

Field Communication Software CommStaff Model: CFS100

Instruction Manual (Smart Transmitter Edition)



Yamatake 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 DST J3000 Ace Smart Transmitter differential pressure transmitters with the model number pattern JT □ 9 □ □ and ST □ 9 □ □.

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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.

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.

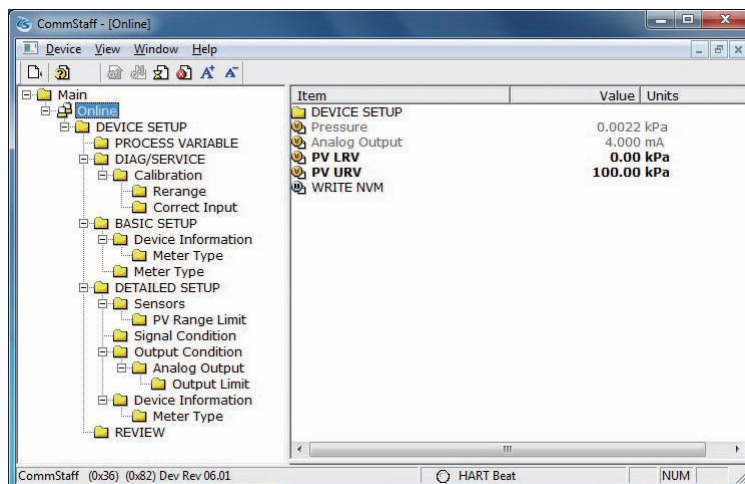
Exit CommStaff before detaching the communications cable from the device, and then start CommStaff again after connecting the communications cable to the new device.

Chapter 2. Configuration

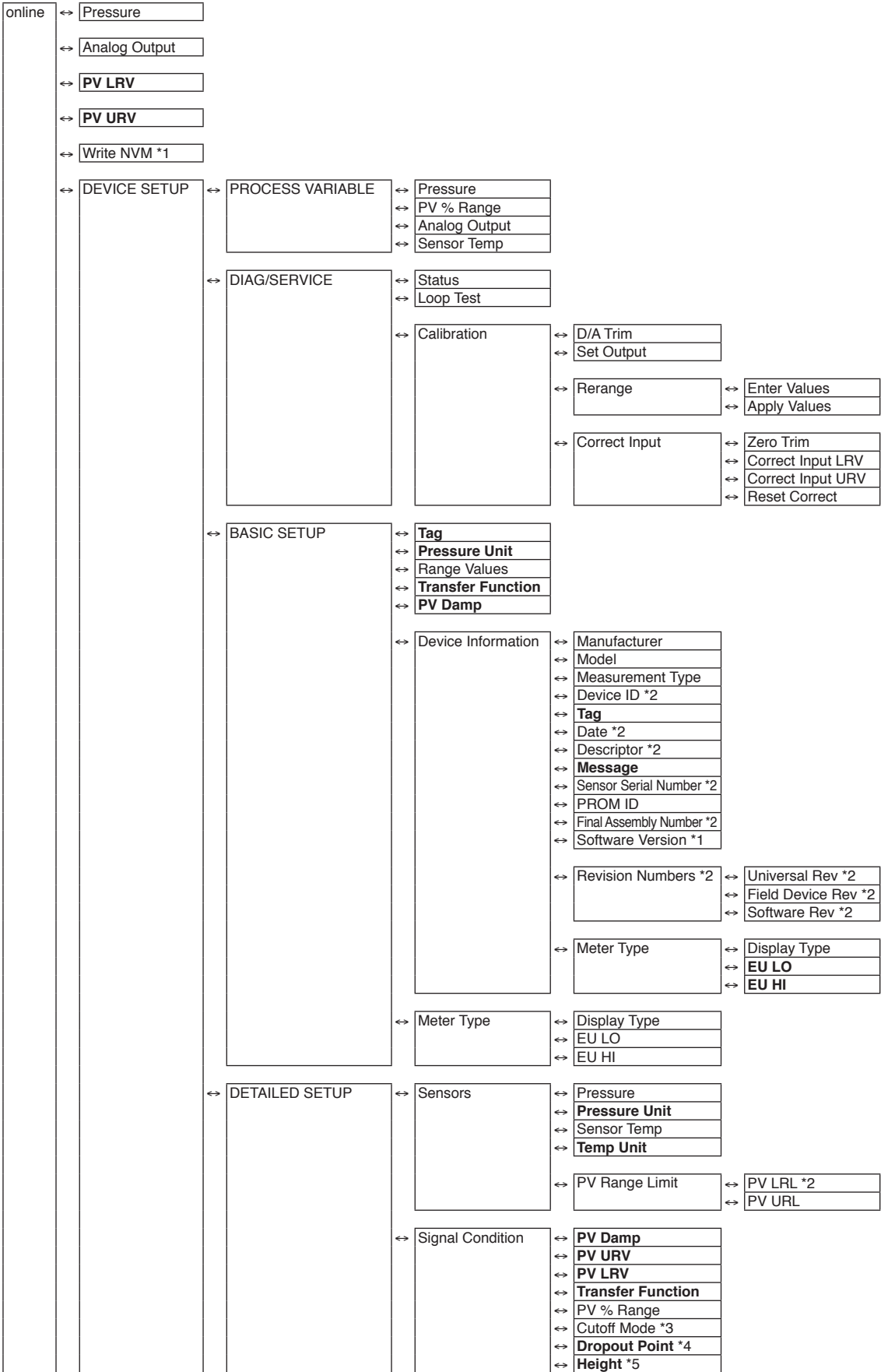
2-1. Menu List

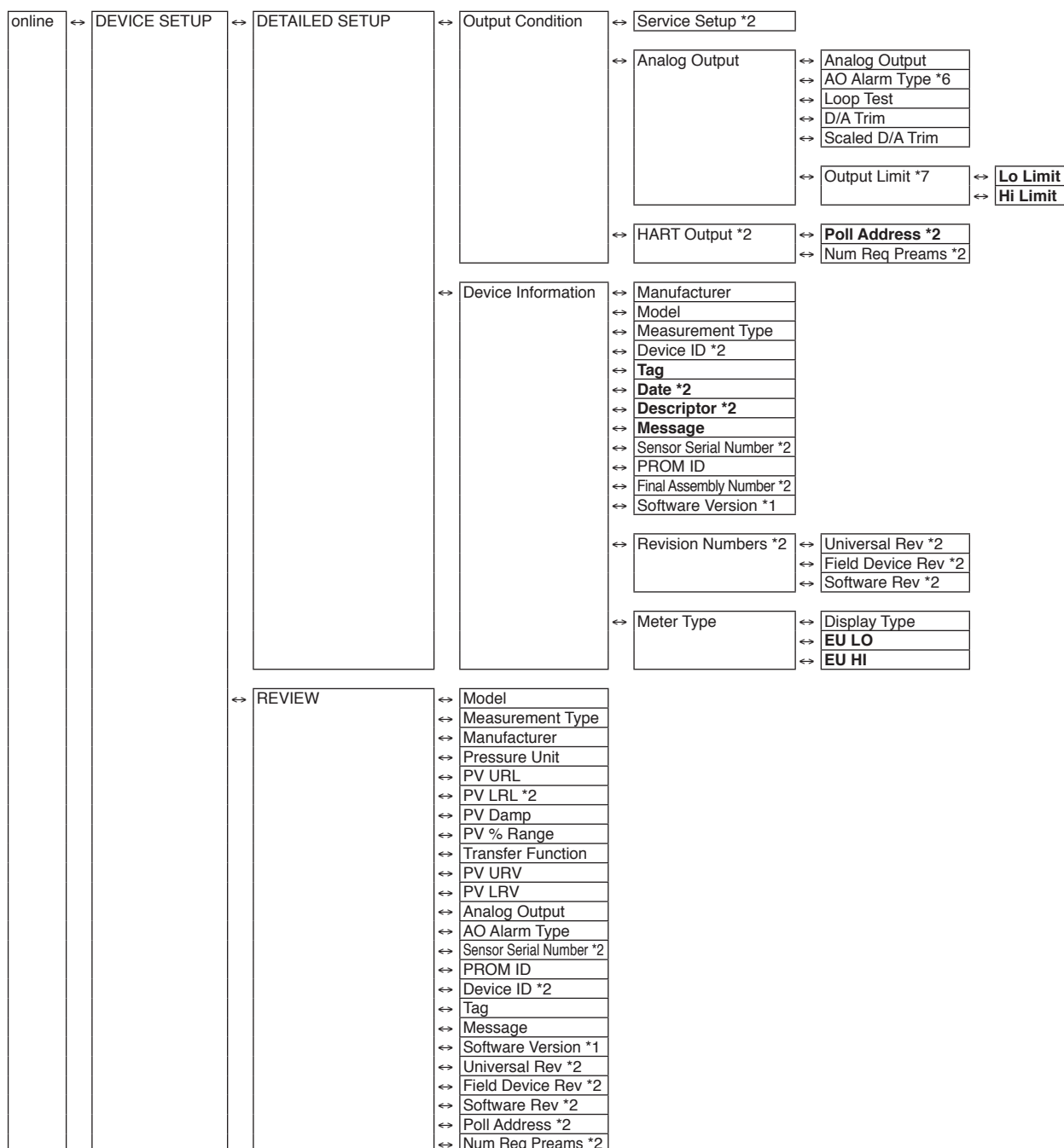
Right-clicking “Online” in the menu tree in the left pane of the CommStaff application window displays a menu. Selecting Expand on the menu displays the expanded menu tree.

Parameters displayed in gray (Pressure and Analog Output in the following window) in the parameter display in the right pane are parameters that cannot be changed. Those displayed in black (PV LRV and PV 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.





*1 Not displayed if HART communications is selected.

*2 Not displayed if SFN communications is selected.

*3 Valid when Transfer Function is set to Sq root. (Displayed.)

*4 Valid when Cutoff mode is not set to DEFAULT. (Displayed.)

*5 Valid if a JTE model is connected. (Displayed.)

*6 Displays the burnout direction.

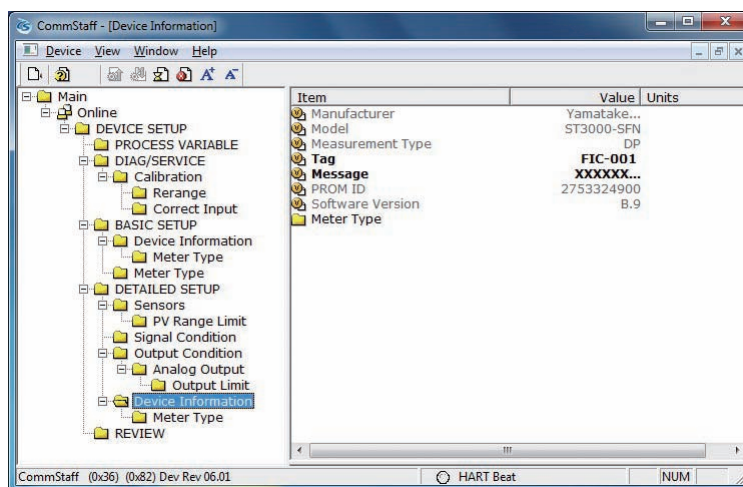
*7 Valid when the burnout direction upper limit or lower limit is selected. (Displayed.)

Setting items and references

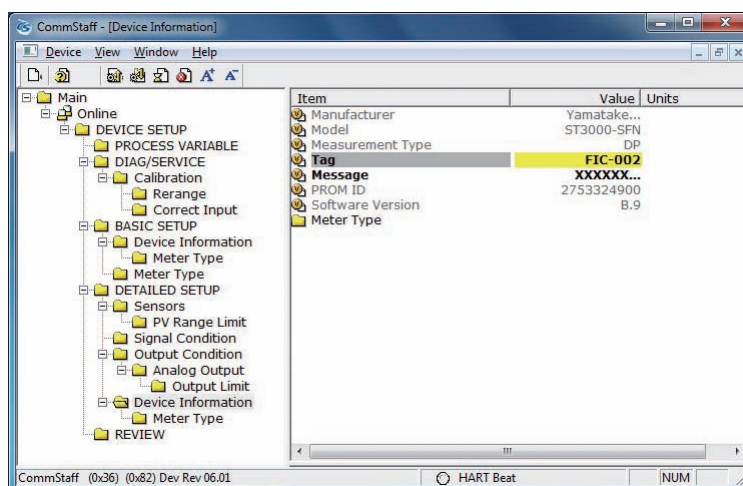
	Task	Parameter	Section of Manual
Preparation, Adjustment"	Tag No., set or check	Tag	2.2
	Measurement range, check or change	Basic Setup	2.7
	Linear/square root output signal, check or set	Transfer Function	2.3
	Output limit (saturation point), check or set	Output Limit	2.10
	Damping time constant, check or set	Damping	2.9
	Units of pressure, check or change	Pressure Unit	2.6
	Zero adjustment, execute	Apply value	3.2
	Loop test, execute	Loop Test	3.1
	Indicator, set	Display	2.4
Maintenance	Calibrate	Correct Input	4.2

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** → **DETAILED SETUP** → **Device Information** → **Tag**.



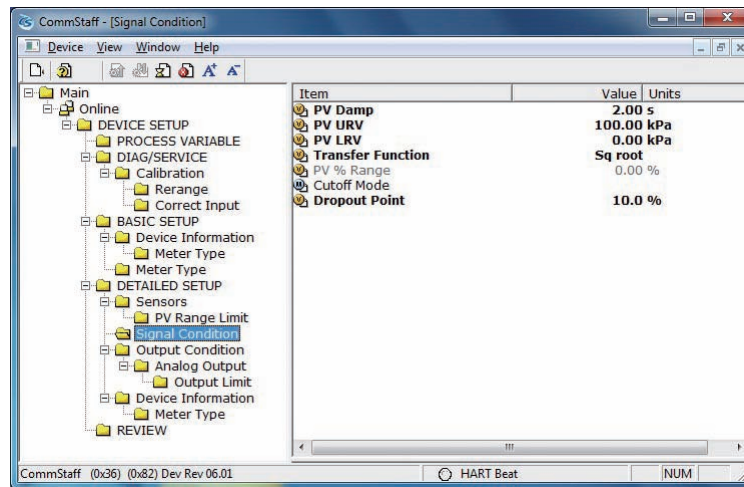
Double-clicking Tag displays the settings screen. On this screen, set the Tag and click the Set button. The tag is highlighted in yellow. Click the Send button to send the new Tag to the transmitter.



2-3. Output Format Configuration

This section explains how to switch between linear and square root output. This menu is useful for when communicating with a differential pressure transmitter.

Select DEVICE SETUP → DETAILED SETUP → Signal Condition → Transfer Function.



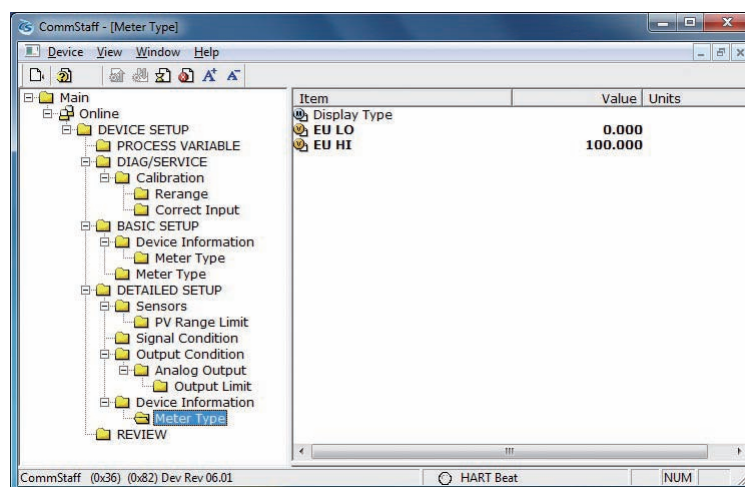
Linear: Linear output

Sq root: Square root output

2-4. Indicator Display Format

This section explains how to configure the indicator display format and the upper and lower limits for engineering units.

Select DEVICE SETUP → DETAILED SETUP → Device Information → Meter Type.



2-4-1. Display format

Mode	Description
E.UNIT (Linear)	Indicates that both the output and the displayed values are linear and equal to scale readings.
% (Linear)	Indicates that both the output and the displayed values are linear and in percent figures.
E.UNIT (Dsp Flow)	Indicates that linear output values and displayed square root values are equal to scale readings.
% (Dsp Flow)	Indicates that linear output values and displayed square root values are in percent figures.

2-4-2. EULO/EUHI (upper and lower limits for engineering units)

This is enabled when Mode is set to E.Unit.

EULO and EUHI values are the upper and lower limits for engineering units (scale readings) displayed on the indicator. They are displayed in the range of -19999 to +19999.

EULO : Value displayed when output is 100%.

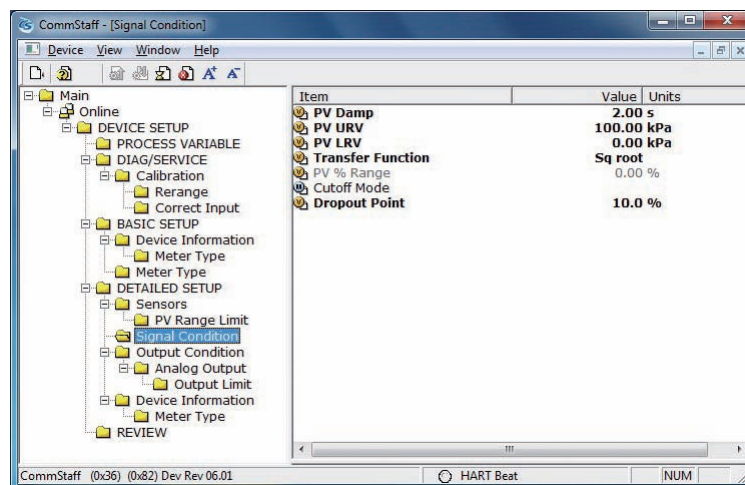
EUHI : Value displayed when output is 0%.

2-5. Low Cutoff Value/Dropout

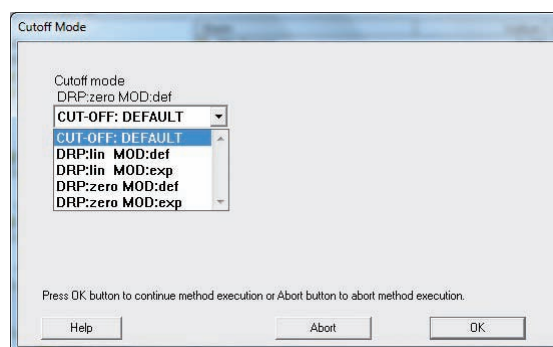
This section explains how to configure the low cutoff value.

This function is enabled only when square root (Sq root) is selected as the output format.

Select DEVICE SETUP → DETAILED SETUP → Signal Condition → Cutoff Mode.



Double-clicking Cutoff Mode displays the settings screen.



DRP: Dropout type (Linear/Zero)

Linear: If the flow rate (%) is set at the dropout point or below, the output changes to linear output.

Zero: If the flow rate (%) is set at the dropout point or below, the output changes to 0 %.

MOD: flow mode (Default: forward direction/Expand: both directions)

Default: Square root extraction output in the forward direction only. Use if there is flow in only 1 direction.

Expand: Square root extraction output in both directions. Use if there is flow in both the forward and reverse directions.

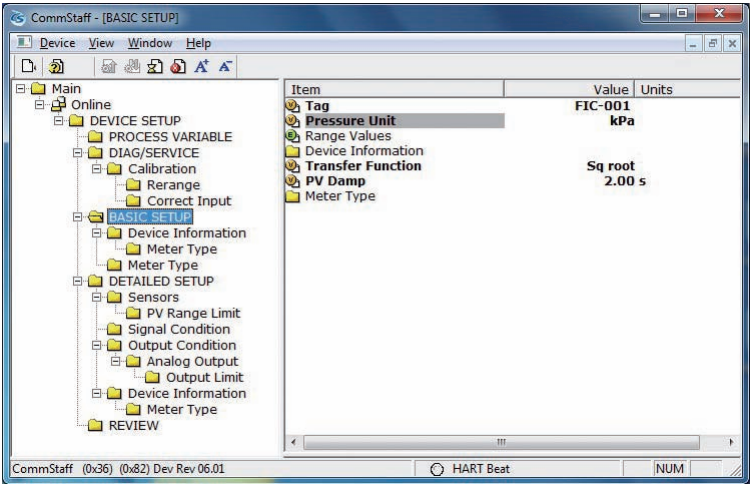
To configure a dropout value, double-click Dropout Point.

CUT-OFF: DEFAULT	The default values for cutoff are as follows. Dropout Point: 7.1 %, Dropout Type: linear, Flow Mode: Default.
DRP: lin MOD:exp	Dropout Type: Linear, Flow Mode: Forward direction.
DRP: lin MOD:exp	Dropout Type: Linear, Flow Mode: Both direction.
DRP: zero MOD:exp	Dropout Type: Zero, Flow Mode: Forward direction.
DRP: zero MOD:exp	Dropout Type: Linear, Flow Mode: Both direction.

2-6. Selecting a Unit of Pressure

This function allows you to select the measurement units for pressure used by the transmitter. Although the configured units for pressure can be changed, the changed settings are not saved by the transmitter. At the next reconnection, measurements are displayed in the default units for pressure, that is, kPa or MPa, not in the changed units.

Select DEVICE SETUP → BASIC SETUP → Pressure Unit.



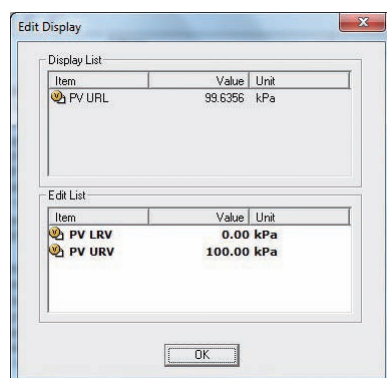
Units for pressure can be selected from the following.

Note: If the ST3000 SFN is used in Japan, the selected units should be part of the standard international system (SI units).

inH2O	inHg	mmH2O	mmHg	psi
bar	mbar	g/Sqcm	kg/Sqcm	Pa
kPa	MPa			

2-7. Measurement Range Configuration

This section explains how to configure the measurement range of the transmitter.
Select DEVICE SETUP → BASIC SETUP → Range Values.



LRV: Value at which 4 mA is output

URV: Value at which 20 mA is output

Double-clicking LRV or URV displays the settings screen. After configuring the measurement range, close the edit screen and click the Send button to send the measurement range value to the transmitter. Values can be input to two decimal places.

Note: In SFC and CommPad, when the LRV (Lower Range Value (0%)) is changed, the URV (Upper Range Value (100%)) also changes by the same amount in order to keep SPAN unchanged. In CommStaff, when Lower Range Value (0%) is changed, Upper Range Value (100%) does not change.

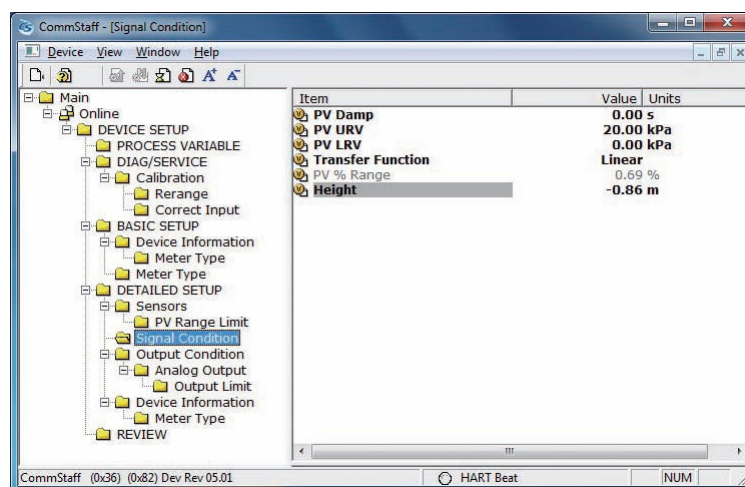
2-8. Function for Adjusting the Temperature of a Sealed Liquid

This function is valid only when a JTE model is connected. If a model other than JTE is connected, the menu is not displayed.

For remote seal pressure transmitters, this is Yamatake's original correction function for minimizing the size of zero point shifts caused by density change in a sealed liquid. Specifically, a temperature sensor on the transmitter measures the ambient temperature, and on this basis the density is corrected.

For this function to be enabled, the height between flanges of the tank on which the transmitter is mounted must be specified.

Select DEVICE SETUP → DETAILED SETUP → Signal Condition → Height.

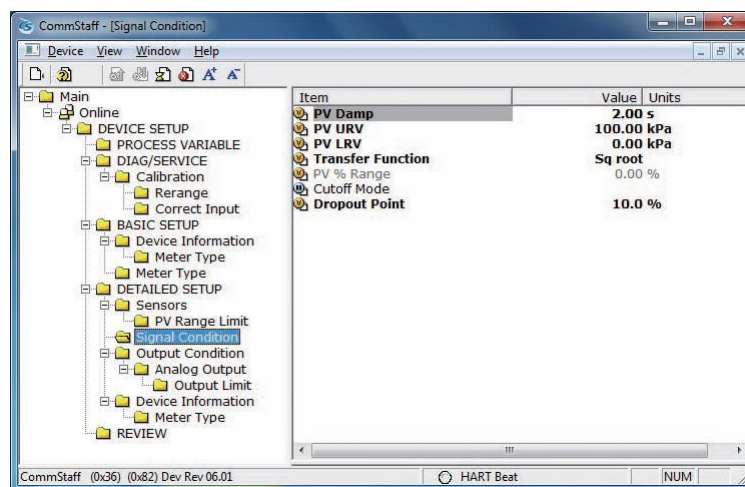


Input the height difference between the flanges in meters. If this function is not enabled, "0.00 m" is displayed.

2-9. Damping Time Constant Configuration

This section explains how to configure the damping time constant.

Select DEVICE SETUP → DETAILED SETUP → Signal Condition → PV Damp.



If SFN communication is used, set a value in the range of 0 to 32 seconds.

The following values can be input. If a value other than the following is input, the closest value is automatically selected.

Unit: sec.

0.0
0.16
0.32
0.48
1.00
2.00
4.00
8.00
16.0
32.0

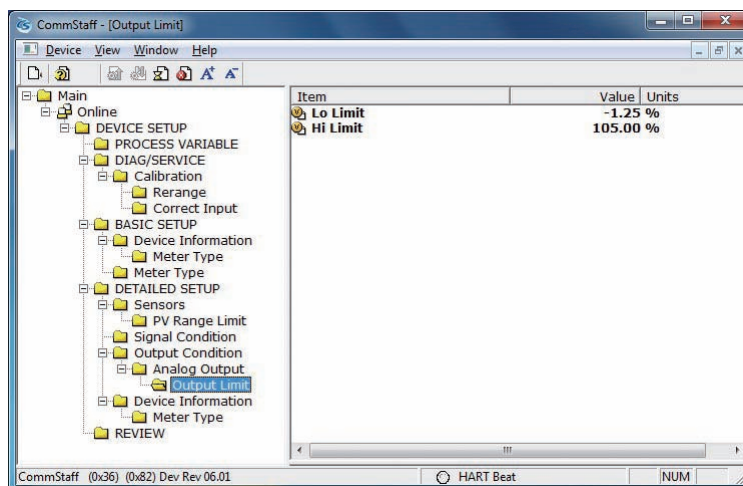
If HART communication is used, set a value in the range of 0 to 120 seconds.

2-10. Output Limit (Output Saturation Point) Configuration

Output limit is enabled only when Burnout is upward or downward. It is disabled if a non-burnout transmitter is used.

The output limit configuration is for specifying the saturation point for output current under normal conditions.

Select DEVICE SETUP → DETAILED SETUP → Output Condition → Analog Output → Output Limit.



The following are the ranges of possible values.

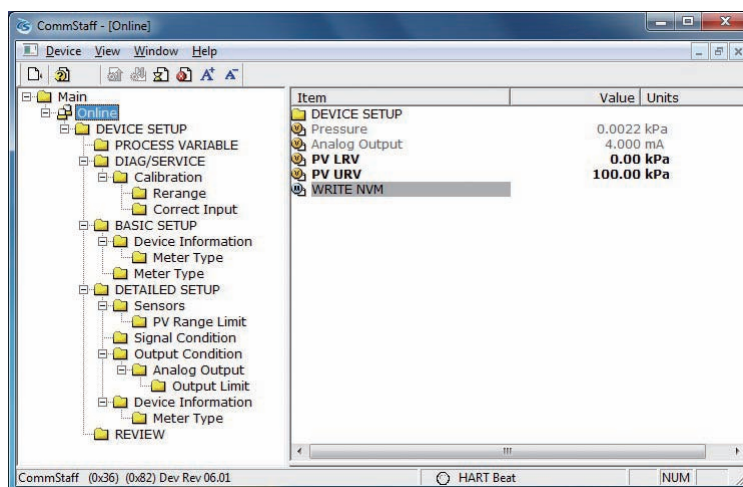
Lo Limit: -5.00 to +49.99 % (SFN transmitter), -1.25% to 49.99% (HART transmitter)

Hi Limit: 50.00 to 105.00 %

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

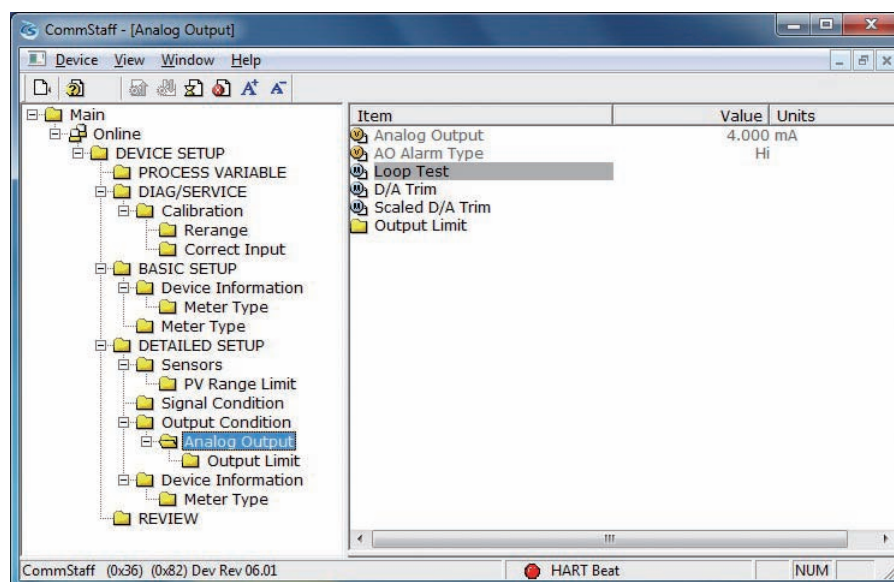
This chapter explains how to prepare for transmitter operation, and provides general instructions to follow when starting transmitter operation.

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

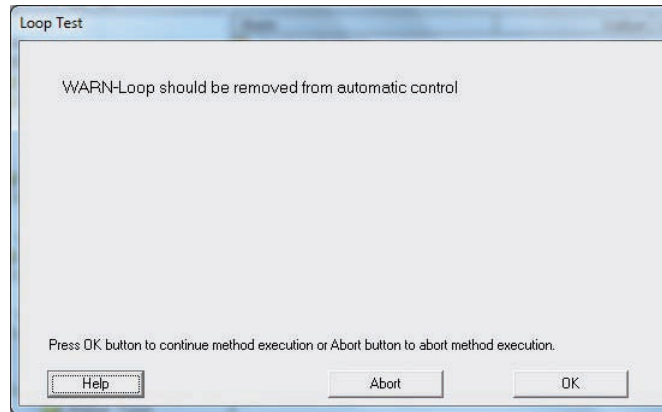
By putting the transmitter in constant current mode, you can keep current outputs constant in the range of 4 - 20 mA. This section explains how to configure the constant current mode and how to return to normal output mode.

Select DEVICE SETUP → DETAILED SETUP → Output Condition → Analog Output → Loop Test.

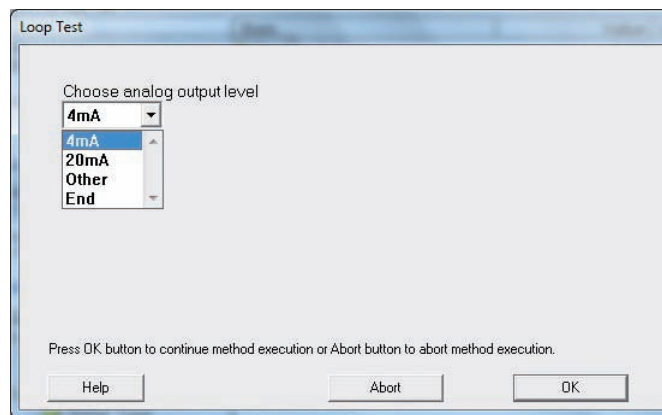
Caution: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.



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.

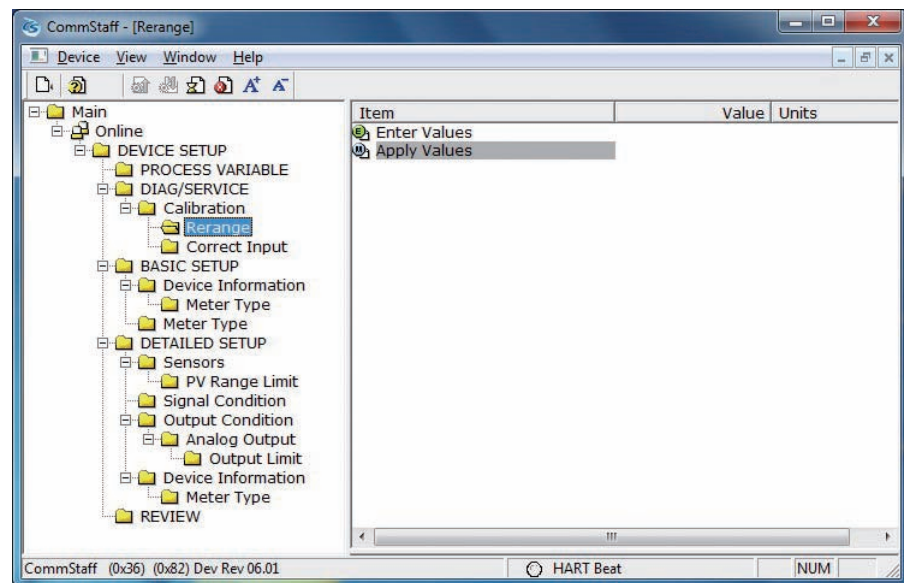
3-2. Range Configuration (Zero and Span Adjustments) according to Input Pressure

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

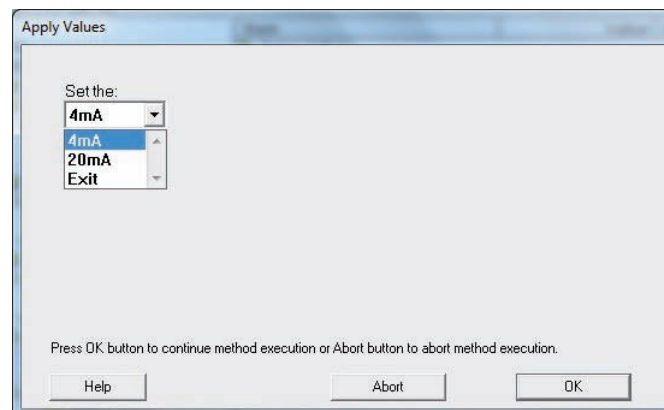
CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

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

Select DEVICE SETUP → DIAG/SERVICE → Calibration → Rerange → 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

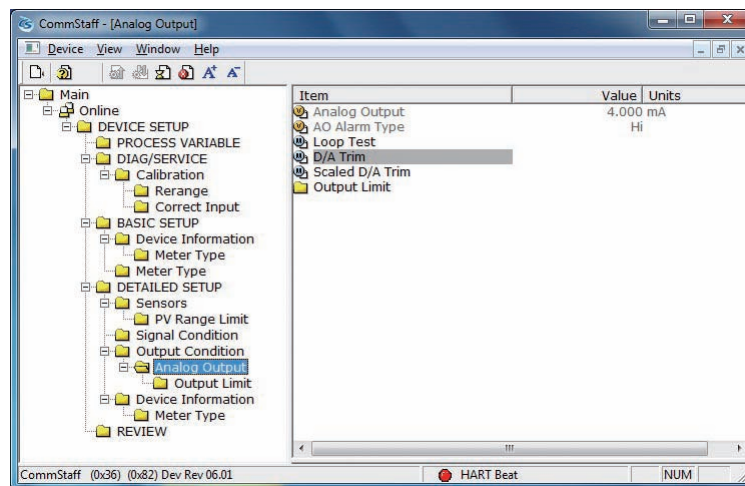
This chapter explains how to calibrate the analog signals of the transmitter, how to calibrate the measurement range, and how to reset a calibrated value to the default value. It also explains how to check the transmitter's self-diagnostic messages.

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 → DETAILED SETUP → Output Condition → Analog Output → D/A Trim.

CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.



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>

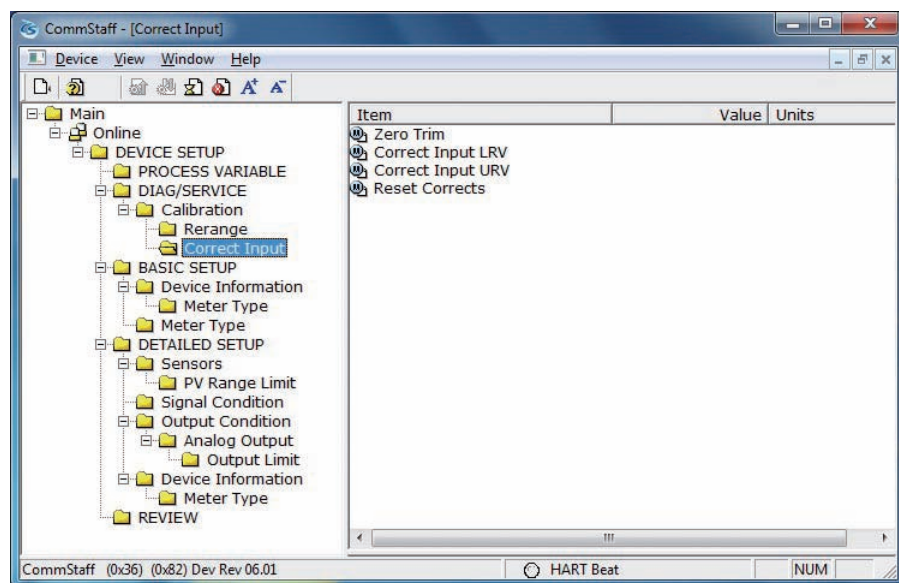
4-2. Measurement Range Calibration according to Actual Pressure

For the DSTJ3000 series differential pressure and pressure transmitters, the measurement range must be calibrated at two points, namely the LRV (input value at 0% output) and URV (input value at 100% output).

This calibration is done when calibrating actual pressures using a standard pressure transmitter. For further details, refer to Chapter 5, “Maintenance and Troubleshooting” in DSTJ3000 Ace Series Smart Transmitter (CM2-DST800-2001).

CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

Select DEVICE SETUP → DIAG/SERVICE → Calibration → Correct Input.

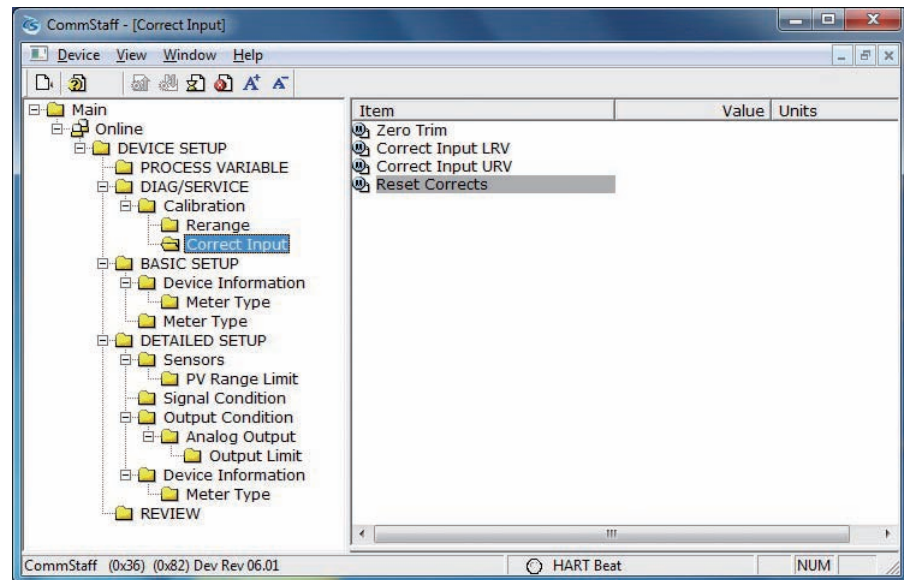


- To calibrate the LRV value, double-click Correct Input LRV. To calibrate the URV value, double-click Correct Input URV.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, 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 → Correct Input → Reset Corrects.

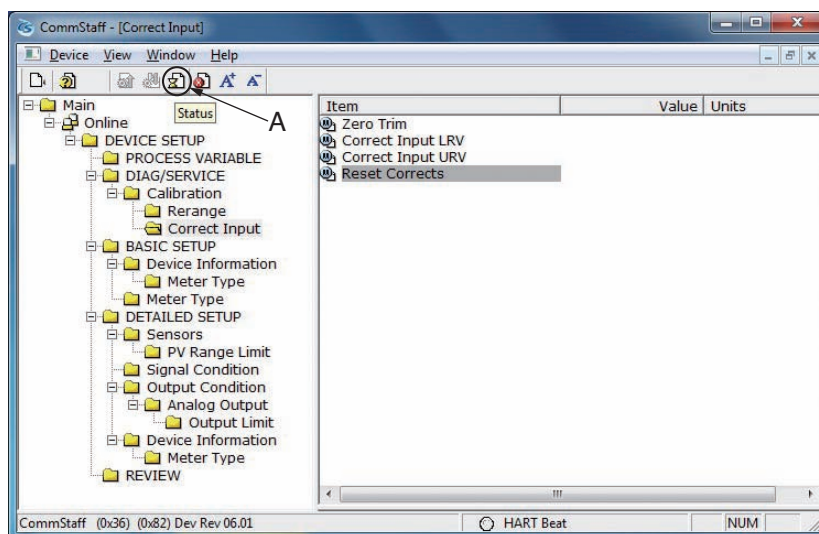


CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

- 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.

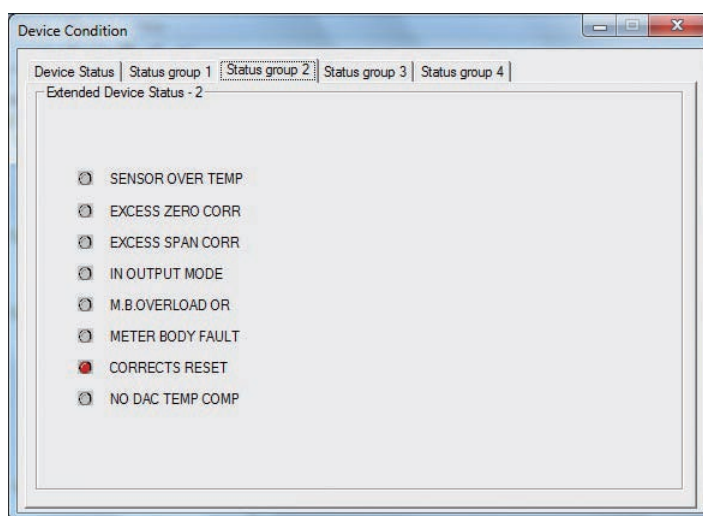
4-4. Checking Self-diagnostic Messages

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



For example, the button to the left of CORRECTS RESET turns red after the calibrated values are reset.

There are 4 status groups. The self-diagnosis details are shown for each group.



The following gives details of the information on self-diagnosis.

	Status message	Meaning
Critical	Invalid Database	Configuration data and/or calibration data is corrupt
	Chara. PROM Fault	PROM function fault
	Suspect Input	· Input data error · Problem in the process · Transmitter fault
	MDU/DAC Fault	Electronic parts fault
	NVM Fault	Electronic parts fault
	RAM Fault	Electronic parts fault
	ROM Fault	Electronic parts fault
Non-critical status	Meter Body Over Temperature	Meter body temperature is too high.
	Excess Zero Correct	The Zero correction factor is outside the acceptable limits for accurate operation.
	Excess Span Correct	The Span correction factor is outside the acceptable limits for accurate operation.
	Meter Body Overload or Meter Body Fault	· the Input pressure exceeds two times the upper range limit of the transmitter · the Transmitter fault
	Correct Reset	Calibration data is initialized.
	External Switch Fault	External switch fault

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