Field Communication Software CommStaff Model: CFS100

Instruction Manual (Advanced Temperature Transmitter Edition)

Azbil Corporation

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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 _.

CONTENTS

Chapter 1. Overview

1-1. Introduction

CommStaff is a tool for communicating with Azbil Corporation's 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 Azbil Corporation's 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 Azbil Corporation's proprietary SFN/DE communication protocol as well as the HART communication protocol.

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

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.*

For information on smart transmitter functions and method of connection, refer to manual No. CM2-ATT100-2001, ThermoPLUS Smart Temperature Transmitter (Remote Type) Model ATT60/70 Operation Manual

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.

* The use of SFN communication changes the transmission signal, so be sure to switch the process control loop to manual mode beforehand.

* For known troubleshooting issues, refer to section 7.4 of CM2-CFS100-2001, the common edition manual.

1-3. Supported Versions

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

The HART communication version of ATT can be used with all versions of CommStaff.

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.

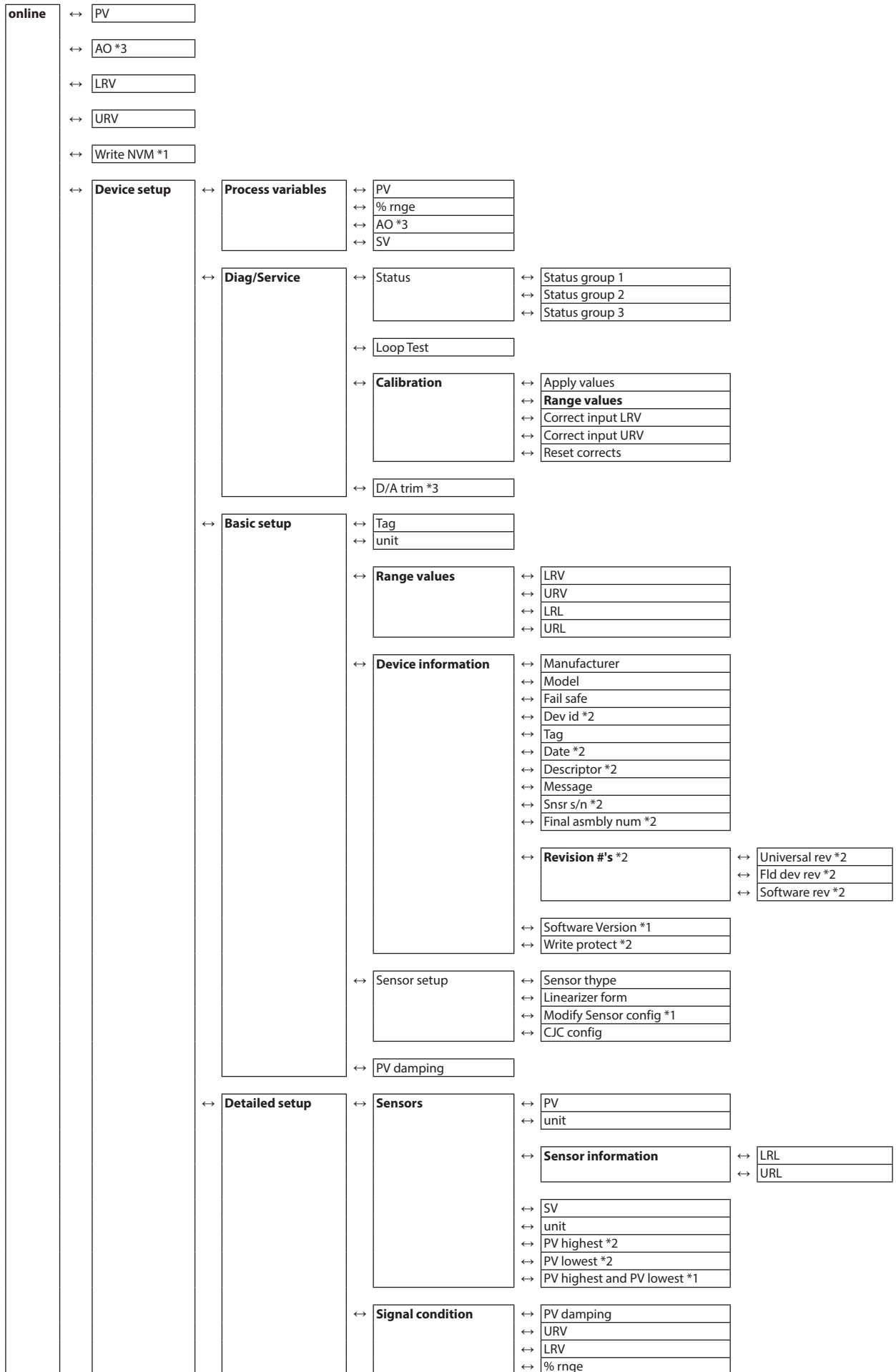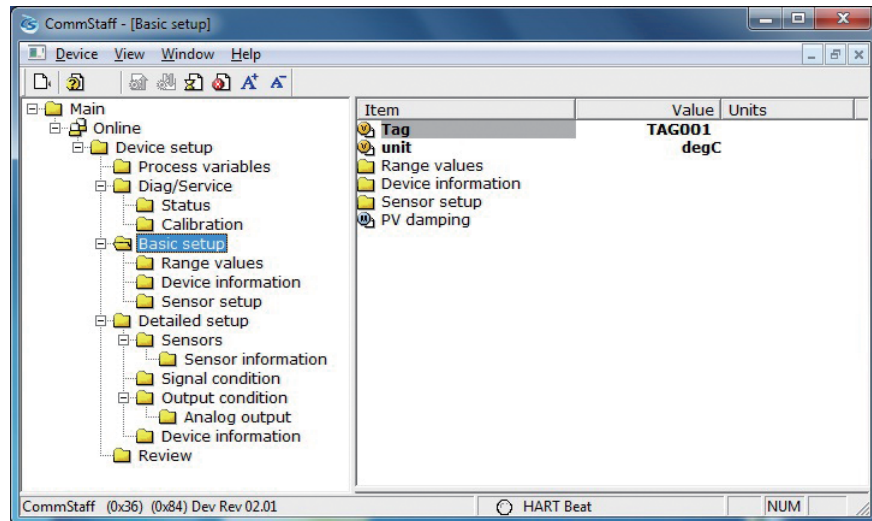| online							
↔ PV							
↔ AO *3							
↔ LRV							
↔ URV							
↔ Write NVM *1							
↔ **Device setup**	↔ **Process variables**	↔ PV					
		↔ % rnge					
		↔ AO *3					
		↔ SV					
	↔ **Diag/Service**	↔ Status	↔ Status group 1				
			↔ Status group 2				
			↔ Status group 3				
		↔ Loop Test					
		↔ **Calibration**	↔ Apply values				
			↔ **Range values**				
			↔ Correct input LRV				
			↔ Correct input URV				
			↔ Reset corrects				
		↔ D/A trim *3					
	↔ **Basic setup**	↔ Tag					
		↔ unit					
		↔ **Range values**	↔ LRV				
			↔ URV				
			↔ LRL				
			↔ URL				
		↔ **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				
		↔ Sensor setup	↔ Sensor thype				
			↔ Linearizer form				
			↔ Modify Sensor config *1				
			↔ CJC config				
		↔ PV damping					
	↔ **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				
			↔ % rnge				

online	↔	Device setup	↔	Detailed setup	↔	Output Condition	↔	Analog output *3	↔	AO *3
									↔	T/C fault detect *3
									↔	Fail safe *3
									↔	Loop Test *3
									↔	D/A trim *3
									↔	Scaled D/A trim *3
							↔	Output *4	↔	T/C fault detect *4
									↔	Fail safe *4
									↔	Loop Test *4
							↔	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		
					↔	DE Configuration *1	↔	DE FS Mode *1		
							↔	DE Format *1		
							↔	DE PV type *1		
							↔	Switch Analog to DE *1 *3		
							↔	Switch DE to Analog *1 *4		
				↔	Review	↔	Model			
						↔	Manufacturer			
						↔	Sensor type			
						↔	Linearizer form			
						↔	CJC config			
						↔	CJC temp			
						↔	unit			
						↔	URL			
						↔	LRL			
						↔	damping			
						↔	% rnge			
						↔	URV			
						↔	LRV			
						↔	AO *3			
						↔	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			
						↔	DE FS Mode *4			
						↔	DE Format *4			
						↔	DE PV type *4			

*1 Not displayed if HART communications is selected.

*2 Not displayed if SFN or DE communication is selected.

*3 Not displayed if DE communication is selected.

*4 Valid (displayed) if DE communication is selected.

4

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.
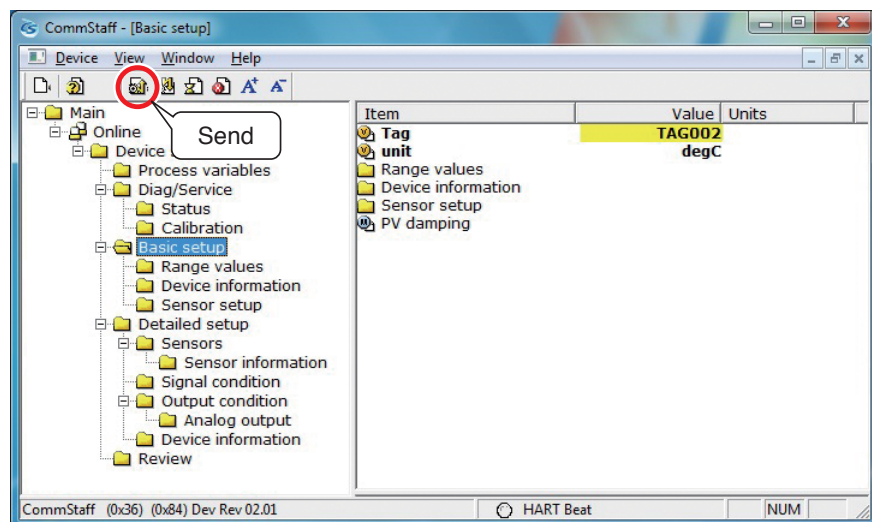
2-3.   Selecting the Engineering Unit

This section explains how to select and change the engineering unit.
Select [Device setup] → [Basic setup] → [unit].
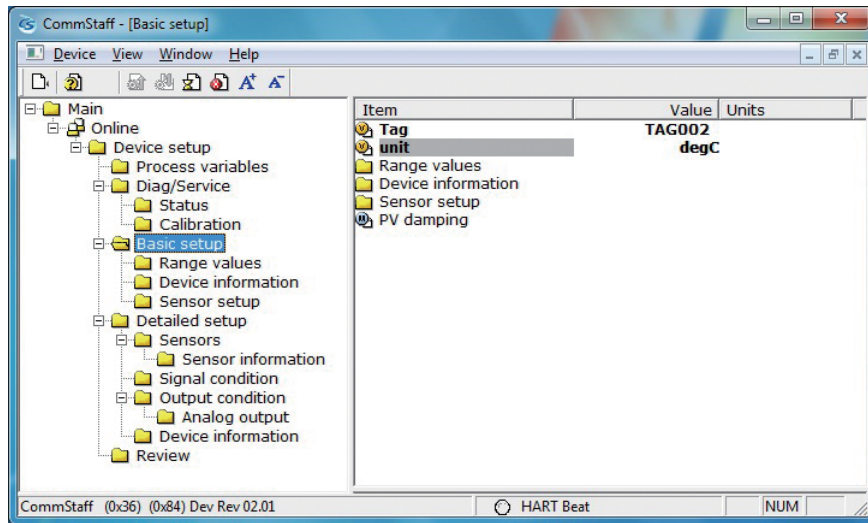
The engineering unit can be selected from the following. After selecting, click the send icon.

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].
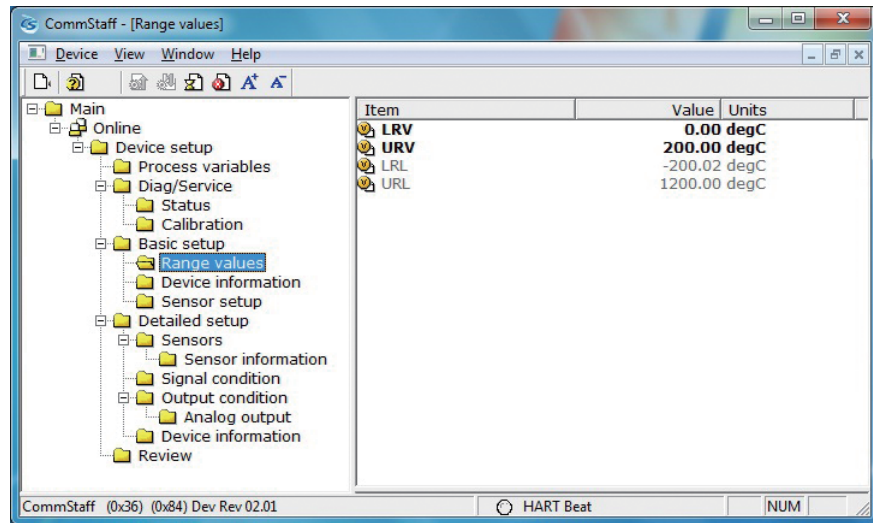
After setting the values, click the send icon.

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 (for HART)

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

Select [Device setup] → [Basic setup] → [Sensor setup] → [Sensor type].
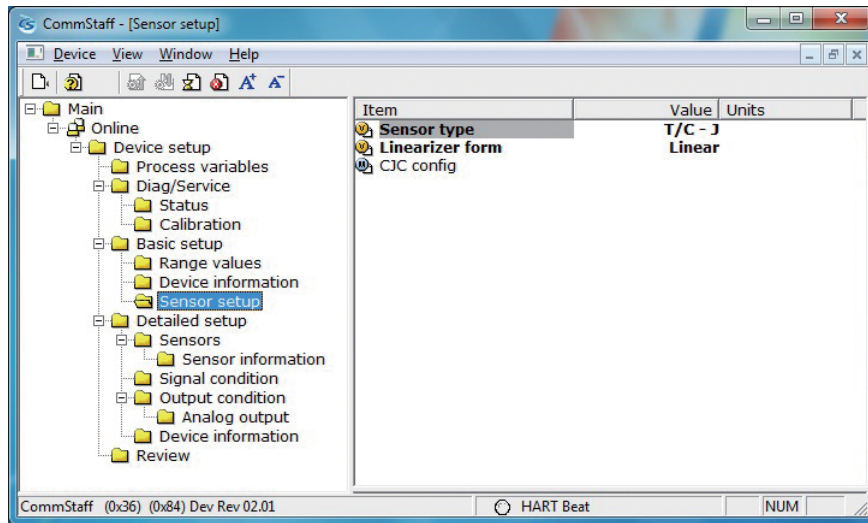
The sensor type can be selected from the following. After selecting, click the send icon.

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
Millivolts	Millivolt input
RTD – Pt100D	RTD, Pt100

2-6.   Selecting the Linearization Calculation Type (for HART)

This section explains how to select and change the type of linearization calculation.
Select [Device setup] → [Basic setup] → [Sensor setup] → [Linearizer form].
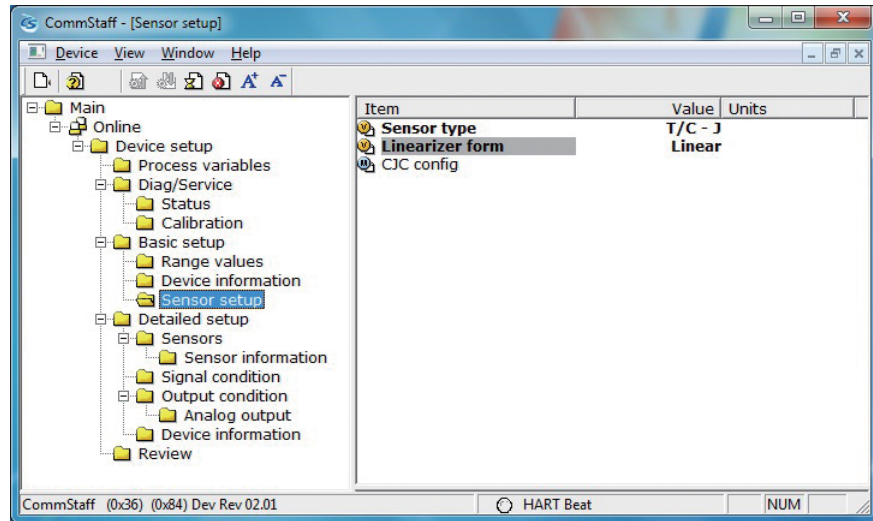
Select Linear or Non-Linear. After selecting, click the send icon.

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. Selecting the Sensor Type and the Linearization Calculation Type (for SFN or DE)

This section explains how to select the sensor type and the linearization calculation Type
Select [Device setup]→[Basic setup]→[Sensor setup]→[Modify Sensor config]
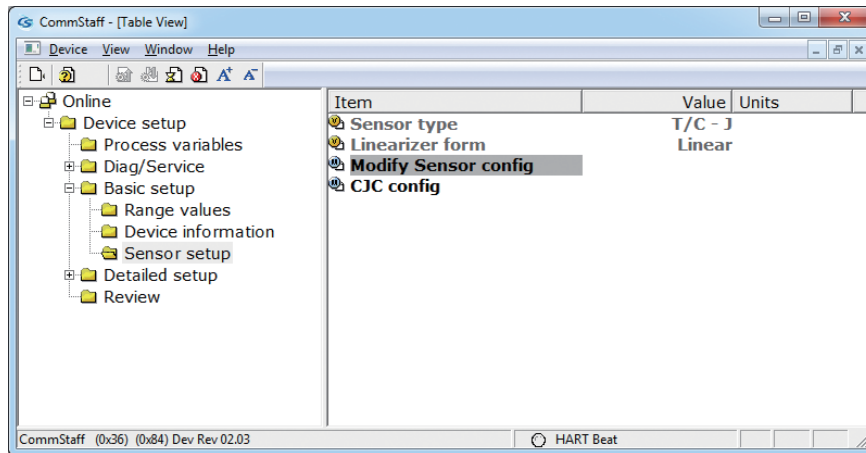
Double-clicking Modify Sensor config displays the following screen.
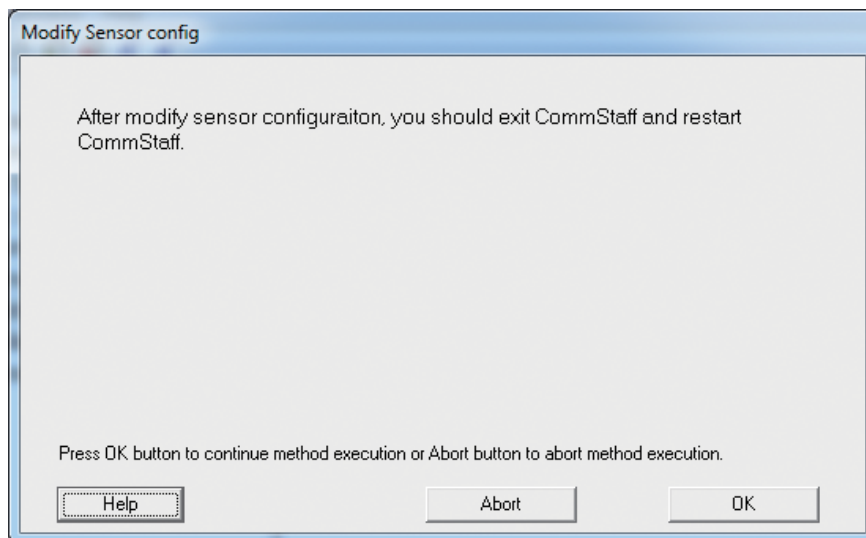
Click OK. The screen changes to the following.
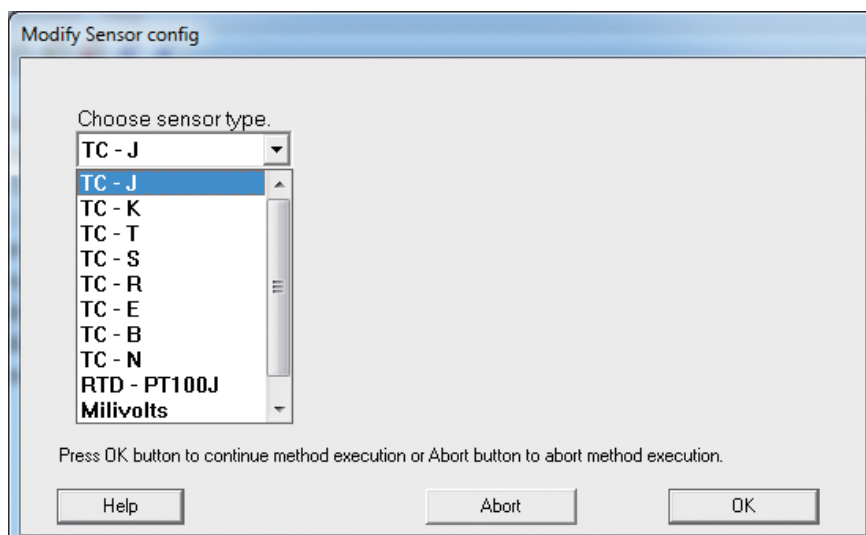
The sensor type can be selected from the following.

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
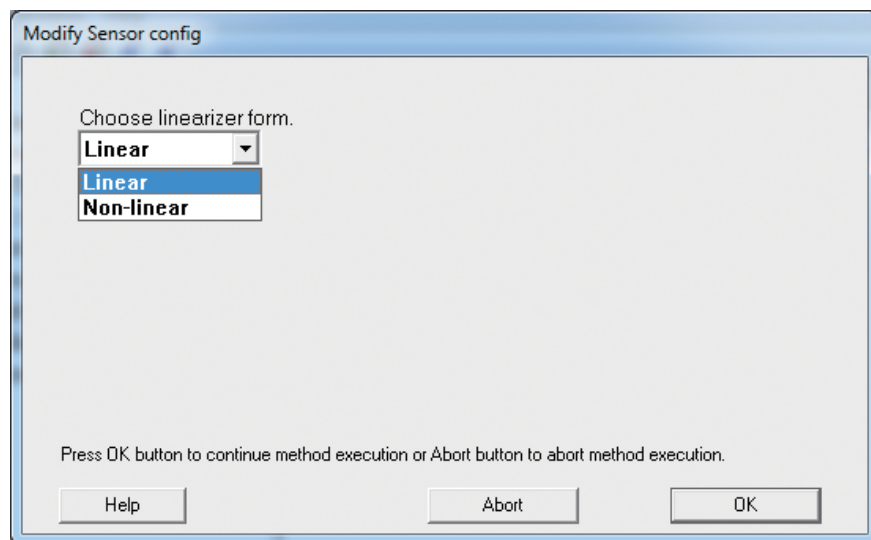
After selecting, Click OK. The screen changes to the following.

Select Linear or Non-Linear. After selecting, Click OK.

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.

2-8.   Cold Junction Compensation Setup

This section explains how to set up cold junction compensation.

Select [Device setup] → [Basic setup] → [Sensor setup] → [CJC config].
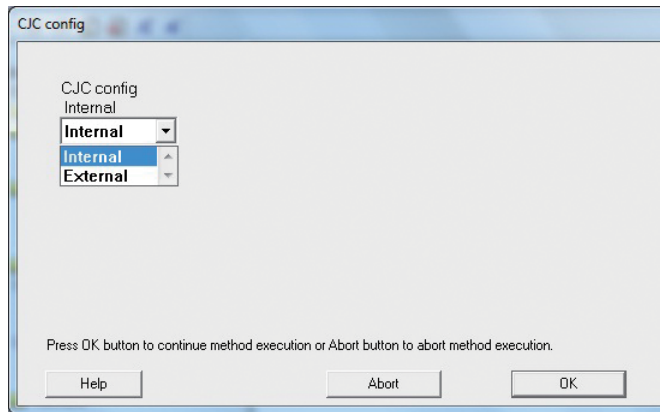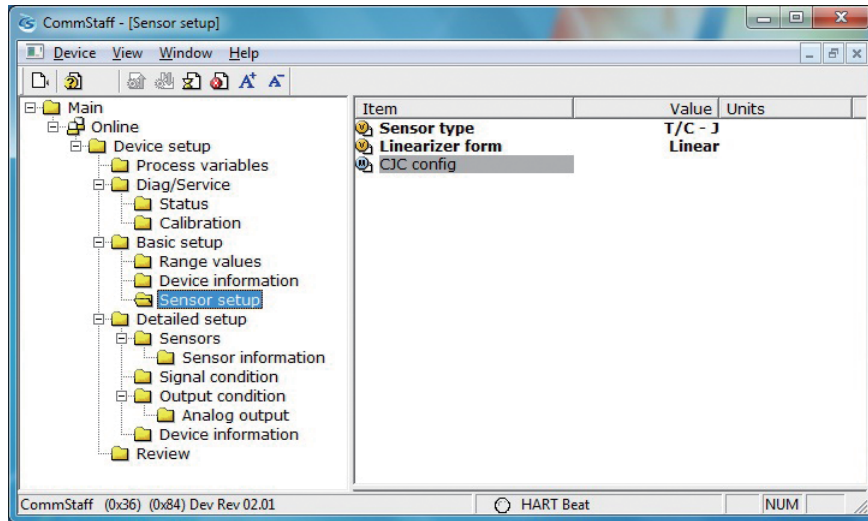
Select Internal or External.

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.

2-9. Selecting the Damping Time Constant

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

Select [Device setup] → [Basic setup] → [PV damping].
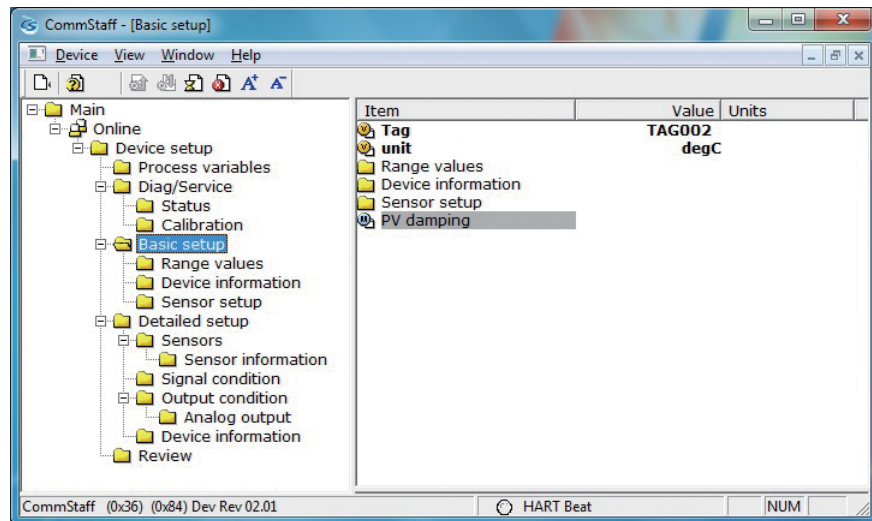
The damping time constant can be selected from the following. After selecting, click the send icon.

0, 0.3, 0.7, 1.5, 3.1, 6.3, 12.7, 25.5, 51.1, 102.3 seconds
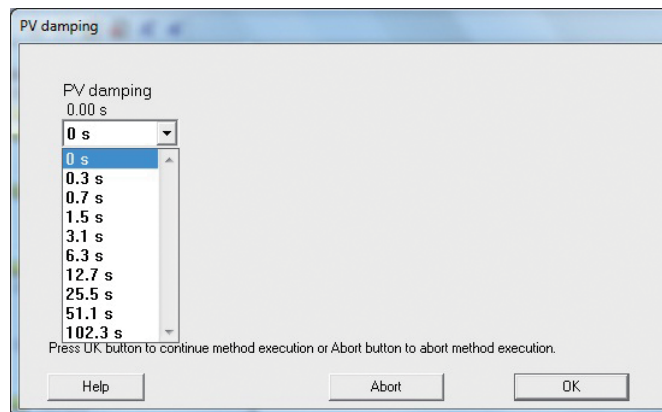
2-10.   Digital LCD Indication Configuration

This section explains how to select and change the LCD indication type.
Select [Device setup] → [Detailed setup] → [Output condition] → [Meter type].
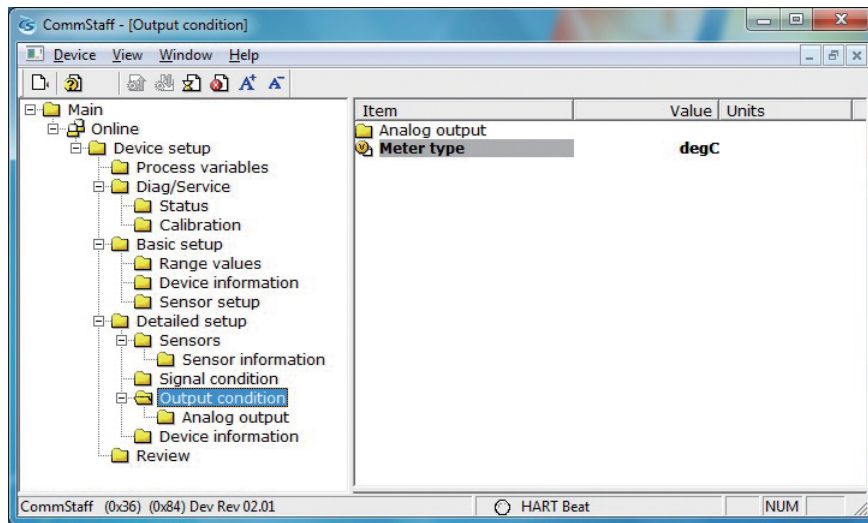
Select degC, degF, or %. After selecting, click the send icon.

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

2-11. 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.
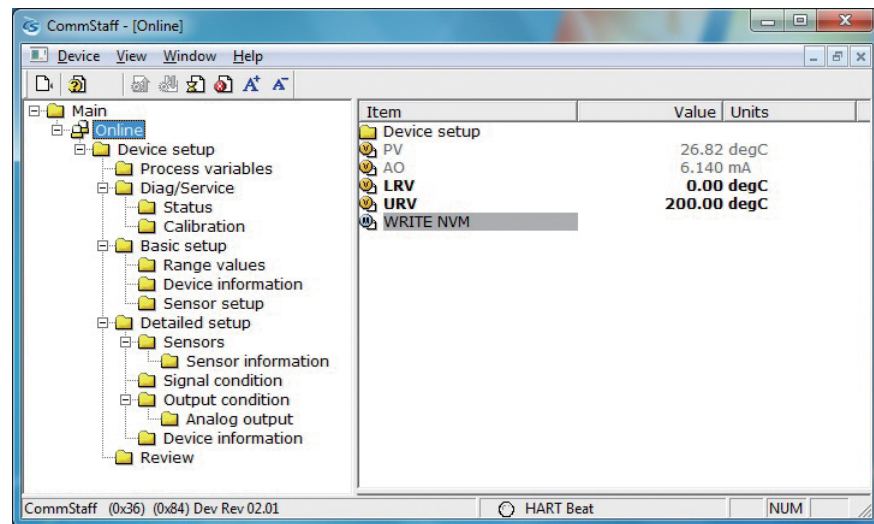
Chapter 3.   Preparations and Starting Operation

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.
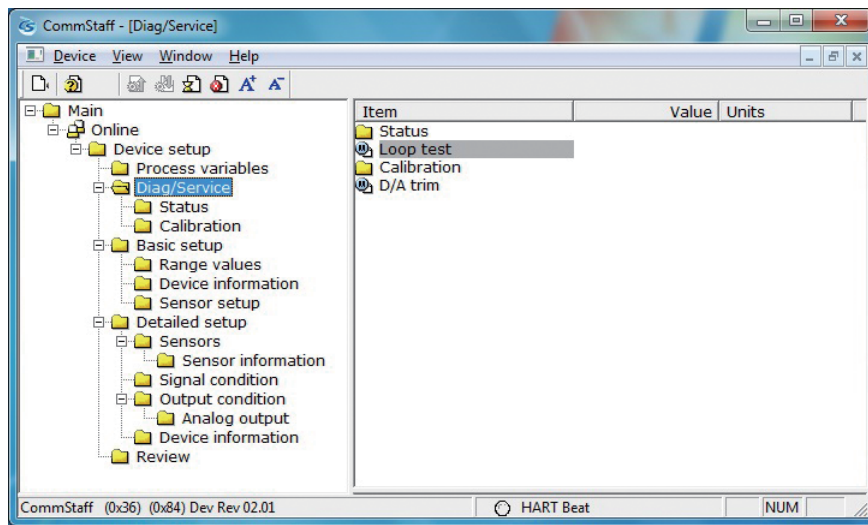
Double-clicking Loop Test displays the following screen.
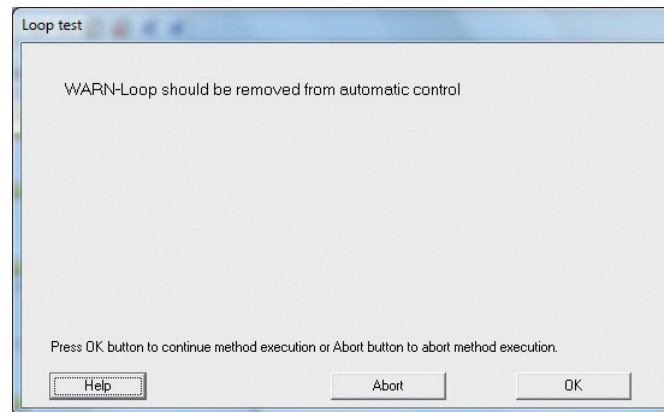
Click OK if there are no problems. The screen changes to the following.
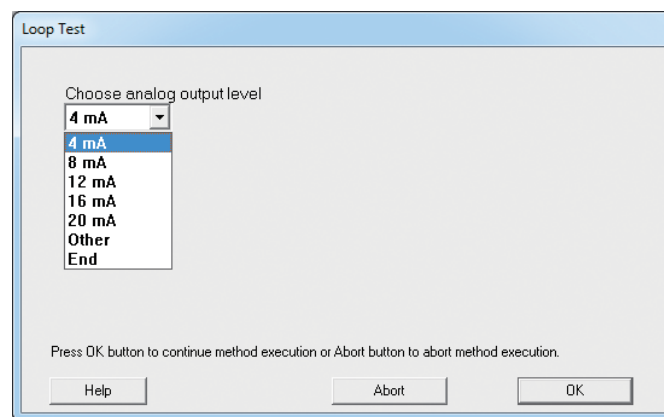
- SFN communication
  Select 4 mA and click OK. Output signals will be fixed at 4 mA (0%).
  Select 8 mA and click OK. Output signals will be fixed at 8 mA (25%).
  Select 12 mA and click OK. Output signals will be fixed at 12 mA (50%).
  Select 16 mA and click OK. Output signals will be fixed at 16 mA (75%).
  Select 20 mA and click OK. Output signals will be fixed 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 normal output mode will resume.

- HART communication
  Select 4 mA and click OK. Output signals will be fixed at 4 mA (0%).
  Select 20 mA and click OK. Output signals will be fixed 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 normal output mode will resume.

3-2. Range Configuration (Zero and Span Adjustments) according to Temperature Sensor Input
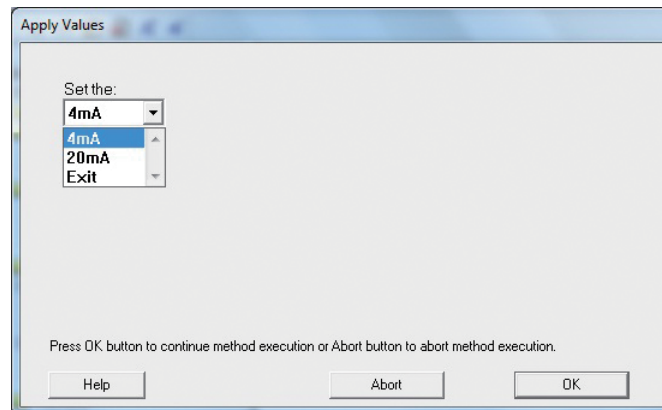
The range can be configured so that the current pressure input into the transmitter becomes 4 mA (0%) or 20 mA (100%).

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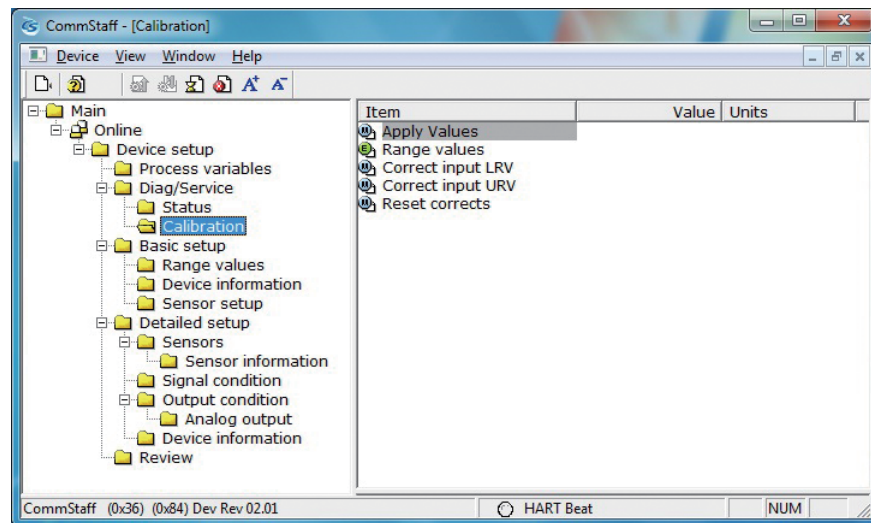
Double-click Apply Values, and a warning is displayed first and then the following screen.

- 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.
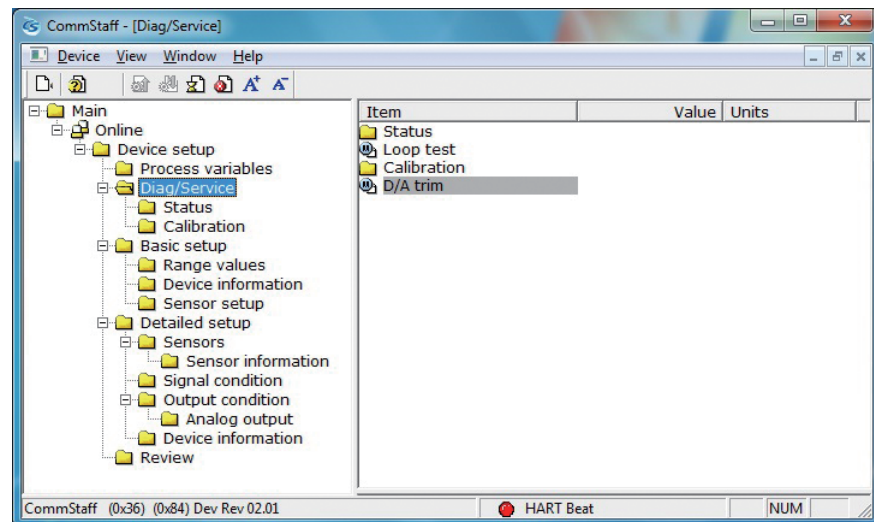
Chapter 4.   Maintenance

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.
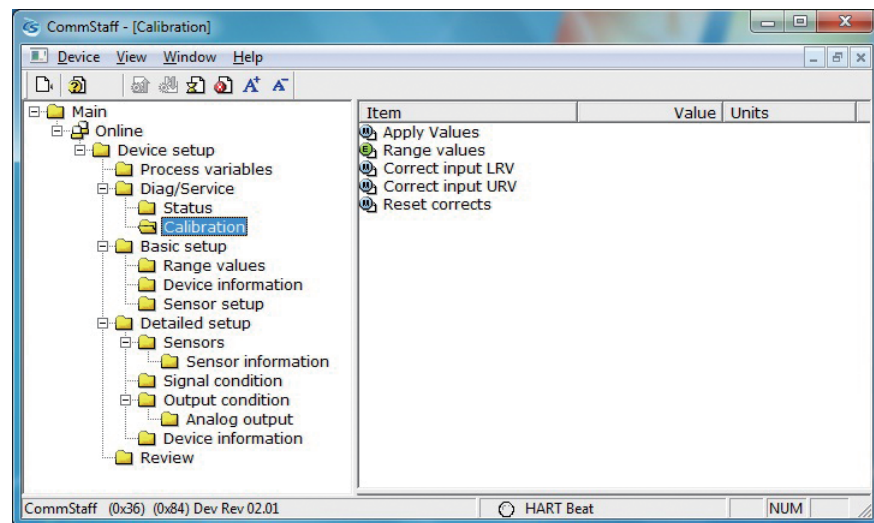
Step	Operation and indication
1	Double-click D/A Trim. WARN - Loop should be removed from automatic control A warning that the loop should be switched from automatic control to manual mode is displayed. After switching to manual mode, click OK. "Connect reference meter" is displayed. Connect the loop to an ammeter (mA) or voltmeter. (It is recommended that an ammeter or voltmeter with an accuracy of 0.03% or better be used.)
2	The following messages are displayed in the order given. Setting fld dev output to 4mA (about to set transmitter output to 4 mA) Click OK if there are no problems. Enter meter value (input the ammeter reading). Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the transmitter. Fld dev output 4.000mA equal to reference meter? (is the transmitter output equal to the reading on the connected ammeter?) 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.
3	Next do the 20 mA calibration. The following messages are displayed in the order given. Setting fld dev output to 20mA (about to set transmitter output to 20 mA) Click OK if there are no problems. Enter meter value (input the ammeter reading) Input the reading of the ammeter and click OK. This allows the adjustment command to be sent to the transmitter. Fld dev output 20.000mA equal to reference meter? (is the transmitter output equal to a reading of the connected ammeter?) 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. 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.

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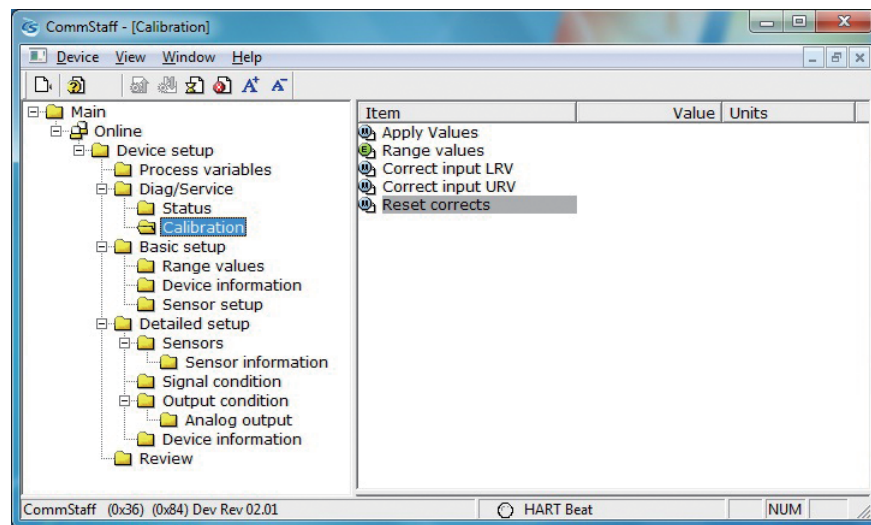
CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.

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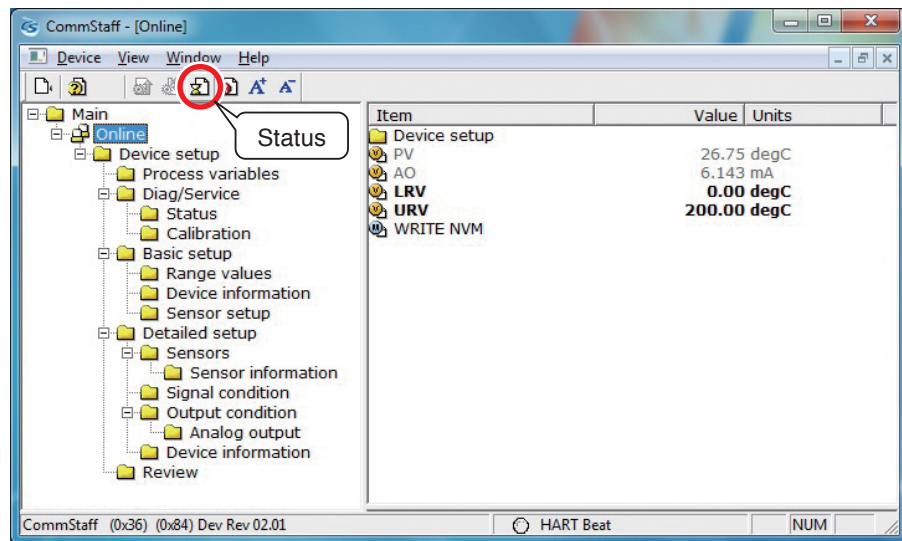
For example, if the thermocouple is disconnected, the T/C Break indicator will turn red as shown below. For details on self-diagnostics, see the ATT temperature transmitter operation manual, which lists the differences in self-diagnostic messages between SFN and HART communication versions.
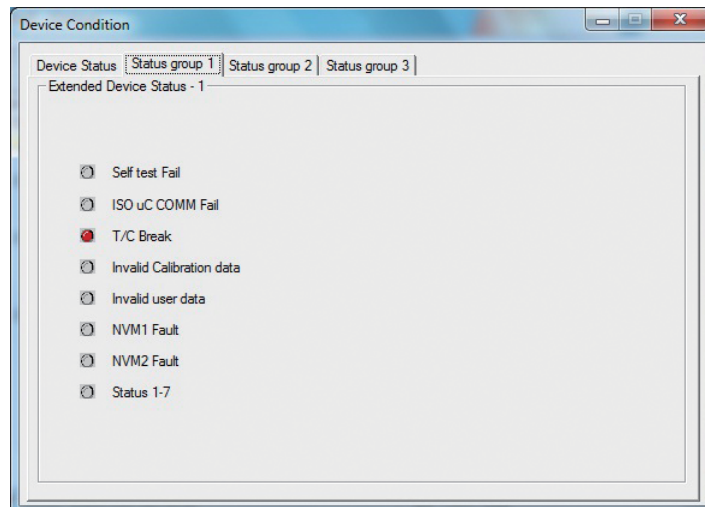
The following gives the meaning of the status messages and the corresponding troubleshooting procedures.

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 electromag-netic interference.	Protect the transmitter and wiring by using appropriate grounding, shieldind 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 tranmitter is operating in output mode.	Go to the Output Mode menu to cancel the output mode.
User correct active	— Transmitter has been adjusted for a particular sensor range. — After sensor type was changed or calibration values were reset, transmitter lost the sensor cali-bration settings and reverted to the original factory calibrations.	Enter the actual LRV and URV values on the LRV/URV calibration screens to improve accuracy.

Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products. You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1. Warranty period and warranty scope
1.1 Warranty period
Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.
1.2 Warranty scope
In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place. Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

(1) Failure caused by your improper use of azbil product (noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);

(2) Failure caused for other reasons than Azbil Corporation's product;

(3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;

(4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;

(5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or

(6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2. Ascertainment of suitability
You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

(1) Regulations and standards or laws that your Equipment is to comply with.

(2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.

(3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down. You are required to provide your Equipment with safety design such as fool-proof design, [*1] and fail-safe design[*2] (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance, [*3] fault tolerance,[*4] or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

*1. A design that is safe even if the user makes an error.
*2. A design that is safe even if the device fails.
*3. Avoidance of device failure by using highly reliable components, etc.
*4. The use of redundancy.

3. Precautions and restrictions on application
Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).
Any Azbil Corporation's products shall not be used for/with medical equipment.
The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product.
However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.
In addition,
you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below.
Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals

(2) For use of specific purposes, such as:
  * Nuclear energy/radiation related facilities
    [For use outside nuclear energy controlled areas] [For use of Azbil Corporation's Limit Switch For Nuclear Energy]
  * Machinery or equipment for space/sea bottom
  * Transportation equipment
    [Railway, aircraft, vessels, vehicle equipment, etc.]
  * Antidisaster/crime-prevention equipment
  * Burning appliances
  * Electrothermal equipment
  * Amusement facilities
  * Facilities/applications associated directly with billing
(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
(5) Machinery or equipment that may affect human lives, human bodies or properties
(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4. Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.

Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5. Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.

In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.

Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc.

as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.

System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.

For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6. Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7. Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason.

For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8. Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice.

For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.

For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9. Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service.

Accordingly, a separate fee will be charged in any of the following cases:

(1) Installation, adjustment, guidance, and attendance at a test run
(2) Maintenance, inspection, adjustment, and repair
(3) Technical guidance and technical education
(4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

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Azbil Corporation