

**Field Communication Software
CommStaff
Model: CFS100
Instruction Manual
(Smart Transmitter GTX Edition)**



Yamatake Corporation

NOTICE

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Instruction Manuals

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

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

Devices Covered by This Manual

This manual pertains to AT9000 Advanced Transmitter Electronic Differential Pressure/Pressure Transmitter with the model number pattern GTX □ □ □.

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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 that you 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.

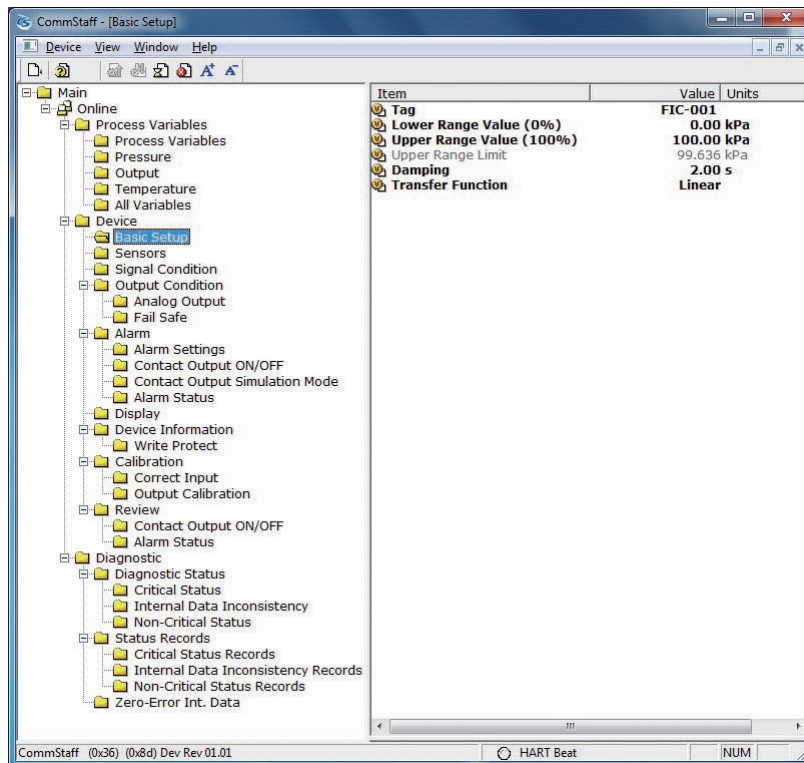
Exit CommStaff before detaching the communications cable from the device, and then start CommStaff again after connecting the communications cable to the new device.

Chapter 2. Configuration

2-1. Menu List

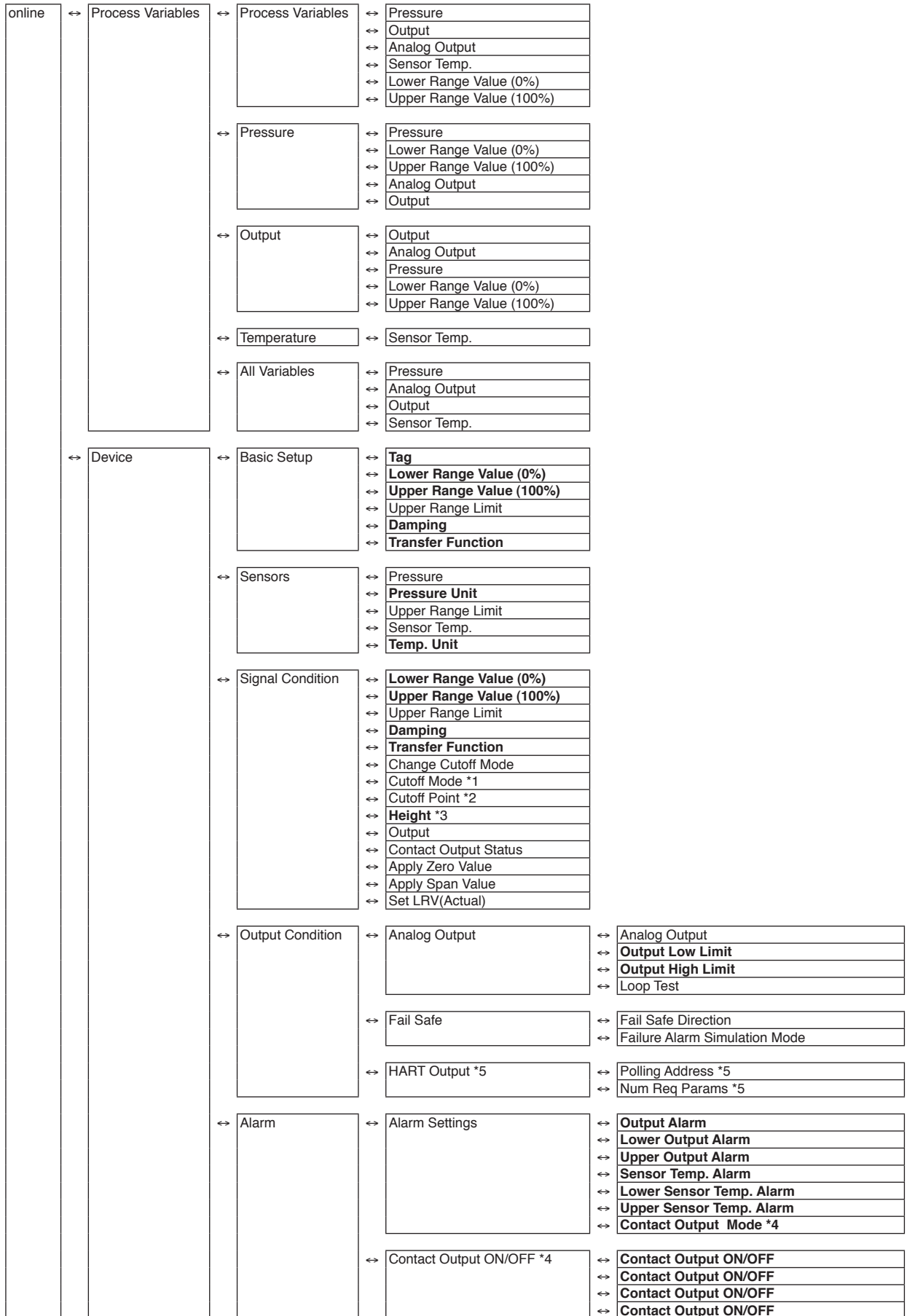
Right-clicking Online on the menu tree in the left pane of the CommStaff application window displays a menu. Selecting Expand on the menu displays the expanded menu tree.

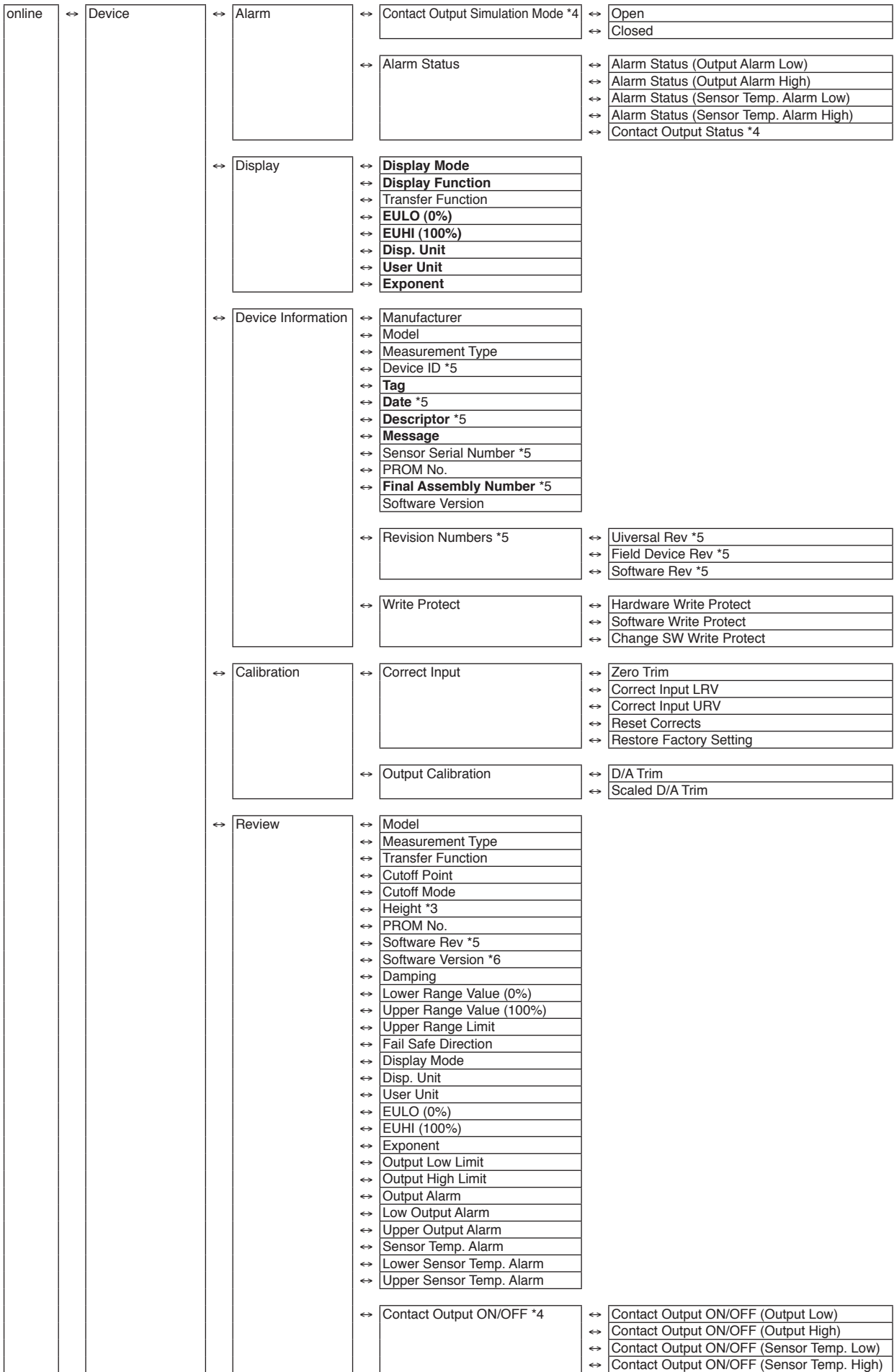
Parameters displayed in gray (Upper Range Limit in the following window) in the parameter display in the right pane are parameters that cannot be changed. Those displayed in black (Tag, Lower Range Value (0%), Upper Range Value (100%), Damping and Transfer Function in the following window) are the parameters that can be changed.

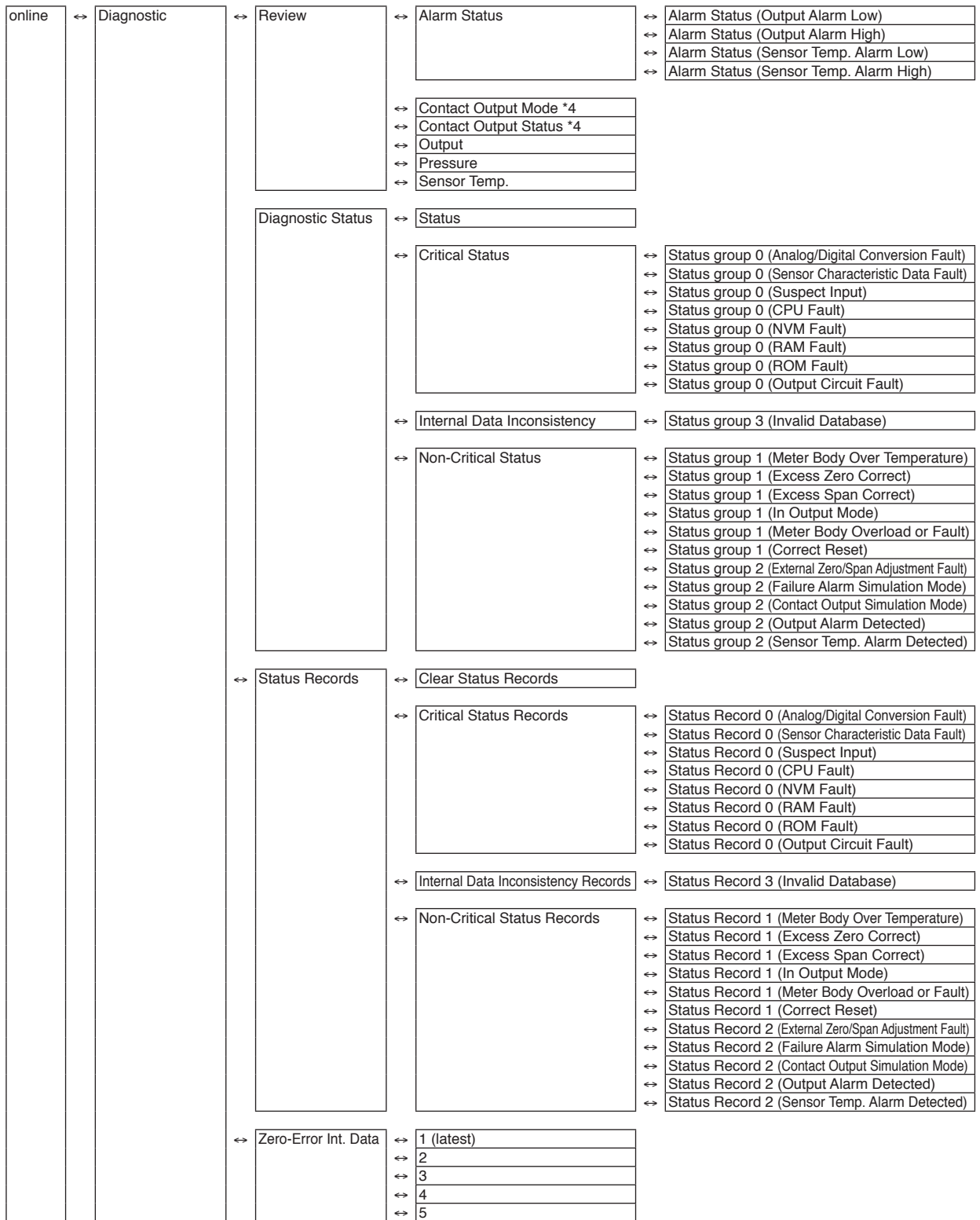


The following gives details of the menus displayed in the menu tree.

Bold items are parameters that can be changed.







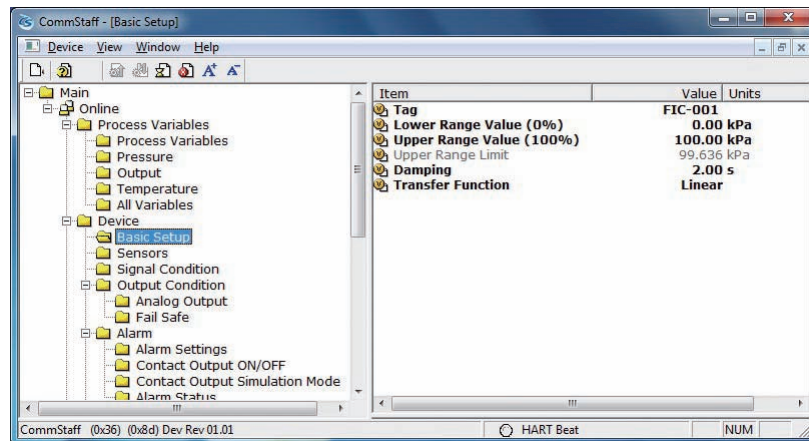
- *1 Valid when Transfer Function is set to Sq root. (Displayed.)
- *2 Valid when Cutoff mode is not set to DEFAULT. (Displayed.)
- *3 Valid when a GTX □ □ R model is connected. (Displayed.)
- *4 Valid if the contact output option is selected. (Displayed.)
- *5 Not displayed if SFN communications is selected.
- *6 Not displayed if HART communications is selected.

Setting items and references

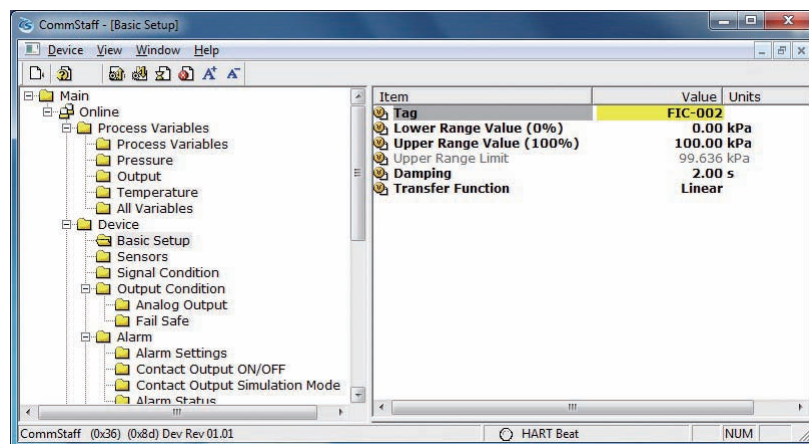
	Task	Parameter	Section of Manual
Preparation, Adjustment	Tag No., set or check	TAG	2.2
	Measurement range, check or change	Basic Setup	2.6
	Linear/square root output signal, check or set	Transfer Function	2.3
	Output limit (saturation point), check or set	Output Limit	2.9
	Damping time constant, check or set	Damping	2.8
	Units of pressure, check or change	Pressure Unit	2.5
	Zero adjustment, execute	Apply value	3.2
	Zero adjustment, execute (when current input value is not 0 %)	Set LRV (Actual)	3.3
	Output behavior in case of error, check	Fail Safe Direction	3.4
	Loop test, execute	Loop Test	3.1
	Alarm settings, check or change	Alarm Settings	2.10
	Alarm status, check	Alarm Status	2.10
	Contact output setting, check or change	Contact Output ON/OFF	2.11
	Indicator, set	Display	2.4
Maintenance	Calibrate	Correct Input	4.2
	Calibration default settings, restore	Restore factory setting	4.3
	Self-diagnosis messages, check	Diagnostic Status	4.4
	Self-diagnosis log, check	Status Records	4.5

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 → Basic Setup → Tag.



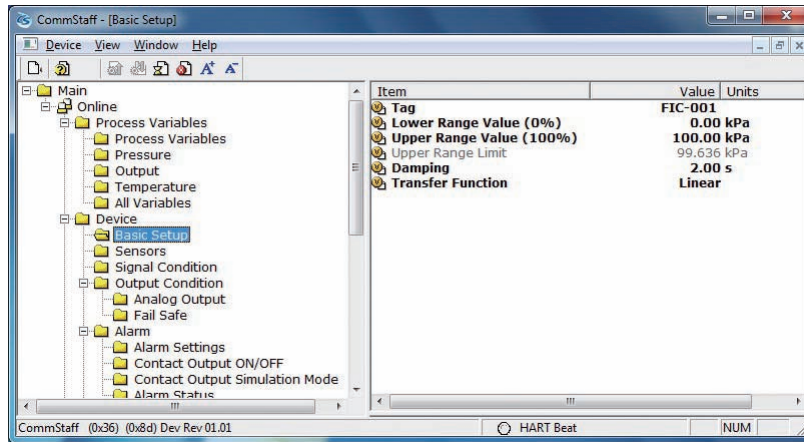
Double-clicking Tag displays the settings screen. On this screen, set the Tag and click the Set button. Tag is highlighted in yellow. Click the Send button to send the new Tag to the transmitter.



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 → Basic Setup → Transfer Function.



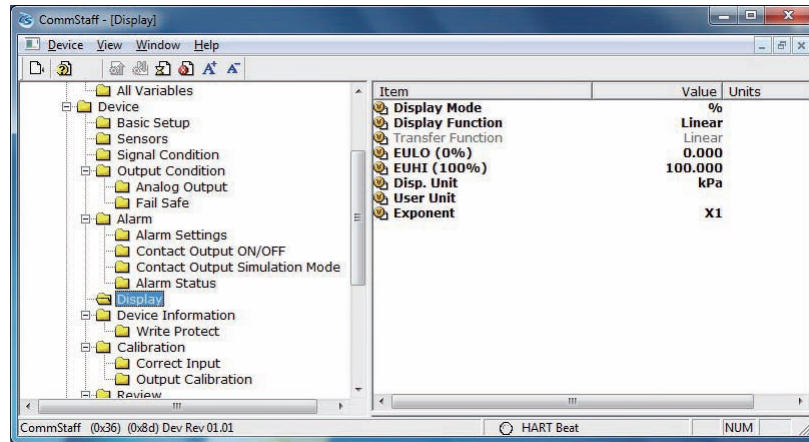
Linear: Linear output

Sq root: Square root output

2-4. Indicator Display Format

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

Select [Device] → [Display].



Some parameters are enabled while others are disabled, depending on the Display Mode settings.

In the following table, enabled parameters are indicated with the ○ symbol and disabled parameters with the — symbol.

Display Mode	%	Pressure	
Display Mode	○	Pressure	○
Display Function	○	—	As in reference information
Transfer Function	As in reference information	As in reference information	○
EULO (0%)	—	—	○
EUHI (100%)	—	—	○
Disp. Unit	—	—	○
User Unit	—	—	— (Jap. vers.: SI units) ○ (Eng. vers.: SI & non-SI)
Exponent	—	—	○

2-4-1. Display format

This function is enabled if Transfer Function is set to Linear.

Configuration	Description
Linear	Indicates that both output and display are linear.
Square root	Indicates output is linear and display is square root.

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

This is enabled when Display Mode is set to Scale.

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%.

2-4-3. Disp. Unit

This is enabled when Display Mode is set to Scale.

Disp. Unit is displayed on the indicator.

Values shown in the table below may be selected.

(Japanese version: SI)

kPa	MPa	Pa	hPa	kPaG
MPaG	kPa abs	MPa abs	Pa abs	hPa abs
g/cm ³	kg/m ³	m ³	l	kl
ml/h	l/h	kl/h	t/h	m ³ /h
km ³ /h	l/min	kl/min	m ³ /min	kl/d
m ³ /d	t/d	kg/h	mm	m
%	t	kg	none	

(English version: non-SI)

user define unit	mmH ₂ O	mmAq	mH ₂ O	inH ₂ O
ftH ₂ O	kPa	MPa	Pa	hPa
kPaG	MPaG	kPa abs	MPa abs	Pa abs
hPa abs	bar	mbar	barG	mbarG
mmHg	inHg	mmHg abs	inHg abs	gf/cm ²
kgf/cm ²	g/cm ²	kg/cm ²	kgf/cm ² G	kgf/cm ² abs
atm	Torr	psi	g/cm ³	kg/m ³
m ³	l	kl	ml/h	l/h
kl/h	Sk/h	Sm ³ /h	t/h	m ³ /h
km ³ /h	Nm ³ /h	kNm ³ /h	l/min	kl/min
m ³ /min	Nml/min	Nl/min	Nm ³ /min	kl/d
m ³ /d	t/d	Nm ³ /d	kg/h	gal/min
gal/h	mm	m	%	t
kg	none			

2-4-4. User Unit

Non-SI units are available in the English version only.

This is enabled when Display Mode is set to Scale.

Available when Disp. Unit is set to User define unit.

Any desired display unit can be set.

2-4-5. Exponent

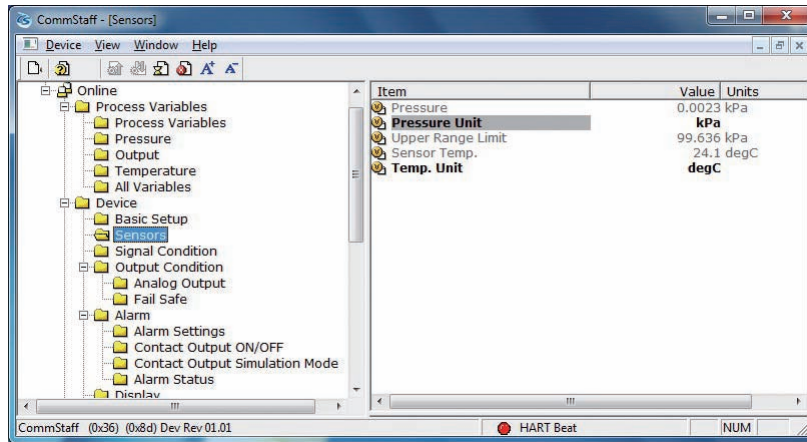
This is enabled when Display Mode is set to Scale.

By setting Exponent, "x10," "x100," or "x1000" can be shown on the display. If "x1" is set, it is not shown on the display.

2-5. Selecting a Unit of Pressure

This function allows you to select the measurement units for pressure used by the transmitter.

Select Device → Sensors → Pressure Unit.



Units for pressure can be selected from the following.

(Jap. vers.: SI units)

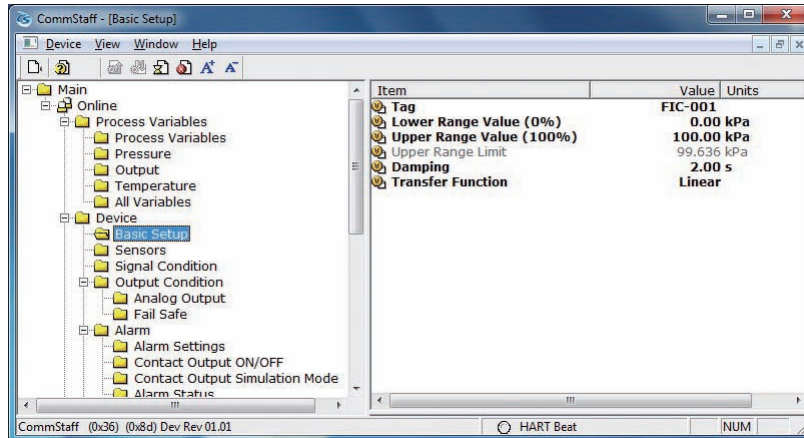
kPa	MPa	Pa	hPa
-----	-----	----	-----

(Eng. vers.: SI & non-SI)

mmH2O	mH2O	inH2O	kPa	MPa
Pa	hPa	bar	mbar	mmHg
inHg	g/cm2	kg/cm2	atm	Torr
psi				

2-6. Measurement Range Configuration

This section explains how to configure the measurement range of the transmitter.
Select Device → Basic Setup.



Lower Range Value (0%): Value at which 4 mA is output

Upper Range Value (100%): Value at which 20 mA is output

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.

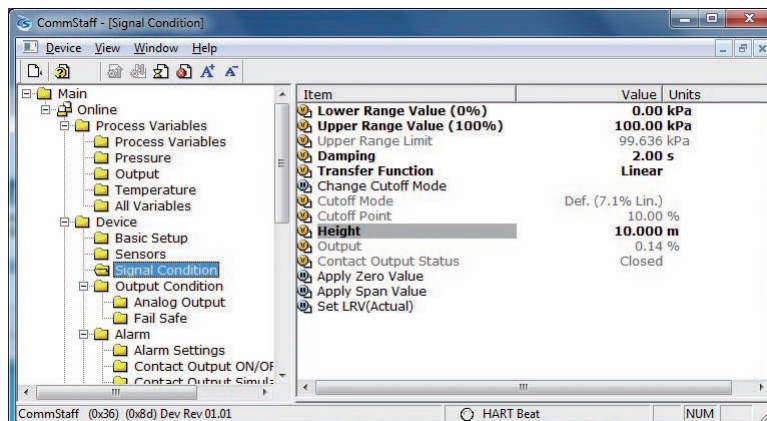
2-7. Function for Adjusting the Temperature of a Sealed Liquid

This function is valid only when a JTE model is connected. If a model other than GTX_R 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 → Signal Condition → Height.

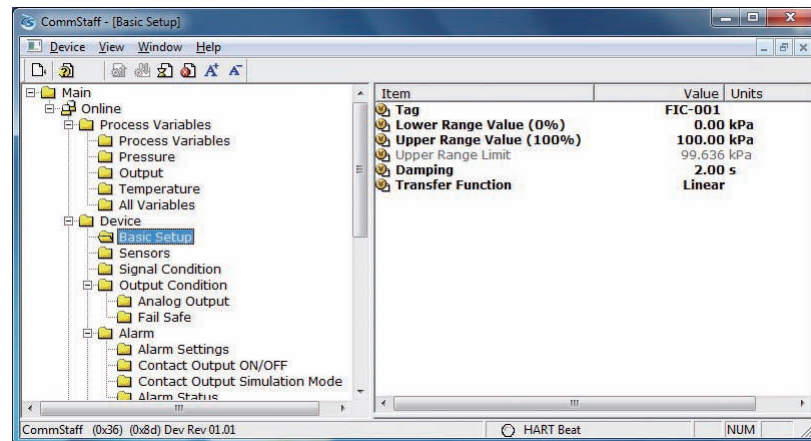


Input the height difference between the flanges in meters. If this function is not enabled, "0.00 m" is displayed.

2-8. Damping Time Constant Configuration

This section explains how to configure the damping time constant.

Select Device → Basic Setup → 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

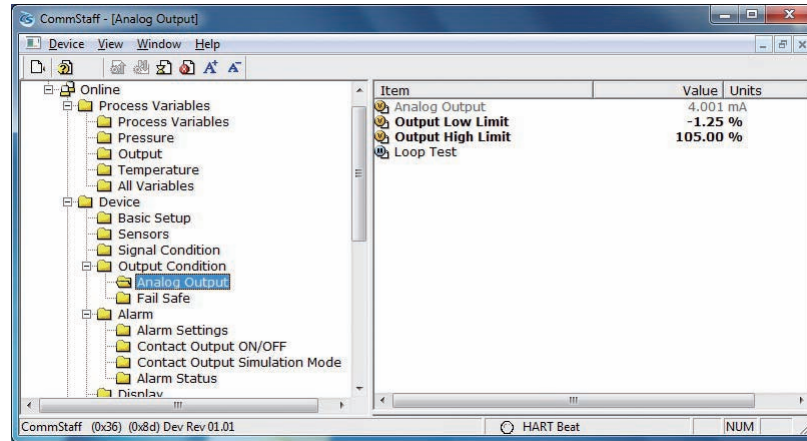
If HART communication is used, set a value in the range of 0 to 120 seconds.

2-9. 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 → Output Condition → Analog Output.



The following are the ranges of possible values.

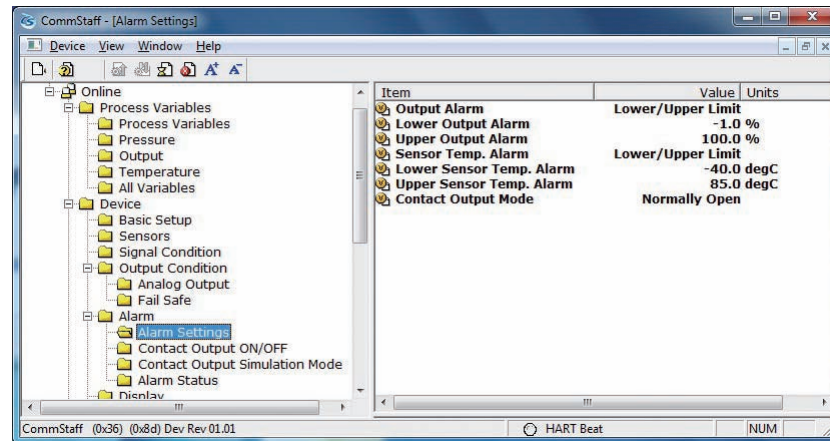
Lo Limit: -2.50 to +49.99 %

Hi Limit: 50.00 to 110.00 %

2-10. Alarm Settings

There are two types of alarm: Output Alarm for detecting output values and Sensor Temp. Alarm for detecting sensor temperatures. For models that support contact output, alarm results can be generated as contact outputs.

Select Device → Alarm → Alarm Setting.



The following are the four Output Alarm settings.

No Alarm	No alarm detection
Lower Limit	Only Lower Output Alarm detection.
Upper Limit	Only Upper Output Alarm detection.
Lower/Upper Limit	Both Lower Output Alarm and Upper Output Alarm detection.

The following are the four Sensor Temp. Alarm settings.

No Alarm	No alarm detection
Lower Limit	Only Lower Output Alarm detection.
Upper Limit	Only Upper Output Alarm detection.
Lower/Upper Limit	Both Lower Output Alarm and Upper Output Alarm detection.

On models with a contact output function, contact output mode can be set.

There are 2 types of Contact Output Mode, as shown below.

Normally Open	Contacts are normally open.
Normally Closed	Contacts are normally closed.

2-11. Contact Output Settings

Contact Output can be set to ON or OFF.

ON: Contact output is valid. OFF: Invalid.

Chapter 3. Preparations and Starting Operation

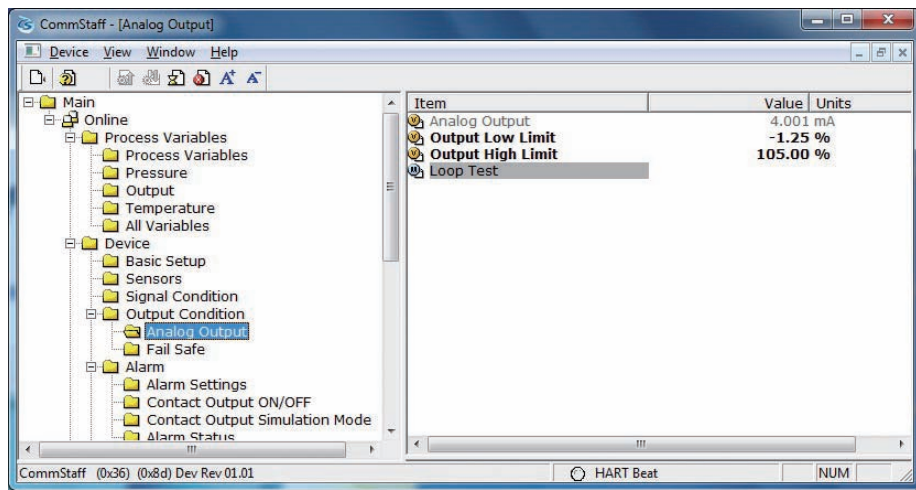
This chapter explains how to prepare for transmitter operation, and provides general instructions to follow when starting transmitter operation.

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

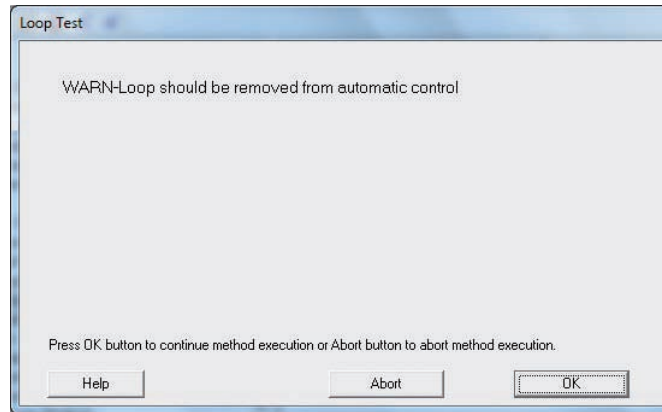
By putting the transmitter in constant current mode, you can keep current outputs constant in the range of 4 - 20 mA. This section explains how to configure the constant current mode and how to return to normal output mode.

Select Device → Output Condition → Analog Output → Loop Test.

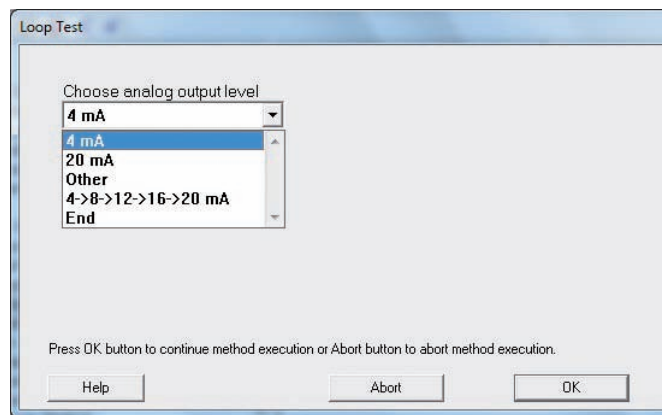
CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.



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.

Select 4 → 8 → 12 → 16 → 20 mA and click OK.

Output signals are set to 4 mA, 8 mA, 12 mA, 16 mA and 20 mA in that order.

If you select End and click OK, a message is displayed notifying you that this will return operation to normal output mode.

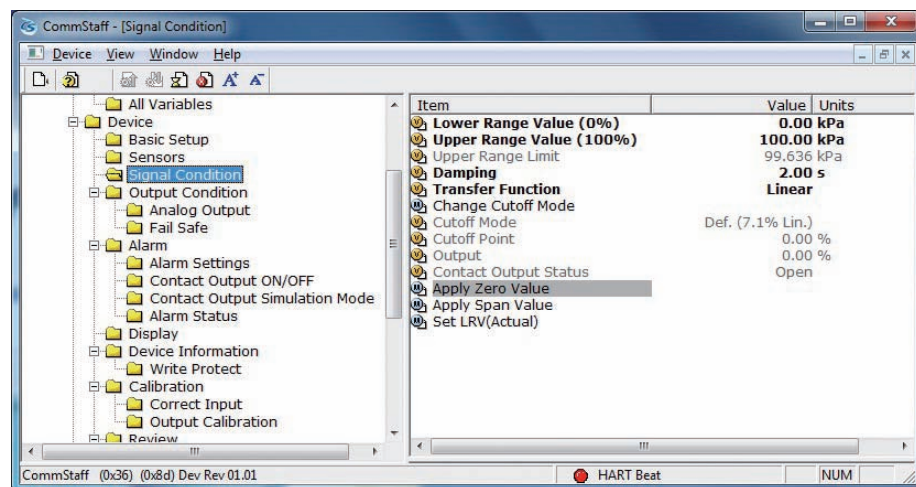
3-2. Range Configuration (Zero and Span Adjustments) according to Input Pressure

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

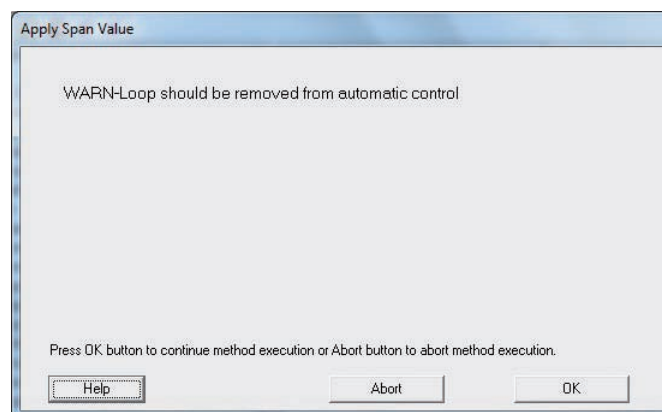
CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

3-2-1. Zero adjustment

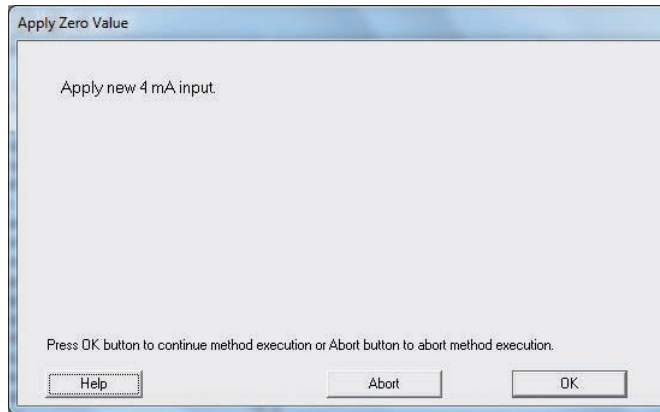
The following describes how the range can be set Zero adjustment to input pressure. Select Device → Signal Condition → Apply Zero Values.



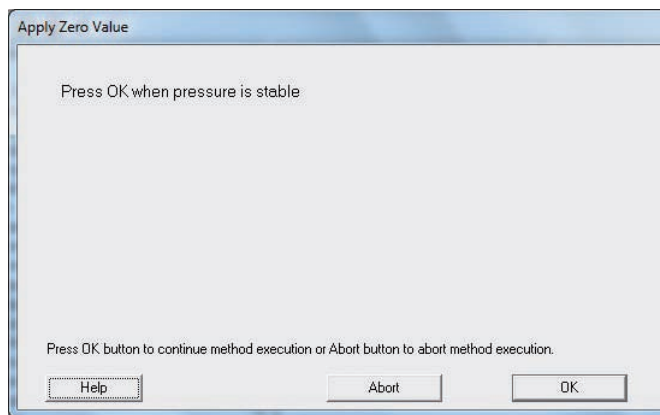
Double-clicking Apply Zero Value displays the following warning. If there are no problems, click OK.



Input the pressure that corresponds to 4 mA and click OK.

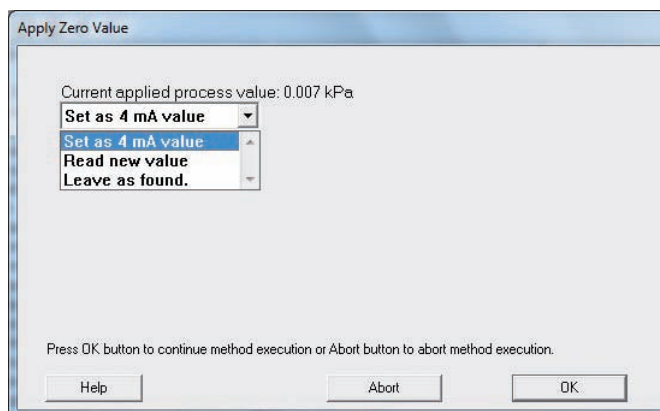


After the input pressure stabilizes, click OK.



The current input pressure is displayed.

If there are no problems, select "Set as 4 mA value" and click OK.

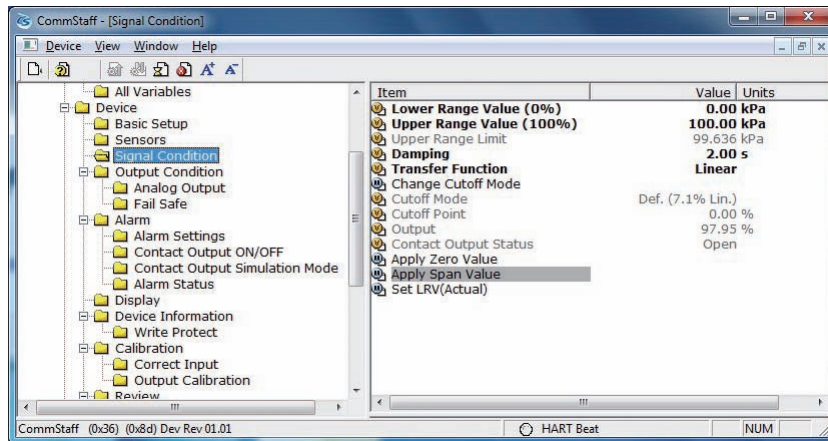


To reread the input pressure, select "Read new value" and click OK.

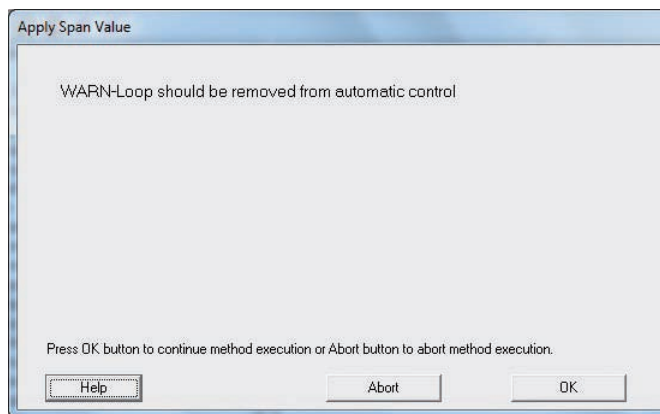
To end the adjustment process, select "Leave as found" and click OK.

3-2-2. Span adjustment

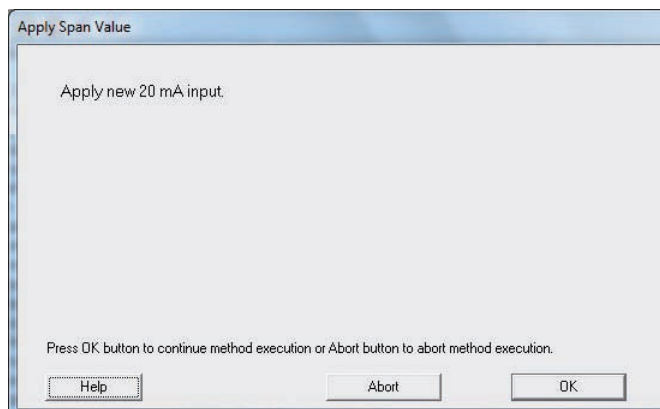
The following describes how the range can be set Span adjustment to input pressure.
Select Device → Signal Condition → Apply Span Values.



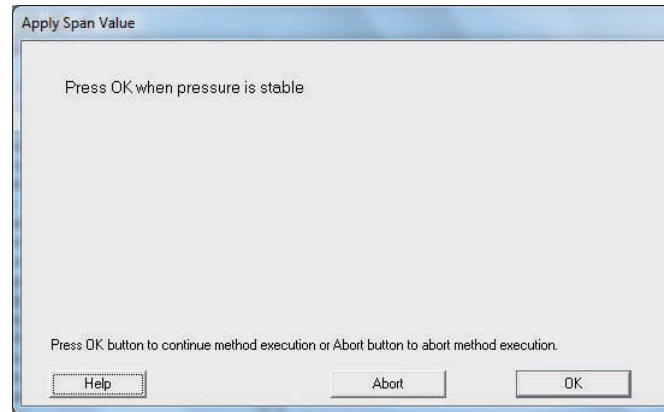
Double-clicking Apply Span Value displays the following warning. If there are no problems, click OK.



Input the pressure that corresponds to 20 mA and click OK.

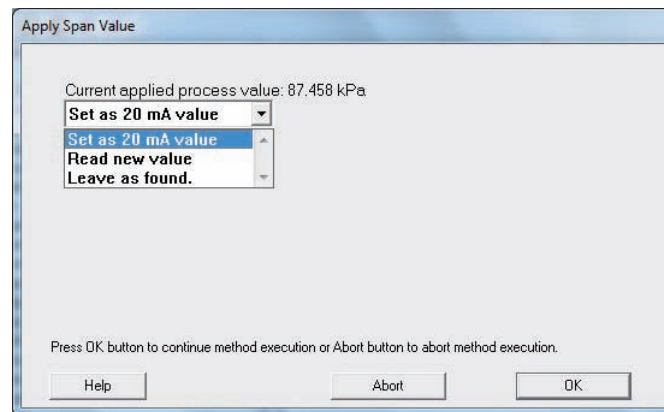


After the input pressure stabilizes, click OK.



The current input pressure is displayed.

If there are no problems, select “Set as 20 mA value” and click OK.



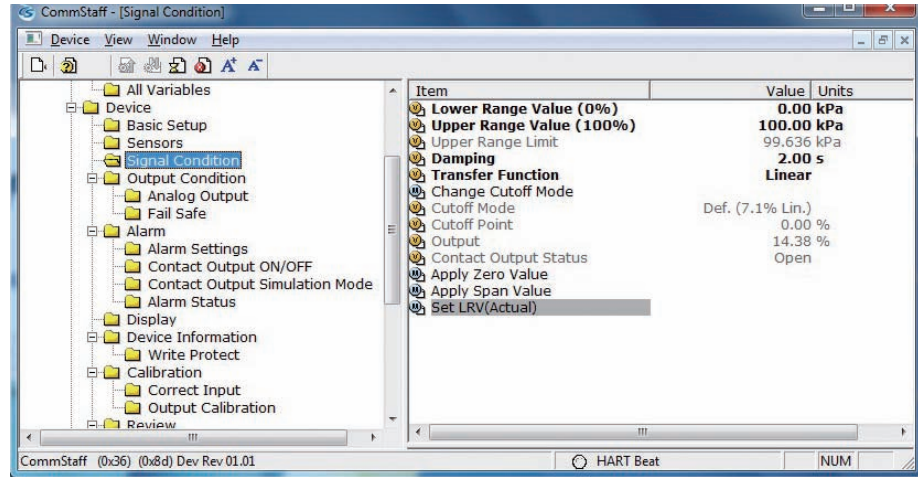
To reread the input pressure, select “Read new value” and click OK.

To end the adjustment process, select “Leave as found” and click OK.

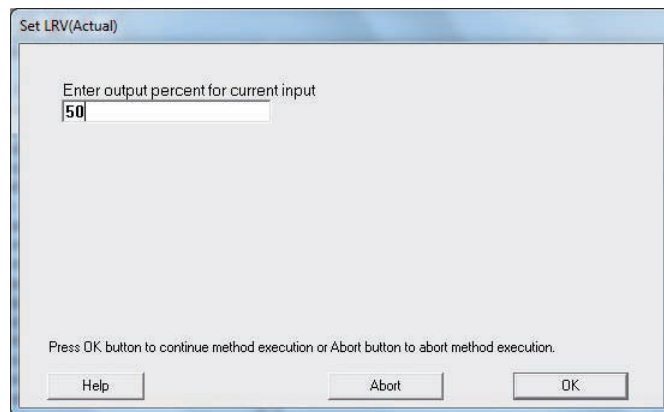
3-3. Zero Point Adjustment according to the Actual Level

This section explains how to adjust the zero point according to the actual level. Perform this adjustment process when you want to set the present tank level to a specific value, for example, 50%.

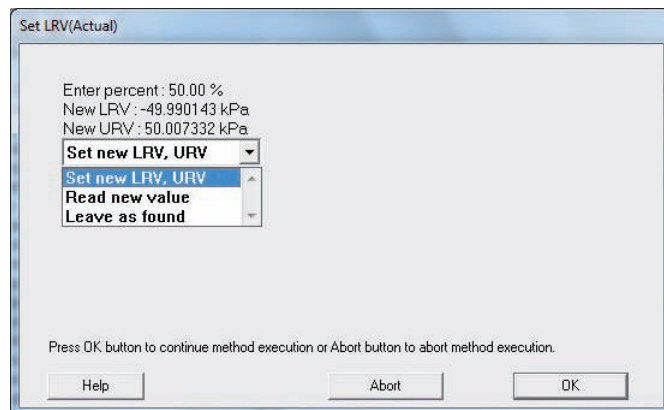
Select Device → Signal Condition → Apply Zero Values.



After two confirmation messages appear, the following screen is displayed. Enter the output value in percent that you want to assign, and click OK.



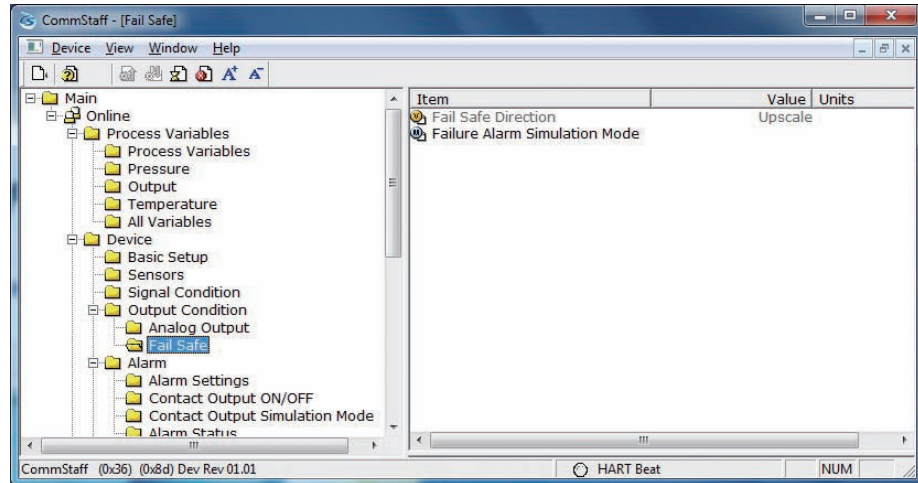
The new LRV and URV are displayed. If there are no problems, select “Set new LRV, URV” and click OK.



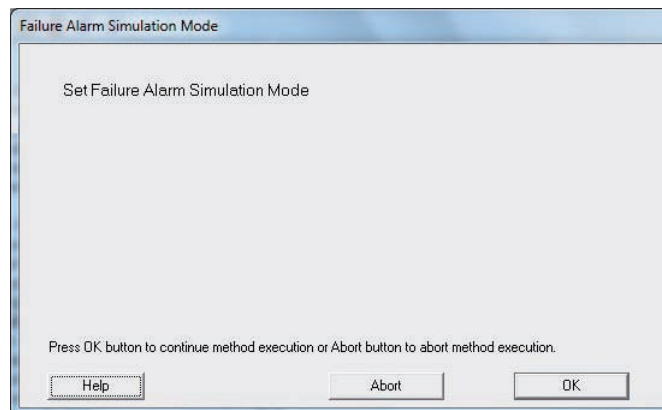
To reread the input pressure, select “Read new value” and click OK. To end the adjustment process, select “Leave as found” and click OK.

3-4. Confirmation of Output Direction in Abnormal Operating Conditions

This section explains how to check the output direction in abnormal operating conditions. Select Device → Output Condition → Fall Safe. Fail Safe Direction is the output direction under abnormal operating conditions.

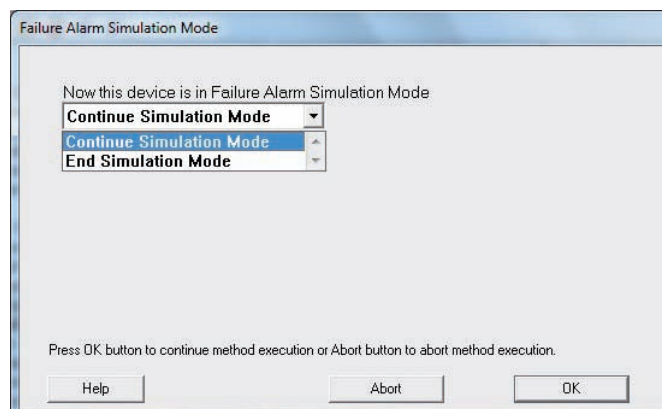


Failure Alarm Simulation Mode allows you to perform a simulation of output current in abnormal operating conditions. Double-clicking will display first the confirmation screen and then the following screen.



Click OK, and the output current will change to the same output as the output in abnormal operating conditions.

To end this process, select "End Simulation Mode" and click OK.



Chapter 4. Maintenance

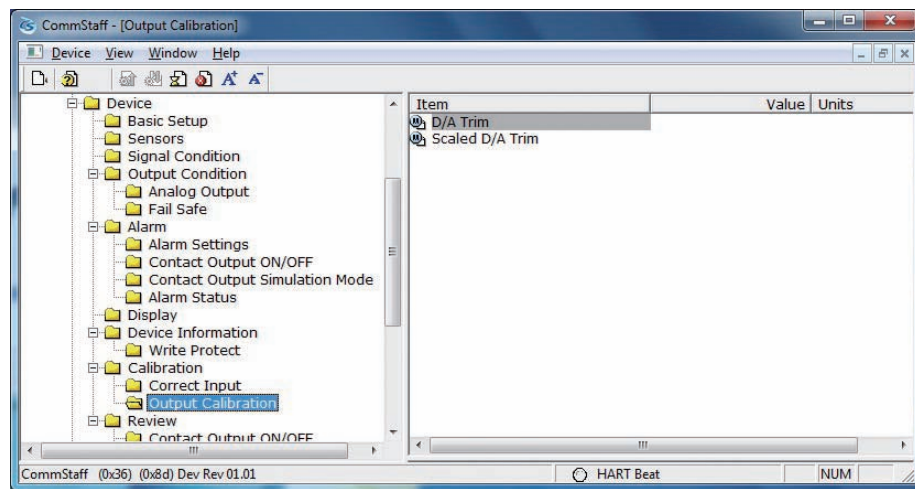
This chapter explains how to calibrate the analog signals of the transmitter, how to calibrate the measurement range, and how to reset a calibrated value to the default value. It also explains how to check the transmitter's self-diagnostic messages.

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 → Calibration → Output Calibration → 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 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) Click OK if there are no problems.</p> <p>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.</p> <p>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.</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) Click OK if there are no problems.</p> <p>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.</p> <p>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.</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>

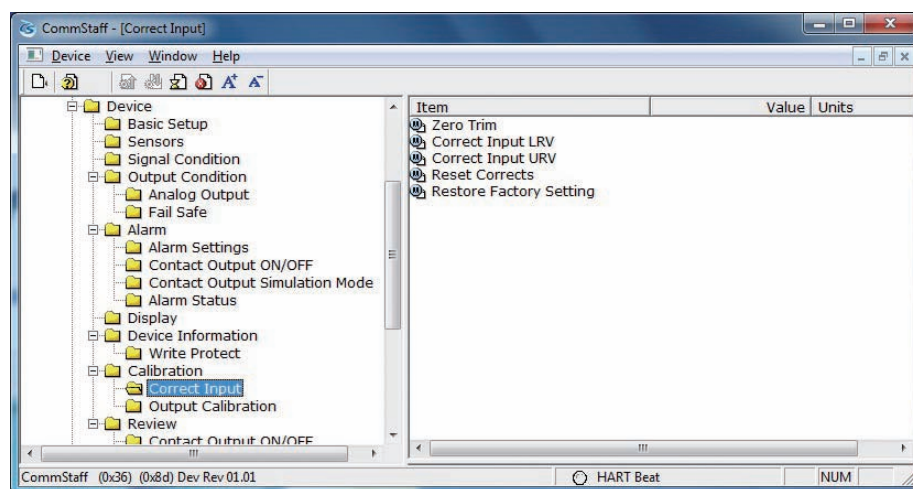
4-2. Measurement Range Calibration according to Actual Pressure

For the AT9000 series Electric differential pressure and pressure transmitters, the measurement range must be calibrated at two points, namely the Lower Range Value (input value at 0% output) and Upper Range Value (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” in AT9000 Advanced Transmitter (CM2-GTX100-2001).

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 → Calibration → Correct Input.

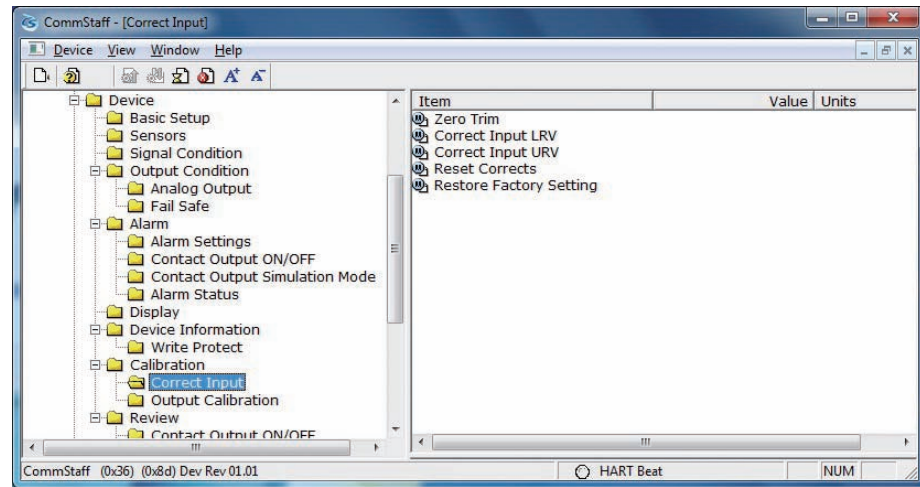


- To calibrate the LRV (Lower Range Value) value, double-click Correct Input LRV. To calibrate the URV (Upper Range Value) value, double-click Correct Input URV.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic 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

The calibrated zero span value can be reset to the factory-set value.

Select Device → Calibration → Correct Input.

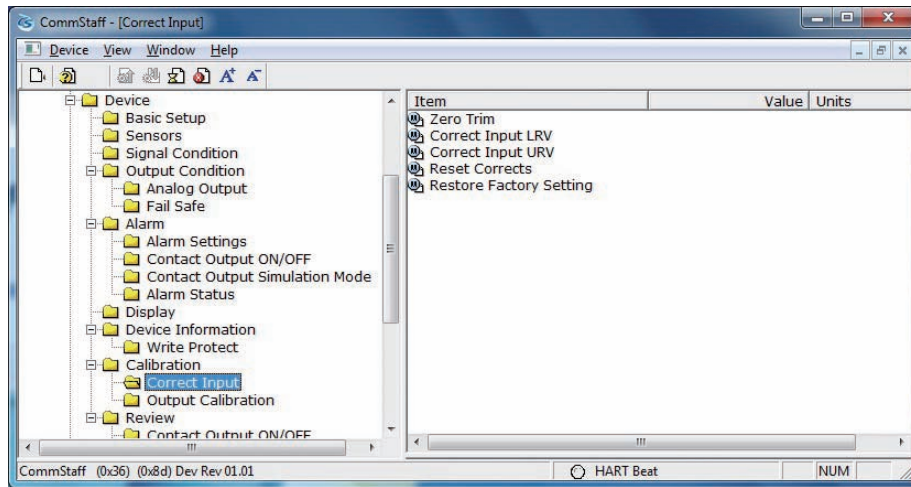


CAUTION: If this operation is performed while the transmitter process is under automatic control, outputs may fluctuate, making transmitter operation dangerous. Before performing this operation, make sure that you switch the process control loop to manual control.

- 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.

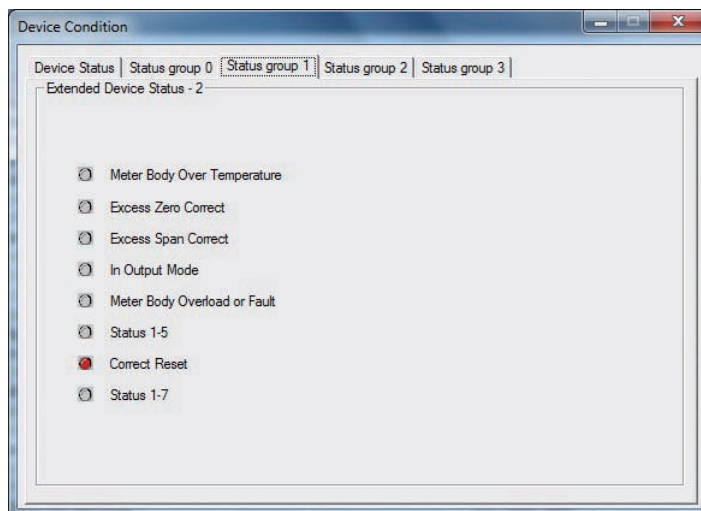
4-4. Checking Self-diagnostic Messages

You can check self-diagnostic messages by clicking the Status icon 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.



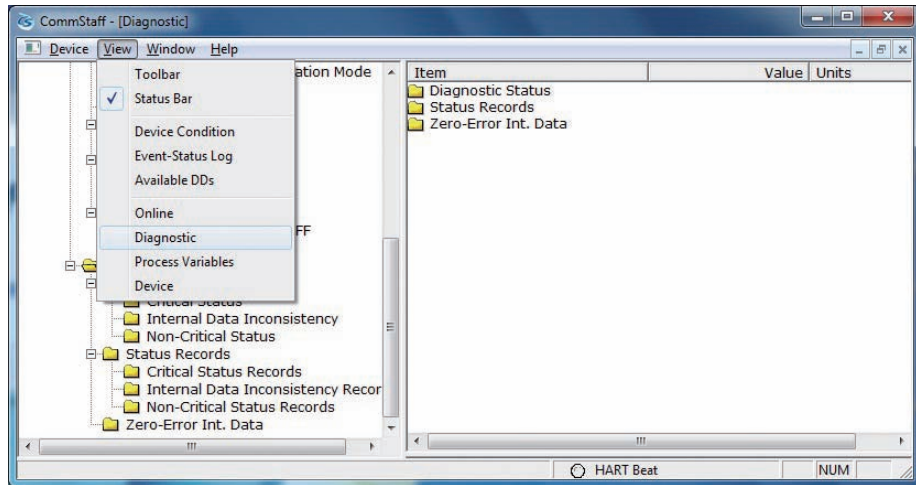
The following gives details of the information on self-diagnosis.

	Status message	Meaning	Required action	Display of Indicator
Internal data inconsistency	Invalid database	Indicates that the settings stored in EEPROM are not correct at the time the power is turned on. However, after the data is reset correctly the error status will be cleared.	Try communicating again. Verify configuration data and recalibrate the device.	Err.09 CONFIG
Critical failure	Analog/Digital Conversion Fault	Input signals for the A/D converter or its peripheral circuits are abnormal.	Contact appropriate personnel.	Err.01 A-D CNV
	Sensor Characteristic Data Fault	There is an error in the characteristic data for the sensor.	Contact appropriate personnel.	Err.02 PROM
	Suspect Input	Sensor operation failure.	Contact appropriate personnel.	Err.03 INPUT
	CPU Fault	CPU (MPU:Micro processing Unit) operation failure	Contact appropriate personnel.	Err.04 CPU
	NVM Fault	EEPROM failure	Contact appropriate personnel.	Err.05 NVM
	RAM Fault	RAM failure	Contact appropriate personnel.	Err.06 RAM
	ROM Fault	ROM failure	Contact appropriate personnel.	Err.07 ROM
	Output Circuit Fault	which the power voltage supplied to the transmitter dips for 1 second or more. Also, if the supply voltage has been abnormal for about 3 minutes, this alarm is displayed.	Contact appropriate personnel.	Err.08 OUTPUT
Non-critical status	Meter Body Over Temperature	Meterbody temperature is too high. The temperature of sensor in the meterbodyexceeds 125 degree C.	Reinstall the device to decrease the temperature to within specifications.	AL.20 M/B.TEMP
	Excess Zero Correct	The zero correction factor is outside the acceptable limits for accurate operation.	Check the input and be sure it matches the calibrated range value.	AL.21 ZERO.CAL
	Excess Span Correct	The span correction factor is outside the acceptable limits for accurate operation.	Check the input and be sure it matches the calibrated range value.	AL.22 SPAN.CAL
	In Output Mode	The device is operating in output mode (Loop test).	Go to the output mode menu to exit the output mode.	Output % OUTMODE
	Meter Body Overload or Meter Body Fault	- The input pressure is more than two times The upper range limit for The device. - Device error.	Check the PV value and replace the device with a larger range model if necessary.	AL.24 OVRLOAD
	Correct Reset	Calibration data is cleared.	Calibrate the lower and upper range values.	AL.26 NO.CALIB
	External Zero/Span Adjustment Fault	External zero/span adjustment error. When external zero/span adjustment is available, this alarm is displayed if the zero or span adjustment switch is turned on for 45 seconds or more, or if both switches are turned on at the same time.	Contact appropriate personnel.	AL.AL.28 SWITCH28
	Contact Output Simulation Mode	The device is operating contact output simulation mode.	To exit contact output simulation mode, go to the alarm/contact output menu.	[Blank] DO.SIM
	Output Alarm Detected	The output is going over upper/lower limit of output alarm.	Check the output.	AL.51 OUT%.AL
	Sensor Temp. Alarm Detected	The sensor temperature is going over upper/lower limit of sensor temp. alarm.	Check the sensor temperature.	AL.52 TEMP.AL

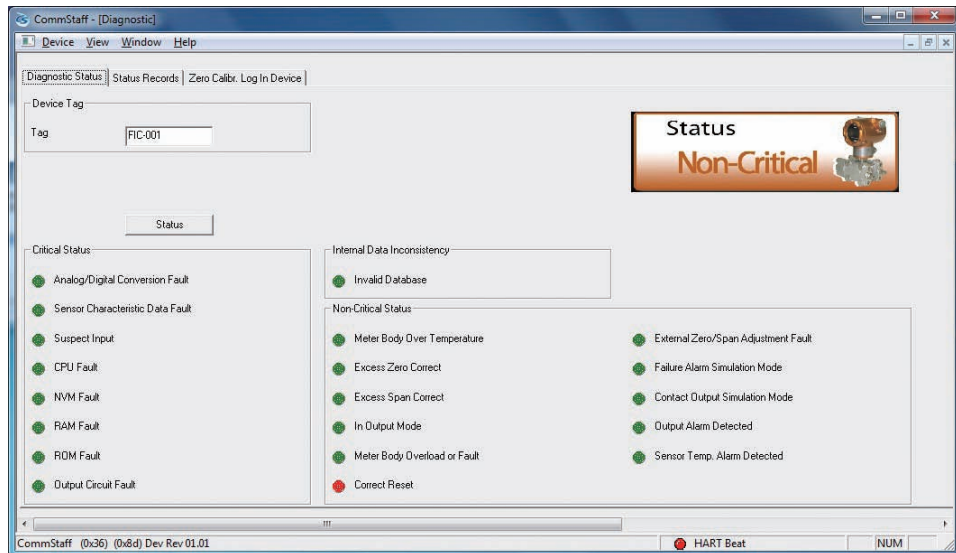
With the AT9000, values can be checked or configured by viewing data in the EDD menu format.

EDD can present data related to self-diagnoses in an easy-to-understand manner.

Click View on the menu bar and select Diagnostic from the menu.



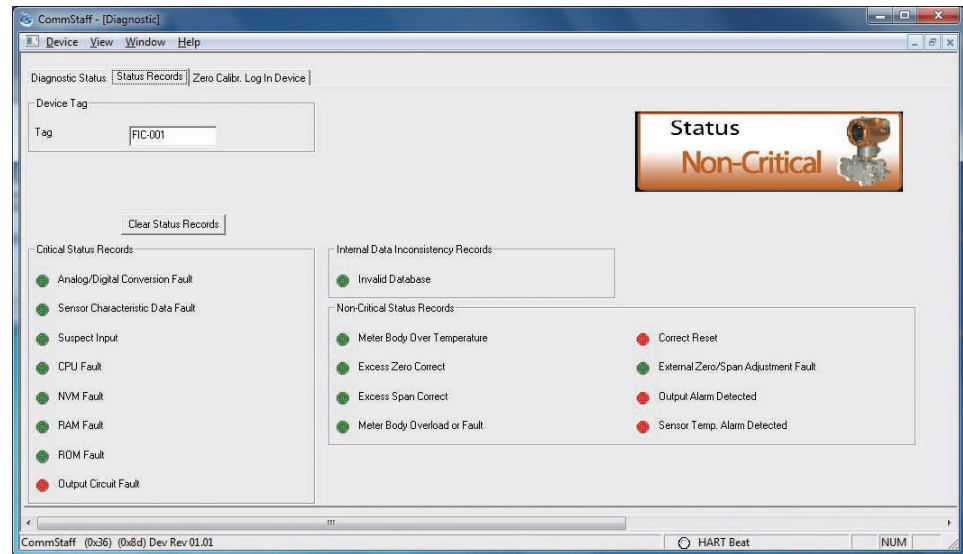
Diagnostic results are displayed in the EDD menu format.



4-5. Checking the Error Log

It is convenient to check the error log in the EDD menu format.

Select (click) the “Status Record” tab as shown in the following screen.

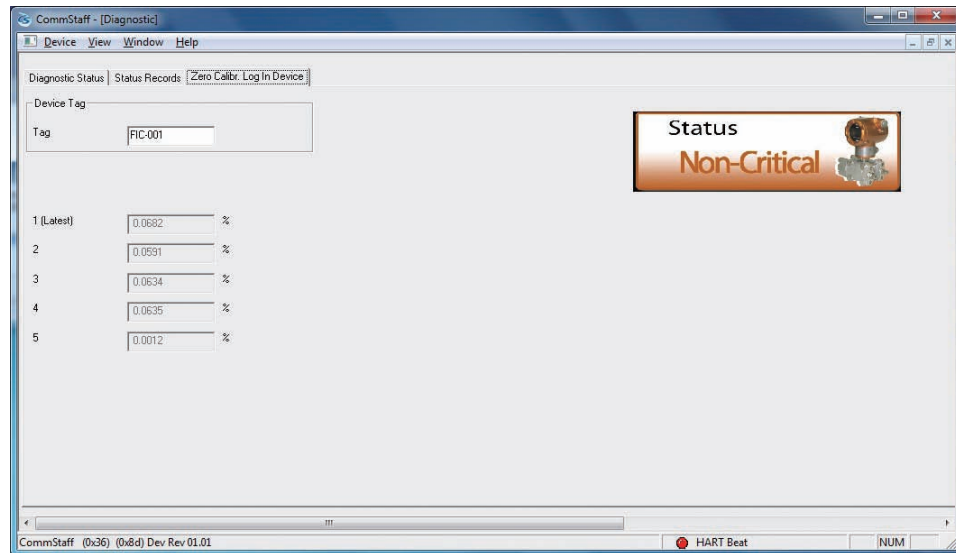


4-6. Checking Internal Data on Zero Calibrations

It is also convenient to check the internal data on zero calibrations in the EDD menu format as shown in the following screen.

Select (click) the “Zero Calibr. Log in Device” tab as shown below.

You can check for internal data on the past five zero calibrations.



Document Number:	CM2-CFS100-2003
Document Name:	Field Communication Software CommStaff Model: CFS100 Instruction Manual (Smart Transmitter GTX Edition)

Date:	Feb. 2011 (initial)
Issued/Edited by:	Yamatake Corporation

Yamatake Corporation