Field Communication Software CommStaff Model: CFS100

Instruction Manual
(Smart Displacement type Level Transmitter SLX Series Edition)

Azbil Corporation

NOTICE

While the information in this manual is presented in good faith and believed to be accurate, Azbil Corporation disclaims any implied warranty of merchantability or fitness for a particular purpose and makes no express warranty except as may be stated in its written agreement with and for its customer.

In no event shall Azbil Corporation be liable to anyone for any indirect, special or consequential damages. This information and specifications in this document are subject to change without notice.

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 Smart Displacement type Level Transmitter with the model number pattern SLX Series

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 model the SLX Series Smart Displacement type Level Transmitter communications 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.

* 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.
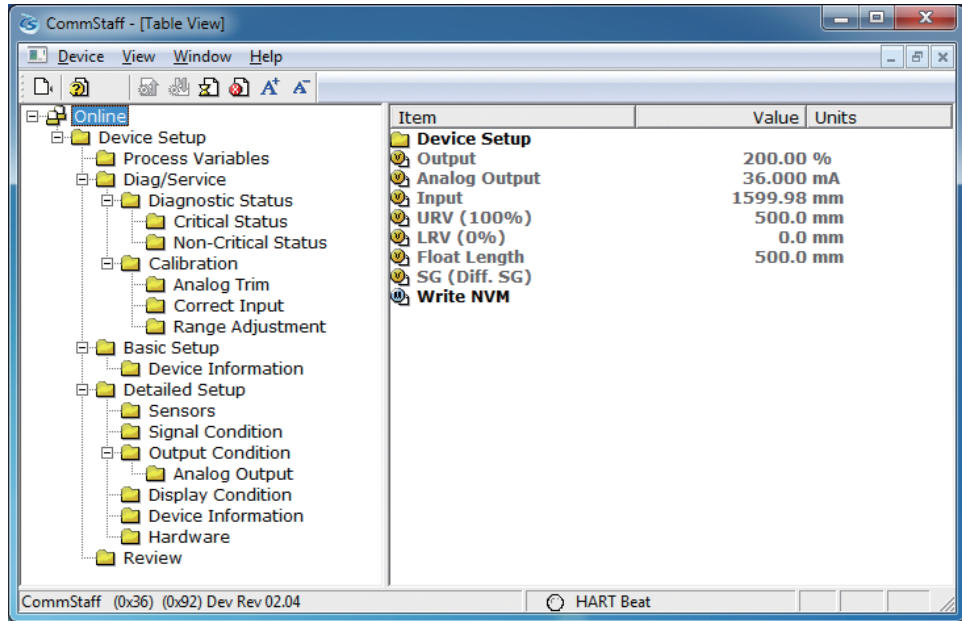
1-3. Supported Versions

CommStaff version 1.1 supports the SLX Series Smart Displacement type Level Transmitter with SFN communications version 4.0 or later.
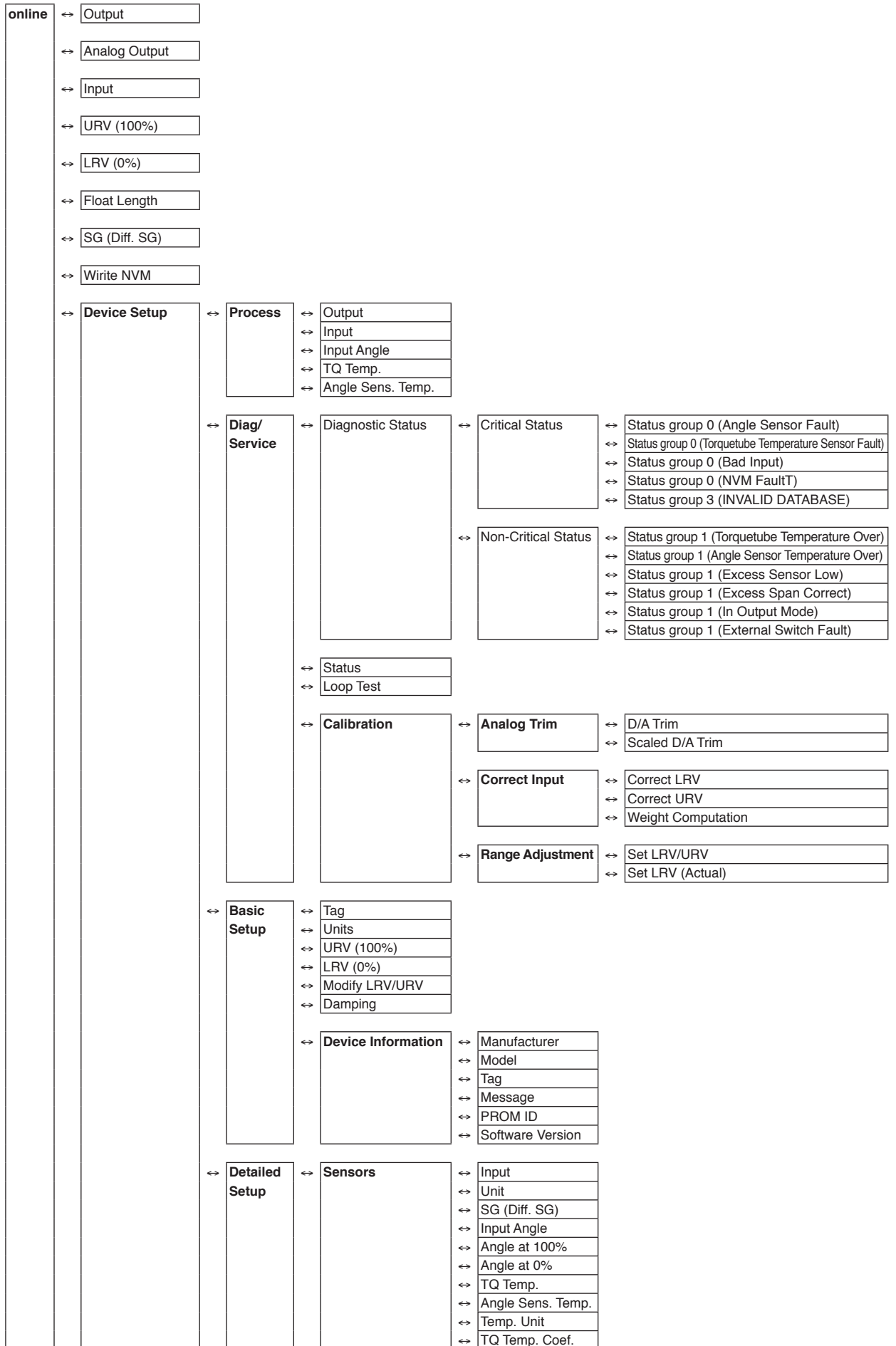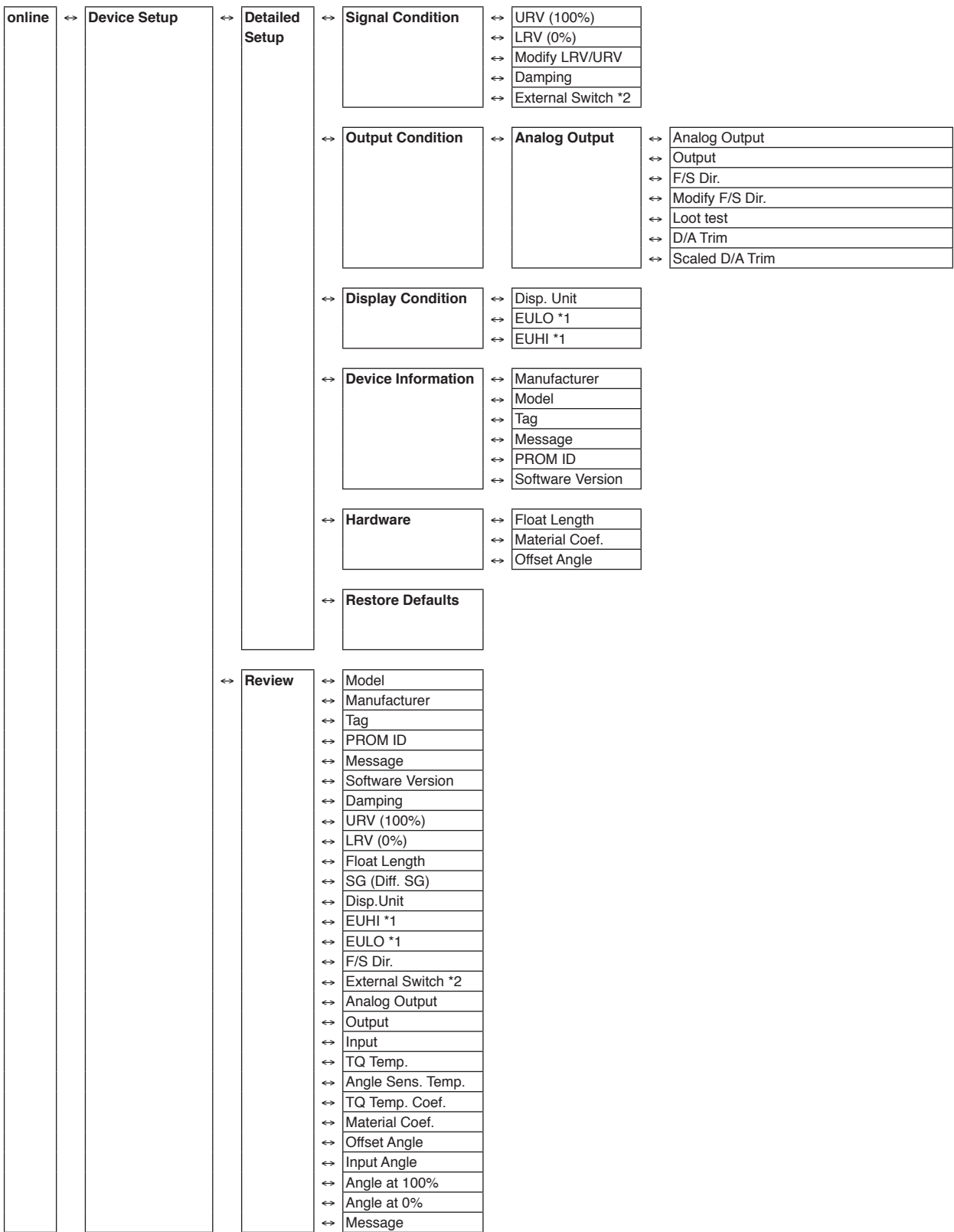
Chapter 2. Configuration

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.

The following gives details of the menus displayed in the menu tree. Bold items are parameters that can be changed.
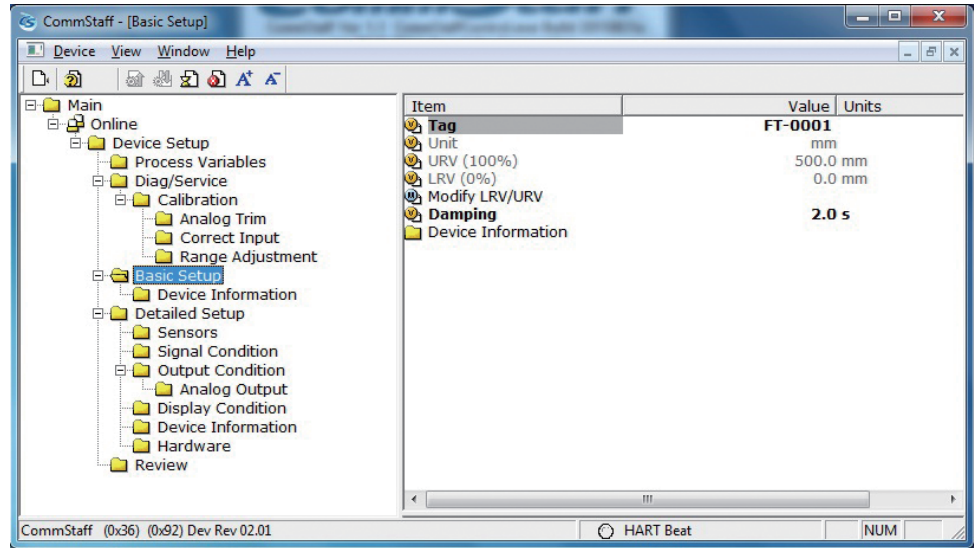
online
- Output
- Analog Output
- Input
- URV (100%)
- LRV (0%)
- Float Length
- SG (Diff. SG)
- Wirite NVM
- **Device Setup**
  - **Process**
    - Output
    - Input
    - Input Angle
    - TQ Temp.
    - Angle Sens. Temp.
  - **Diag/ Service**
    - Diagnostic Status
      - Critical Status
        - Status group 0 (Angle Sensor Fault)
        - Status group 0 (Torquetube Temperature Sensor Fault)
        - Status group 0 (Bad Input)
        - Status group 0 (NVM FaultT)
        - Status group 3 (INVALID DATABASE)
      - Non-Critical Status
        - Status group 1 (Torquetube Temperature Over)
        - Status group 1 (Angle Sensor Temperature Over)
        - Status group 1 (Excess Sensor Low)
        - Status group 1 (Excess Span Correct)
        - Status group 1 (In Output Mode)
        - Status group 1 (External Switch Fault)
    - Status
    - Loop Test
    - **Calibration**
      - **Analog Trim**
        - D/A Trim
        - Scaled D/A Trim
      - **Correct Input**
        - Correct LRV
        - Correct URV
        - Weight Computation
      - **Range Adjustment**
        - Set LRV/URV
        - Set LRV (Actual)
  - **Basic Setup**
    - Tag
    - Units
    - URV (100%)
    - LRV (0%)
    - Modify LRV/URV
    - Damping
    - **Device Information**
      - Manufacturer
      - Model
      - Tag
      - Message
      - PROM ID
      - Software Version
  - **Detailed Setup**
    - **Sensors**
      - Input
      - Unit
      - SG (Diff. SG)
      - Input Angle
      - Angle at 100%
      - Angle at 0%
      - TQ Temp.
      - Angle Sens. Temp.
      - Temp. Unit
      - TQ Temp. Coef.

online	↔	Device Setup	↔	Detailed Setup	↔	Signal Condition	↔	URV (100%)		
							↔	LRV (0%)		
							↔	Modify LRV/URV		
							↔	Damping		
							↔	External Switch *2		
					↔	Output Condition	↔	Analog Output	↔	Analog Output
									↔	Output
									↔	F/S Dir.
									↔	Modify F/S Dir.
									↔	Loot test
									↔	D/A Trim
									↔	Scaled D/A Trim
					↔	Display Condition	↔	Disp. Unit		
							↔	EULO *1		
							↔	EUHI *1		
					↔	Device Information	↔	Manufacturer		
							↔	Model		
							↔	Tag		
							↔	Message		
							↔	PROM ID		
							↔	Software Version		
					↔	Hardware	↔	Float Length		
							↔	Material Coef.		
							↔	Offset Angle		
					↔	Restore Defaults				
			↔	Review	↔	Model				
					↔	Manufacturer				
					↔	Tag				
					↔	PROM ID				
					↔	Message				
					↔	Software Version				
					↔	Damping				
					↔	URV (100%)				
					↔	LRV (0%)				
					↔	Float Length				
					↔	SG (Diff. SG)				
					↔	Disp.Unit				
					↔	EUHI *1				
					↔	EULO *1				
					↔	F/S Dir.				
					↔	External Switch *2				
					↔	Analog Output				
					↔	Output				
					↔	Input				
					↔	TQ Temp.				
					↔	Angle Sens. Temp.				
					↔	TQ Temp. Coef.				
					↔	Material Coef.				
					↔	Offset Angle				
					↔	Input Angle				
					↔	Angle at 100%				
					↔	Angle at 0%				
					↔	Message				

*1. Displayed if Disp. Unit is set to "Eng. Unit."

*2 Not displayed if the transmitter version is 3.0 or lower.

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].

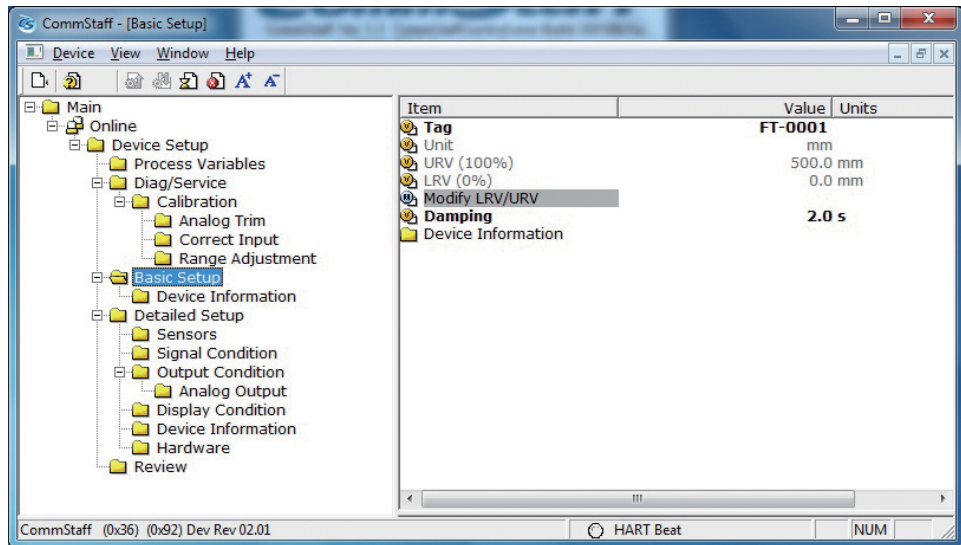Double-clicking Tag displays the settings screen. On this screen, set the Tag and click the Set button.

The tag is highlighted in yellow. Click the Send button to send the new Tag to the transmitter.
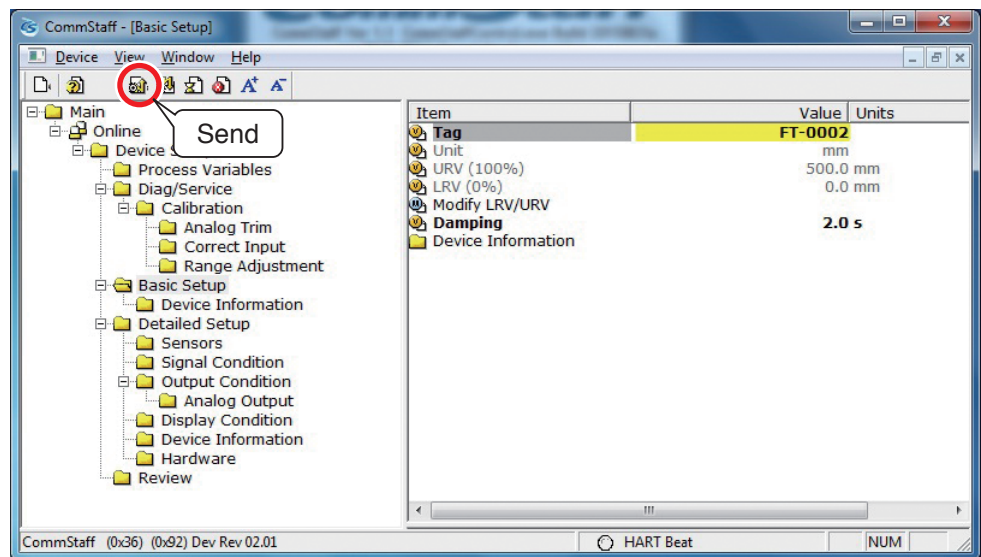
2-3.　Range Setting

This section tells how to configure the flow rate range.
Select [Device Setup] → [Basic Setup] → [Modify LRV/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.

- When "Enter LRV (0%) value (mm)" is displayed, input the LRV value and click OK.

- When "Enter URV (100%) value (mm)" is displayed, input the URV value and click OK.

- If transmission was successful, [Modify LRV/URV succeeded] will be displayed. Click OK.

- The "Note - Loop may be returned to automatic control" message is displayed. Click OK.

2-4. Setting the Specific Gravity

When using this instrument as a level meter, use this screen to set the specific gravity. When using this instrument as a phase boundary meter, use this screen to set the difference in specific gravity between the upper and the lower layer liquids.

Select [Device Setup] → [Detailed Setup] → [Sensors] → [SG (Diff. SG)].
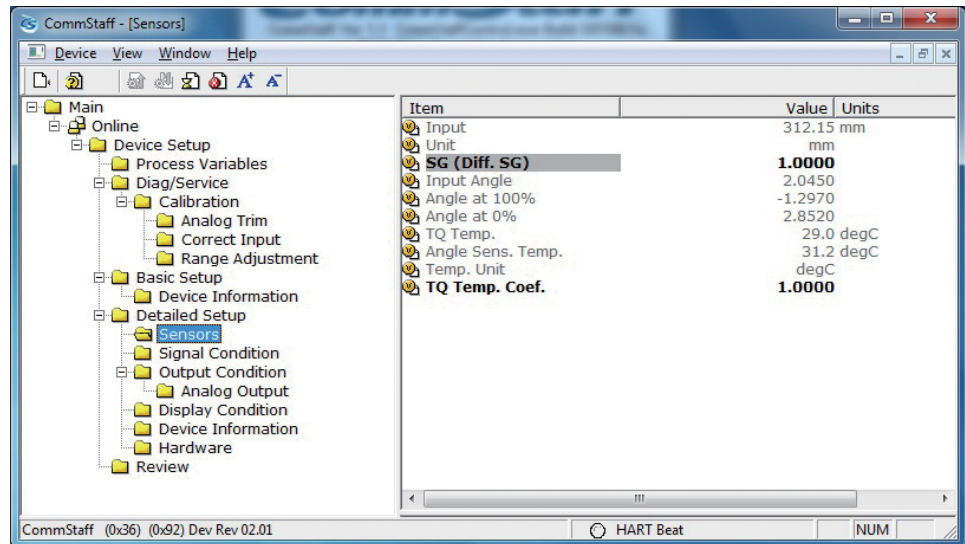
2-5.   Display setup

This section explains how to set up the display.
Select [Device Setup] → [Detailed Setup] → [Display Condition] → [Main Display] → [Disp. Unit].
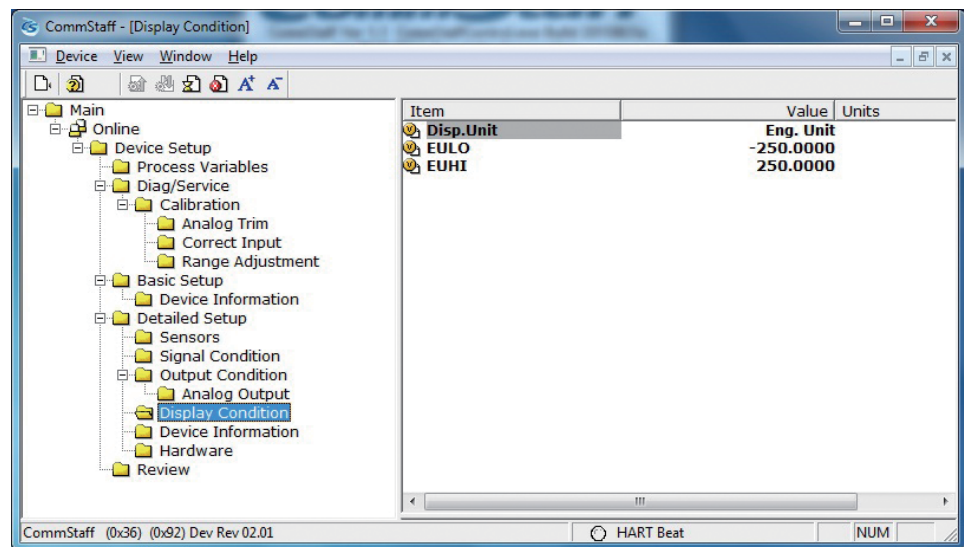
For the unit of display, select either percentage (%) or engineering units (Eng. Unit). If Eng. Unit is selected, set EULO and EUHI as well.

2-6. Damping Time Constant Configuration

This section explains how to configure the damping time constant.
Select [Device Setup] → [Basic setup] → [Damping].
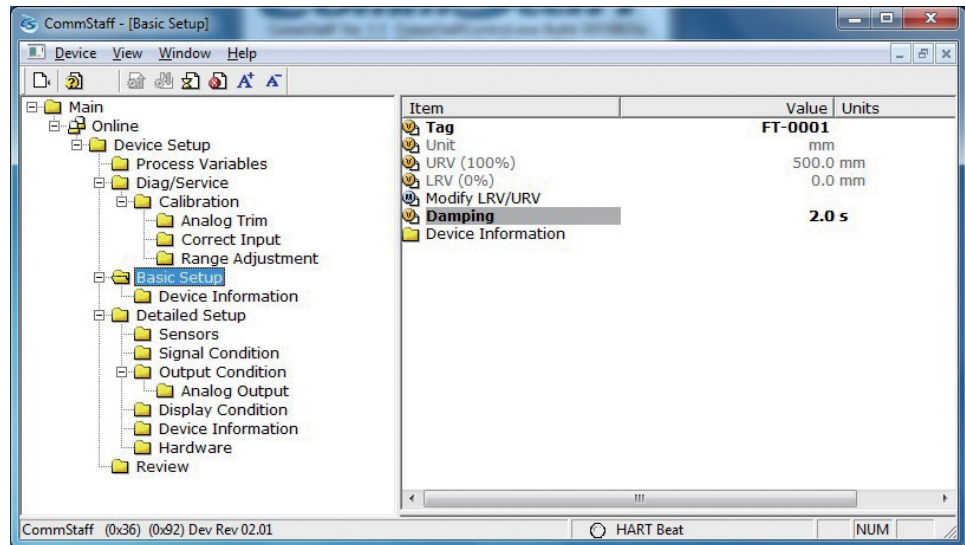
Set a value in the range of 0 to 100 seconds.
The following values can be input. If a value other than the following is input, the closest value is automatically selected.

Unit: s

0.0
0.5
2.0
3.0
4.0
5.0
10.0
50.0
100.0

2-7.   Burnout Direction Confirmation and Configuration

This section explains how to confirm the direction of burnout.
Select [Device Setup] → [Detailed Setup] → [Output Condition] → [Analog Output] → [F/S Dir.].
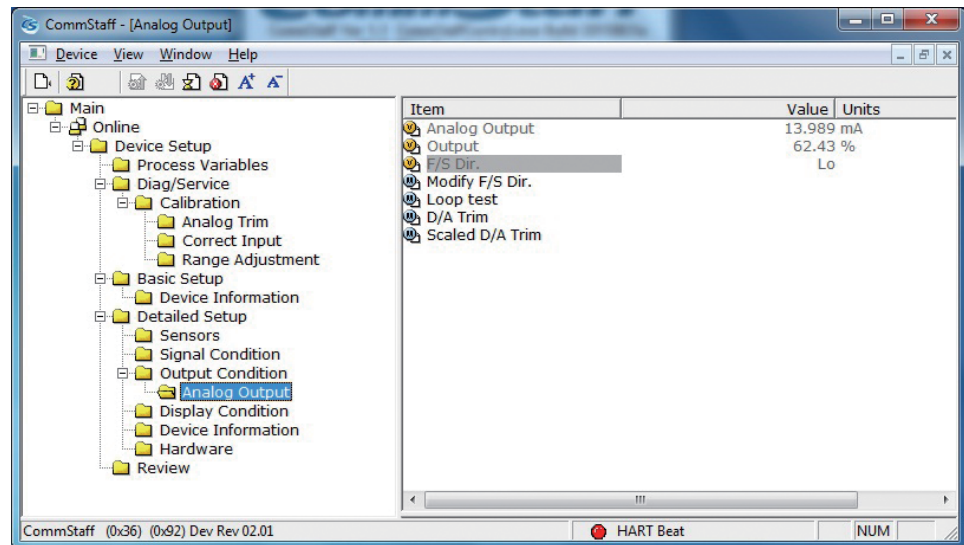
The burnout direction shows the output behavior if a critical failure occurs.

Non	Output will be unpredictable.
Hi	Output will exceed the upper limit.
Lo	Output will be less than the lower limit.

- To change the direction of burnout, select [Device Setup] → [Detailed Setup] → [Output Condition] → [Analog Output] → [Modify F/S Dir.].

- 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.

- Select Hi, Lo, or None and click OK.

- If the send succeeds, [Modify LRV/URV succeeded] will be displayed. Click OK.

- The message "Note - Loop may be returned to automatic control" appears. Click OK.

2-8.   Zero point adjustment

This section explains how to adjust the range. The following three methods are available.

Set LRV	Sets the current input value as the lower limit of the range.
Set URV	Sets the current input value as the upper limit of the range.
Set LRV (Actual)	Adjusts the LRV so that the current sensor output level becomes the specified percentage of output.

2-8-1.   Set LRV/URV

This section explains how to adjust the Set LRV/URV.
Select [Device Setup] → [Diag/Service] → [Calibration] → [Range Adjustment] → [Set LRV/URV].
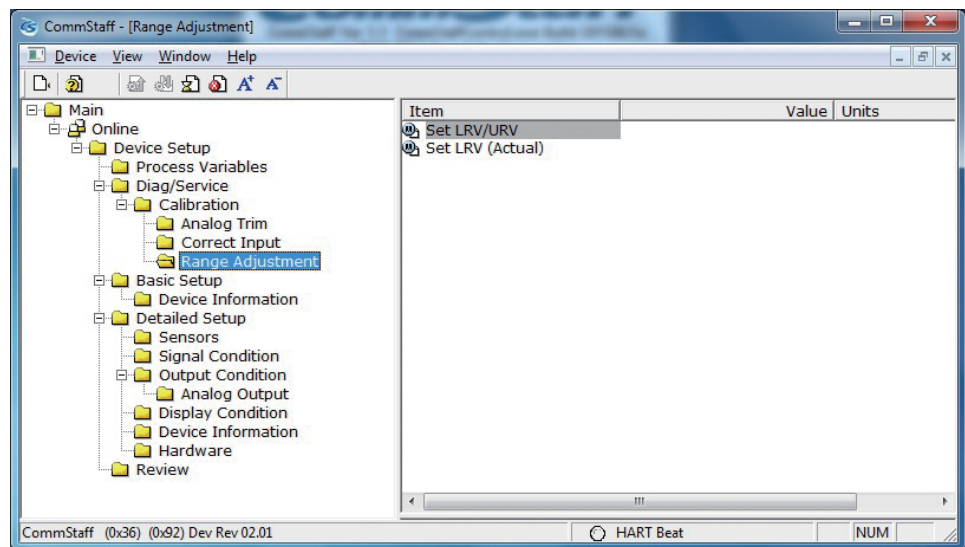
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.

- A list of items to be adjusted will be displayed. To adjust LRV or URV, select [LRV (0%)] or [URV (100%)] respectively, and click [OK].

- Either "Apply new LRV (0%) input" or "Apply new URV (100%) input" will be shown. Input the necessary data and click [OK].

- The current (most recently input) value will be displayed. If it is acceptable for the adjustment, select either [Set as LRV(0%) values] or [Set as URV (100%) values], and click [OK].To changing the input value, after adjusting the input select [Read new values], and click [OK]. To go back to the previous menu without adjusting, select [Leave as found] and click [OK].

- After adjustment, the selection menu appears again. If adjustment work is done, select [Exit] and click [OK]. To continue with further adjustment work, select [LRV(0%)] or [URV(100%)], and click [OK].

- Selecting [Exit] will display the message "Note - Loop may be returned to automatic control." Click [OK].

2-8-2. Set LRV (Actual)

This section explains how to adjust the Set LRV (Actual).
Select [Device Setup] → [Diag/Service] → [Calibration] → [Range Adjustment] → [Set LRV (Actual)].
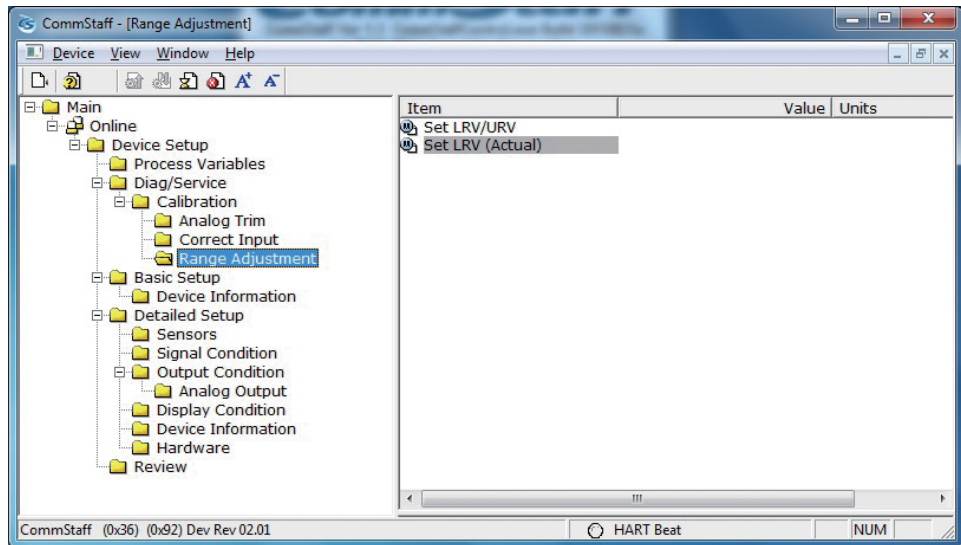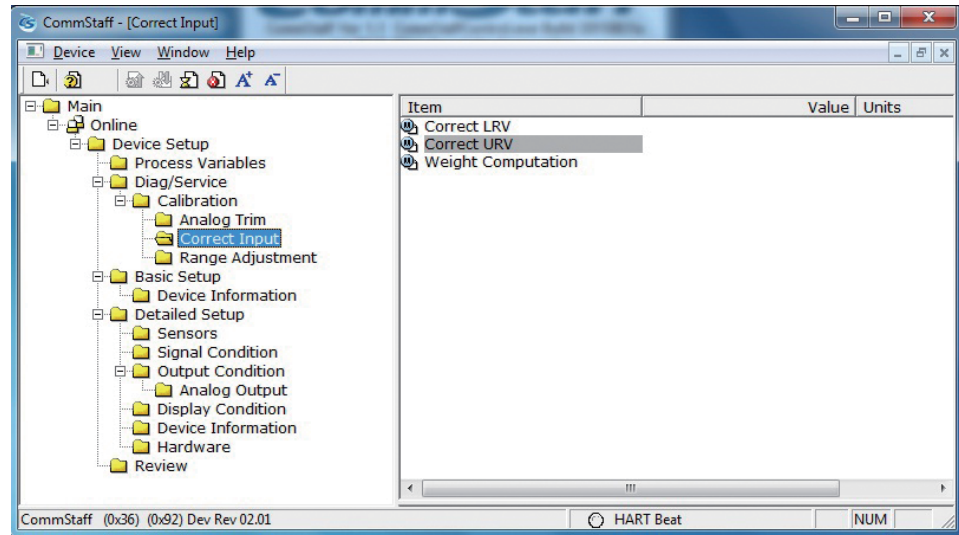

- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.

- When the message "Enter new set output (%)" is displayed, input the desired output value and click [OK].

- The message "About to Set output" will be displayed. Click [OK].

- When adjustment is complete the message "Note - Loop may be returned to automatic control" is displayed. Click [OK].

12

2-9.   Calibration

Calibration includes the following three functions.

Correct LRV	Calibrates using the zero point (LRV)
Correct URV	Calibrates using the span (URV)
Weight computation for calibration	To calculate the appropriate weight for calibration when using the actual weight

2-9-1.   Correct LRV

This section explains the Correct LRV function.

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] → [Correct Input] → [Correct LRV].
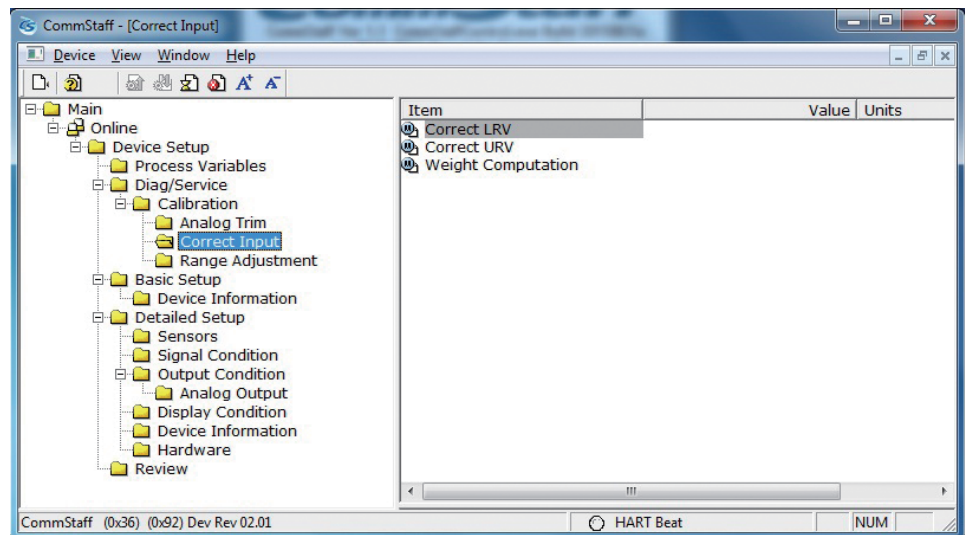

- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.

- "Apply DP LRV value" will be displayed. To apply a weight appropriate for the LRV, click [OK].

- "Press OK when input value is stable" is displayed. After confirming that input pressure has stabilized, click OK.

- If the calibration succeeds, [LRV corrected] will be displayed. 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.
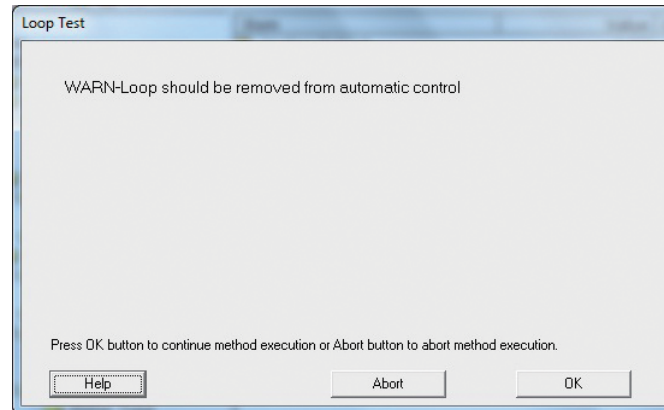
2-9-2. Correct URV

This section explains the Correct URV function.

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] → [Correct Input] → [Correct 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 DP URV value" will be displayed. To apply a weight appropriate for the URV, click [OK].

- "Press OK when input value is stable" is displayed. After confirming that input pressure has stabilized, click OK.

- If the calibration succeeds, [URV corrected] will be displayed. 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.

2-9-3. Weight computation for calibration

This section explains how to use the Weight computation for calibration function.

Select [Device Setup] → [Diag/Service] → [Calibration] → [Correct Input] → [Weight Computation].
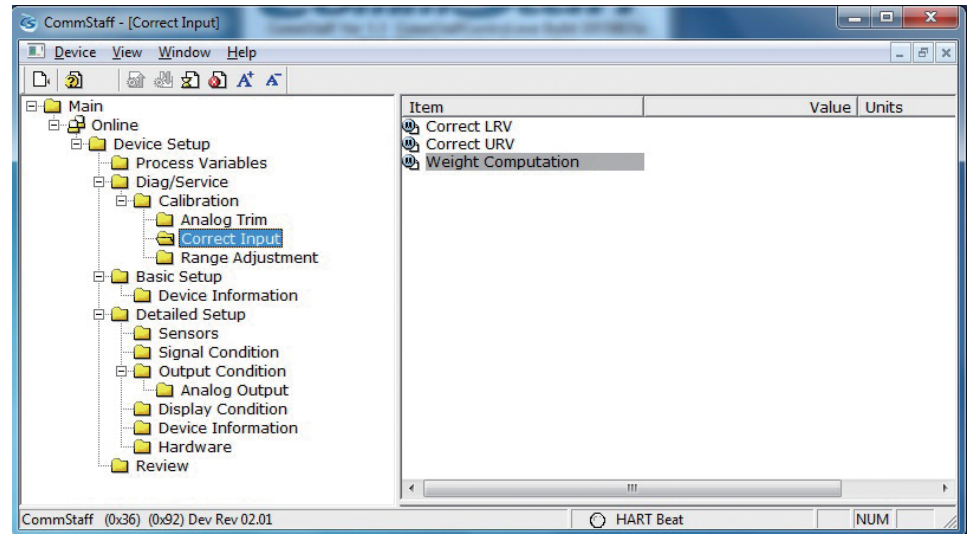
- When the message "Choose meter type" appears, select either [Level meter] or [Phase boundary meter], and click [OK].

- The message "Enter mass of the float (g)" will be displayed. Input the float mass and click [OK].

- When the message "Enter diameter of the float (mm)" is shown, input the float diameter and click [OK].

- If the phase boundary meter option was selected, "Enter specific gravity of the lower liquid" will be shown. Input the specific gravity and click [OK].

- The weight for 0, 25, 50, 75, and 100 % output will be computed and displayed. To complete, click [OK].

2-10. Constant current output

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.
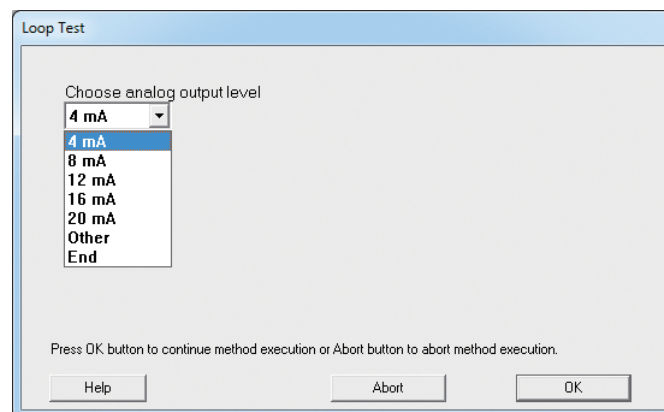
- Select 4 mA and click OK. Output signals will be fixed at 4 mA (0%).

- 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.

2-11.   Calibration of output current

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

Select [Device Setup] → [Diag/Service] → [Calibration] → [Analog Trim] → [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.
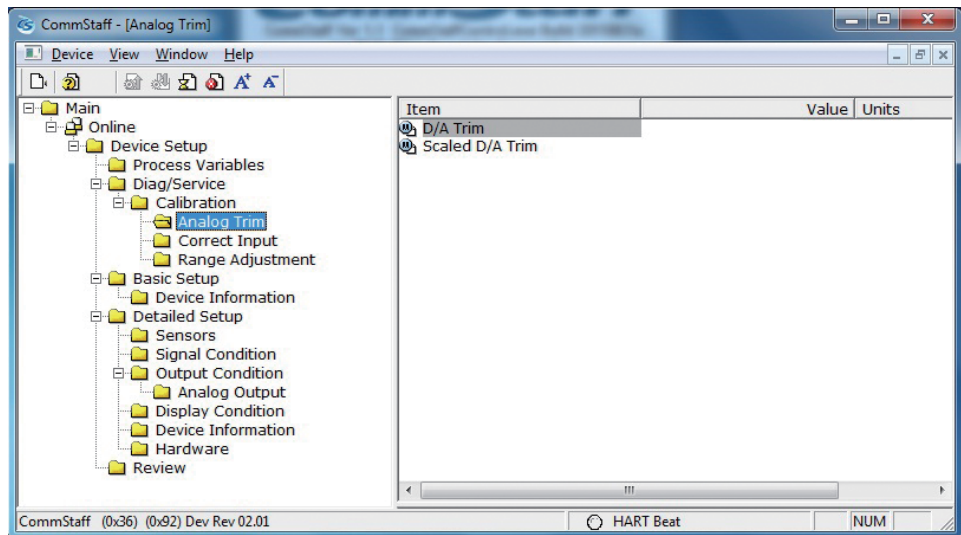
Step	Operation and indication
1	Double-click D/A Trim. WARN - Loop should be removed from automatic control A warning that the loop should be switched from automatic control to manual mode is displayed. After switching to manual mode, click OK. "Connect reference meter" is displayed. Connect the loop 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.

2-12. Hardware information

This section explains how to set Float Length, Material Coef. and Offset Angle.

Depending on the desired item, select [Device Setup] → [Detailed Setup] → [Hardware] → [Float Length] / [Material Coef.] / [Offset Angle].
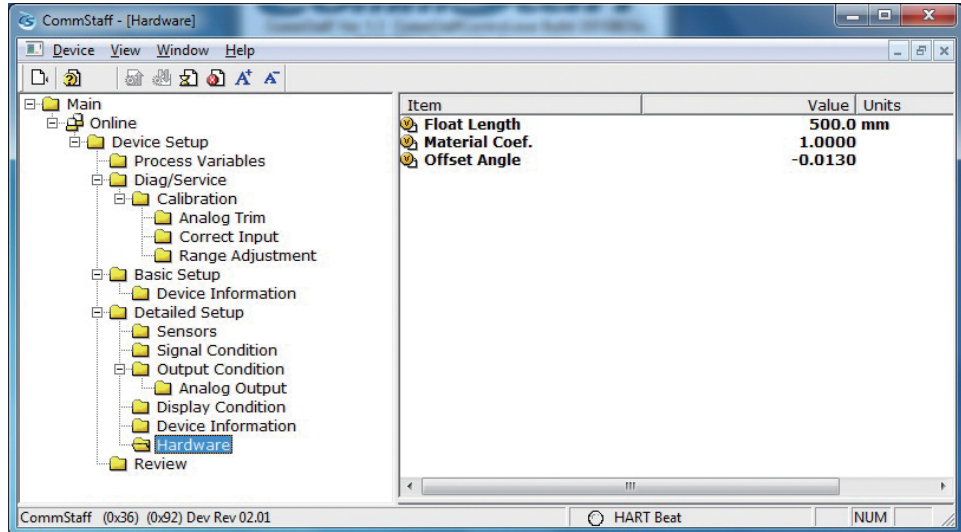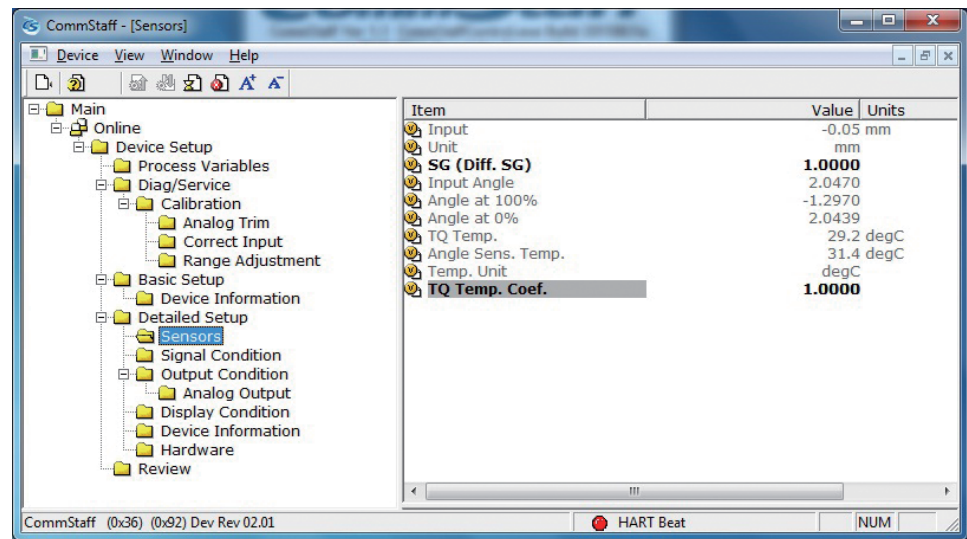

Note: If any of the settings of float length, material coefficient, and offset angle is changed, proper measurement may be impossible.

2-13.   TQ Temp. coef.
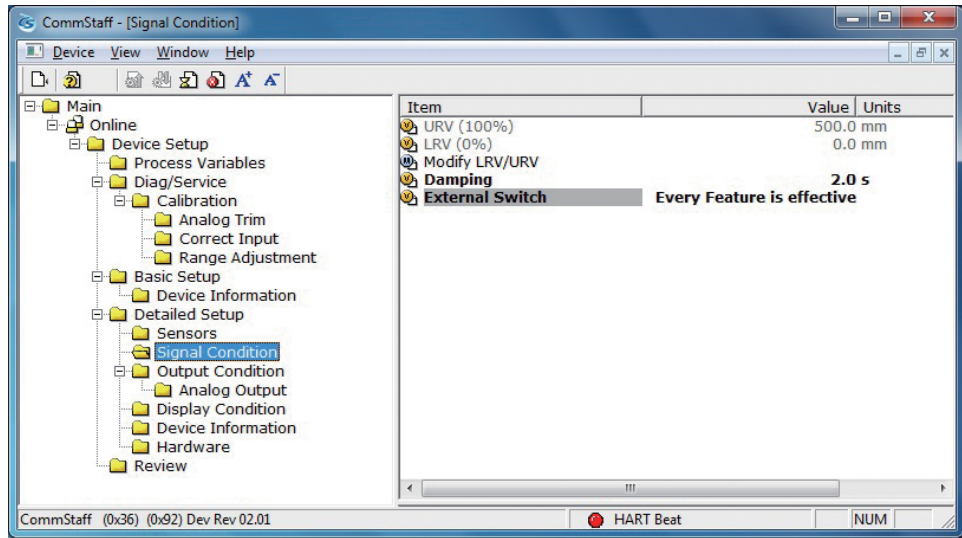
This section shows how to set the TQ (torque tube) temperature coefficient.

Set [Device Setup] → [Detailed Setup] → [Sensors] → [TQ Temp. Coef.].

2-14. External Switch Settings.

This section explains the functions that can be performed by the external switches.

Set [Device Setup] → [Detailed Setup] → [Signal Condition] → [External Switch].

The following two items can be selected.

Every feature is effective	Every feature is available. Damping, zero-span adjustment, and setting LRV (actual) can be done by the external switches.
Only Set LRV (Actual) is effective	Only the setting of the LRV (actual) can be done.

2-15. Restore Factory Defaults

This function restores the factory-shipped settings and adjusted values.

CAUTION: After restoring the factory defaults, exit CommStaff and restart it.

Set [Device Setup] → [Detailed Setup] → [Restore Defaults].
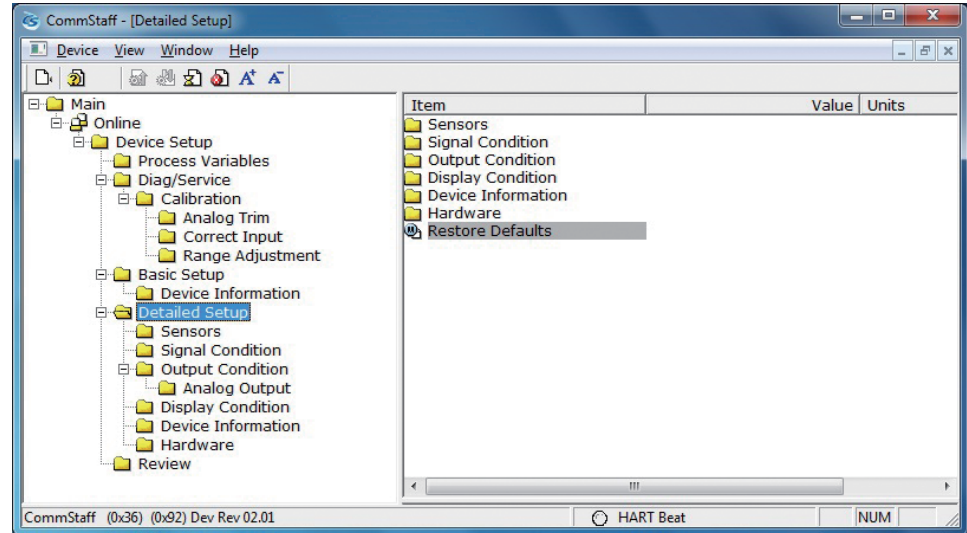
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.

- Executing this function will remove all the data input by the user. The message "This returns to the setting in case of shipment. All setting which was changed by the customer is lost" will be shown. Click [OK] to restore the defaults.

- If sent successfully, the message "All settings and calibration data are reset to factory default values. Exit CommStaff and restart CommStaff" will be displayed. When the procedure is complete, be sure to exit CommStaff and restart it. 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.

2-16.   Memo

A memo stored within the device can be set and displayed.

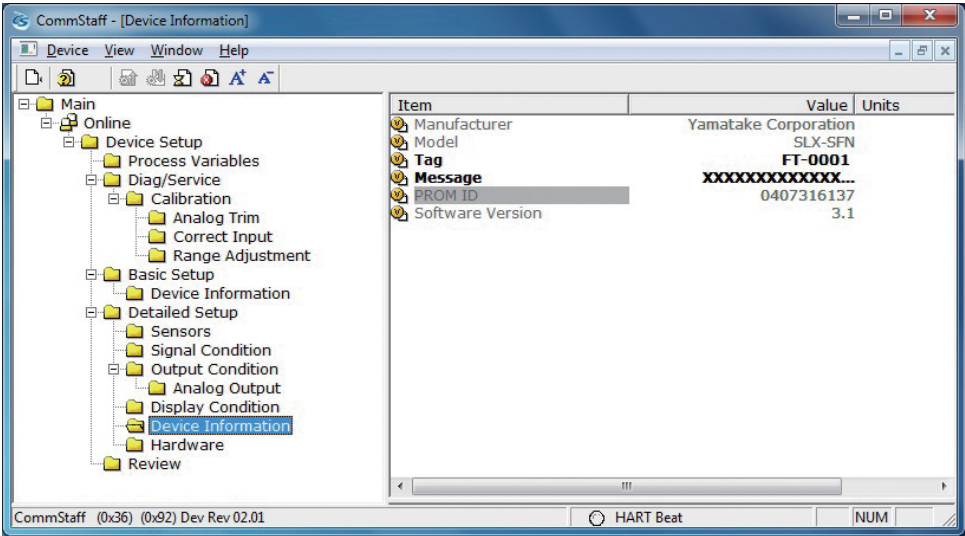The maximum length is 32 alphanumeric characters.

Select [Device Setup] → [Detailed Setup] → [Device Information] → [Message].
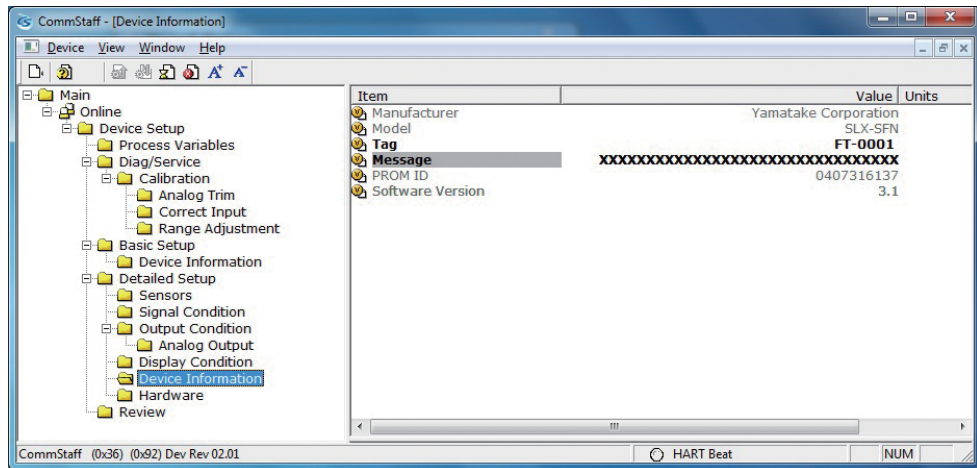
2-17. PROM ID
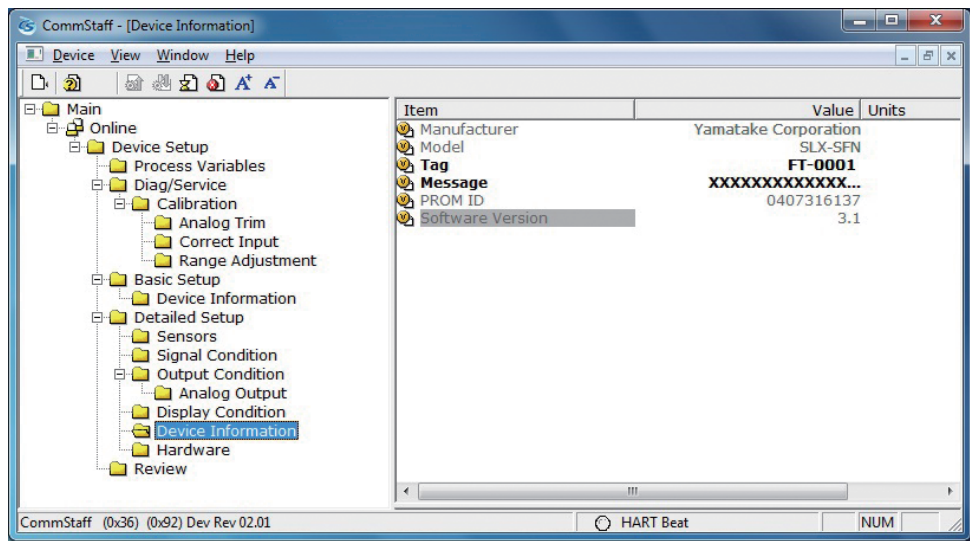
The following shows how to check the PROM ID.

Select [Device Setup] → [Detailed Setup] → [Device Information] → [PROM ID].

2-18.   Software version

The software version of the device can be displayed as shown below.

Select [Device Setup] → [Detailed Setup] → [Device Information] → [Software Version].
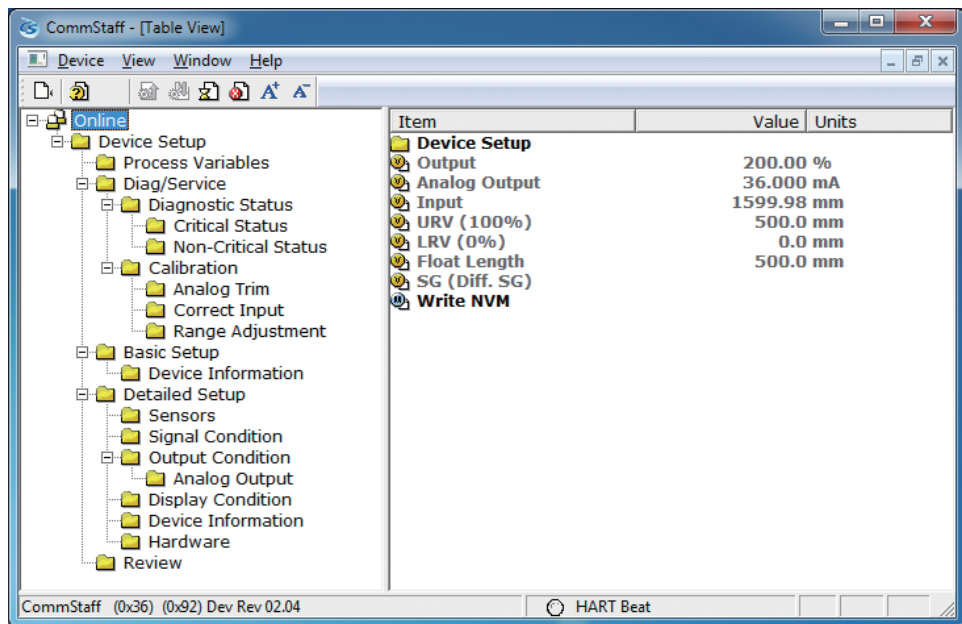
2-19. NVM Save

When configuration data is sent to the transmitter, the transmitter stores the data periodically in nonvolatile memory. If the transmitter is turned off before the data is saved, 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.
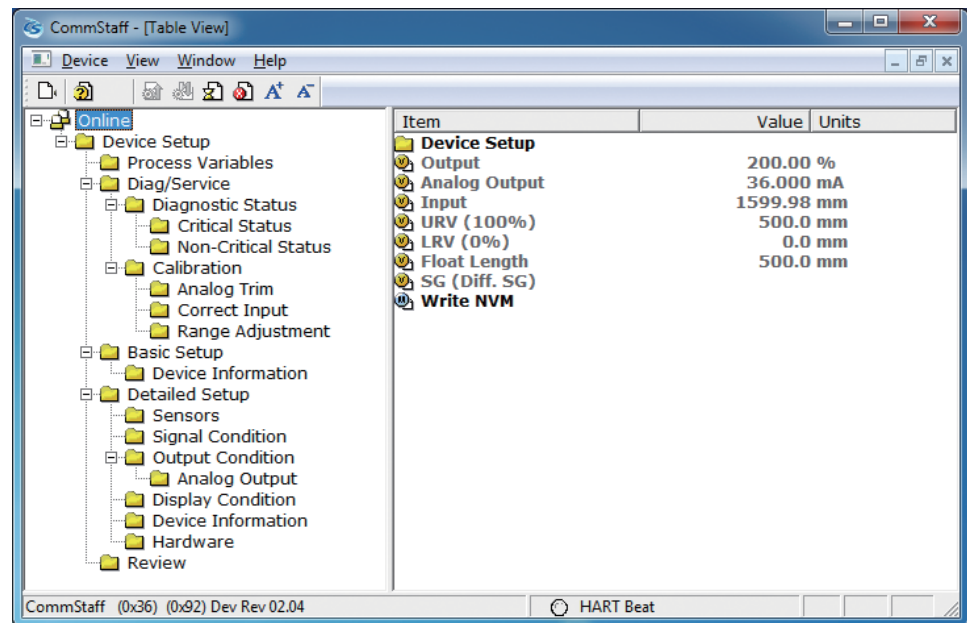
Chapter 3. Checking Self-diagnostic Messages

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

3-1. Status Message

Status	Status message	What it means	
Invalid database	Invalid database	Configuration data and/or calibration data is invalid.	Tap [Exit] and try communicating again. Verify configuration data and recalibrate the device.
Critical Failure	Angle Sensor Fault	The connector of the angle sensor comes off or is the trouble of the angle sensor.	Confirm the connector of the angle sensor. When not solving, the exchange of the gauge part is necessary.
	Torquetube Temperature Sensor Fault	The connector of the temperature sensor comes off or is the trouble of the temperature sensor.	Confirm the connector of the torque tube temperature sensor. When not solving, it is necessary to exchange a temperature sensor.
	Bad Input	The input angle exceeds latitude.	Contact appropriate personnel
	NVM Fault	NVM check error	1. Turn the power off and then on again. 2. Replace the main board. If the problem persists, contact the appropriate personnel.
Instrument status	Torquetube Temperature Over	The temperature of TQ exceeds latitude.	The torque tube temperature make a 400degC (752degF) range become from -200degC (-328degF)
	Angle Sensor Temperature Over	The temperature of the angle sensor exceeds latitude.	The angle sensor temperature make -30 - 80 DC become. In case of the explosion proof and the display model, confirm an ambient temperature condition.
	Excess Sensor Low	The zero correction factor is outside the acceptable limits for accurate operation.	Check the input and be sure it matches the calibrated range value.
	Excess Span Correct	The span correction factor is outside acceptable limits for accurate operation.	Confirm a given weight or given liquid and do calibration.
	In Output Mode	The device is operating in output mode.	Go to the output mode menu to clear the output mode
	External Switch Fault	External switch fault.	Contact appropriate personnel.

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.

AAS-511A-014-09

Azbil Corporation