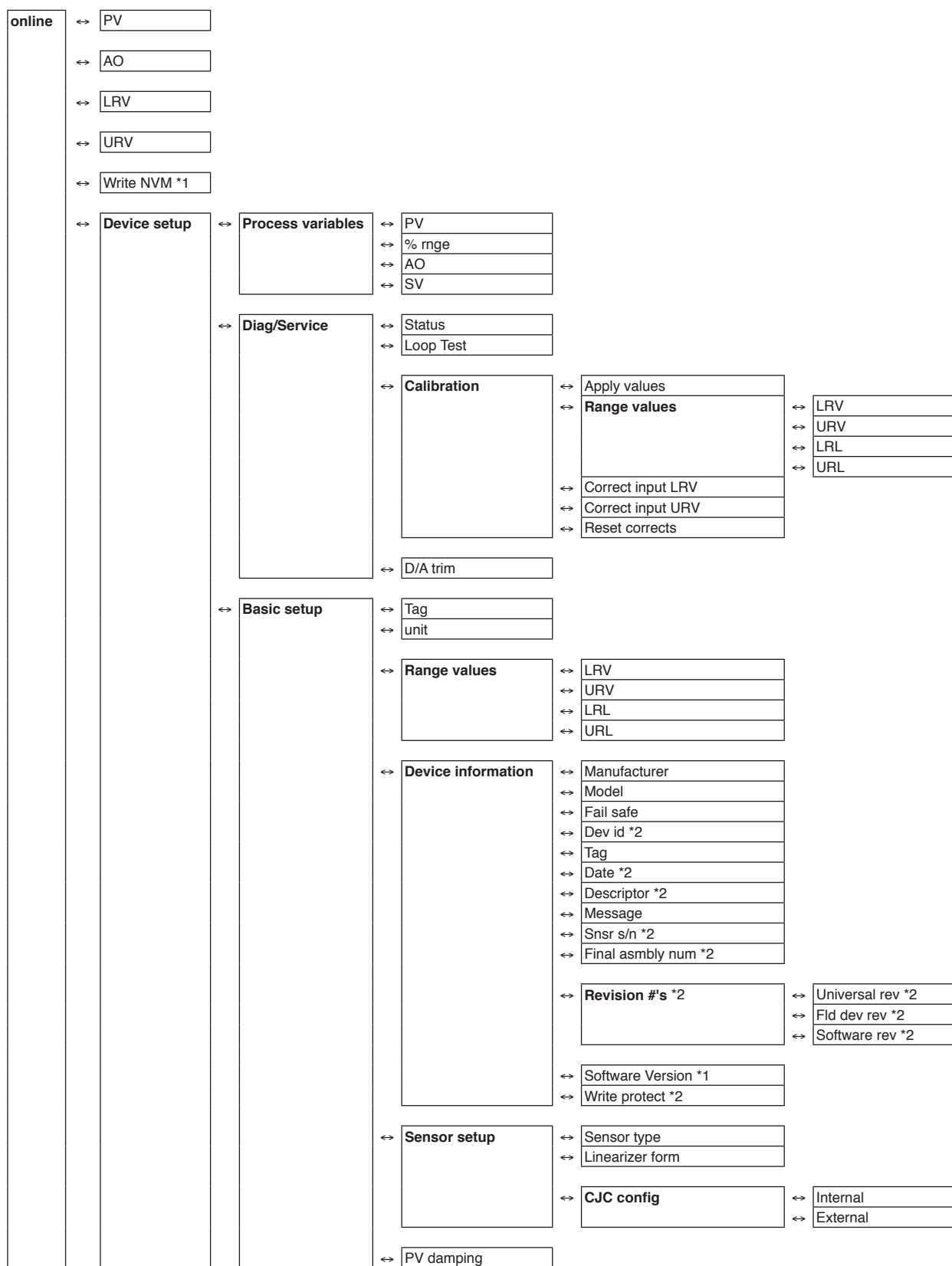
2-1. Menu List

Right-clicking “Online” in the menu tree in the left pane of the CommStaff application window displays a menu. Selecting Expand on the menu displays the expanded menu tree.

Parameters displayed in gray (PV and AO in the following window) in the parameter display in the right pane are parameters that cannot be changed. Those displayed in black (LRV and URV in the window below) are parameters that can be changed.



The following gives details of the menus displayed in the menu tree. Bold items are parameters that can be changed.



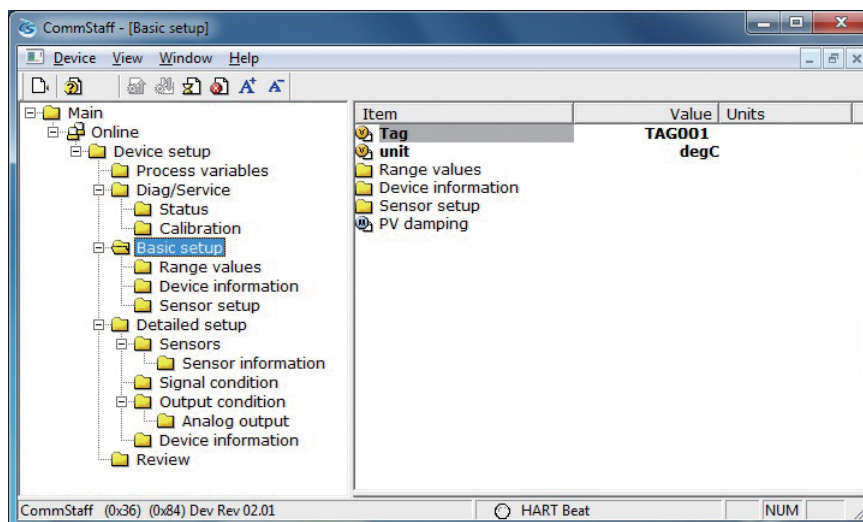
online	↔	Device setup	↔	Detailed setup	↔	Sensors	↔	PV		
							↔	unit		
							↔	Sensor information	↔	LRL
							↔	URL		
							↔	SV		
							↔	unit		
							↔	PV highest *2		
							↔	PV lowest *2		
							↔	PV highest and PV lowest *1		
							↔	Signal condition	↔	PV damping
↔	URV									
↔	LRV									
↔	% rng									
↔	Output Condition	↔	Analog output	↔	AO					
↔		↔	T/C fault detect							
↔		↔	Fail safe							
↔		↔	Loop Test							
↔		↔	D/A trim							
↔		↔	Scaled D/A trim							
↔		↔	HART output *2	↔	Poll addr *2					
↔		↔	Num req preams *2							
↔		↔	Meter type							
↔		↔	Device information	↔	Manufacturer					
↔		↔	Model							
↔		↔	Fail safe							
↔		↔	Dev id *2							
↔		↔	Tag							
↔		↔	Date *2							
↔		↔	Descriptor *2							
↔		↔	Message							
↔		↔	Snsr s/n *2							
↔		↔	Final asmbly num *2							
↔		↔	Revision #'s *2	↔	Universal rev *2					
↔		↔		↔	Fld dev rev *2					
↔		↔		↔	Software rev *2					
↔		↔	Software Version *1							
↔		↔	Write protect *2							
↔		↔	Review	↔	Model					
↔		↔		↔	Manufacturer					
↔		↔		↔	Sensor type					
↔		↔		↔	Linearizer form					
↔		↔		↔	CJC config					
↔		↔		↔	CJC temp					
↔		↔		↔	unit					
↔		↔		↔	URL					
↔		↔		↔	LRL					
↔		↔		↔	damping					
↔		↔		↔	% rng					
↔		↔		↔	URV					
↔		↔		↔	LRV					
↔		↔		↔	AO					
↔		↔		↔	Fail safe					
↔		↔		↔	Snsr s/n *2					
↔		↔		↔	Dev id *2					
↔		↔		↔	Tag					
↔		↔		↔	Message					
↔		↔		↔	Software Version *1					
↔		↔		↔	Universal rev *2					
↔		↔		↔	Fld dev rev *2					
↔		↔		↔	Software rev *2					
↔		↔		↔	Poll addr *2					
↔		↔		↔	Num req preams *2					

*1 Not displayed if HART communications is selected.

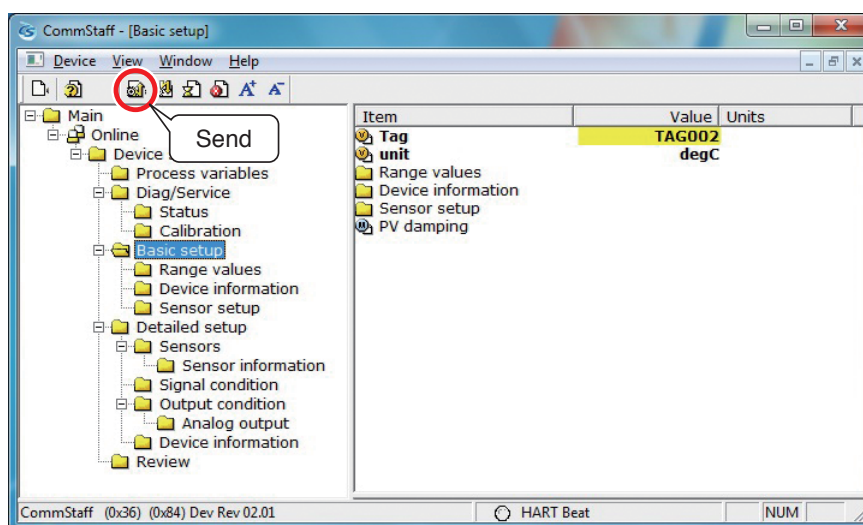
*2 Not displayed if SFN communications is selected.

2-2. Tag Number Configuration

This section explains how to input or change the tag No. In the menu tree in the left pane, select [Device setup] → [Basic setup] → [Tag].



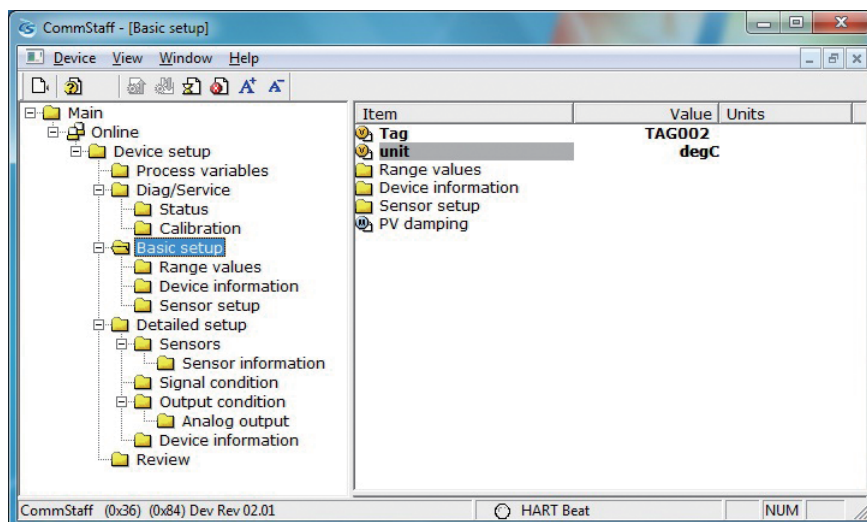
Double-clicking Tag displays the settings screen. On this screen, set the Tag and click the Set button. The tag is highlighted in yellow. Click the Send button to send the new Tag to the transmitter.



2-3. Selecting the Engineering Unit

This section explains how to select and change the engineering unit.

Select [Device setup] → [Basic setup] → [unit].



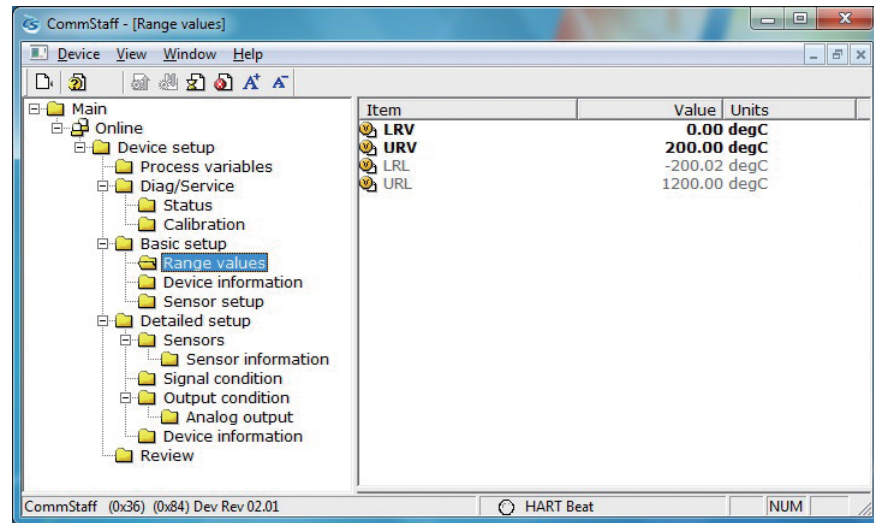
The engineering unit can be selected from the following. After selecting, click the send icon.

DegC
degF
degR
Kelvin

2-4. Measurement Range Configuration

This section explains how to select and change the measurement range.

Select [Device setup] → [Basic setup] → [Range values].



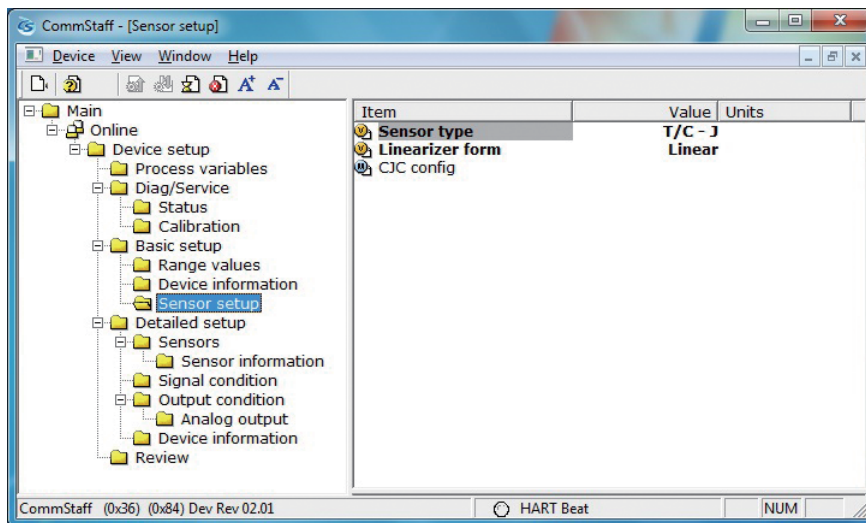
After setting the values, click the send icon.

LRV	Lower Range Value, 4 mA output
URV	Upper Range Value, 20 mA output
LRL	Lower Range Limit (unchangeable lower limit of the range)
URL	Upper Range Limit (unchangeable upper limit of the range)

2-5. Selecting the Sensor Type

This section explains how to select and change the sensor type.

Select [Device setup] → [Basic setup] → [Sensor setup] → [Sensor type].



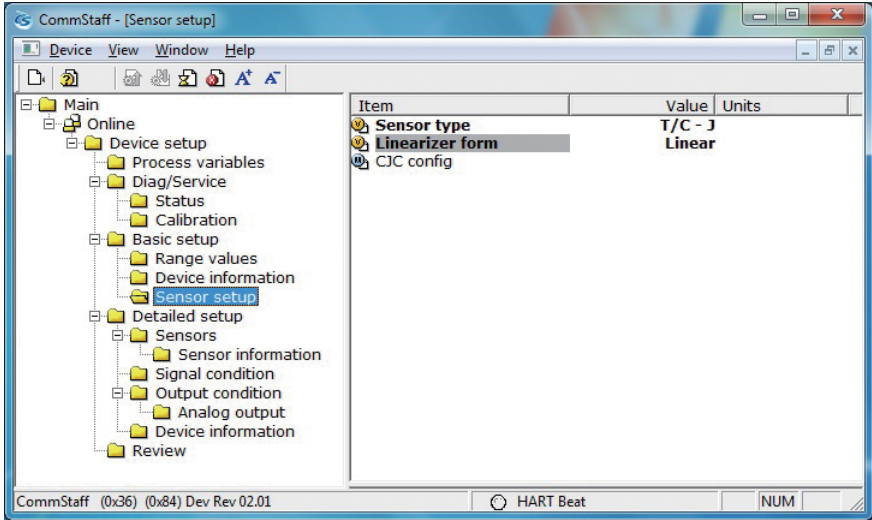
The sensor type can be selected from the following. After selecting, click the send icon.

T/C – J	Thermocouple, type J
T/C – K	Thermocouple, type K
T/C – T	Thermocouple, type T
T/C – S	Thermocouple, type S
T/C – R	Thermocouple, type R
T/C – E	Thermocouple, type E
T/C – B	Thermocouple, type B
T/C – N	Thermocouple, type N
RTD – PT100J *	RTD, Pt100J
Millivolts	Millivolt input
RTD – Pt100D	RTD, Pt100

* Pt100J cannot be selected for HART communications.

2-6. Selecting the Linearization Calculation Type

This section explains how to select and change the type of linearization calculation.
Select [Device setup] → [Basic setup] → [Sensor setup] → [Linearizer form].



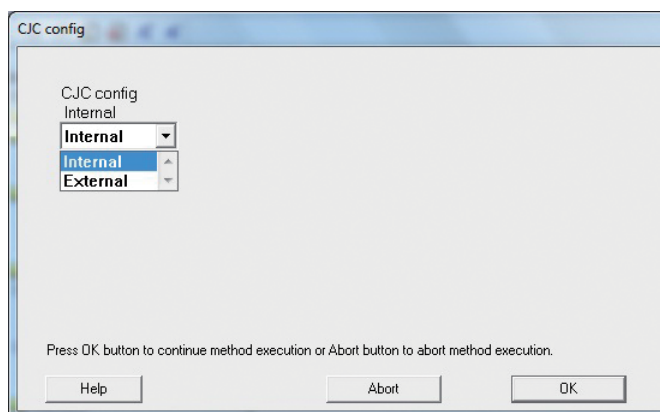
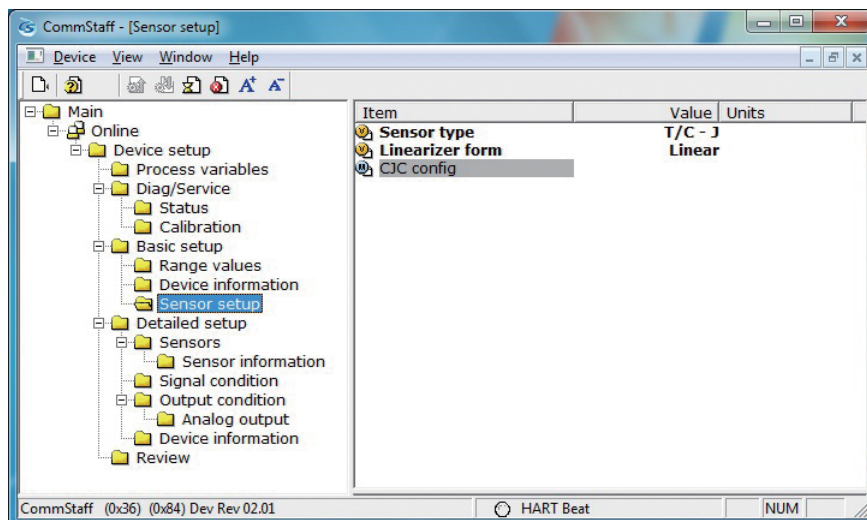
Select Linear or Non-Linear. After selecting, click the send icon.

Linear	The transmitter converts the signal from the temperature sensor to a temperature value and outputs current in an amount that is commensurate with the output range.
Non-Linear	The input signal from the temperature sensor is directly output.

2-7. Cold Junction Compensation Setup

This section explains how to set up cold junction compensation.

Select [Device setup] → [Basic setup] → [Sensor setup] → [CJC config].



Select Internal or External.

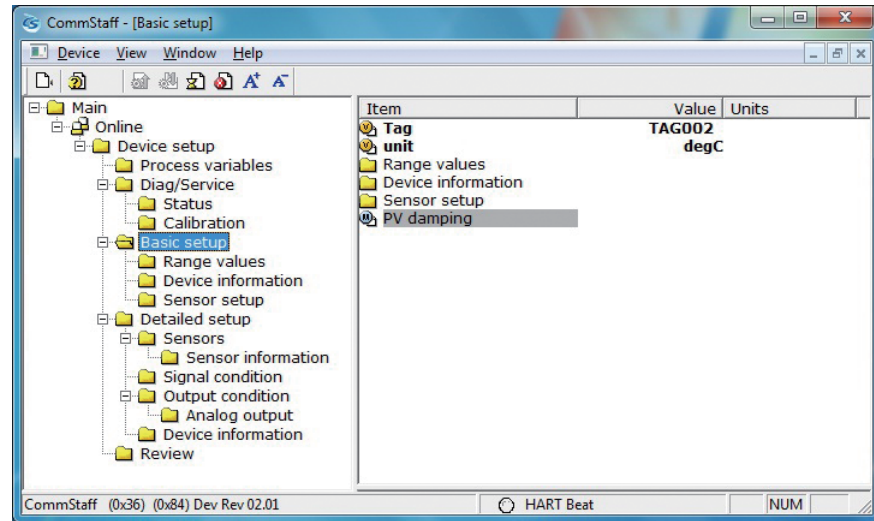
Internal	Use the internal cold junction in the transmitter.
External	Use an external cold junction prepared by the user.

Note: If External is selected, input the external cold junction temperature.

2-8. Selecting the Damping Time Constant

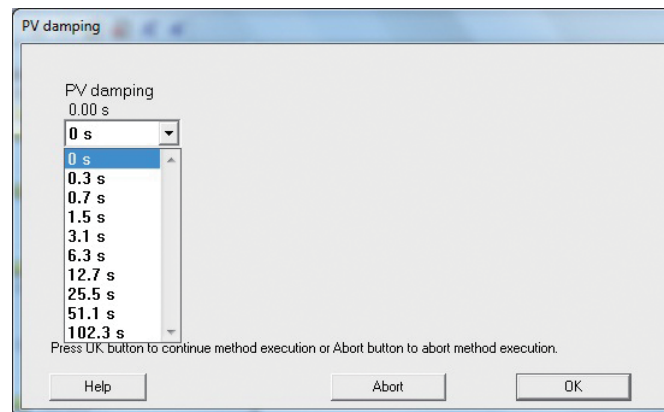
This section explains how to select and change the damping time constant.

Select [Device setup] → [Basic setup] → [PV damping].



The damping time constant can be selected from the following. After selecting, click the send icon.

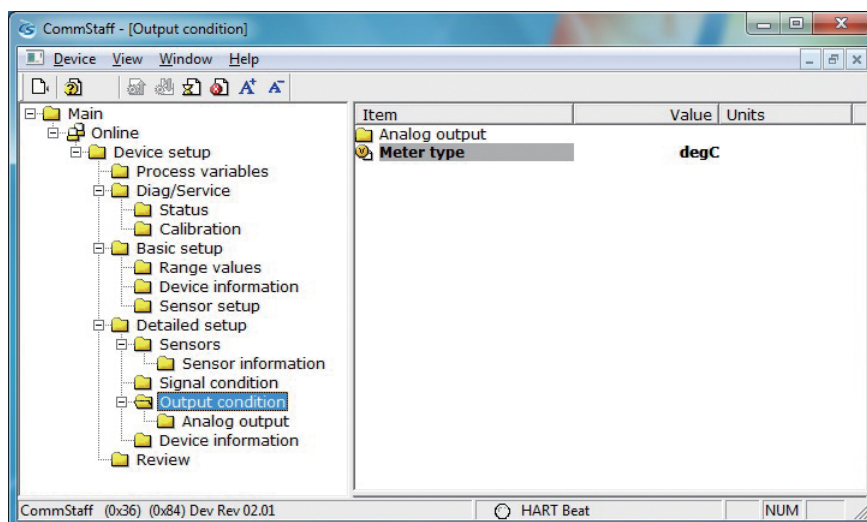
0, 0.3, 0.7, 1.5, 3.1, 6.3, 12.7, 25.5, 51.1, 102.3 seconds



2-9. Digital LCD Indication Configuration

This section explains how to select and change the LCD indication type.

Select [Device setup] → [Detailed setup] → [Output condition] → [Meter type].



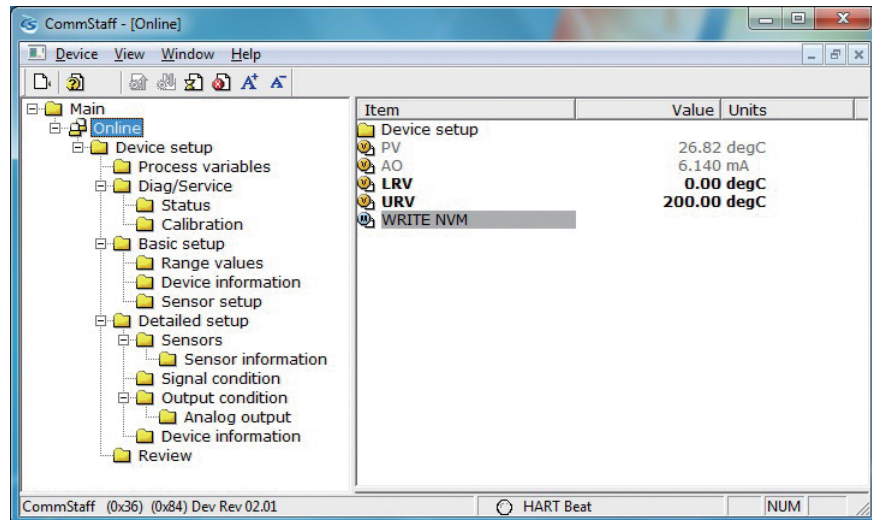
Select degC, degF, or %. After selecting, click the send icon.

degC	Actual scale reading (°C)
degF	Actual scale reading (°F)
%	Percentage

2-10. NVM Save

The transmitter saves configured data in nonvolatile memory 30 seconds after it is sent to the transmitter. If the transmitter power is turned off in less than 30 seconds, configuration data that has been sent will be lost, and the existing saved data will remain in the transmitter. To avoid this, NVM Save can be used.

Select the “Online” menu at the top of the menu tree and execute WRITE NVM. This allows configuration data that has been sent to be saved in nonvolatile memory so that the transmitter power can be turned off.



Chapter 3. Preparations and Starting Operation

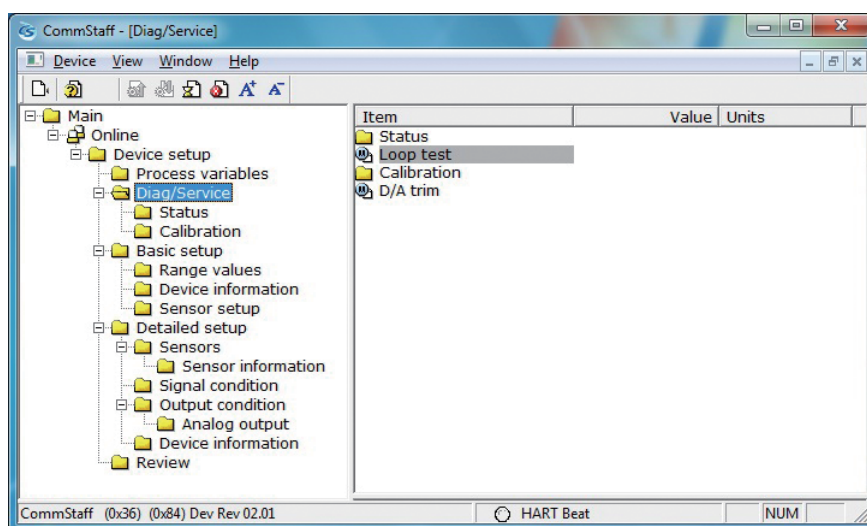
This chapter explains how to prepare for transmitter operation, and provides general instructions to follow when starting transmitter operation.

3-1. Confirmation of Output Signals (Loop Test)

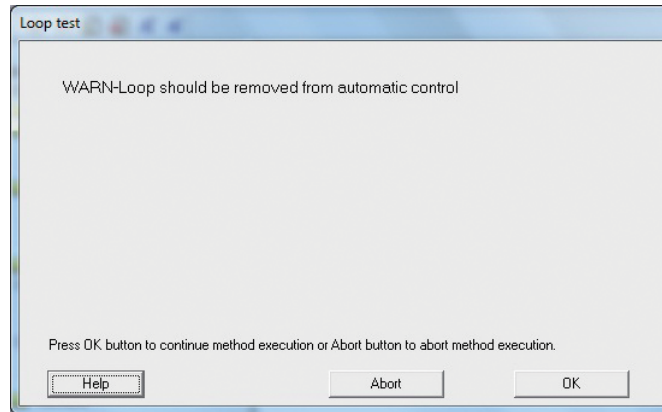
By putting the transmitter in constant current mode, you can keep current outputs constant in the range of 4 - 20 mA. This section explains how to configure the constant current mode and how to return to normal output mode.

Select [Device setup] → [Diag/Service] → [Loop test].

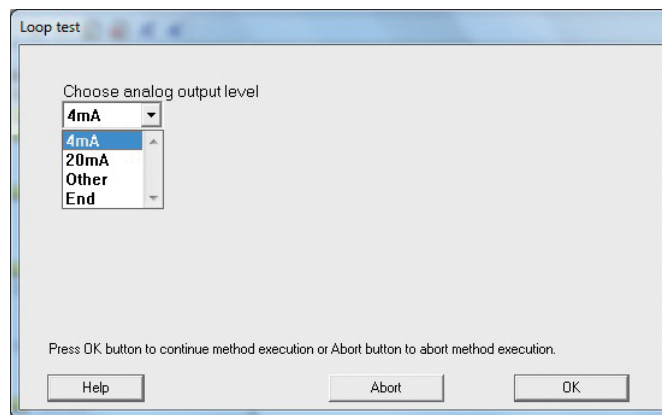
CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.



Double-clicking Loop Test displays the following screen.



Click OK if there are no problems. The screen changes to the following.



- Select 4 mA and click OK. Output signals are kept at 4 mA (0%).
- Select 20 mA and click OK. Output signals are kept at 20 mA (100%).
- To input a different value, select Other and Click OK.
- If you select End and click OK, a message is displayed notifying you that this will return operation to normal output mode.

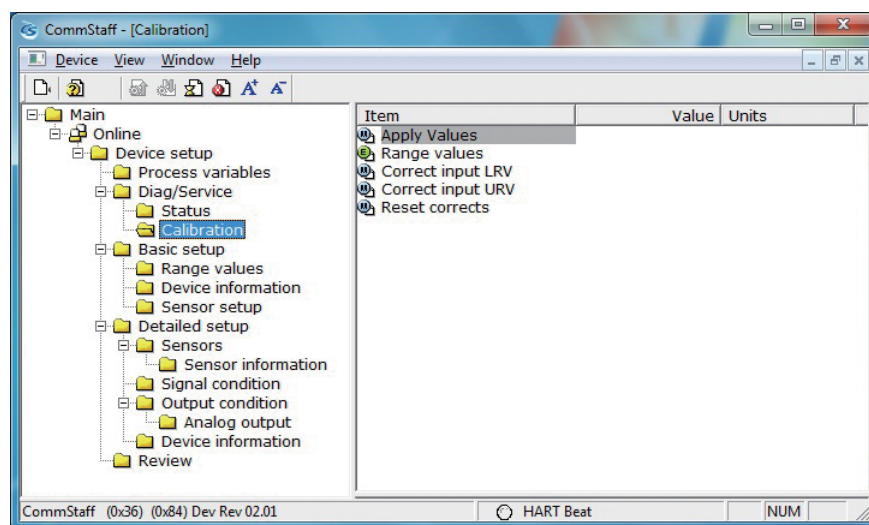
3-2. Range Configuration (Zero and Span Adjustments) according to Temperature Sensor Input

The range can be configured so that the current pressure input into the transmitter becomes 4 mA (0%) or 20 mA (100%).

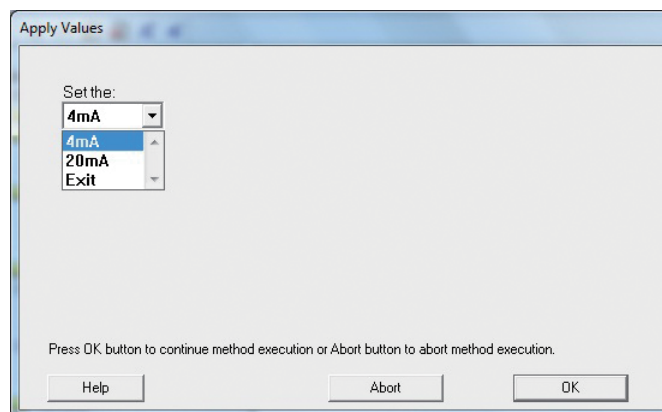
CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.

The following describes how the range can be changed according to input pressure.

Select [Device setup] → [Diag/Service] → [Calibration] → [Apply Values].



Double-click Apply Values, and a warning is displayed first and then the following screen.



- Select 4 mA and click OK. The range is reconfigured so that the current input pressure becomes the 4 mA output pressure (zero adjustment).
- Select 20 mA and click OK. The range is reconfigured so that the current input pressure becomes the 20 mA output pressure (span adjustment).
- Select Exit and click OK. This completes the configuration process.

Chapter 4. Maintenance

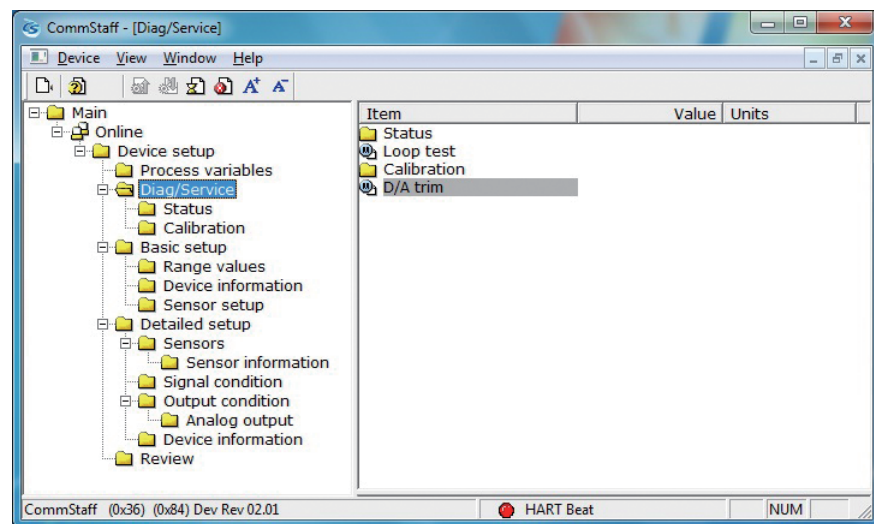
This chapter explains how to calibrate the analog signals of the transmitter, how to calibrate the measurement range, and how to reset a calibrated value to the default value. It also explains how to check the transmitter's self-diagnostic messages.

4-1. Calibration of Analog Outputs

By connecting to an ammeter and comparing measured values, you can calibrate the 0% and 100% analog outputs.

Select [Device setup] → [Diag/Service] → [D/A trim].

CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.



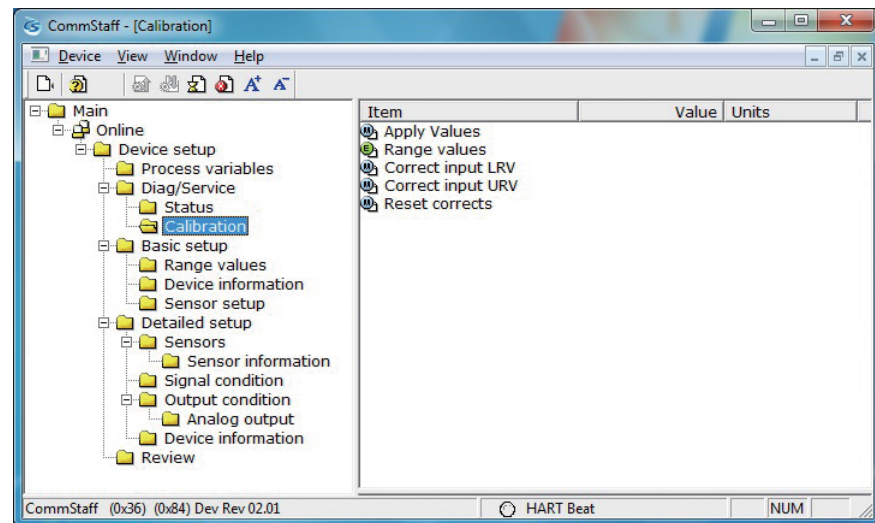
Step	Operation and indication
1	<p>Double-click D/A Trim.</p> <p>WARN - Loop should be removed from automatic control</p> <p>A warning that the loop should be switched from automatic control to manual mode is displayed. After switching to manual mode, click OK.</p> <p>“Connect reference meter” is displayed. Connect the loop to an ammeter (mA) or voltmeter. (It is recommended that an ammeter or voltmeter with an accuracy of 0.03% or better be used.)</p>
2	<p>The following messages are displayed in the order given.</p> <p>Setting fld dev output to 4mA (about to set transmitter output to 4 mA)</p> <p>Click OK if there are no problems.</p> <p>Enter meter value (input the ammeter reading).</p> <p>Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the transmitter.</p> <p>Fld dev output 4.000mA equal to reference meter? (is the transmitter output equal to the reading on the connected ammeter?)</p> <p>If the transmitter output is not equal to the reading of the ammeter, select No and click OK. This allows the adjustment process to continue.</p>
3	<p>Next do the 20 mA calibration.</p> <p>The following messages are displayed in the order given.</p> <p>Setting fld dev output to 20mA (about to set transmitter output to 20 mA)</p> <p>Click OK if there are no problems.</p> <p>Enter meter value (input the ammeter reading)</p> <p>Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the transmitter.</p> <p>Fld dev output 20.000mA equal to reference meter? (is the transmitter output equal to a reading of the connected ammeter?)</p> <p>If the transmitter output is not equal to the reading of the ammeter, select No and click OK. This allows the adjustment process to continue.</p> <p>Finally, a message is displayed notifying you that this will return operation to normal measurement mode and that the 20 mA calibration process is complete.</p>

4-2. Measurement Range Calibration according to Actual Temperature

For the ThermoPLUS Smart Temperature Transmitter, the measurement range must be calibrated at two points, namely the LRV (input value at 0% output) and URV (input value at 100% output). For further details, refer to Chapter 3, “Operations and Settings” in ThermoPLUS Smart Temperature Transmitter (Remote Type) Model ATT60/70 Operation Manual, CM2-ATT100-2001.

CAUTION: If the transmitter’s process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.

Select [Device setup] → [Diag/Service] → [Calibration].

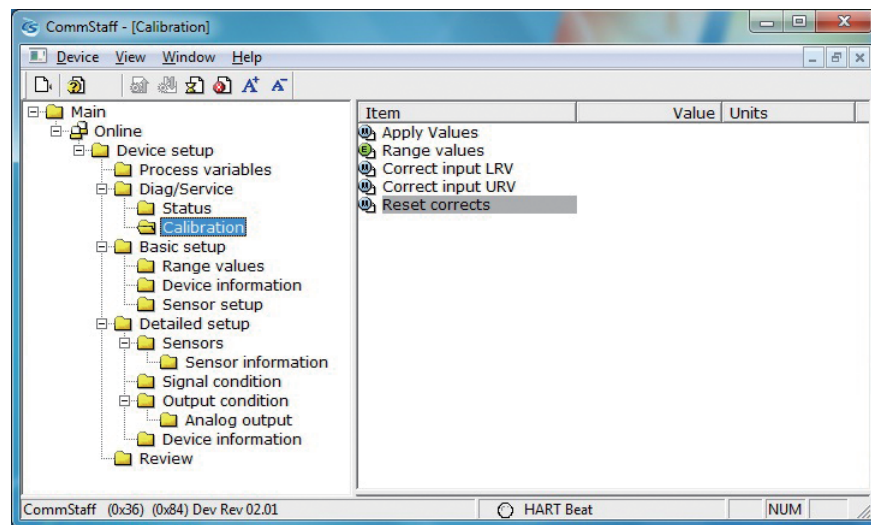


- To calibrate the LRV value, double-click Correct Input LRV. To calibrate the URV value, double-click Correct Input URV.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.
- “Apply LRV pressure” or “Apply URV pressure” is displayed. If the value of the standard pressure generator is equal to LRV (0%) or URV (100%), click OK.
- “Press OK when pressure is stable” is displayed. After confirming that input pressure has stabilized, click OK.
- The “Note - Loop may be returned to automatic control” message is displayed to notify you that you can now switch back to automatic control. Click OK.

4-3. Calibrated Value Reset

This operation is for resetting the calibrated zero-span value. Since the calibrated value is deleted, you must recalibrate following the steps described in 4.2.

Select [Device setup] → [Diag/Service] → [Calibration] → [ResetCorrects].

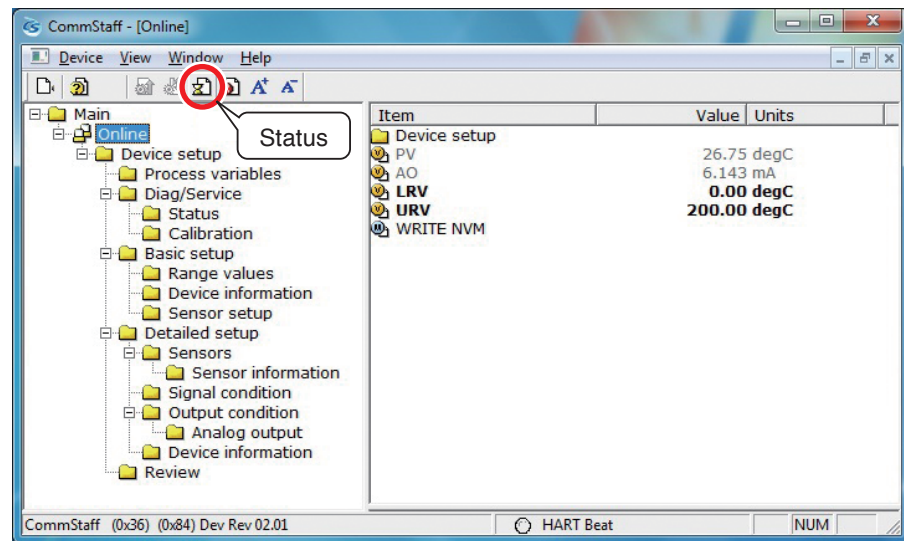


CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.

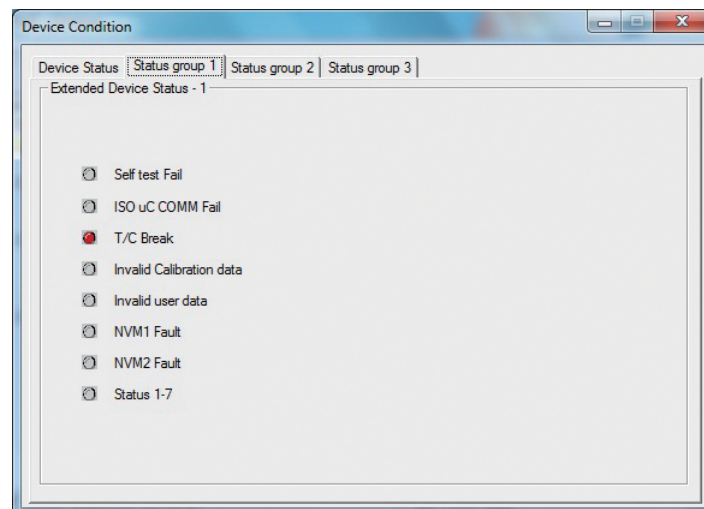
- Double-click Reset Corrects. The “WARN - Loop should be removed from automatic control” message is displayed, warning that the loop should be switched from automatic control to manual mode. After switching to manual mode, click OK.
- The “About to Reset corrects” message is displayed to notify you that calibrated values will be reset. Click OK.
- After the calibrated values are reset, “Reset Corrects OK” is displayed. Click OK.
- The “Note - Loop may be returned to automatic control” message is displayed to notify you that you can now switch the loop back to automatic control. Click OK.

4-4. Checking Self-diagnostic Messages

You can check self-diagnostic messages by clicking the Status icon in the below or “Device status” in the “Display” menu.



For example, if the thermocouple is disconnected, the T/C Break indicator will turn red as shown below. For details on self-diagnostics, see the ATT temperature transmitter operation manual, which lists the differences in self-diagnostic messages between SFN and HART communication versions.



The following gives the meaning of the status messages and the corresponding troubleshooting procedures.

Status message	Meaning	Required action
Critical failure		
Self test Fail	Electronic component failure	Contact the appropriate personnel.
ISO uC COMM Fail	Electronic component failure	Contact the appropriate personnel.
T/C Break	Disconnection occurred on the sensor	Check the wiring on the sensor. Replace thermocouples or compensation lead wire and connections.
Invalid Calibration data	Electronic component failure	Contact the appropriate personnel.
Invalid user data	Electronic component failure	Contact the appropriate personnel.
NVM1 Fault	Electronic component failure	Contact the appropriate personnel.
NVM2 Fault	Electronic component failure	Contact the appropriate personnel.
Instrument status		
Ambient temperature HI/LO	The cold junction temperature was outside the transmitter's operating temperature range (-40 to 85 °C or -40 to 185 °F).	Reduce the transmitter's ambient temperature by using a screen, by cooling the air with an air purge, or by changing the transmitter to the separable type.
Uncertain read	Sensor error.	Check or replace the sensor.
	Sensor type or range setting was not correct.	Check or change the sensor type. Check the sensor range and change the LRV/URV.
	Transmitter and/or wiring was disturbed by strong electromagnetic interference.	Protect the transmitter and wiring by using appropriate grounding, shielding etc.
I/P out of SPEC	The input value was beyond the upper-limit or lower-limit value for the sensor.	Replace the sensor with an appropriate one.
Uncertain CJC	Electronic component failure	Contact the appropriate personnel.
Excess LRV Correct	The LRV correction factor is outside the acceptable limits for accurate operation.	Check the input and make sure it matches the calibrated range value.
Excess URV Correct	The URV correction factor is outside the acceptable limits for accurate operation.	Check the input and make sure it matches the calibrated range value.
In Output Mode	The transmitter is operating in output mode.	Go to the Output Mode menu to cancel the output mode.
User correct active	<ul style="list-style-type: none"> — Transmitter has been adjusted for a particular sensor range. — After sensor type was changed or calibration values were reset, transmitter lost the sensor calibration settings and reverted to the original factory calibrations. 	Enter the actual LRV and URV values on the LRV/URV calibration screens to improve accuracy.

Document Number:	CM2-CFS100-2006
Document Name:	Field Communication Software CommStaff Model: CFS100 Instruction Manual (Advanced Temperature Transmitter Edition)
Date:	Nov. 2011 (initial)
Issued/Edited by:	Yamatake Corporation

Yamatake Corporation