

Field Communication Software Model: CFS100

Instruction Manual (Smart Transmitter Model JTD720A 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 Model CFS100 (CommStaff) can be found in the Common Edition manual (No. CM2-CFS100-2001). For information on the operation of a device used with Model CFS100, consult the manual for that particular device.

The Common Edition manual for Model CFS100, 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 ST3000 model JTD720A with the model number pattern JTD720A

CONTENTS

Chapter 1. Overview..... 1

- 1-1. Introduction.....1
- 1-2. Important Notes1

Chapter 2. Preparation before Operation 2

- 2-1. Menu List2
- 2-2. Tag Number Configuration.....7
- 2-3. Output Format Configuration8
 - 2-3-1. Checking or setting Linear/ Sq root output8
 - 2-3-2. Checking or setting the output direction (forward only, or forward and reverse)9
 - 2-3-3. Checking or setting the low cutoff value.....10
- 2-4. Setting the indicator11
 - 2-4-1. Checking or setting the indicator display conformity (Linear or Disp Flow)11
 - 2-4-2. Checking or setting the indicator display unit12
 - 2-4-3. Checking or setting the lower and upper limits of indicator14
- 2-5. Checking or setting the lower and upper limits of the differential pressure range15
- 2-6. Adjustments of range16
 - 2-6-1. Adjustment of the differential pressure range16
 - 2-6-2. Adjustment of the pressure range.....17
 - 2-6-3. Adjustment of the temperature range18
- 2-7. Setting the temperature-pressure correction19
 - 2-7-1. Checking or setting the formula.....19
 - 2-7-2. Checking or setting the correction type20
 - 2-7-3. Checking or setting the design pressure20
 - 2-7-4. Checking or setting the design temperature21
 - 2-7-5. Checking or setting the static pressure elevation.....21
 - 2-7-6. Checking or setting the temperature sensor type22
- 2-8. Conducting a loop test.....23
- 2-9. Damping Time Constant Configuration.....25
- 2-10. Checking output fail safe direction.....26
- 2-11. NVM Save27

Chapter 3. Maintenance 28

- 3-1. Calibration.....28
 - 3-1-1. Calibrating the differential pressure28
 - 3-1-2. Calibrating when pressure is equalized.....30
 - 3-1-3. Calibrating the pressure.....31
 - 3-1-4. Calibrating the atmospheric pressure32
 - 3-1-5. Calibrating a temperature33
 - 3-1-6. Calibrating the output signal34
- 3-2. Checking the output signal using dummy input36
- 3-3. Checking the PROM ID.....37
- 3-4. Checking the software version38
- 3-5. Switching the measured gas.....39
- 3-6. Checking device temperature40
- 3-7. Checking Self-diagnostic Messages41

Chapter 4. Status Message..... 42

Chapter 1. Overview

1-1. Introduction

Model CFS100 (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 FieldComm Group.

This manual describes how to use the model JTD720A Smart 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 Model CFS100 Operation Manual. *Before reading this manual, make sure to read the main Model CFS100 Operation Manual thoroughly.*

For information on smart transmitter functions and method of connection, refer to manual No. CM2-DST720-2001, ST3000 Smart Multivariable Transmitter Model: JTD720A User's Manual

1-2. Important Notes

* When changing connected devices

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

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

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

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

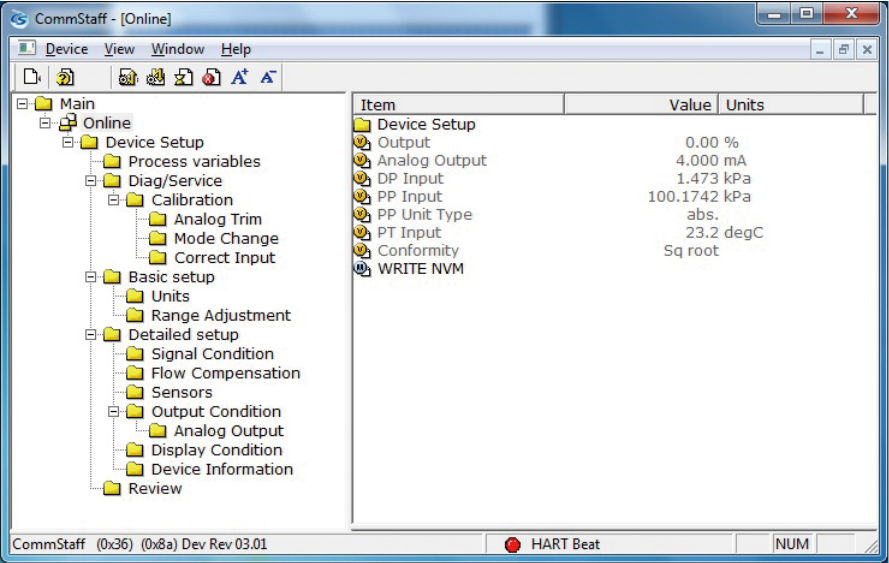
Chapter 2. Preparation before Operation

2-1. Menu List

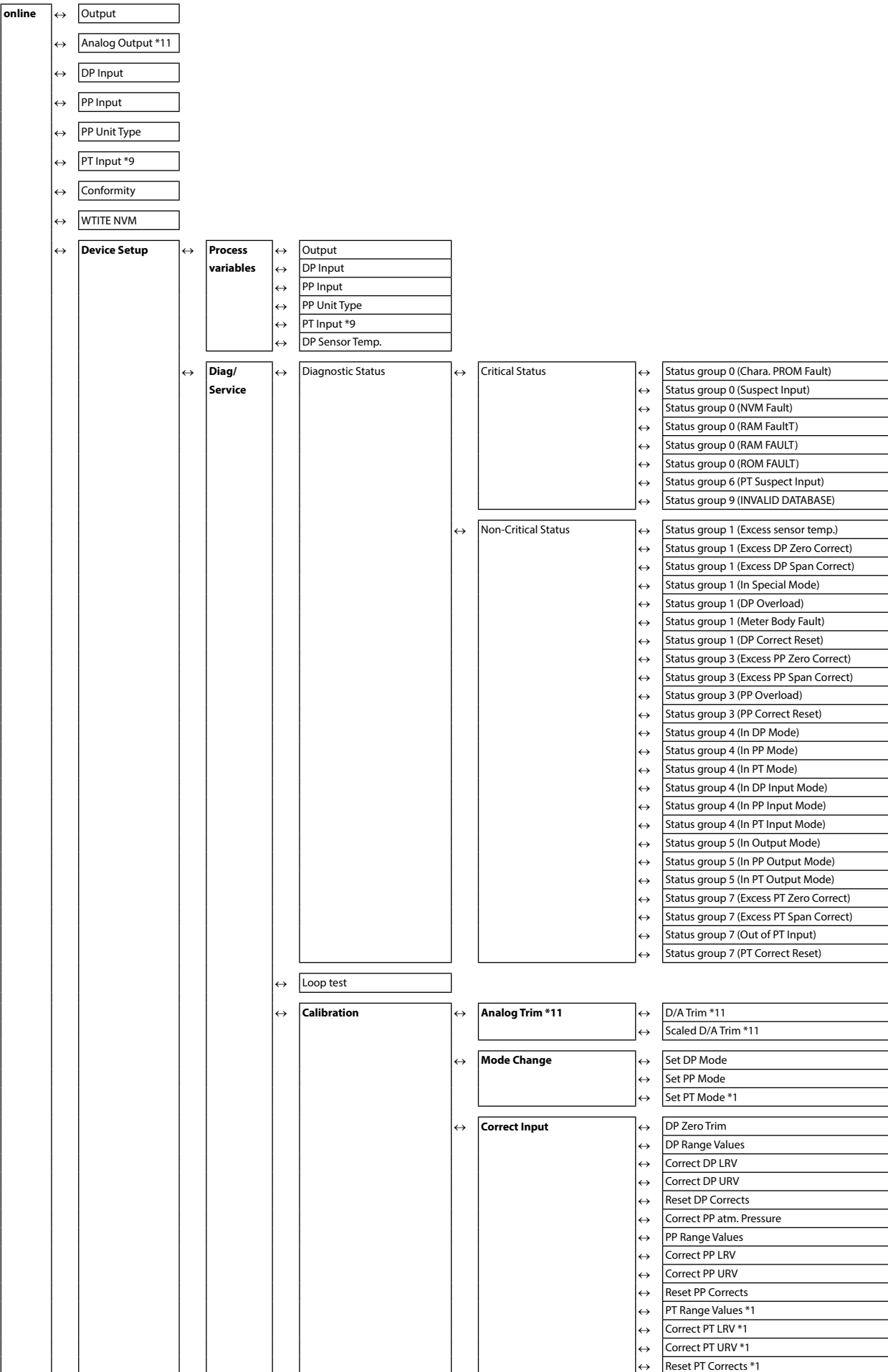
Right-clicking “Online” in the menu tree in the left pane of the CommStaff application window displays a menu. Selecting Expand on the menu displays the expanded menu tree.

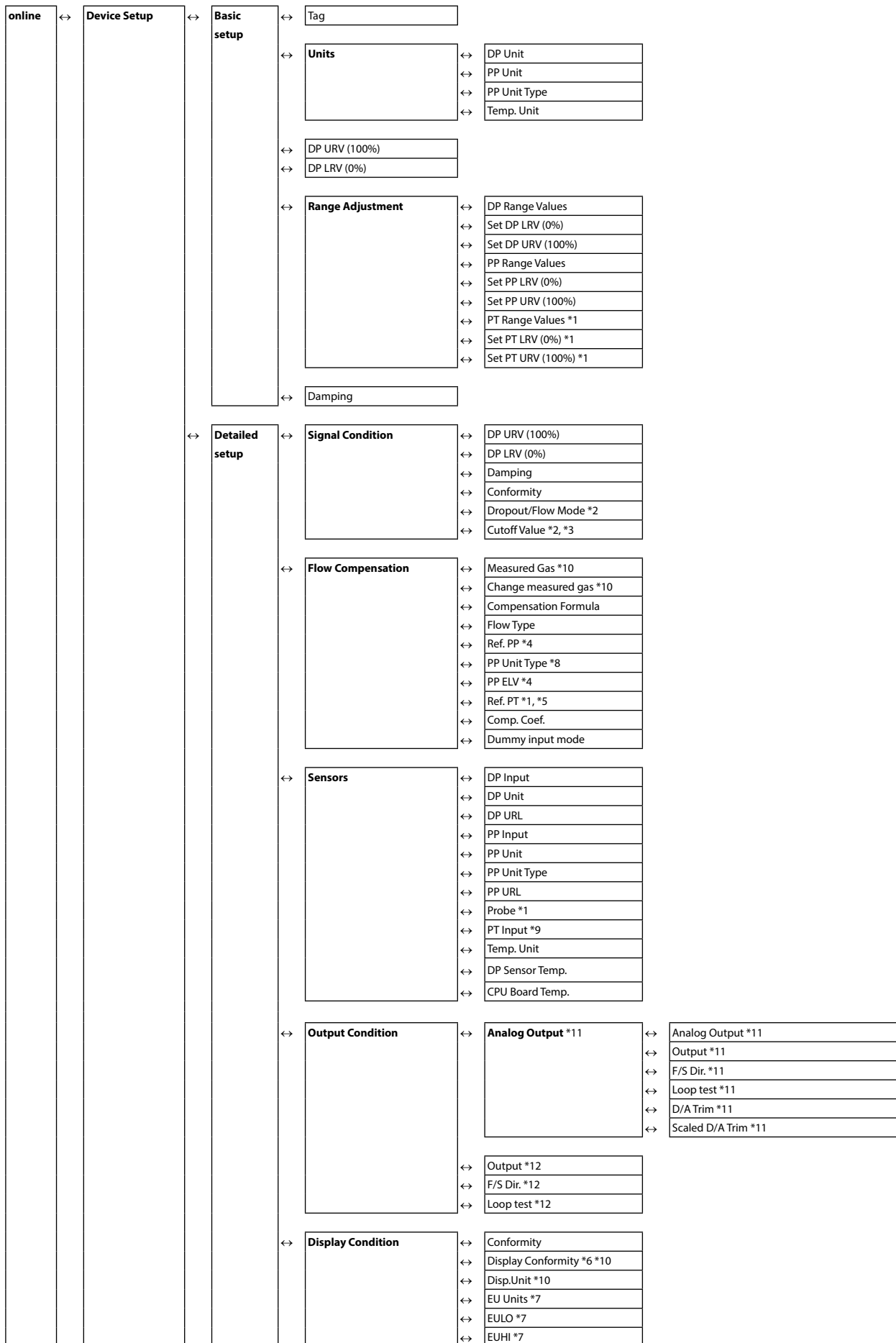
Parameters displayed in gray (Output and Analog Output in the following window) in the parameter display in the right pane are parameters that cannot be changed.

Those displayed in black (WRITE NVM in the window below) are parameters that can be changed.



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





online	↔	Device Setup	↔	Detailed setup	↔	Device Information	↔	Manufacturer
								Model
								Tag
								Message
								PROM ID
								Software Version
						DE Configuration	↔	DE FS Mode
								DE Format
								DE PV type
								PV1
								PV2
								PV3
								SV1
								SV2
								SV3
								Switch Analog to DE *11
								Switch DE to Analog *12
				Review	↔		↔	Model
								Manufacturer
								Tag
								Conformity
								Dropout/Flow Mode *2
								Cutoff Value *2, *3
								Compensation Formula
								Flow Type
								PROM ID
								Software Version
								Damping
								DP URV (100%)
								DP LRV (0%)
								DP Unit
								Ref. PP *4
								PP ELV *4
								Ref. PT *1, *5
								Display Conformity *6 *10
								Disp.Unit *10
								EU Units *7
								EULO *7
								EUHI *7
								F/S Dir.
								Output
								Comp. Coef.
								DP Sensor Temp.
								CPU Board Temp.
								DP URL
								DP Input
								PP URL
								PP URV (100%)
								PP LRV (0%)
								PP Unit
								PP Unit Type
								PP Input
								Probe *1
								PT URL *1
								PT LRL *1
								PT URV (100%) *1
								PT LRV (0%) *1
								PT Input *9
								DE FS Mode
								DE Format
								DE PV type
								PV1
								PV2
								PV3
								SV1
								SV2
								SV3

If there are multiple conditions, they all must be met for the item to be displayed.

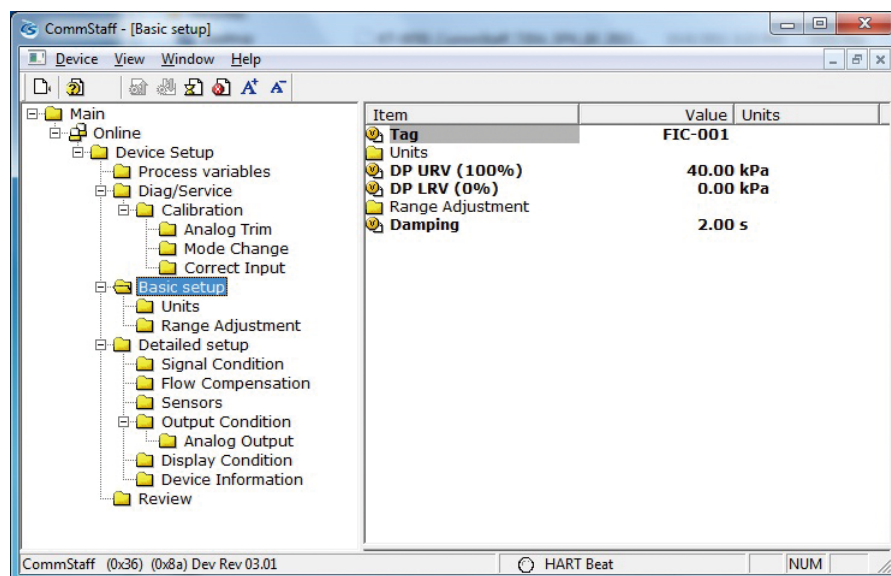
*1 Displayed when Measured Gas is set for Ideal Gas. Not displayed when the setting is Saturated Steam.

*2 Displayed when Conformity is set for Sq root. Not displayed when the setting is Linear.

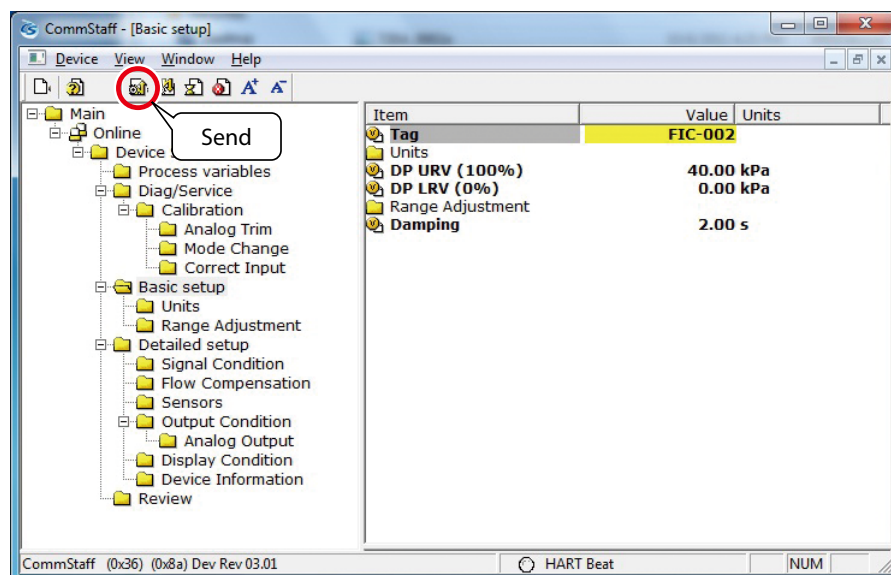
- *3 Displayed when the Dropout/Flow Mode is set for something other than Def. (7.1% Lin.).
Not displayed when it is set to Def. (7.1% Lin.)
- *4 Displayed when Compensation Formula is set for Temp.comp. or Temp. Pressure comp.
- *5 Displayed when Compensation Formula is set for Pressure comp. or Temp. Pressure comp.
- *6 Displayed when Conformity is set for Linear.
- *7 Displayed when Disp.Unit is set for Eng.Unit.
- *8 PP Unit Type in the Flow Compensation menu is displayed even through it is not required unless pressure calibration is being done.
- *9 PT Input shows the calculated saturated steam temperature when the measured gas is saturated steam.
- *10 Not displayed if the transmitter version is 7.7 or lower.
- *11 Not displayed if DE communication is selected.
- *12 Valid (displayed) if DE communication is selected.

2-2. Tag Number Configuration

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



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

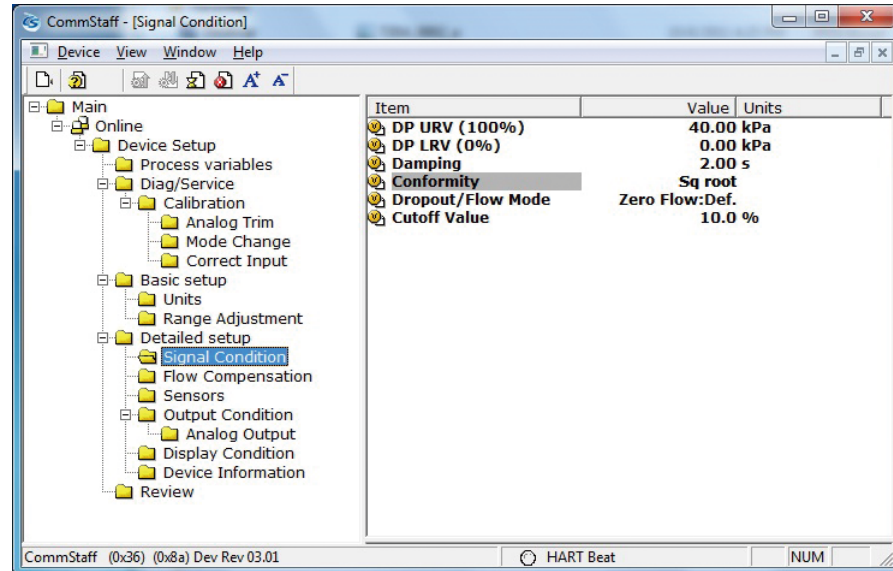


2-3. Output Format Configuration

2-3-1. Checking or setting Linear/ Sq root output

This section explains how to switch between linear and square root output.

Select [Device Setup] → [Detailed setup] → [Signal Condition] → [Conformity].



Double-clicking [Conformity] will display a dialog box for selection of one of the following items.

Linear / Sq root

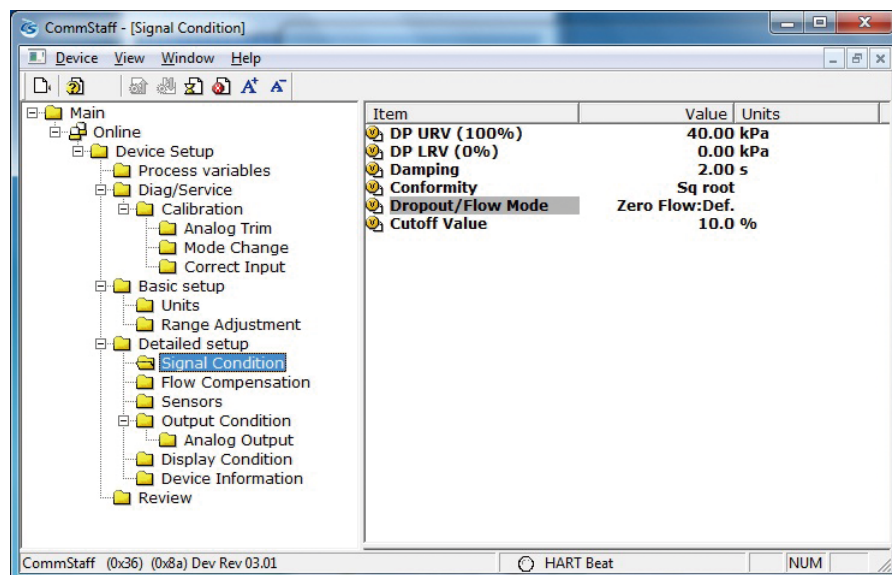
After selecting, click the <Set> button. After the dialog box closes, click the <Send> button.

2-3-2. Checking or setting the output direction (forward only, or forward and reverse)

This displays or changes the output direction when setting the square root extraction output (forward only, or forward and reverse).

This function is enabled if Conformity is set to Sq root.

Select [Device Setup] → [Detailed setup] → [Signal Condition] → [Dropout/Flow Mode].



The output direction can be selected from the following five types.

Selection options	Output direction	Output at cutoff	Low Cutoff Value
Zero Flow: Def	Forward	Zero	Any (depends on Cutoff Value setting)
Lin Flow: Def	Forward	Linear	Any (depends on Cutoff Value setting)
Zero Flow: Bi-dir.	Forward and reverse	Zero	Any (depends on Cutoff Value setting)
Lin Flow: Bi-dir.	Forward and reverse	Linear	Any (depends on Cutoff Value setting)
Def. (7.1% Lin)	Forward	Linear	7.1 % (default)

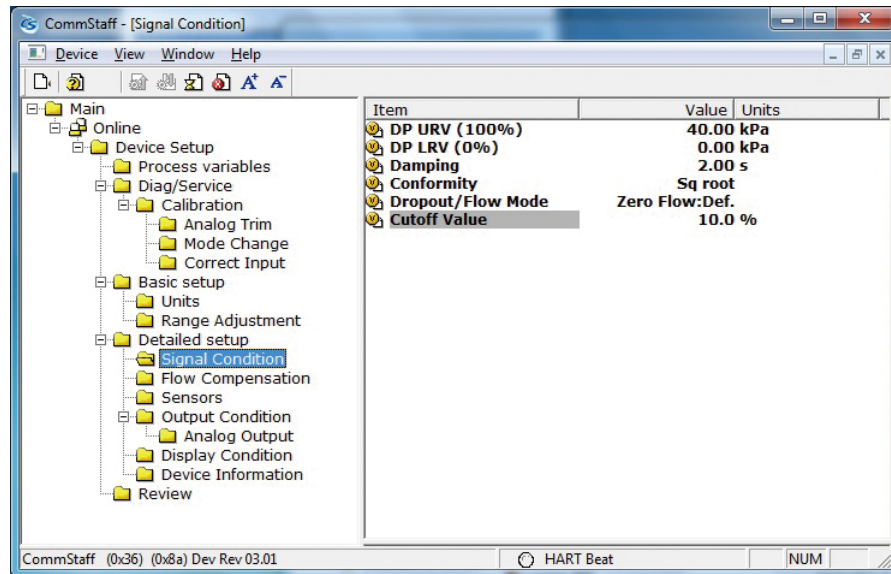
2-3-3. Checking or setting the low cutoff value

Select [Device Setup] → [Detailed setup] → [Signal Condition] → [Cutoff Value]

The low flow cutoff value is effective with the following settings.

Conformity	Sq root
Dropout/Flow Mode	Not "Def. (7.1 % Lin)"

It can be set from 0 to 20 %

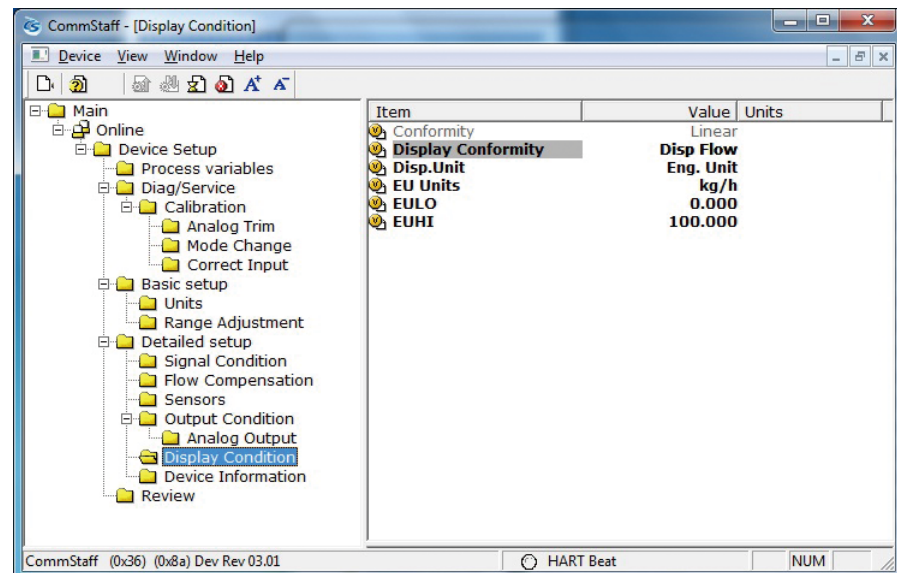


2-4. Setting the indicator

2-4-1. Checking or setting the indicator display conformity (Linear or Disp Flow)

When Conformity is set at Linear, the Display Conformity can be set at either Linear or Disp Flow.

Select [Device Setup] → [Detailed setup] → [Display Condition] → [Display Conformity].

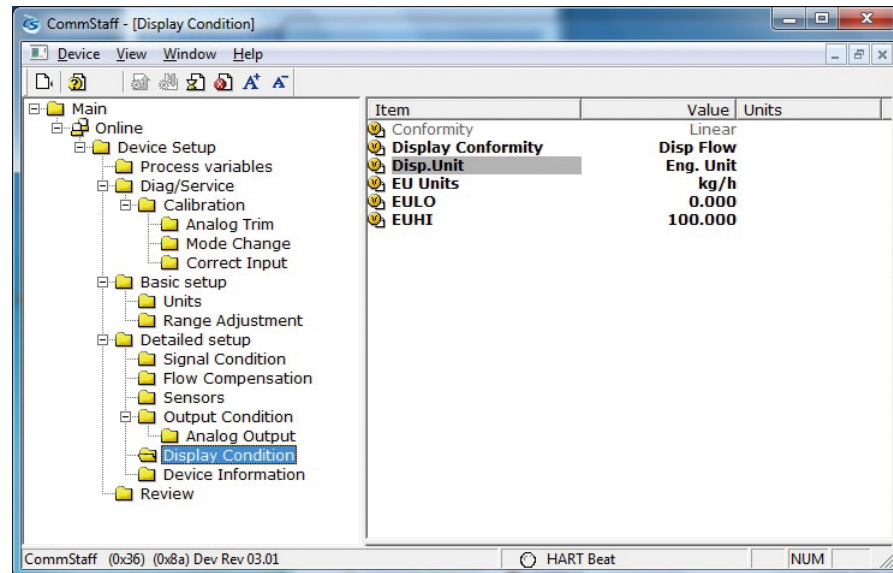


Note: If the software version of the device is Ver.7.7 or earlier then this item is not supported and so is not displayed.

2-4-2. Checking or setting the indicator display unit

First, the display unit should be set to either % or engineering unit (Eng. Unit) under the Disp. Unit item.

Select [Device Setup] → [Detailed setup] → [Display Condition] → [Disp. Unit].

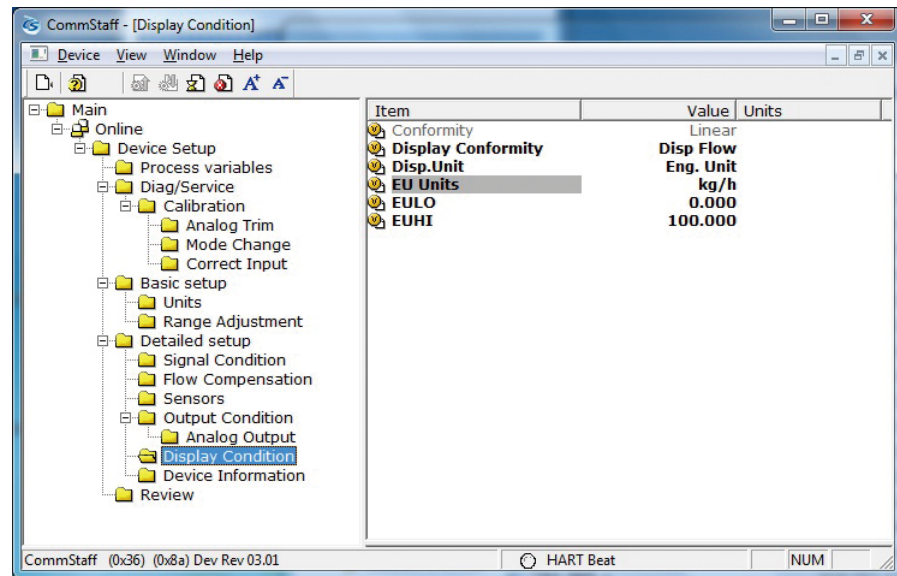


Note: If the software version of the device is Ver.7.7 or earlier then this item is not supported and so is not displayed.

To set to % display, configure in EU Units.

If Disp. Unit is set to Eng. Unit, next make a selection for EU Units.

Select [Device Setup] → [Detailed setup] → [Display Condition] → [EU Units].



The following units are available. For use in Japan, select an SI unit

gal/s	l/s	Ft ³ /s	m ³ /s	Ft ³ /min
gal/min	l/min	IGPM	m ³ /min	cm ³ /min
m ³ /h	ImpG/h	cm ³ /h	l/h	gal/h
MilG/d	Mill/d	Ft ³ /d	m ³ /d	ImpG/d
BPD	gal/d	kgal/d	l/s	l/min
l/h	l/d	kl/s	kl/min	kl/h
kl/d	m ³ /s	m ³ /min	m ³ /h	m ³ /d
Nm ³ /s	Nm ³ /min	Nm ³ /h	Nm ³ /d	t/s
t/min	t/h	t/d	g/s	g/min
g/h	kg/s	kg/min	kg/h	kg/d
MetT/min	MetT/h	MetT/d	lb/s	lb/min
lb/h	lb/d	ShTon/m	Shton/h	ShTon/d

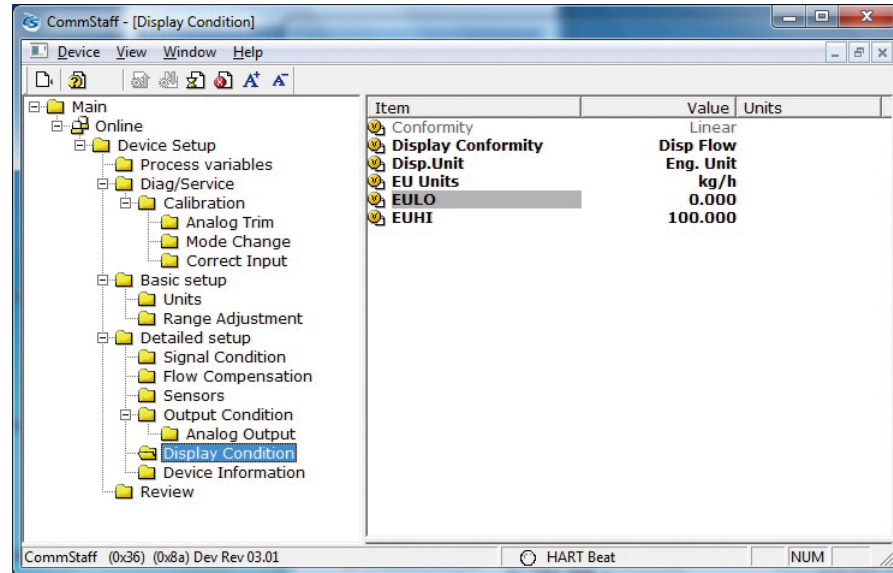
Note: If the device software version is 7.7 or earlier, select % or engineering unit (Eng. Unit) for “EU Units.”

When set to % display, the device displays 0 to 100% regardless of the EULO and EUHI values.

2-4-3. Checking or setting the lower and upper limits of indicator

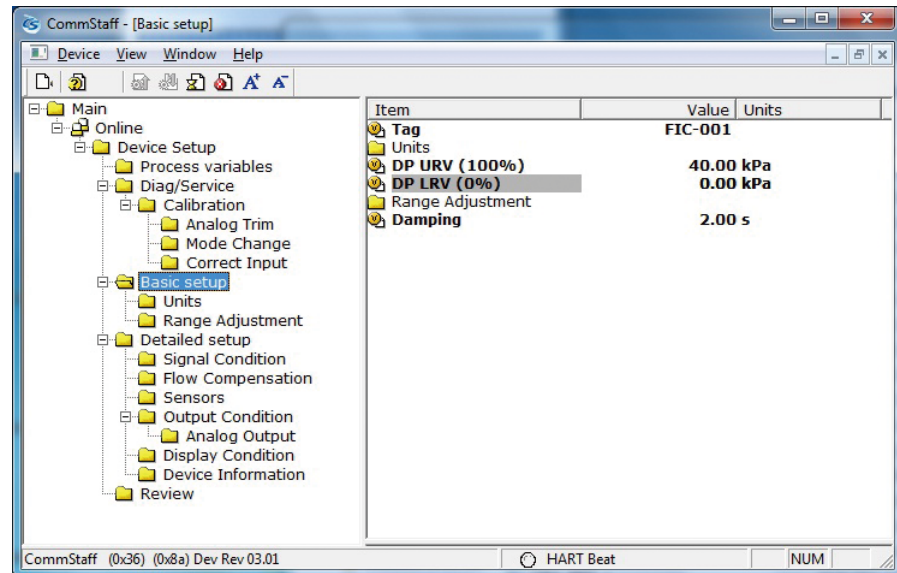
EULO and EUHI values are the upper and lower limits for engineering units (scale readings) displayed on the indicator. They are displayed in the range of -19999 to +19999.

Select [Device Setup] → [Detailed setup] → [Display Condition] → [EULO]/[EUHI].



2-5. Checking or setting the lower and upper limits of the differential pressure range

To display or change the lower and upper limits of the differential pressure range, select [Device Setup] → [Basic setup] → [DP LRV (0%)] / [DP URV (100%)].



Note: When using SFC or CommPad, if the LRV is changed, the URV will change by the same amount so that the span does not change. However, when using CommStaff, the URV does not change if the LRV is changed.

2-6. Adjustments of range

Adjust the range so that the LRV or URV is equal to the present transmitter input value.

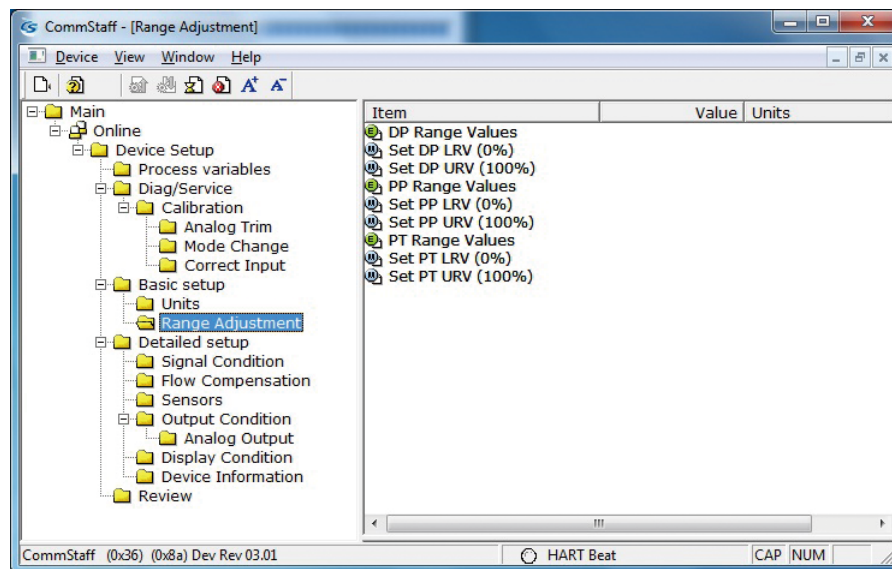
2-6-1. Adjustment of the differential pressure range

Adjust the range so that the DP LRV or DP URV is equal to the present differential input value.

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

The following describes how to set the range to the differential pressure input value.

Select [Device Setup] → [Basic setup] → [Range Adjustment].



- To adjust the DP LRV value, double-click Set DP LRV (0%). To adjust the DP URV value, double-click Set DP URV (100%).
- 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.
- The question “Set DP Mode. OK?” appears in order to confirm configuration of the differential pressure mode. To set the mode, click [OK].
- Either “Set DP LRV (0%)” or “Set DP URV (100%)” is displayed. To set the range value to the present input value, click [OK].
- If the adjustment succeeds, [Set DP LRV succeeded] or [Set DP URV succeeded] will be displayed. Click [OK].
- After clearing the differential pressure mode, 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.

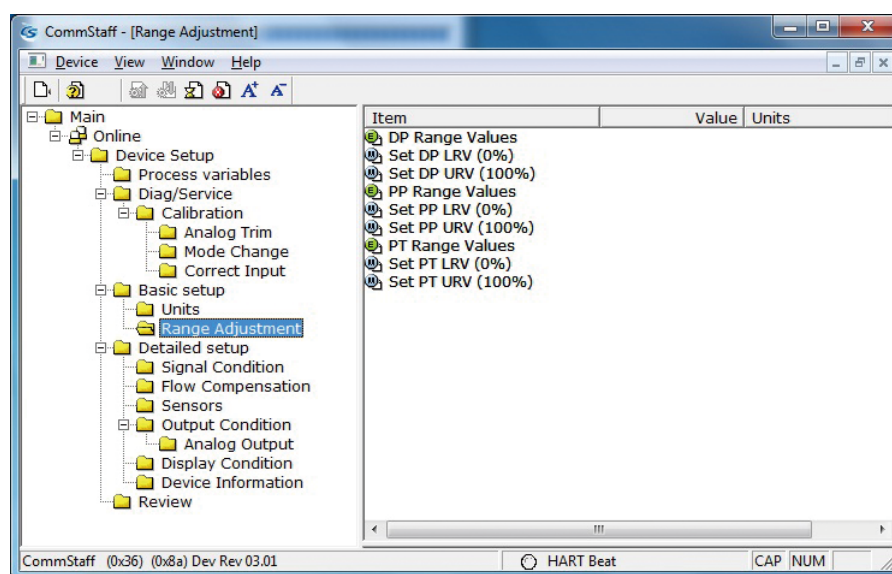
2-6-2. Adjustment of the pressure range

Adjust the range so that the PP LRV or PP URV is equal to the present pressure input value.

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

The following describes how to set the range to the pressure input value.

Select [Device Setup] → [Basic setup] → [Range Adjustment].



- To adjust the PP LRV value, double-click Set PP LRV (0%). To adjust the PP URV value, double-click Set PP URV (100%).
- 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].
- The question "Set PP Mode. OK?" appears in order to confirm configuration of the pressure mode. To set the mode, click [OK].
- Either "Set PP LRV (0%)" or "Set PP URV (100%)" is displayed. To set the range value to the present input value, click [OK].
- If the adjustment succeeds, [Set PP LRV succeeded] or [Set PP URV succeeded] will be displayed. Click [OK].
- After clearing the pressure mode, 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.
- For pressure type (abs or gauge), check PP Unit Type.

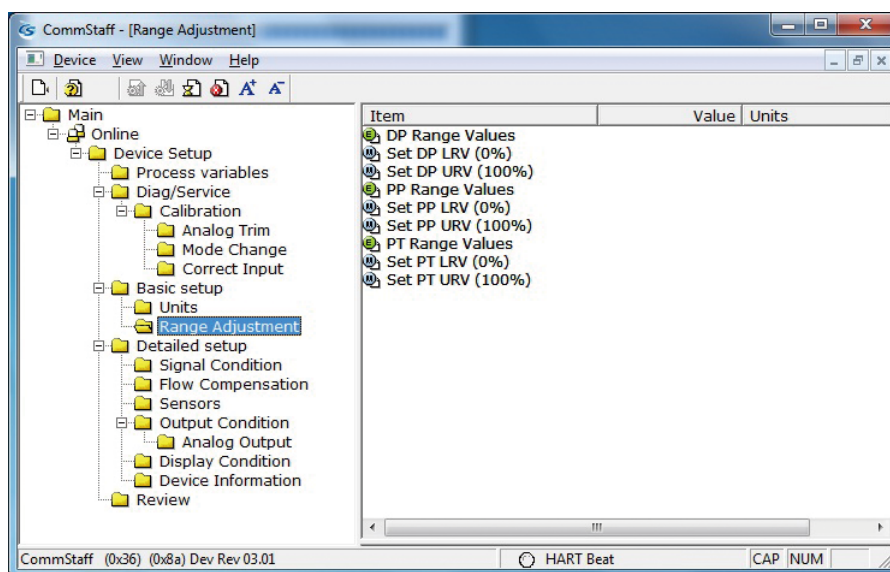
2-6-3. Adjustment of the temperature range

Adjust the range so that the PT LRV or PT URV is equal to the present temperature input value.

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

The following describes how to set the range to the temperature input value.

Select [Device Setup] → [Basic setup] → [Range Adjustment].



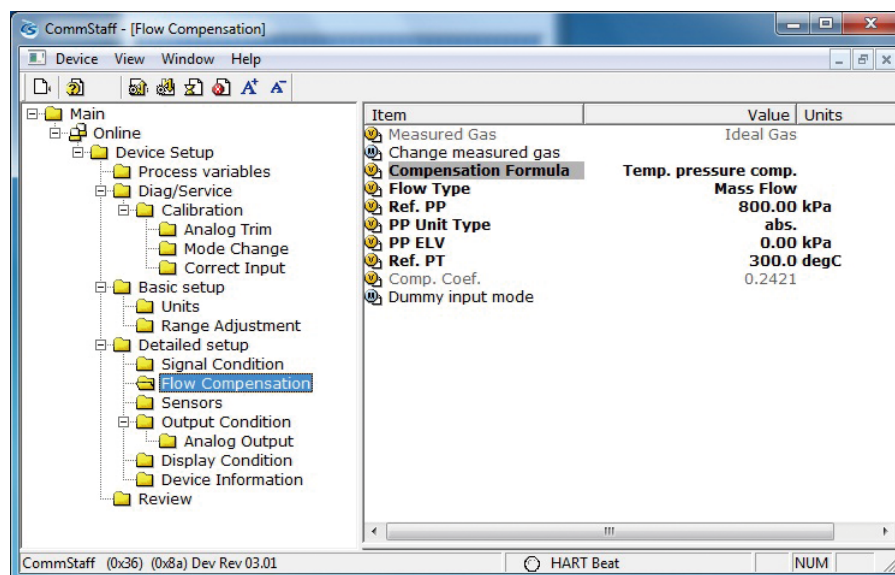
- To adjust the PT LRV value, double-click Set PT LRV (0%). To adjust the PT URV value, double-click Set PT URV (100%).
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.
- The question “Set PT Mode. OK?” appears in order to confirm configuration of the temperature mode. To set the mode, click [OK].
- Either “Set PT LRV (0%)” or “Set PT URV (100%)” is displayed. To set the range value to the present input value, click [OK].
- If the adjustment succeeds, [Set PT LRV succeeded] or [Set PT URV succeeded] will be displayed. Click [OK].
- After clearing the temperature mode, 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.

2-7. Setting the temperature-pressure correction

2-7-1. Checking or setting the formula

If the measured gas is an ideal gas, the formula can be changed, but if it is saturated steam, the formula cannot be changed.

Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Compensation Formula].



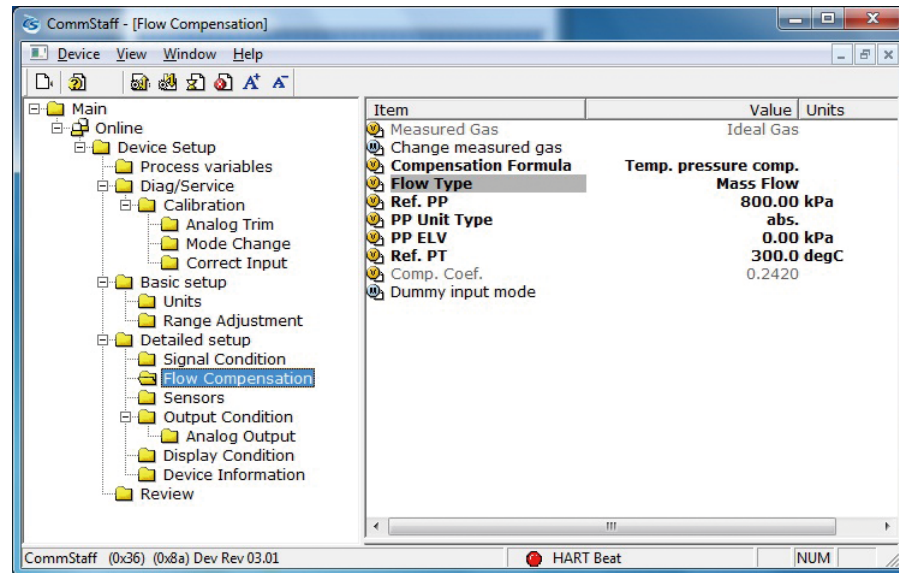
The formula can be selected from the following.

No comp	No correction
Pressure comp.	Pressure correction
Temp. comp.	Temperature correction
Temp. pressure comp.	Temperature and pressure correction

2-7-2. Checking or setting the correction type

If the measured gas is an ideal gas, the formula can be changed, but if it is saturated steam, the formula cannot be changed.

Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Flow Type].



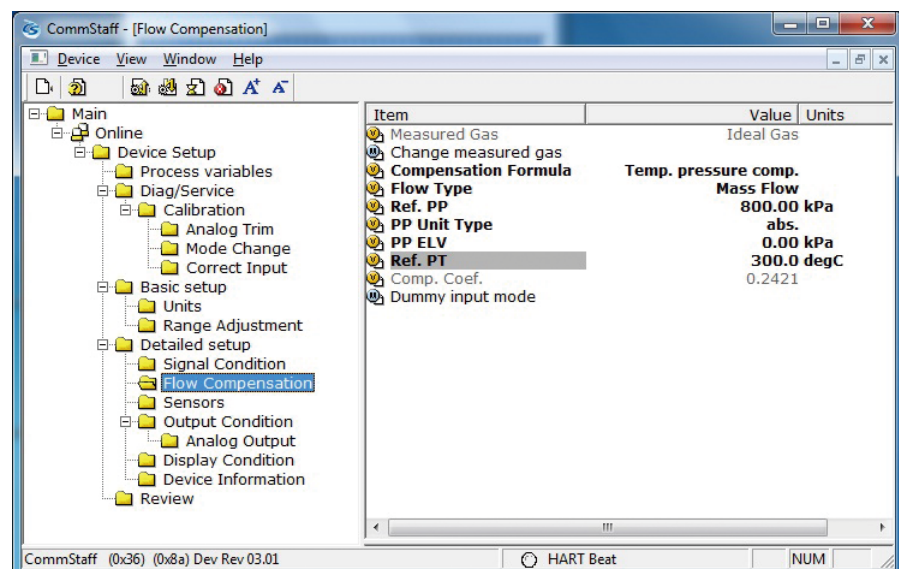
The correction type can be selected from the following.

Mass Flow
Volume Flow

2-7-3. Checking or setting the design pressure

When Compensation Formula is set at Pressure comp. or Temp. pressure comp., it is effective. It is also effective when the measured gas is set to Saturated Steam.

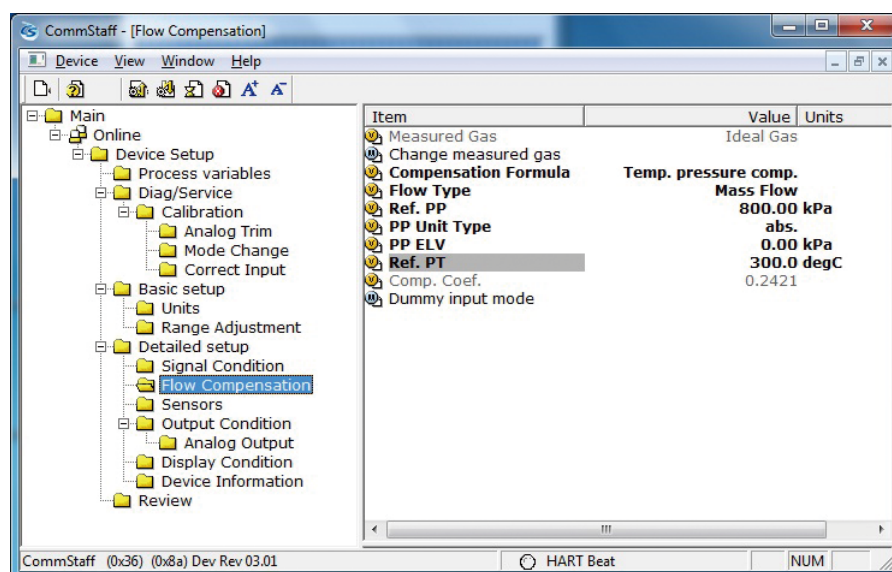
Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Ref. PT].



2-7-4. Checking or setting the design temperature

When Compensation Formula is set at Temp comp. or Temp. pressure comp., it is effective.

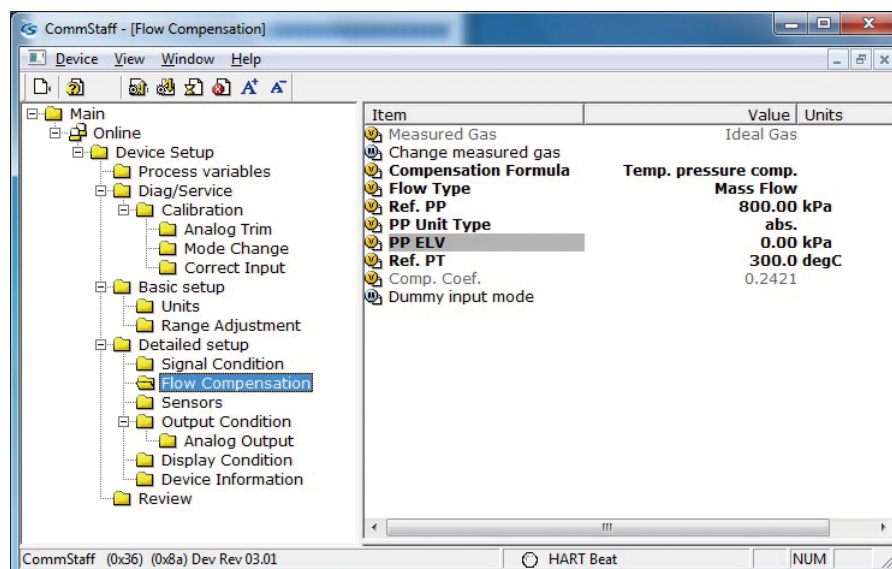
Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Ref. PT].



2-7-5. Checking or setting the static pressure elevation

When Compensation Formula is set at Pressure comp. or Temp. pressure comp., it is effective. It is also effective when the measured gas is set to Saturated Steam.

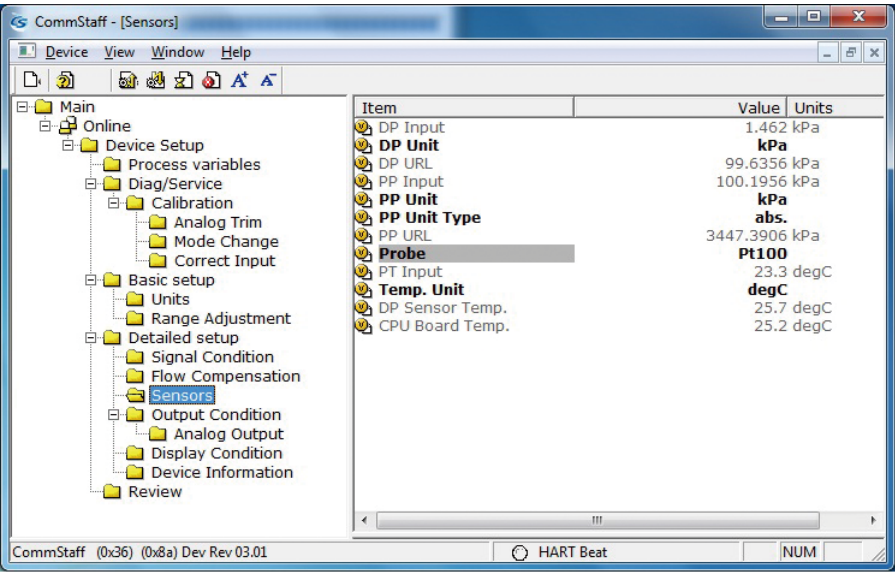
Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [PP ELV].



2-7-6. Checking or setting the temperature sensor type

This setting is effective when the measured gas is an ideal gas.

Select [Device Setup] → [Detailed setup] → [Sensors] → [Probe].



The temperature sensor can be selected from the following two types.

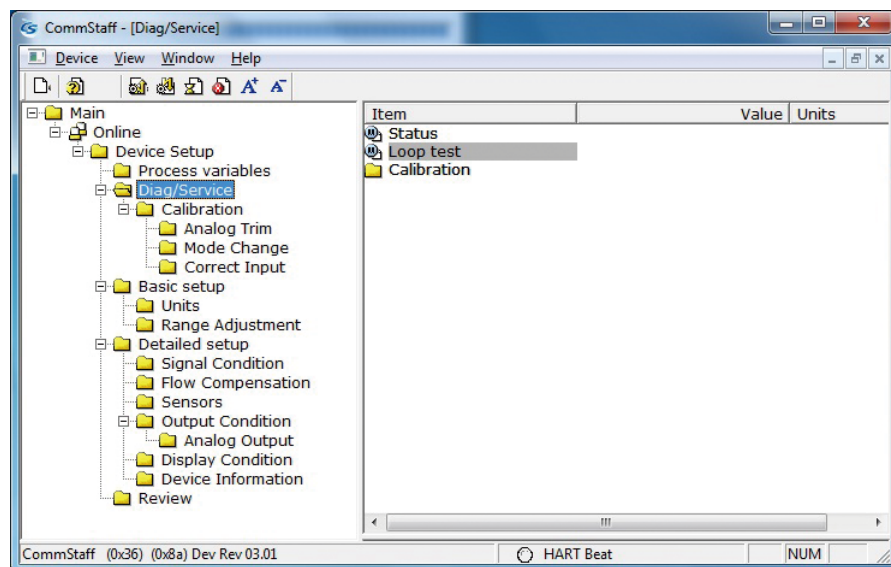
Pt100
JPt100

2-8. Conducting a loop test

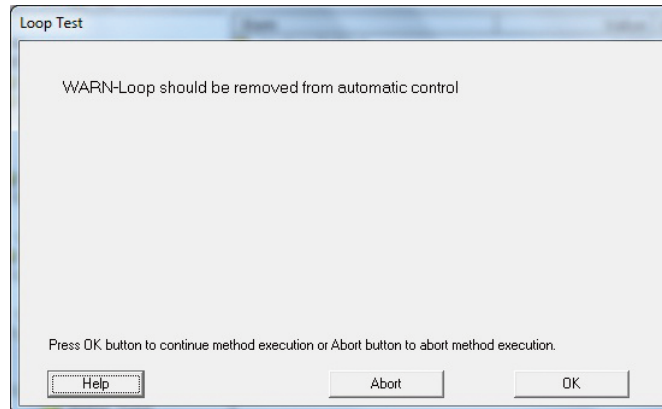
By putting the transmitter in constant current mode, you can keep current outputs constant in the range of 4 - 20 mA. This section explains how to configure the constant current mode and how to return to normal output mode.

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

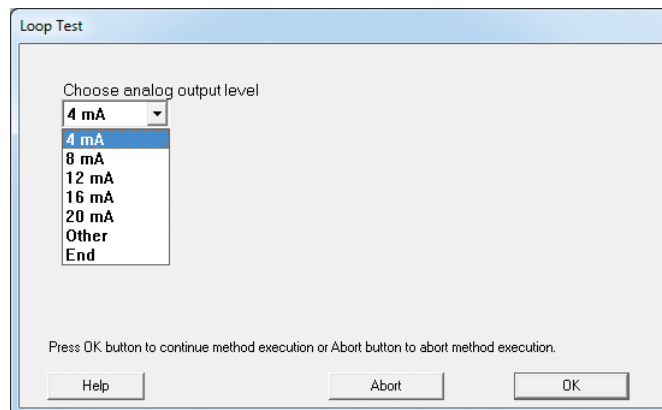
CAUTION: If the transmitter's process is controlled automatically, this reset action could put the operation at risk by causing output fluctuation. Before resetting, make sure that the control loop for the process is manually controlled.



Double-clicking Loop Test displays the following screen.



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

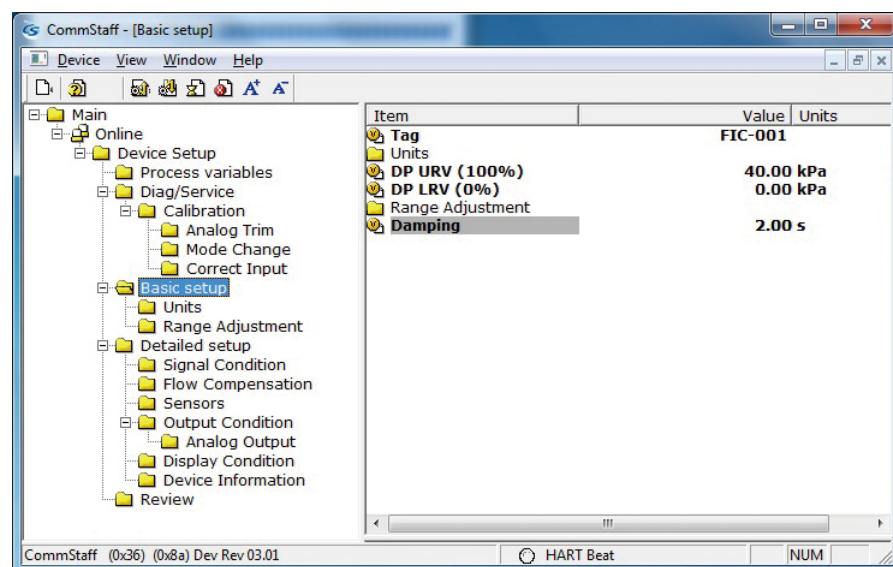


- Select 4 mA and click OK. Output signals will be fixed at 4 mA (0%).
- Select 8 mA and click OK. Output signals will be fixed at 8 mA (25%).
- Select 12 mA and click OK. Output signals will be fixed at 12 mA (50%).
- Select 16 mA and click OK. Output signals will be fixed at 16 mA (75%).
- Select 20 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.

2-9. Damping Time Constant Configuration

This section explains how to configure the damping time constant.

Select [Device Setup] → [Basic setup] → [Damping].



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

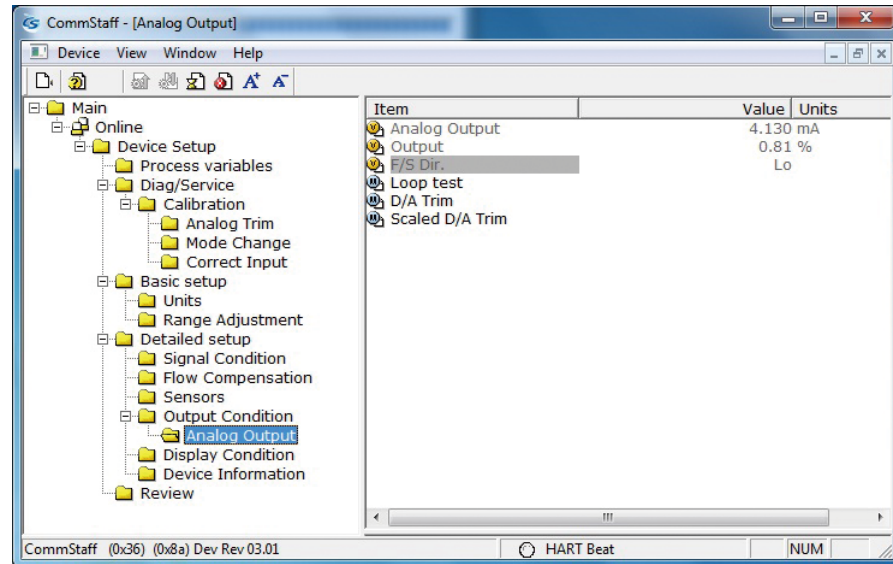
Unit:s

0.0
0.16
0.32
0.48
1.00
2.00
4.00
8.00
16.0
32.0

2-10. Checking output fail safe direction

The following tells how to check the output fail safe direction.

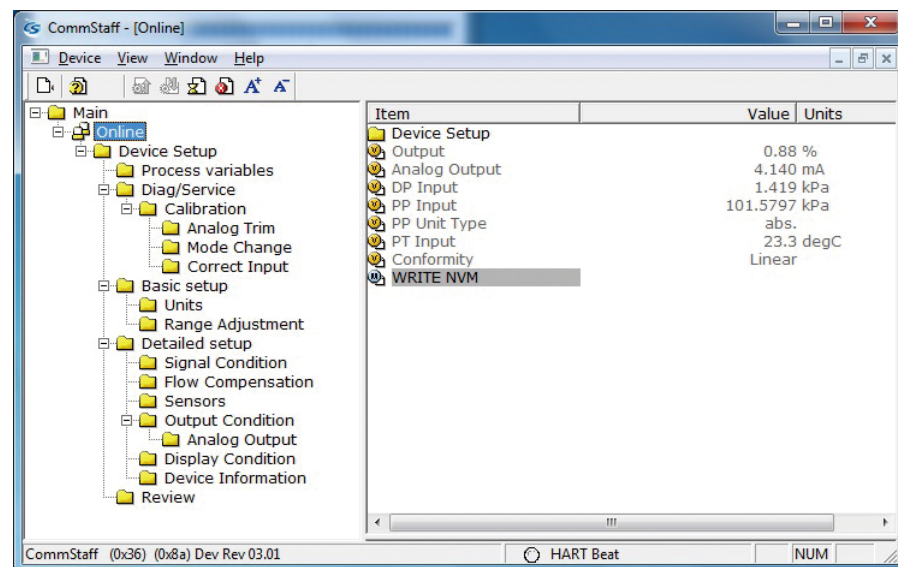
Select [Device Setup] → [Detailed setup] → [Output Condition] → [Analog Output] → [F/S Dir.].



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. Maintenance

This section explains the general procedures for transmitter maintenance.

3-1. Calibration

3-1-1. Calibrating the differential pressure

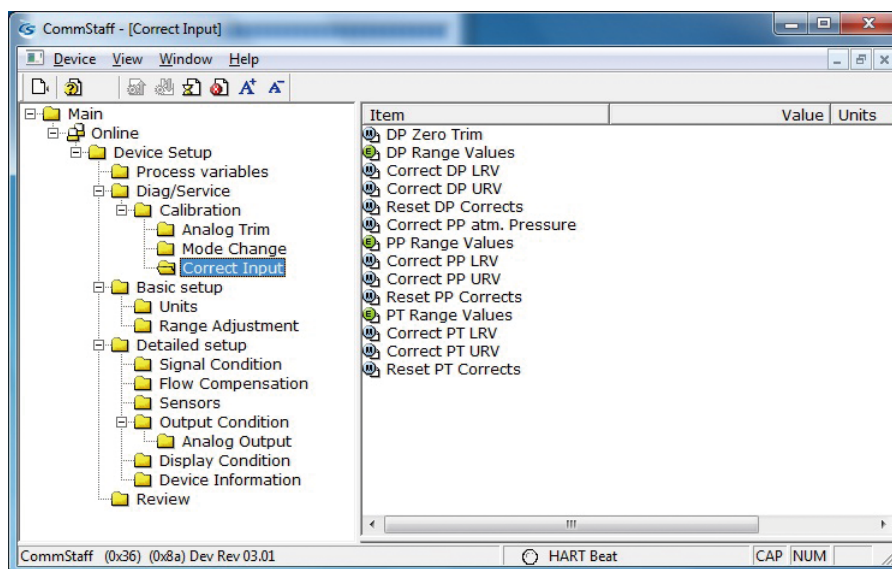
For the STD720A series smart multivariable transmitters, the measurement range must be calibrated at two points, namely the LRV (input value at 0% output) and URV (input value at 100% output).

This calibration is done when calibrating actual pressures using a standard pressure transmitter.

For further details, refer to Chapter 4, “Calibrating the Transmitter” in ST3000 Smart Multivariable Transmitter (CM2-DST720-2001).

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

Select [Device Setup] → [Diag/Service] → [Calibration] → [Correct Input].



- First, double-click DP Range Values, and check the values for DP LRV and the DP URV. If a change is necessary, change the values.
- To calibrate the DP LRV value, double-click Correct DP LRV. To calibrate the DP URV value, double-click Correct Input DP URV. When changing both the DP LRV and the DP URV, be sure to do the DP LRV first.
- 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.

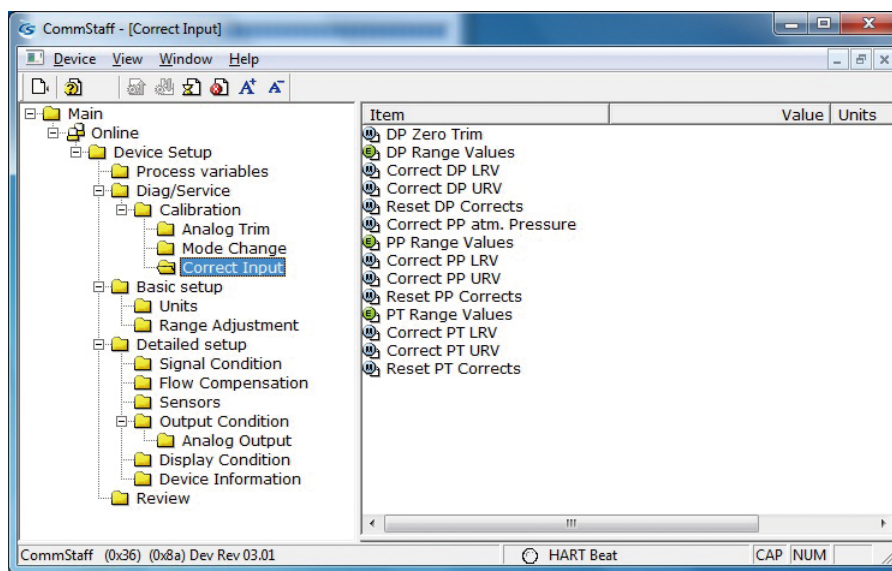
- A warning that this operation will affect the sensor calibration (WARN-This will affect sensor calibration) is displayed. To proceed, click [OK].
- The question “Set DP Mode. OK?” appears in order to confirm configuration of the differential pressure mode. To set the mode, click [OK].
- Either “Apply DP LRV pressure” or “Apply DP URV pressure” is displayed. If the value of the standard pressure generator is equal to DP LRV or DP URV, click OK.
- “Press OK when pressure is stable” is displayed. After confirming that input pressure has stabilized, click OK.
- If the calibration succeeds, [Correct DP LRV succeeded] or [Correct DP URV succeeded] will be displayed. Click [OK].
- After clearing the differential pressure mode, 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.

3-1-2. Calibrating when pressure is equalized

The calibration method when the pressure is equalized is as follows.

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].

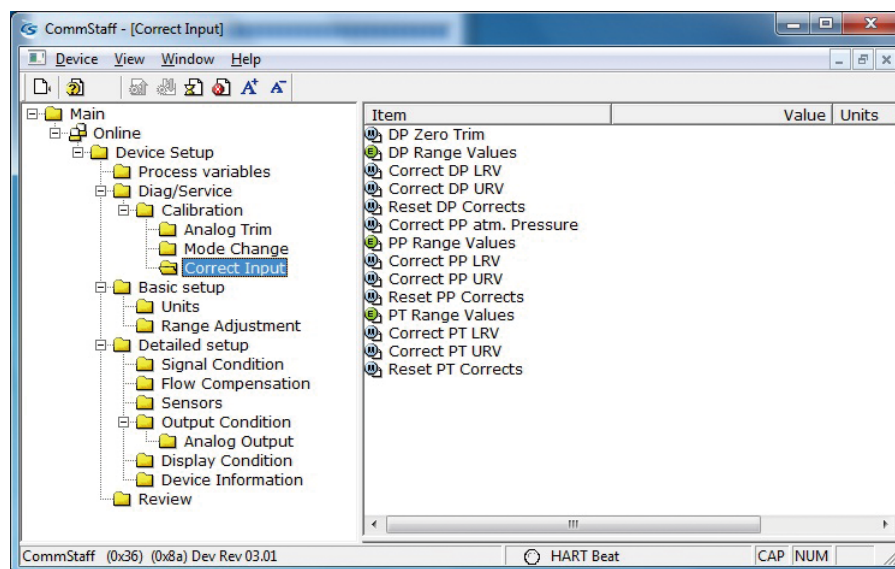


- Double-click DP Zero Trim.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.
- A warning that this operation will affect the sensor calibration (WARN-This will affect sensor calibration) is displayed. To proceed, click [OK].
- The question “Set DP Mode. OK?” appears in order to confirm configuration of the differential pressure mode. To set the mode, click [OK].
- When “Apply 0 input to sensor” is displayed and the differential pressure input is equalized, click [OK].
- If the calibration succeeds, [DP zero trim succeeded] will be displayed. Click [OK].
- After clearing the differential pressure mode, 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.

3-1-3. Calibrating the pressure

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].



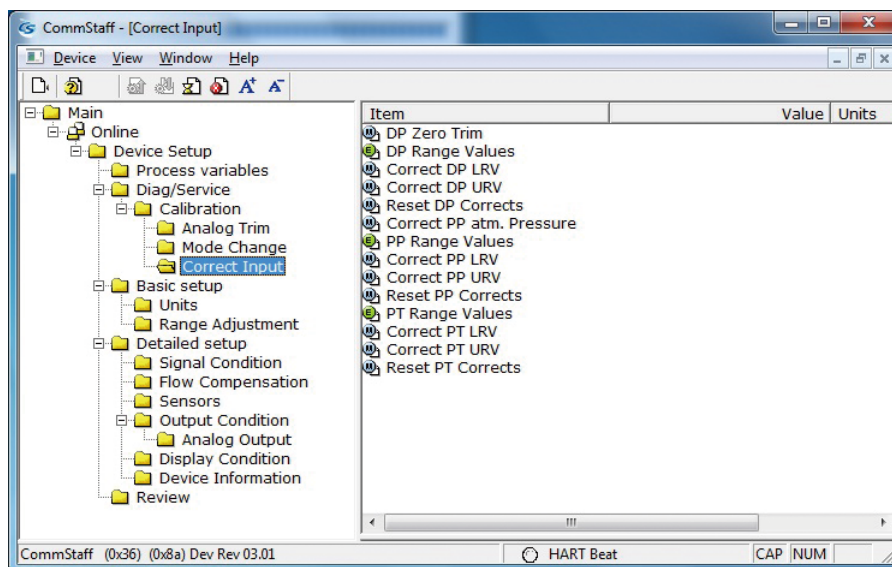
- First, double-click PP Range Values, and check the values for PP LRV and the PP URV. If a change is necessary, change the values.
- To calibrate the PP LRV value, double-click Correct Input PP LRV. To calibrate the PP URV value, double-click Correct Input PP URV. When changing both the PP LRV and the PP URV, be sure to do the PP LRV first.
- 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 warning that this operation will affect the sensor calibration (WARN-This will affect sensor calibration) is displayed. To proceed, click [OK].
- The question “Set PP Mode. OK?” appears in order to confirm configuration of the pressure mode. To set the mode, click [OK].
- Either “Apply PP LRV pressure” or “Apply PP URV pressure” is displayed. If the value of the standard pressure generator is equal to PP LRV or PP URV, click OK.
- “Press OK when pressure is stable” is displayed. After confirming that input pressure has stabilized, click OK.
- If the calibration succeeds, [Correct PP LRV succeeded] or [Correct PP URV succeeded] will be displayed. Click [OK].
- After clearing the pressure mode, 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.

3-1-4. Calibrating the atmospheric pressure

Calibrate the pressure to set the pressure on the transmitter as 1 atmospheric pressure (101.3 kPa abs.)

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].

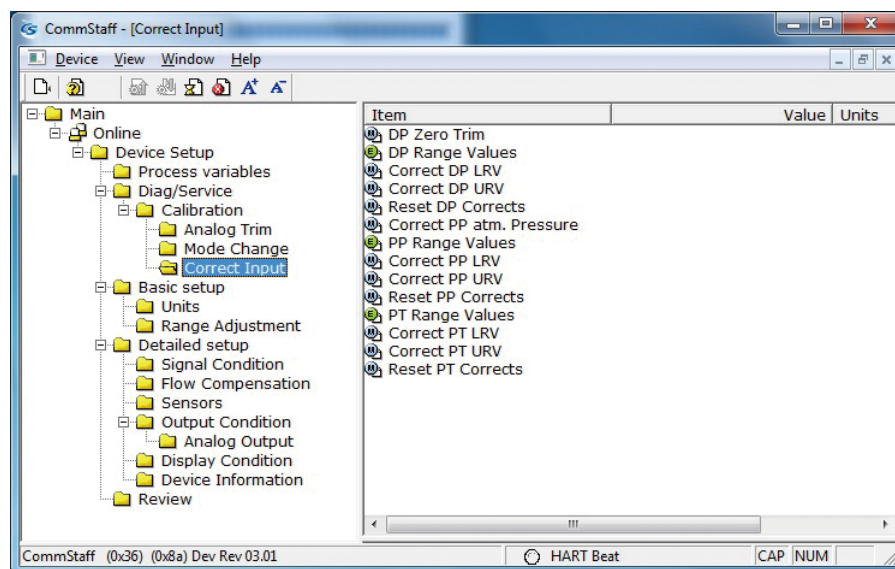


- Double-click PP atm. Pressure.
- A warning that the loop should be switched from automatic control to manual mode is displayed (WARN - Loop should be removed from automatic control). After switching to manual mode, click OK.
- A warning that this operation will affect the sensor calibration (WARN-This will affect sensor calibration) is displayed. To proceed, click [OK].
- The question “Set PP Mode. OK?” appears in order to confirm configuration of the pressure mode. To set the mode, click [OK].
- “Apply 0 input to sensor” is displayed. After input the atmospheric pressure, click OK.
- “Press OK when pressure is stable” is displayed. After confirming that input pressure has stabilized, click OK.
- If the calibration succeeds, [Correct PP atm. pressure succeeded] will be displayed. Click [OK].
- After clearing the pressure mode, 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.

3-1-5. Calibrating a temperature

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].



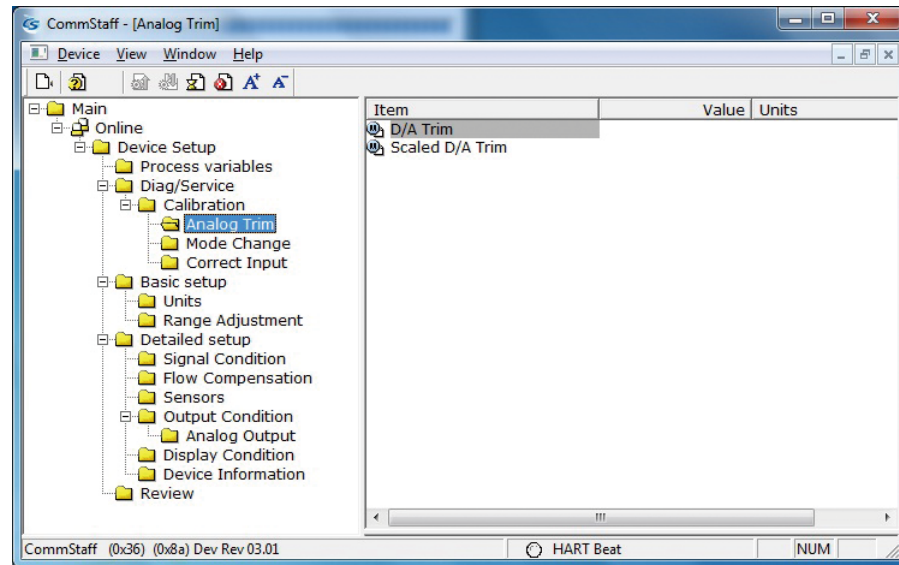
- First, double-click PT Range Values, and check the values for PT LRV and the PTURV. If a change is necessary, change the values.
- To calibrate the PT LRV value, double-click Correct Input PT LRV. To calibrate the PT URV value, double-click Correct Input PT URV. When changing both the PT LRV and the PT URV, be sure to do the PT LRV first.
- 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 warning that this operation will affect the sensor calibration (WARN-This will affect sensor calibration) is displayed. To proceed, click [OK].
- The question “Set PT Mode. OK?” appears in order to confirm configuration of the pressure mode. To set the mode, click [OK].
- Either “Apply PT LRV value” or “Apply PT URV value” is displayed. If the value of the reference input temperature is equal to PT LRV or PT URV, click OK.
- “Press OK when pressure is stable” is displayed. After confirming that reference input temperature has stabilized, click OK.
- If the calibration succeeds, [Correct PT LRV succeeded] or [Correct PT URV succeeded] will be displayed. Click [OK].
- After clearing the pressure mode, 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.

3-1-6. Calibrating the output signal

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

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] → [Analog Trim] → [D/A Trim].

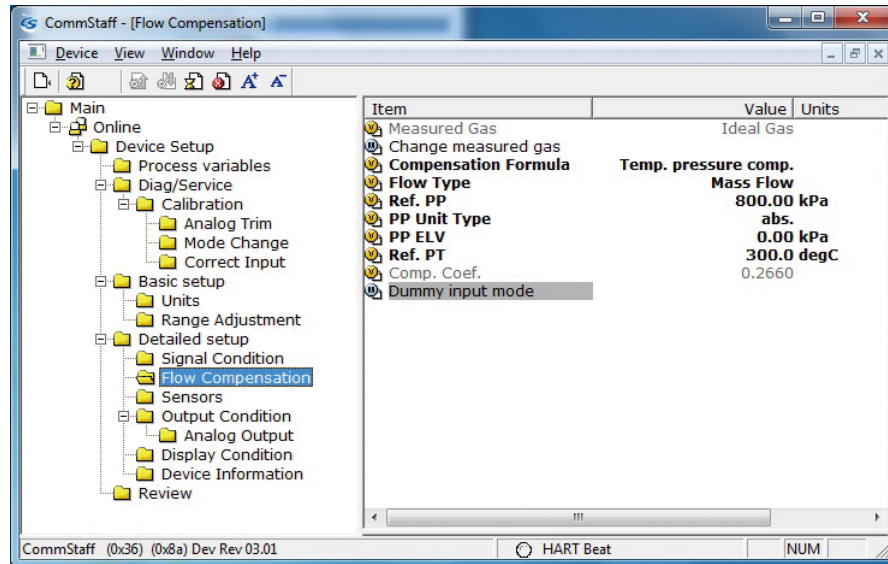


Step	Operation and indication
1	<p>Double-click D/A Trim.</p> <p>WARN - Loop should be removed from automatic control</p> <p>A warning that the loop should be switched from automatic control to manual mode is displayed. After switching to manual mode, click OK.</p> <p>“Connect reference meter” is displayed. 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>

3-2. Checking the output signal using dummy input

By setting up a dummy input, it is possible to check the output signal.

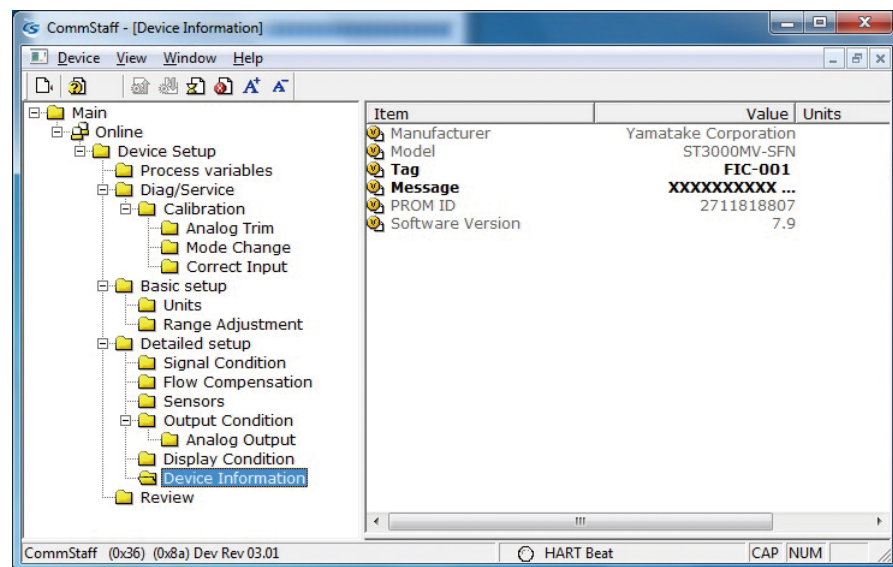
Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Dummy input mode].



- Double-click Dimmy input mode.
- 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.
- The message “Choose either real or dummy DP” is displayed. For simulated input, select Dummy DP. If dummy input is not desired, select Real DP.
- If Dummy DP was selected, the Dummy DP input screen will be displayed. Input the desired Dummy DP.
- The message “Choose either real or dummy PP” is displayed. For simulated input PP, select Dummy PP. If dummy input PP is not desired, select Real DP.
- If Dummy PP was selected, the Dummy PP input screen will be displayed. Input the desired Dummy PP.
- The message “Choose either real or dummy PT” is displayed. For simulated input PT, select Dummy PT. If dummy input PT is not desired, select Real DP.
- If Dummy PT was selected, the Dummy PT input screen will be displayed. Input the desired Dummy PT.
- The output and the Comp.Coef values at the present settings will be displayed. To exit, 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.

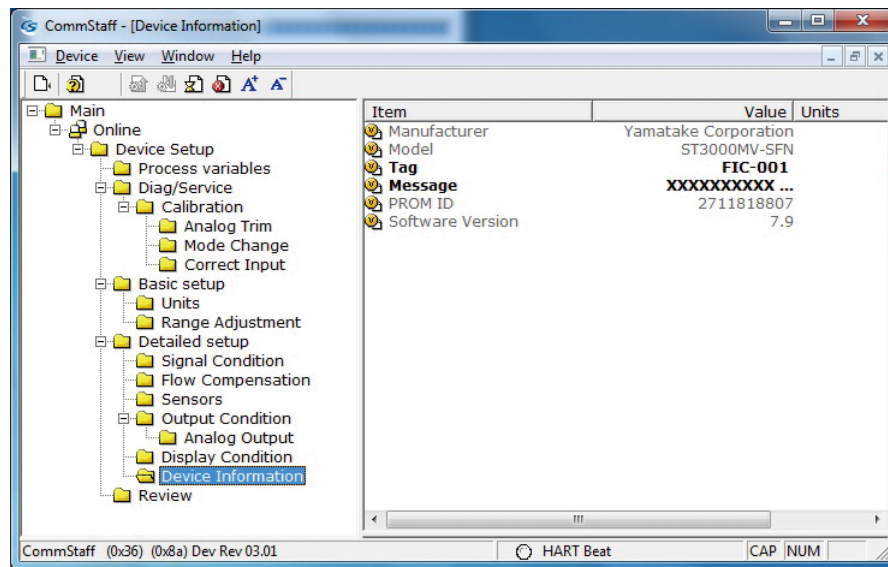
3-3. Checking the PROM ID

Select [Device Setup] → [Detailed setup] → [Device Information].



3-4. Checking the software version

Select [Device Setup] → [Detailed setup] → [Device Information].

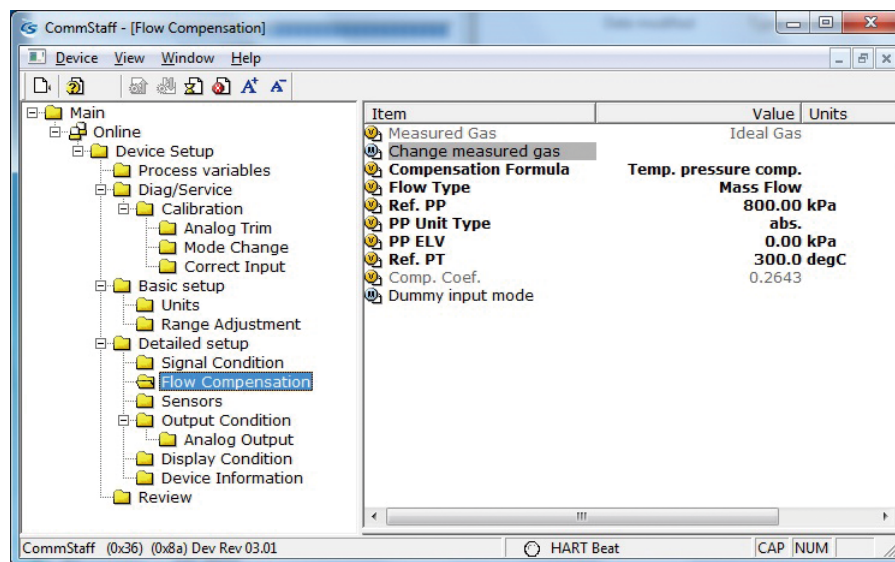


3-5. Switching the measured gas

The measured gas can be switched between Ideal Gas and Saturated Steam.

CAUTION: After switching the measured gas, temporarily turn CommStaff off. Then restart CommStaff.

Select [Device Setup] → [Detailed setup] → [Flow Compensation] → [Change measured gas].

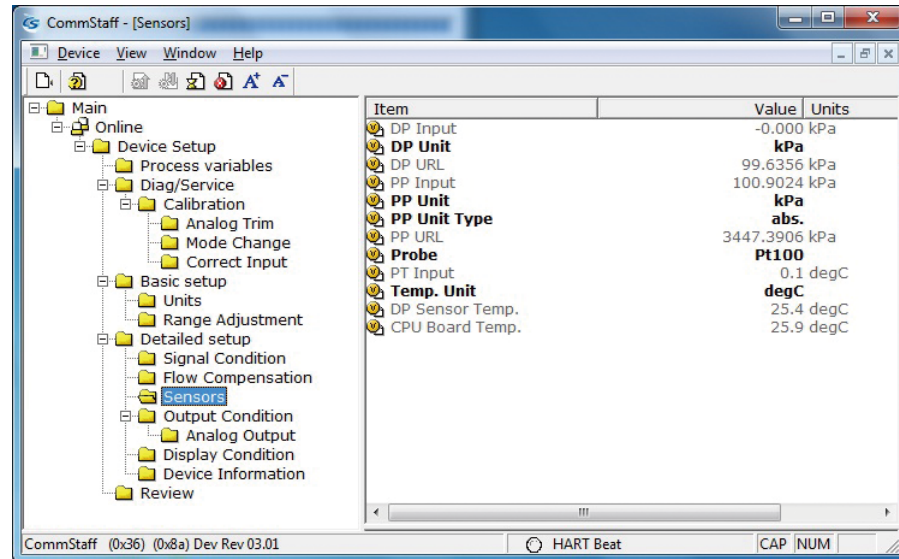


- Double-click “Change measured gas.”
- After changing the measured gas, a message warning that Commstaff must be restarted is displayed (WARNING -- You must restart CommStaff after changing the measured gas type.) To proceed, click [OK].
- The selection screen for the measured gas will be displayed. Choose either Ideal Gas or Saturated Steam and click [OK].
- Another warning message will be displayed. Click [OK] to proceed.
- After the measured gas has been changed, the message “Measured gas was changed. EXIT COMMSTAFF AND RESTART COMMSTAFF” will be displayed. Click [OK], exit from CommStaff, and restart it.

3-6. Checking device temperature

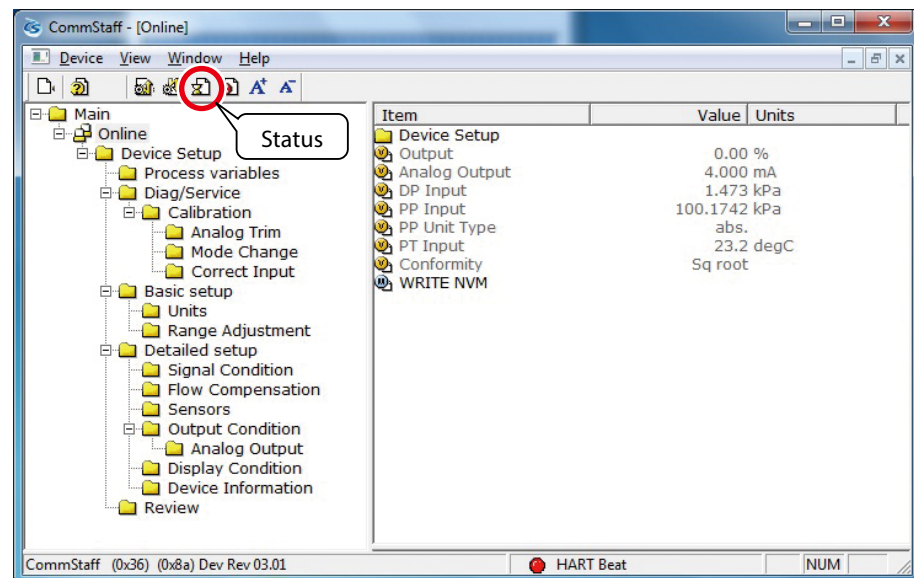
The differential pressure sensor temperature and CPU board temperature can be checked.

Select [Device Setup] → [Detailed setup] → [Sensors] → [DP Sensor Temp.] or [CPU Board Temp.].



3-7. 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.



Chapter 4. Status Message

Status message	Meaning	Required action
Internal data inconsis-tency		
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		
Status 1-0	Unknown error	Contact appropriate personnel.
Chara. PROM Fault	PROM function fault	Invalid device characteristics data. Contact appropriate personnel.
Suspect Input	- Input data error - Problem with the process - Device error	Invalid sensor and/or electronics board. Contact appropriate personnel.
Status 1-3	Unknown error	Contact appropriate personnel.
NVM Fault	Electronic component failure	Bad electronics board. Contact appropriate personnel.
RAM Fault	Electronic component failure	Bad electronics board. Contact appropriate personnel.
ROM Fault	Electronic component failure	Bad electronics board. Contact appropriate personnel.
Status 1-7	Unknown error	Contact appropriate personnel.
Status 7-0	Unknown error	Contact appropriate personnel.
Status 7-1	Unknown error	Contact appropriate personnel.
PT Suspect Input	- Input data error - Problem with the process - Device error	Resistance thermometer wires may be down or connected incorrectly. If the problem persists, electronics board may be invalid. Contact appropriate personnel.
Status 7-3	Unknown error	Contact appropriate personnel.
Status 7-4	Unknown error	Contact appropriate personnel.
Status 7-5	Unknown error	Contact appropriate personnel.
Status 7-6	Unknown error	Contact appropriate personnel.
Status 7-7	Unknown error	Contact appropriate personnel.

Status message	Meaning	Required action
Non-critical status		
Excess sensor temp.	Meter body temperature is too high.	Relocate device to keep temperature within specification limits.
Excess DP Zero Correct	DP Zero correction factor is outside acceptable limits for accurate operation.	Check if the calibration value is suitable for the input pressure value. Recalibrate device.
Excess DP Span Correct	DP Span correction factor is outside acceptable limits for accurate operation.	Check if the calibration value is suitable for the input pressure value. Recalibrate device.
In Special Mode	Device is operating in DP mode, PP mode, PT mode, input mode and/or output mode.	Return to measuring mode to clear message.
DP Overload	The input pressure exceeds two times the upper range limit of the device. In such a case output is at the upper or lower limit.	Check PV value and decrease the differential pressure to within specifications.
Meter Body Fault	The input pressure exceeds two times The upper range limit of The device. Device error	Check PV value and decrease the differential pressure to within specifications.
DP Correct Reset	DP calibration data discarded.	Calibrate the zero point and span of the DP range.
Status 2-7	Unknown error	Contact appropriate personnel.
Status 3-0	Unknown error	Contact appropriate personnel.
Status 3-1	Unknown error	Contact appropriate personnel.
Status 3-2	Unknown error	Contact appropriate personnel.
Status 3-3	Unknown error	Contact appropriate personnel.
Status 3-4	Unknown error	Contact appropriate personnel.
Status 3-5	Unknown error	Contact appropriate personnel.
Status 3-6	Unknown error	Contact appropriate personnel.
Status 3-7	Unknown error	Contact appropriate personnel.
Status 4-0	Unknown error	Contact appropriate personnel.

Status message	Meaning	Required action
Non-critical status		
Excess PP Zero Correct	The PP Zero correction factor is outside the acceptable limits for accurate operation.	Check if the calibration value is suitable for the input pressure value. Recalibrate device.
Excess PP Span Correct	The PP Span correction factor is outside the acceptable limits for accurate operation.	Check if the calibration value is suitable for the input pressure value. Recalibrate device.
Status 4-3	Unknown error	Contact appropriate personnel.
PP Overload	- the Input pressure exceeds two times the upper range limit of the device. - Device error	Check PV value and decrease the static pressure to within specifications.
Status 4-5	Unknown error	Contact appropriate personnel.
PP Correct Reset	PP calibration data discarded.	Calibrate the zero point and span of the PP range.
Status 4-7	Unknown error	Contact appropriate personnel.
In DP Mode	The device is operating in differential pressure mode.	Exit DP Adjustment / DP Calibration screen to clear differential pressure mode.
In PP Mode	The device is operating in process pressure (static pressure) mode.	Exit PP Adjustment / PP Calibration screen to clear process pressure mode.
In PT Mode	The device is operating in process temperature mode.	Exit PT Adjustment / PT Calibration screen to clear process temperature mode.
Status 5-3	Unknown error	Contact appropriate personnel.
In DP Input Mode	The device is operating in differential pressure input mode.	Tap [Clear] to clear differential pressure input mode.
In PP Input Mode	The device is operating in process pressure (static pressure) input mode.	Tap [Clear] to clear process pressure (static pressure) input mode.
In PT Input Mode	The device is operating in process temperature input mode.	Tap [Clear] to clear process temperature input mode.
Status 5-7	Unknown error	Contact appropriate personnel.
Status 6-0	Unknown error	Contact appropriate personnel.
Status 6-1	Unknown error	Contact appropriate personnel.
Status 6-2	Unknown error	Contact appropriate personnel.
Status 6-3	Unknown error	Contact appropriate personnel.

Status message	Meaning	Required action
Non-critical status		
In Output Mode	The device is operating in output mode.	Tap [Clear output mode] to clear output mode.
In PP Output Mode	PV2 is operating in output mode.	Tap [Clear output mode] to clear process pressure output mode.
In PT Output Mode	PV3 is operating in output mode.	Tap [Clear output mode] to clear process temperature output mode.
Status 6-7	Unknown error	Contact appropriate personnel.
Status 8-0	Unknown error	Contact appropriate personnel.
Excess PT Zero Correct	PT Zero correction factor exceeds acceptable limits.	Check if the calibration value is suitable for the input value. Recalibrate device.
Excess PT Span Correct	PT Span correction factor exceeds acceptable limits.	Check if the calibration value is suitable for the input value. Recalibrate device.
Status 8-3	Unknown error	Contact appropriate personnel.
Out of PT Input	- process temperature Input is out of sensor range. - Device error	Temperature may exceed operating limits. Check process temperature. Or, bad resistance thermometer and/or electronics board. Contact appropriate personnel.
Status 8-5	Unknown error	Contact appropriate personnel.
PT Correct Reset	PT calibration data discarded.	Calibrate the zero point and span of the PT range.
Status 8-7	Unknown error	Contact appropriate personnel.
Status 9-0	Unknown error	Contact appropriate personnel.
Status 9-1	Unknown error	Contact appropriate personnel.
Status 9-2	Unknown error	Contact appropriate personnel.
Status 9-3	Unknown error	Contact appropriate personnel.
Status 9-4	Unknown error	Contact appropriate personnel.
Status 9-5	Unknown error	Contact appropriate personnel.
Status 9-6	Unknown error	Contact appropriate personnel.
Status 9-7	Unknown error	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

3.1 Restrictions on application

Please follow the table below for use in nuclear power or radiation-related equipment.

	Nuclear power quality*5 required	Nuclear power quality*5 not required
Within a radiation controlled area*6	Cannot be used (except for limit switches for nuclear power*7)	Cannot be used (except for limit switches for nuclear power*7)
Outside a radiation controlled area*6	Cannot be used (except for limit switches for nuclear power*7)	Can be used

*5. Nuclear power quality: compliance with JEAG 4121 required

*6. Radiation controlled area: an area governed by the requirements of article 3 of "Rules on the Prevention of Harm from Ionizing Radiation," article 2 2 4 of "Regulations on Installation and Operation of Nuclear Reactors for Practical Power Generation," article 4 of "Determining the Quantity, etc., of Radiation-Emitting Isotopes," etc.

*7. Limit switch for nuclear power: a limit switch designed, manufactured and sold according to IEEE 382 and JEAG 4121.

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.

3.2 Precautions on application

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
[When used outside a radiation controlled area and where nuclear power quality is not required]
[When the limit switch for nuclear power is used]
 - * 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 inquiries 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. After manufacturing is discontinued, we may not be able to provide replacement products even within the warranty period.

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.

Document Number:

CM2-CFS100-2007

Document Name:

Field Communication Software

Model: CFS100

Instruction Manual (Smart Transmitter Model JTD720A
Edition)

Date:

1st edition: Nov. 2011

5th edition: Jul. 2021

Issued/Edited by:

Azbil Corporation

Azbil Corporation