azbil

CM2-CFS100-2012

Field Communication Software

Model: CFS100

Instruction Manual

(Smart two-wire electromagnetic flow meter MagneW™ Neo+/MagneW Two-wire PLUS+)

Azbil Corporation

NOTICE

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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 Smart two-wire electromagnetic flow meter MagneW™ Neo^{+}/MagneW Two-wire PLUS^{+}Models: MTG11A/B, MTG15A, MTG18A, MTG14C

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Chapter 1. Overview

1.1. Introduction

Model CFS100 (CommStaff) is a software tool designed to communicate with and configure Azbil Corporation's smart field devices (DSTJ Smart Transmitters, etc.). CommStaff runs on Windows-based PCs. It establishes communication when the USB port of a PC and the communication port of an Azbil Corporation smart device are connected via the communication interface.

CommStaff supports both Azbil Corporation's SFN/DE and HART protocols.

Note: HART® is a registered trademark of FieldComm Group.

This manual describes how to use the MTG version of CommStaff. For specifications and instructions that are not particular to a smart device, but are common for all versions of CommStaff, such as CommStaff installation instructions, see *Field Communication Software Model: CFS100 (Common Edition) User's Manual*. Before reading this manual, be sure to read the manual mentioned above.

1.2. Important Notes

- When changing the connected device

  CommStaff continuously communicates with the device to update the display of dynamic values such as pressure. Accordingly, if the communication cable is removed during communications in order to change the device, a communication error will occur. Exit CommStaff before detaching the communication cable from the device.

  Then restart CommStaff after connecting the communication cable to the new device.

- Write protection

  If the write protection level of the electromagnetic flowmeter is 3, CommStaff cannot communicate with it. To establish communications, set the level to 2 or lower.

- Local settings card

  Some of the electromagnetic flowmeter settings are associated with other device settings. If such settings are changed, an error may occur because the values do not match. The local settings card allows users to correct a mistaken setting easily. Using it to change settings is recommended.

- Device status check after changing settings or when receiving an error message via communications.

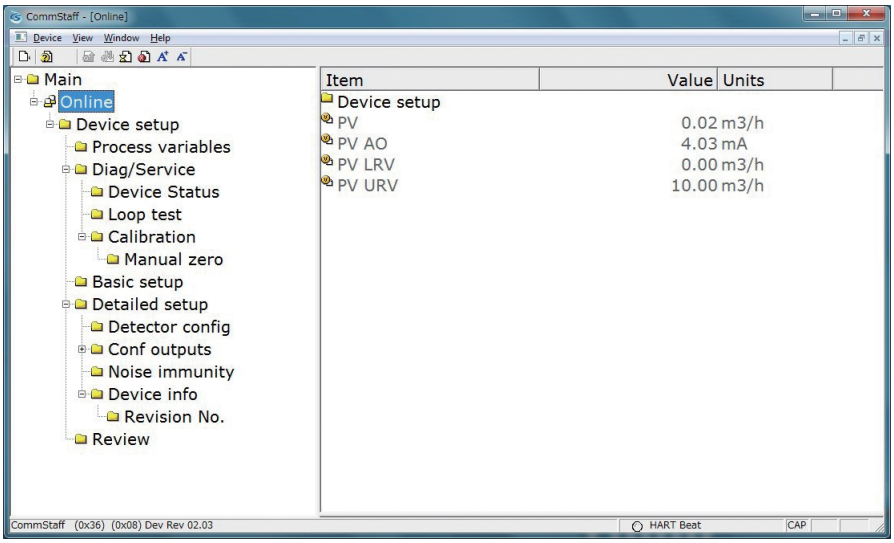
  Before returning to normal operation after changing settings, or if an error message is received after changing settings via communications, check the status according to the method shown in section 3.1, “Device status check.” If a status error occurs, change the settings so that the problem does not occur, referring to chapter 4.

Chapter 2. Device Setup

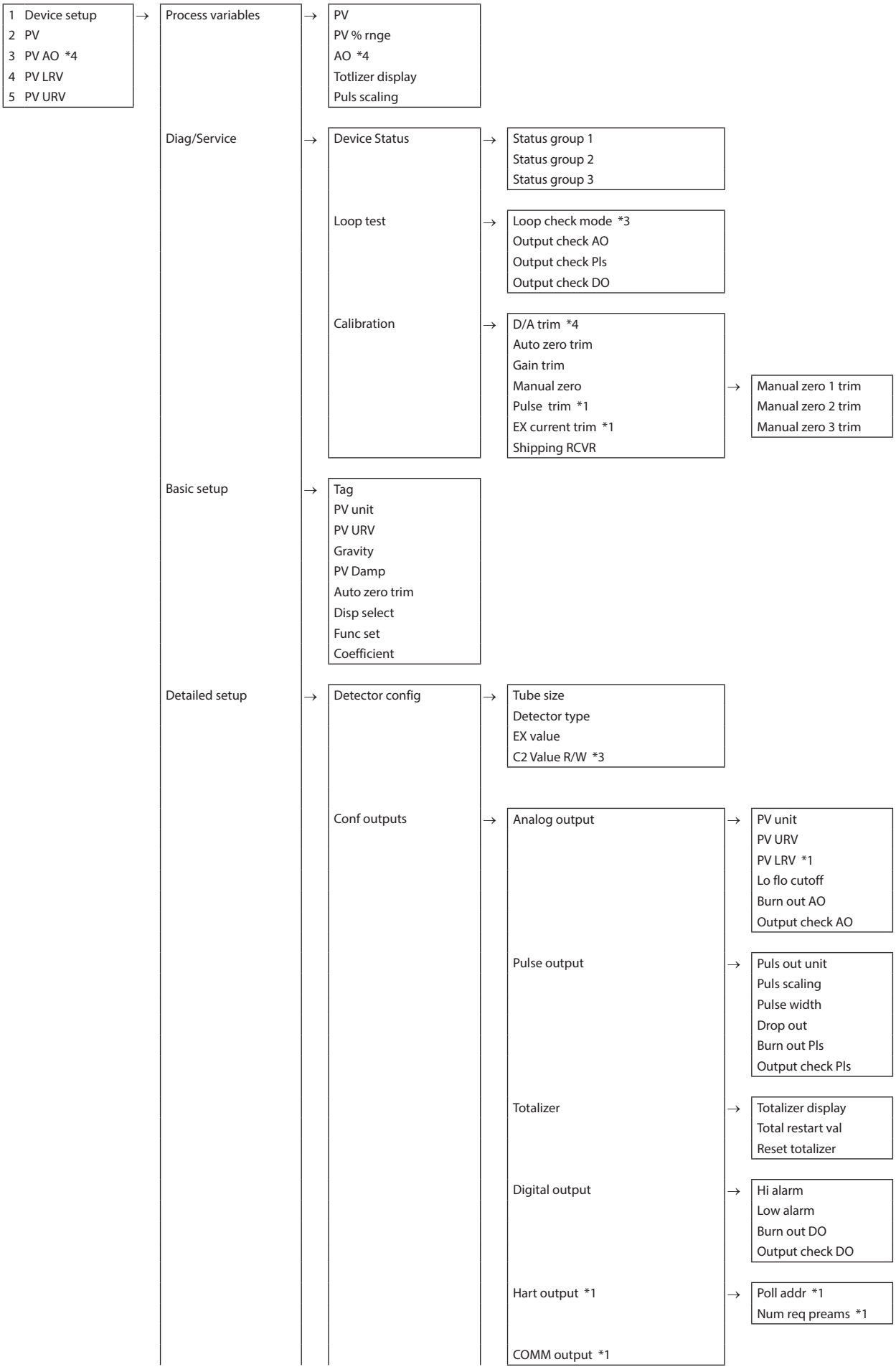
2.1 Menu tree

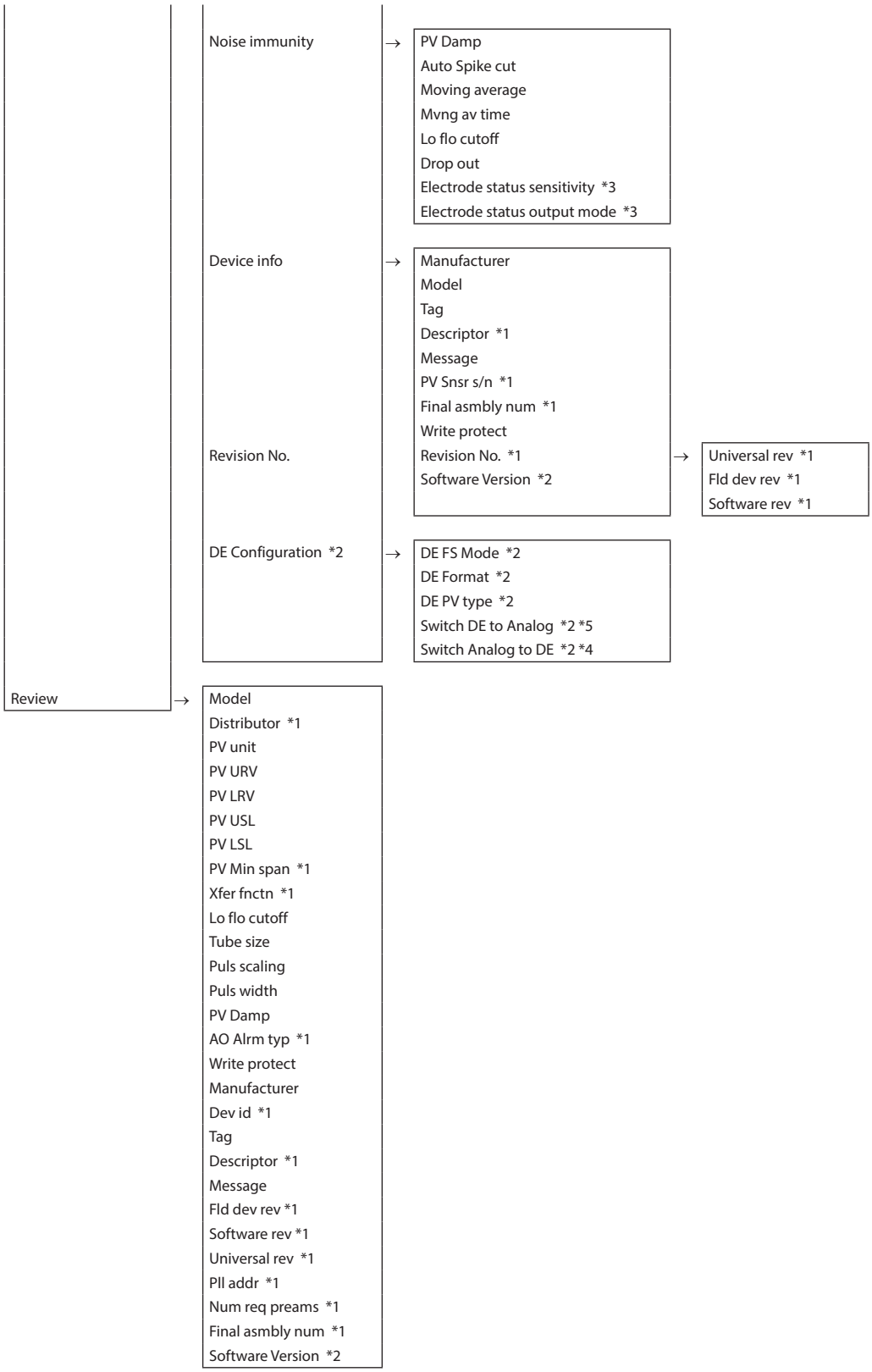
To show the menu selection, right-click Online on the menu tree in the left pane of the CommStaff window. Select Expand to expand the entire menu tree.

The parameters displayed in gray (PV, PV AO, PV LRV, PV URV in the figure below) in the right pane cannot be modified.



A detailed menu tree is shown below.





*1. Not displayed if communication protocol is SFN or DE.

*2. Not displayed if communication protocol is HART.

*3. Not displayed in MTG software Ver. 6.4 or earlier.

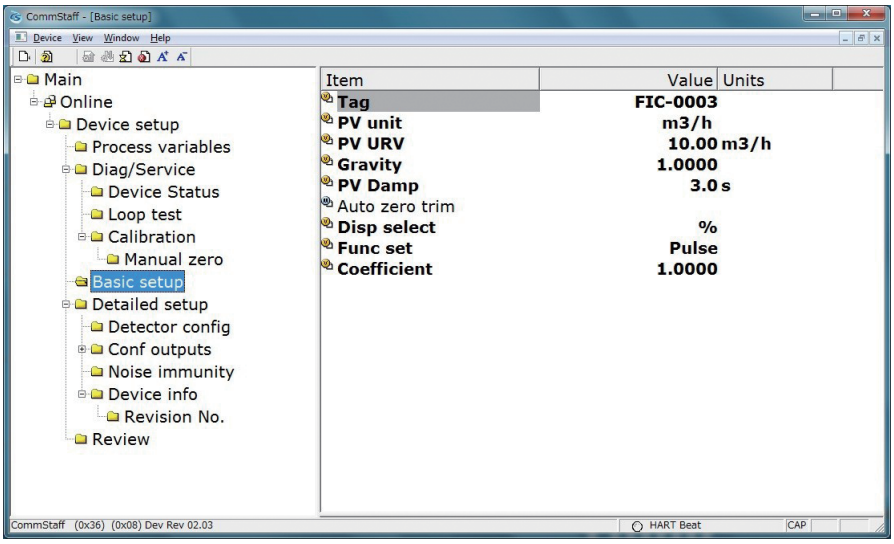
*4. Not displayed if communication protocol is DE.

*5. Not displayed if communication protocol is SFN.

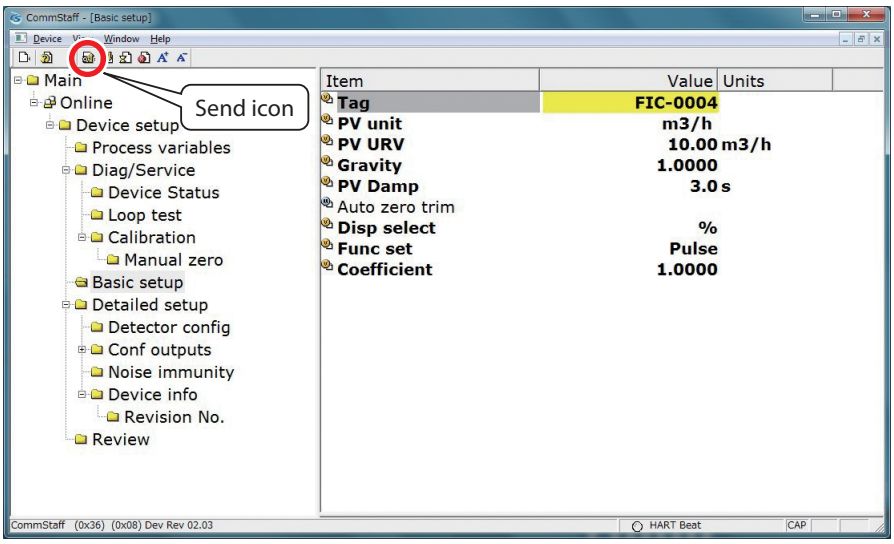
2.2 Basic setup

2.2.1 Tag setup

The section explains how to input and change a tag No. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Tag].



Double-click Tag to display the settings screen. Enter the desired tag No. and then click the Set button. The tag is highlighted in yellow. Click the Send button to send the new tag to the device.



Note. The characters that can be used for tags are letters (A–Z), numbers (0–9), ":" (colon), "-" (hyphen), "." (period), "/" (slash), and " " (space).

2.2.2 Flow rate unit of measurement

Since this setting may cause a configuration error, be sure to read chapter 4 before setting.

After changing the setting, check the status according to the method shown in section 3.1, “Device status check,” to make sure that there is no configuration error.

This section explains how to set the unit of measurement for flow rate. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [PV unit].

Set the flow rate unit.

Selectable units:

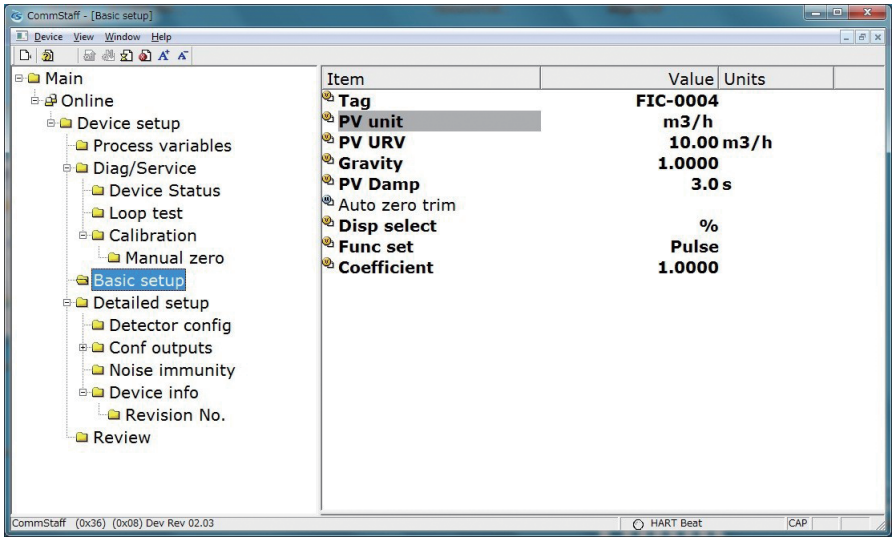
m3/d, m3/h, m3/m, m3/s, l/d, l/h, l/m, l/s, cm3/d, cm3/h, cm3/m, cm3/s, t/d, t/h, t/m, t/s, kg/d, kg/h, kg/m, kg/s, g/d, g/h, g/m, g/s

BPD, BPH, BPM, BPS, kGPD, kGPH, kGPM, kGPS, IGPD, IGPH, IGPM, IGPS, KIGPD, KIGPH,

KIGPM, KIGPS, mIGPD, mIGPH, mIGPM, mIGPS, GPD, GPH, GPM, GPS, mGPD, mGPH, mGPM,

mGPS, lb/d, lb/h, lb/m, lb/s

Note. With MTG software Ver. 6.4 or earlier, CommStaff cannot change the settings for mIGPH, mIGPM, or mIGPS. To change these units, use the local setting card.

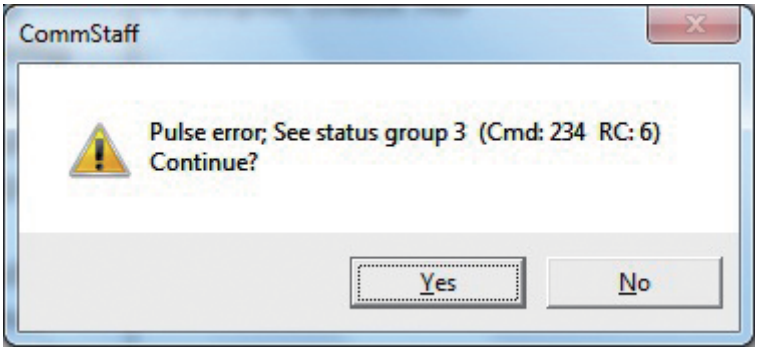


If a configuration error occurs

When the flow rate unit is changed, a configuration error like the one in the figure below may occur.

A message like SPAN OVER ERROR or PULSE SCALE ERROR will appear in the message box.

See chapter 4, and correct the error by changing the flow rate unit.



2.2.3 Range

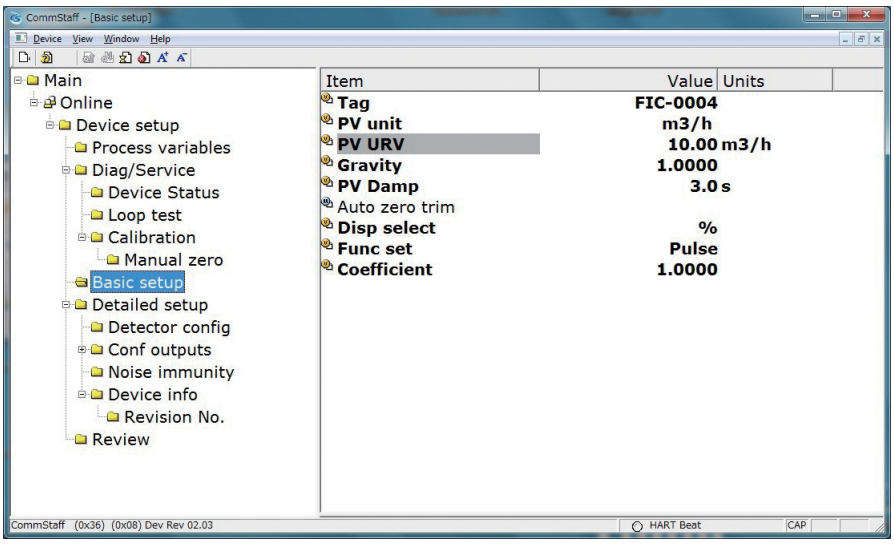
This section explains how to set the flow rate range. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [PV URV].

Enter a range value. The setting range is from 0 to 12 m/s (flow speed).

(Guaranteed accuracy is from 0 to 10.0 m/s.)

If the value is out of range, an error indication is displayed. Enter another value.

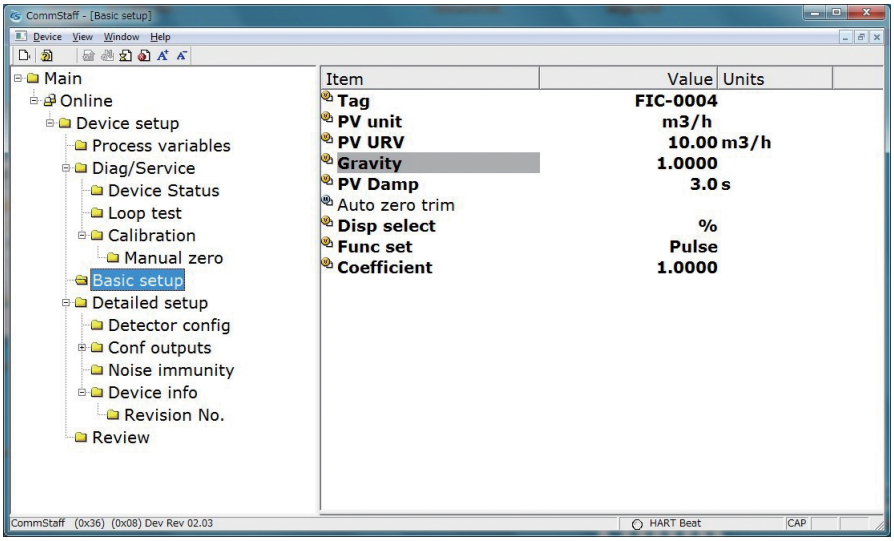
After changing the setting, check the status according to the method shown in section 3.1, “Device status check,” to make sure that there is no configuration error.



2.2.4 Specific gravity

This section explains how to set the unit of measurement for specific gravity. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Gravity].

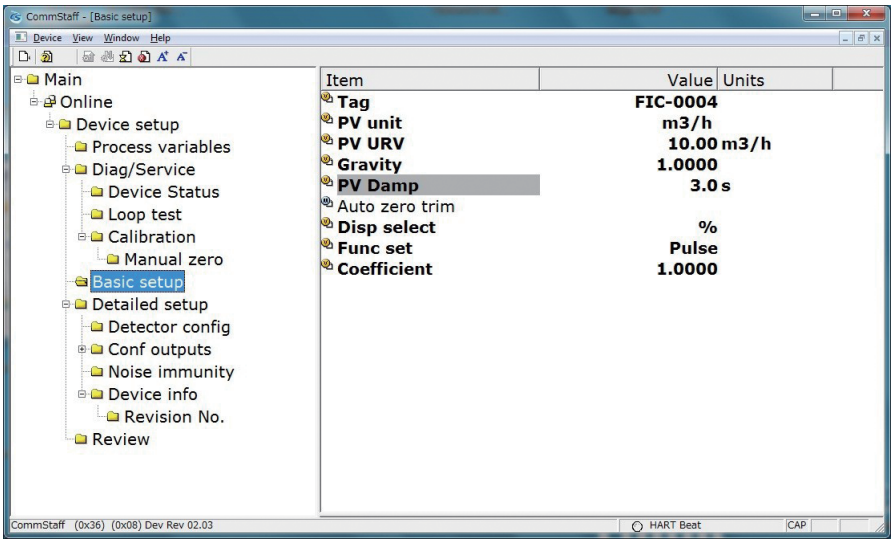
Enter a specific gravity value. The setting range for specific gravity is from 0.1000 to 5.9999.



2.2.5 Damping time constant

This section explains how to set the damping time constant. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [PV Damp].

Enter a damping time constant. The setting range for the damping time constant is from 0.5 to 199.9 s.

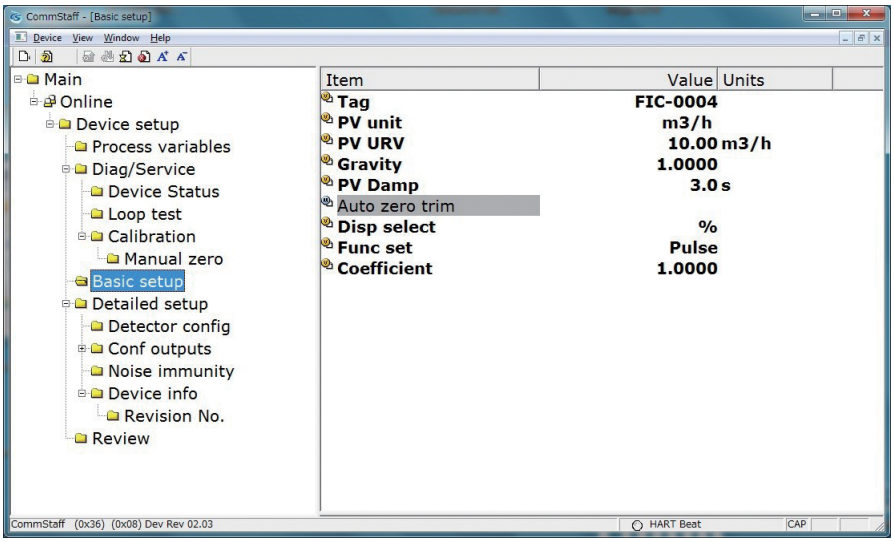


2.2.6 Auto zero adjustment

This section explains how to execute auto zero adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Auto zero trim].

Adjustment procedure

- Stop the flow of the fluid in the flowmeter completely.
- A dialog box appears saying "Confirm flow rate is zero, wait 120s." If automatic zero adjustment is desired, click OK. If ABORT is clicked, adjustment of the zero point is aborted.
- A dialog box appears saying "Waiting for auto zero to complete." If automatic zero adjustment is desired, click OK.
- After about 120 seconds, when a dialog box appears saying "Auto zero complete," automatic zero adjustment is complete. Click OK to close the dialog box.

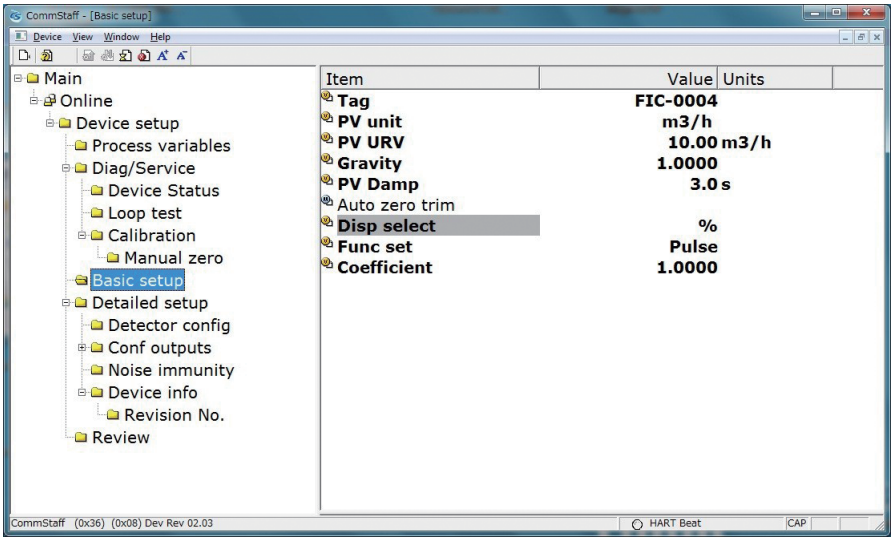


Note. If ABORT is clicked during adjustment, CommStaff stops displaying the zero adjustment process, but the electromagnetic flowmeter continues the adjustment.

2.2.7 Selection of display type

This section explains how to set the display. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Disp select].

Specify a display method. The available display methods are %, RATE, and TOTAL.



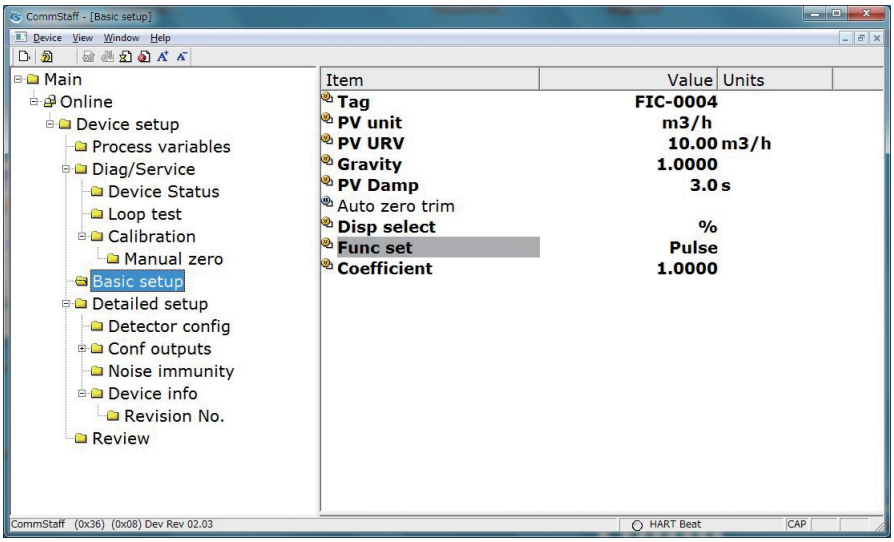
Note. If the communication protocol is SFN, and if the low flow cutoff value is set lower than the low limit, a configuration error occurs.

Make sure that the conditions for setting the low flow cutoff mentioned in section 2.4.3 are satisfied, and then reconfigure.

2.2.8 Function setup

This section explains how to configure the function setup. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Func set].

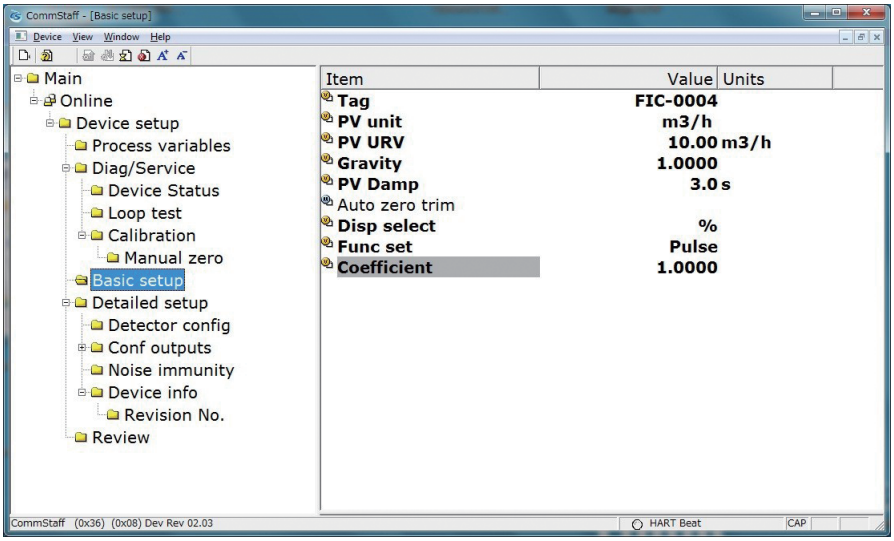
Select Pulse (pulse output) or STOUT (contact output) for function setup.



2.2.9 Correction factor setting

This section explains how to set up the correction factor for flow rate calculations. In the menu tree in the left pane of the window, select [Device setup] → [Basic setup] → [Coefficient].

Enter a correction factor. The setting range is from 0.1000 to 5.9999.



2.3 Detector settings

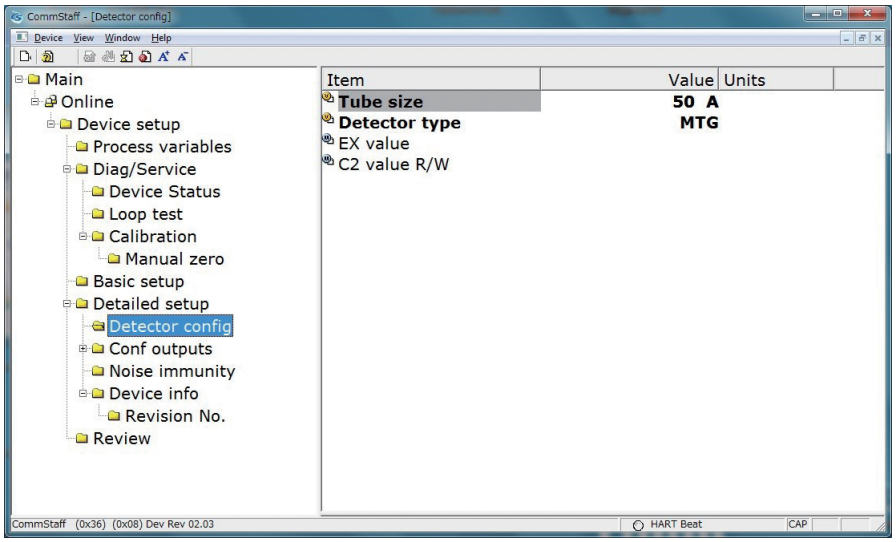
2.3.1 Detector tube size

This section explains how to set the detector tube size. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Detector config] → [Tube size].

Enter a detector tube size.

Setting range:

2.5A, 5A, 10A, 15A, 20A, 25A, 32A, 40A, 50A, 65A, 80A, 100A, 125A, 150A, 200A, 250A, 300A, 350A, 400A, 450A, 500A, 600A, 700A, 800A, 900A, 1000A, 1100A

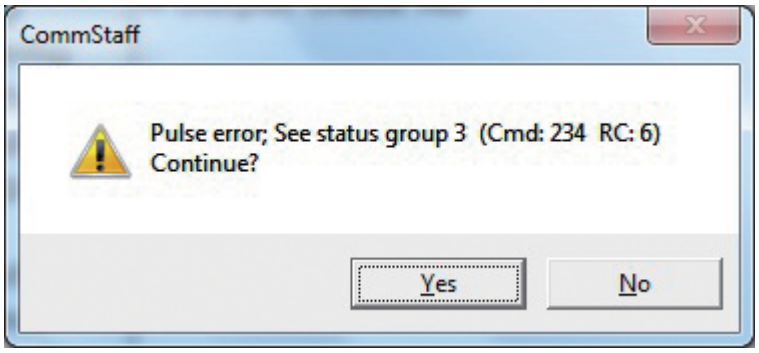


Note. If the tube size is changed, the flow rate URV will be converted to a flow speed of 1m/s. Restart CommStaff and reconnect it to the flowmeter.

If a configuration error occurs

If the tube size is changed, the flow rate URV will change, and accordingly a configuration error like the following may occur.

See chapter 4, correct the error, and set the tube size again.



Sample procedure (for changing 50A to 100A)

- Change 50A to 100A.
- An error like the above occurs.
- If the dialog box above asks “Contunue ?,” select Yes.

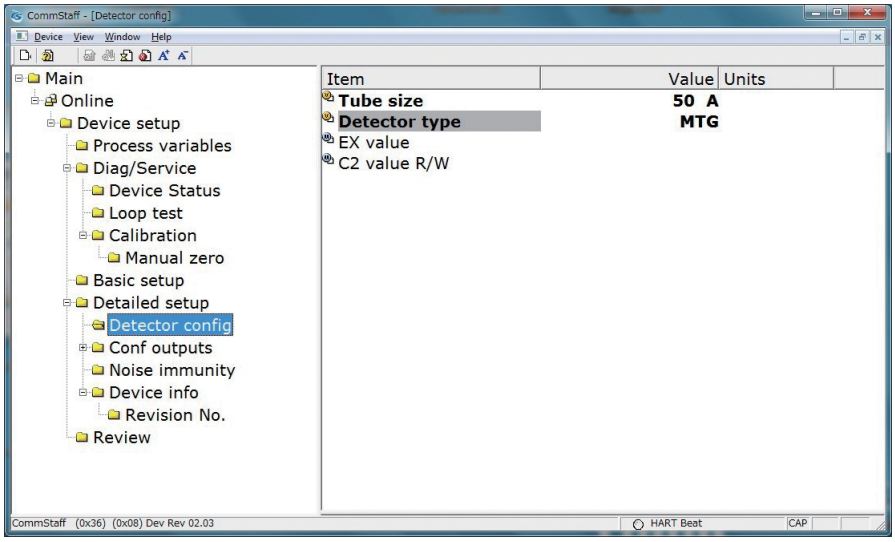
  (At this point, 100A is displayed on CommStaff. However, setting has not been completed yet.)
- See chapter 4 and correct the error.
- Change the tube size back to 50A from 100A. (At this point, another error may occur. Continue the procedure anyway.)
- Change the tube size from 50A to 100A again. If there is no configuration error, the settings change is complete.

2.3.2 Detector type

This section explains how to set the detector type. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Detector config] → [Detector type].

Enter a detector type. The available detector types are MTG and TST.

TST is used for adjustments and loop checks.

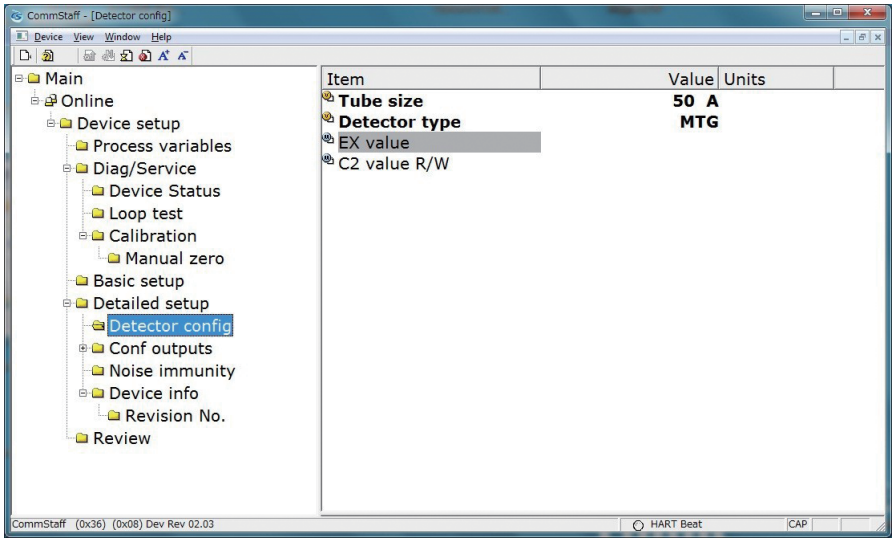


2.3.3 Detector constant

This section explains how to set the detector constant. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Detector config] → [EX value].

Enter the detector constant (EX value) that is etched on the detector's nameplate.

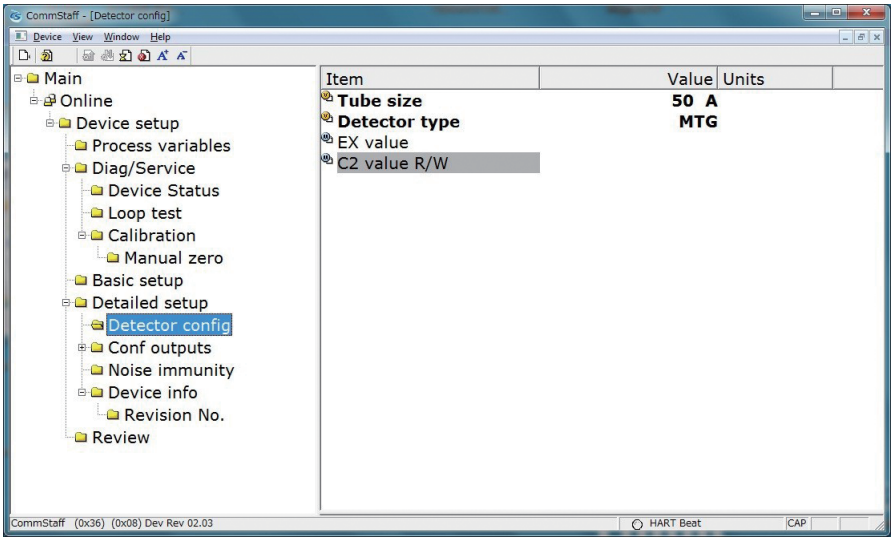
The setting range for the detector constant is from 200.0 to 699.9.



2.3.4 Detector constant C2

This section explains how to set the detector constant C2. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Detector config] → [C2 value R/W].

The detector can be set to a value from 0.5000 to 1.5000.

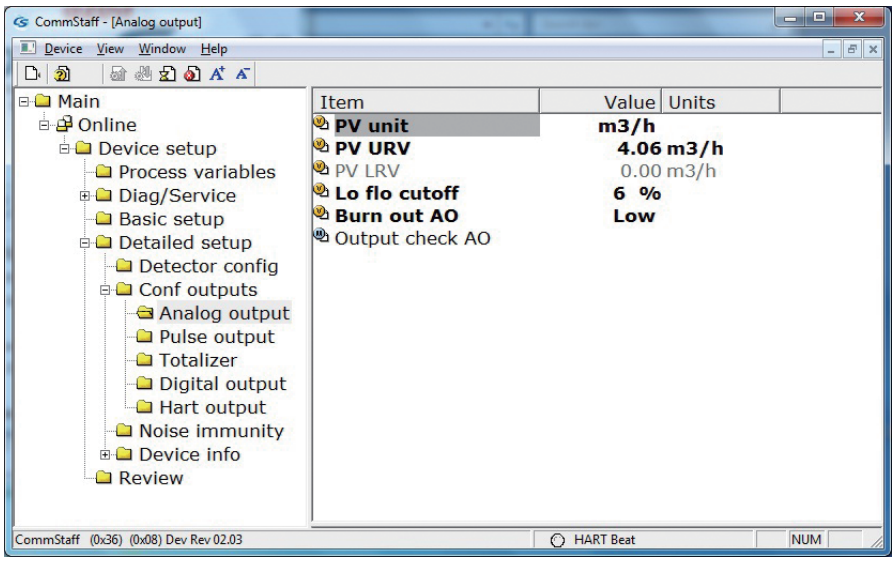


2.4 Analog output setup

2.4.1 Flow rate unit of measurement

This section explains how to set the unit of measurement for flow rate. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Analog output] → [PV unit].

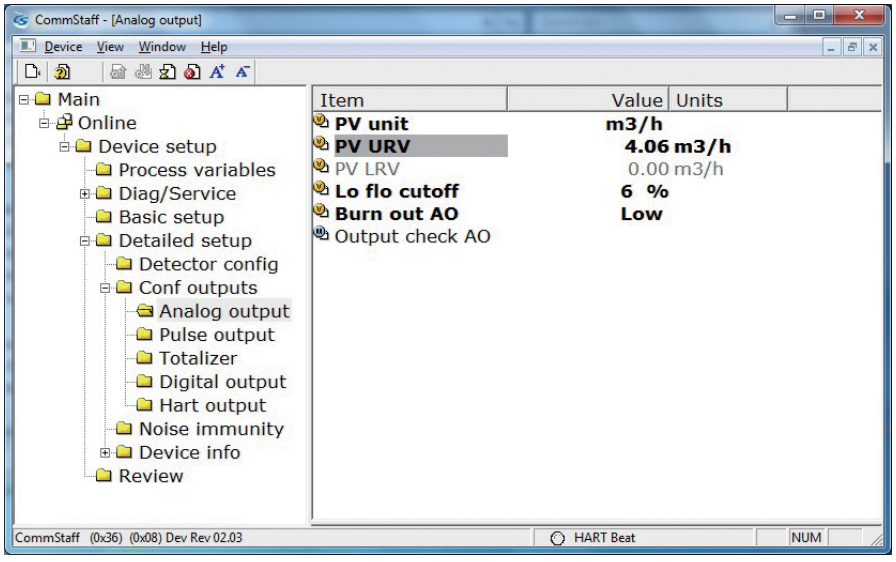
For details, refer to section 2.2.2, “Flow rate unit of measurement.”



2.4.2 Range

This section explains how to set the flow rate range. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Analog output] → [PV URV].

For details, refer to section 2.2.3, “Range.”



2.4.3 Low flow cutoff

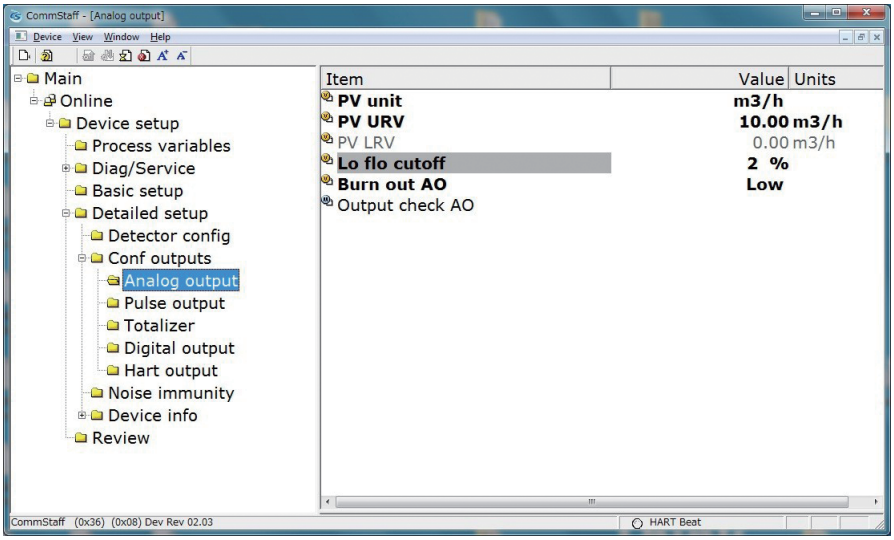
This section explains how to set the low flow cutoff. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Analog output] → [Lo flo cutoff].

Enter a value for low flow cutoff. The setting range is from 1 to 10 %.

The low limit for low flow cutoff is calculated from the flow speed range as shown below.

(1) If the high limit of the flow speed range exceeds 3 m/s, the low limit is 1 % of the high limit.

(2) If the high limit of the flow speed range is 3 m/s or less, the low limit is determined so that the flow rate cutoff has a flow speed no higher than 0.03 m/s.

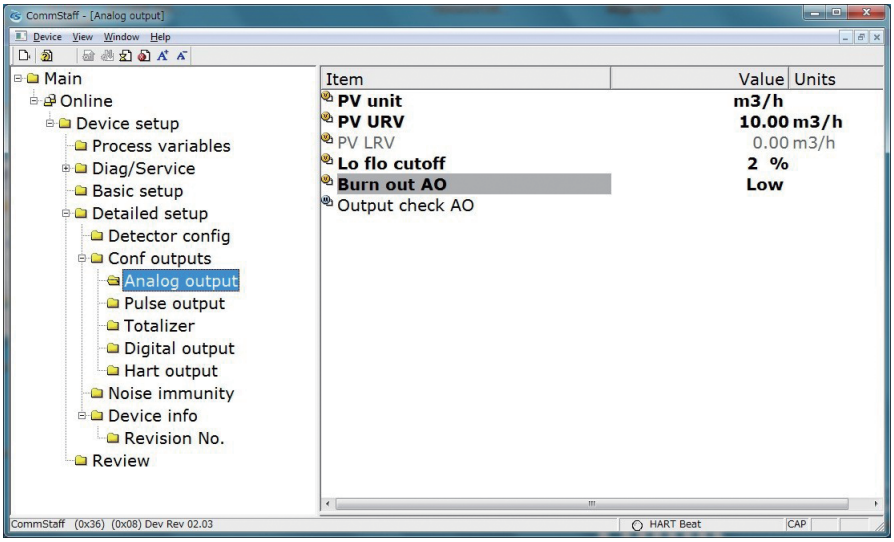


Note. When setting via communications, even if a value smaller than the low limit is set, no configuration error will be displayed. However, the setting on the flowmeter will not decrease below the low limit.

2.4.4 Burnout setting for analog output

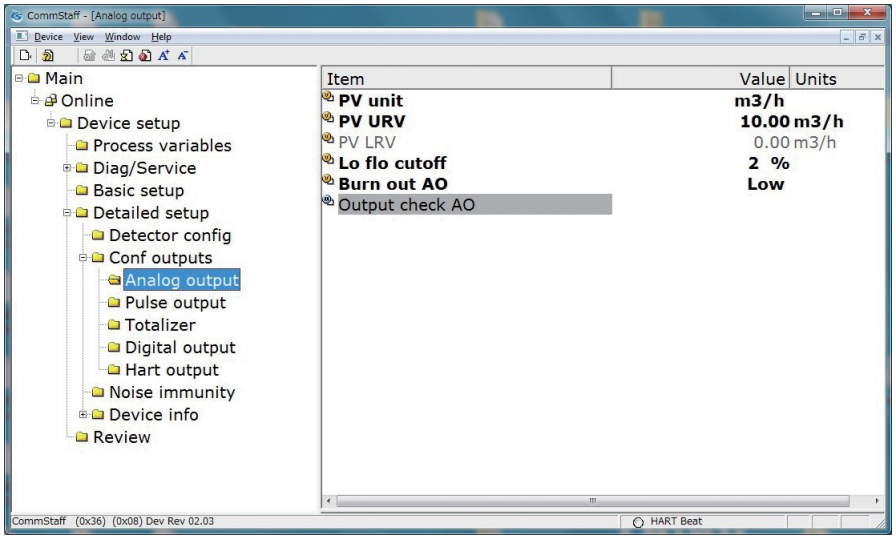
This section explains how to set the analog output behavior in case a hard failure occurs. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Analog output] → [Burn out AO].

Select a burnout setting from among LOW, HIGH, and Hold.



2.4.5 Analog output check

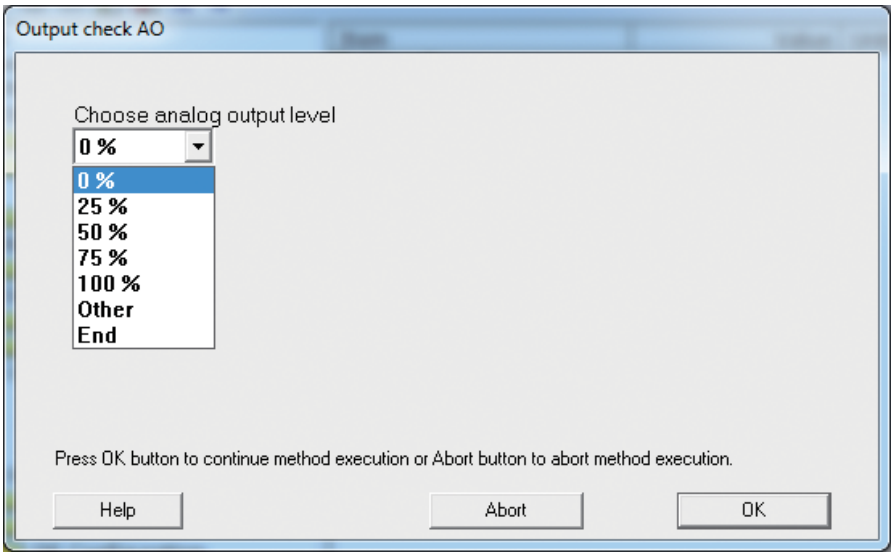
This section explains how to output a fixed-value analog current. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Analog output] → [Output check AO].



Output method

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Choose output check analog current” appears. To check the output, select START and then press OK.

The following screen will be displayed.



- SFN communication
  Select 0% and click OK. Output signals will be fixed at 0% (4 mA).
  Select 25% and click OK. Output signals will be fixed at 25% (8 mA).
  Select 50% and click OK. Output signals will be fixed at 50% (12 mA).
  Select 75% and click OK. Output signals will be fixed at 75% (16 mA).
  Select 100% and click OK. Output signals will be fixed at 100% (20 mA).
  To input a different value, select Other and Click OK.
  If you select End and click OK, a message is displayed notifying you that normal output mode will resume.

- HART communication
  The message "Set another value" appears. Enter the desired fixed output value. The setting range is from 0 to +100 %

- To end the operation, press ABORT.

2.5 Pulse output setup

2.5.1 Pulse weight unit of measurement

Since this setting may cause a configuration error, be sure to read chapter 4 before setting.

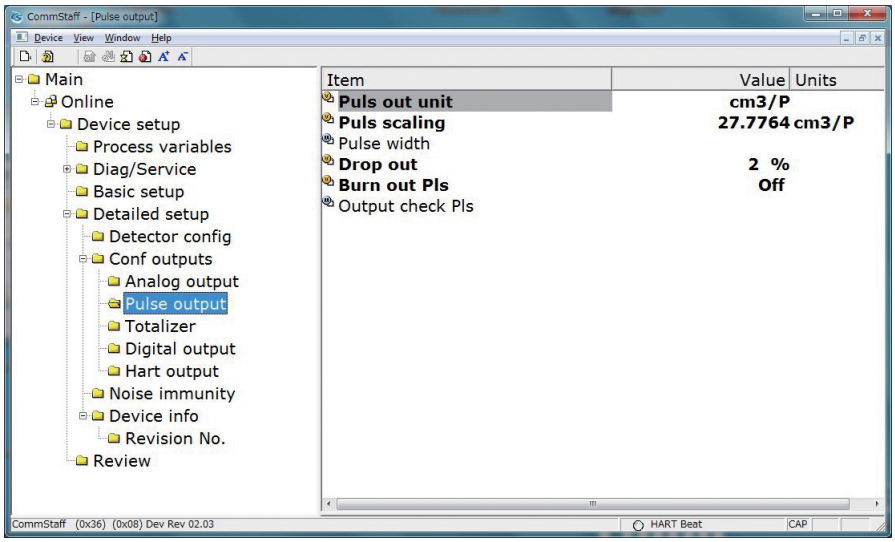
After changing the setting, check the status according to the method shown in section 3.1, “Device status check,” to make sure that there is no configuration error.

This section explains how to set the unit of measurement for pulse weight. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Puls out unit].

Set a unit for the pulse weight.

Selectable units:

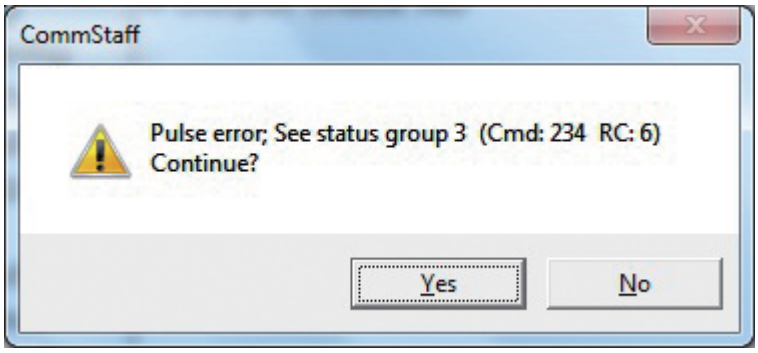
m3/P, l/P, cm3/P, t/P, kg/P, g/P, B/P, kG/P, G/P, mG/P, IG/P, KIG/P, mIG/P, lb/P



If a configuration error occurs

When the flow rate unit is changed, a configuration error like the one in the figure below may occur. A message like SPAN OVER ERROR or PULSE SCALE ERROR will appear in the message box.

See chapter 4, correct the error, and set the pulse unit again.



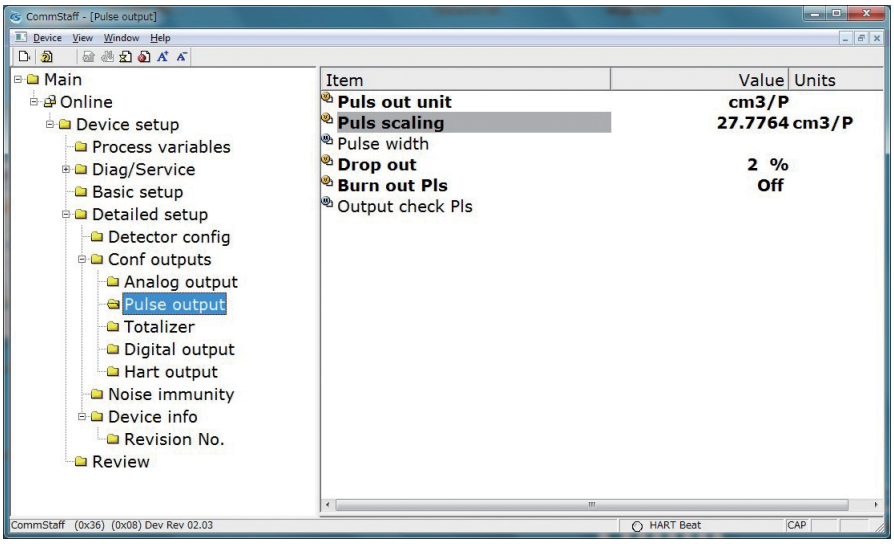
2.5.2 Pulse weight

This section explains how to set the pulse weight. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Puls scaling].

Set the pulse weight.

The setting range for pulse weight is from 0.0001 to 200 Hz.

If the value is out of range, an error indication is displayed. Enter another value.

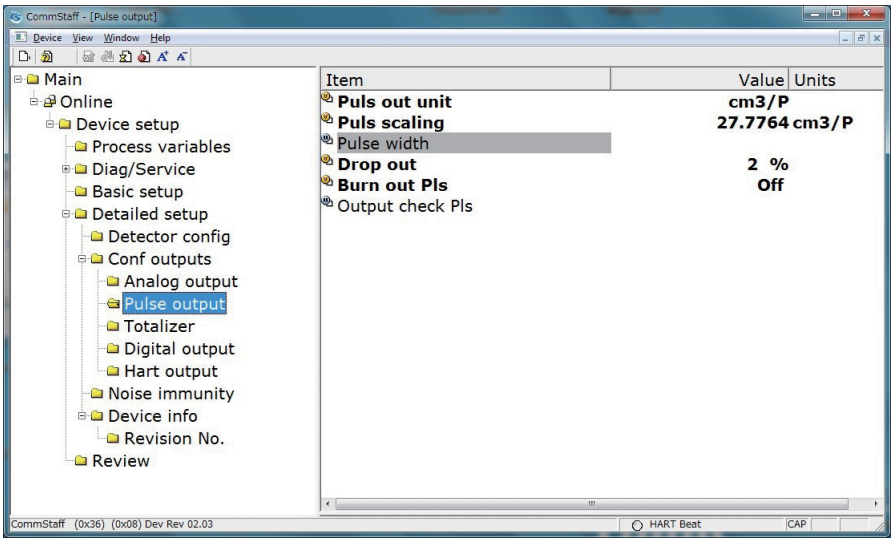


2.5.3 Pulse width

This section explains how to set the pulse width. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Pulse width].

Setting method

- If changing 50 % of duty to the real value, select YES and then press OK. If no change is needed, select NO.
- Enter the pulse width. The pulse width can be set to less than 70 % of duty.

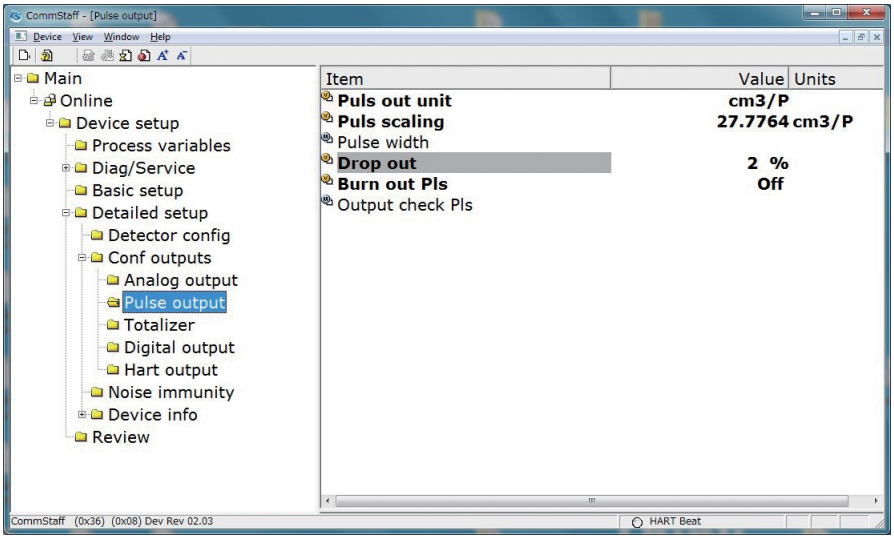


Note. With HART communications, even in case of 50 % duty, the pulse width is displayed (default setting: 30 ms).
During SFN communications, in case of 50 % of pulse width duty, the pulse width is 0 ms.

2.5.4 Dropout

This section explains how to set the dropout. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Drop out].

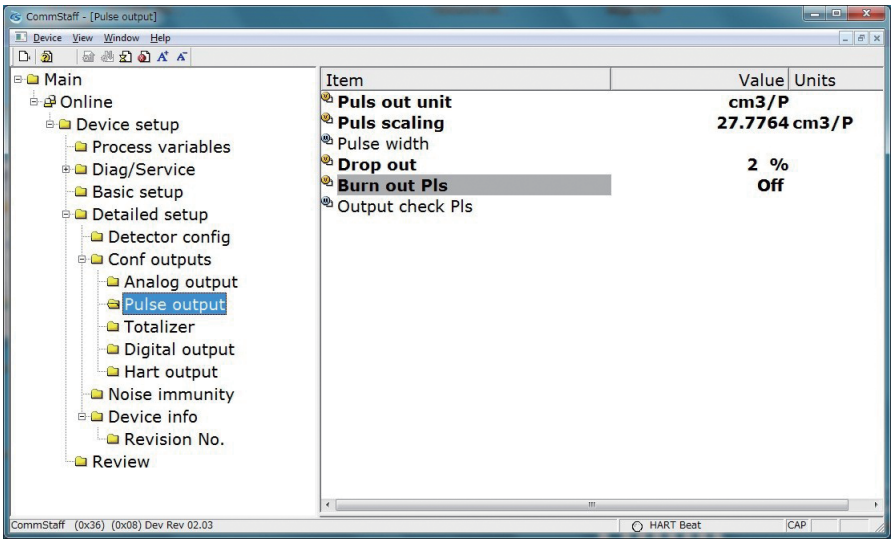
Enter a dropout value. The setting range is from 0 to 10 %.



2.5.5 Burnout setting for pulse output

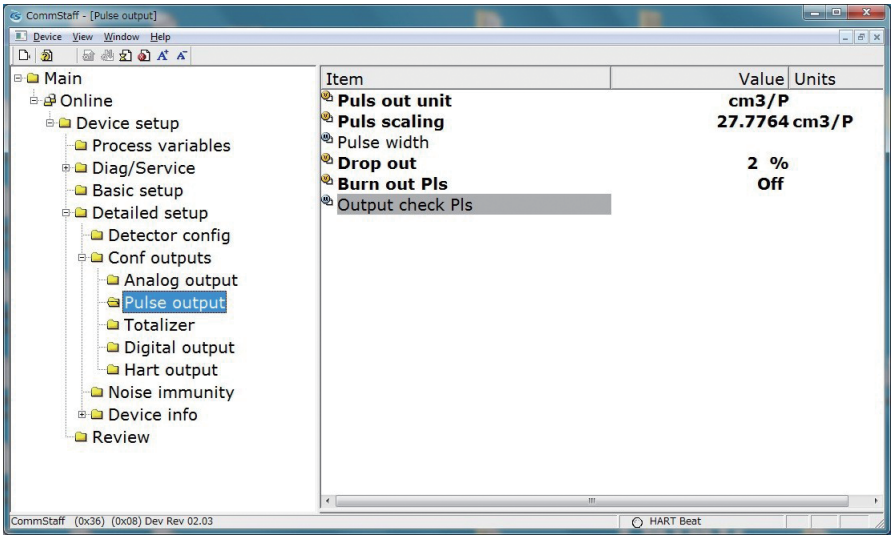
This section explains how to set the pulse output behavior in case a hard failure occurs. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Burn out Pls].

Select a burnout setting from among Off and Hold.



2.5.6 Pulse output check

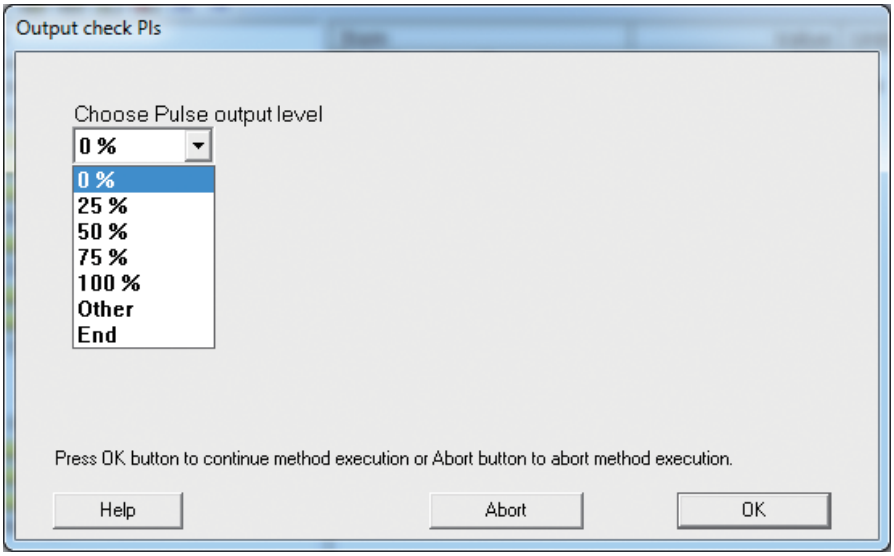
This section explains how to output a fixed pulse. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Pulse output] → [Output check Pls].



Output method

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Choose output check pulse” appears. To check the output, select START and then press OK.

The following screen will be displayed.



- SFN communication
  Select 0% and click OK. Output signals will be fixed at 0% (4 mA).
  Select 25% and click OK. Output signals will be fixed at 25% (8 mA).
  Select 50% and click OK. Output signals will be fixed at 50% (12 mA).
  Select 75% and click OK. Output signals will be fixed at 75% (16 mA).
  Select 100% and click OK. Output signals will be fixed at 100% (20 mA)..
  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.

Note. If the communication protocol is SFN, the low limit of this mode is 2 %.
(Even if a value less than 2 % is entered, 2 % of output is produced.)

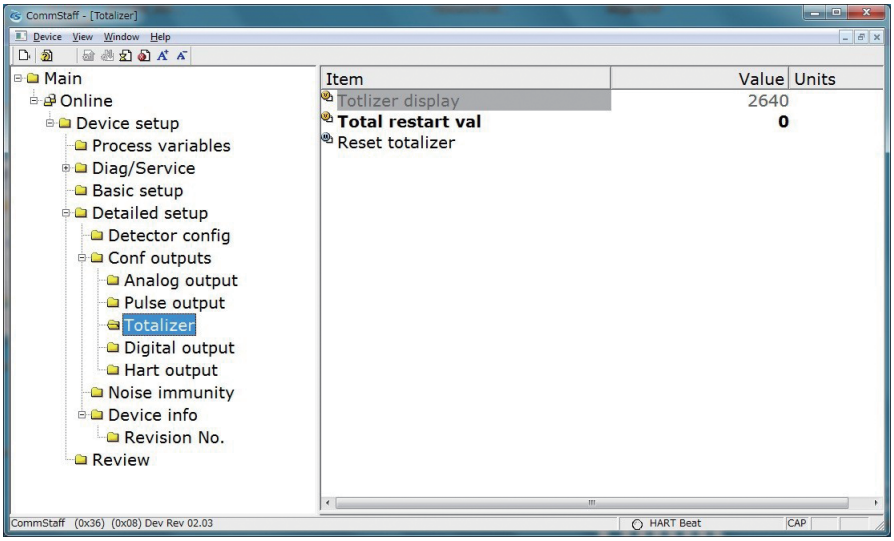
- HART communication
  The message "Set another value" appears. Enter the desired fixed output value. The setting range is from 0 to +100 %

- To end the operation, press ABORT.

2.6 Totalized value setup

2.6.1 Displaying the totalized value

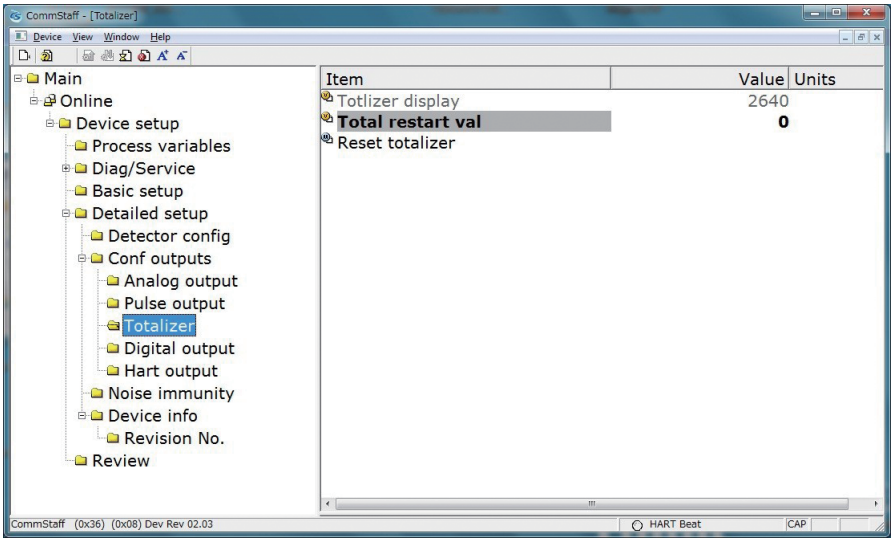
This section explains how to display the current totalized value. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Totalizer] → [Totalizer display].



2.6.2 Totalizer restart value

This section explains how to set the value at which the totalizer is reset. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Totalizer] → [Total restart val].

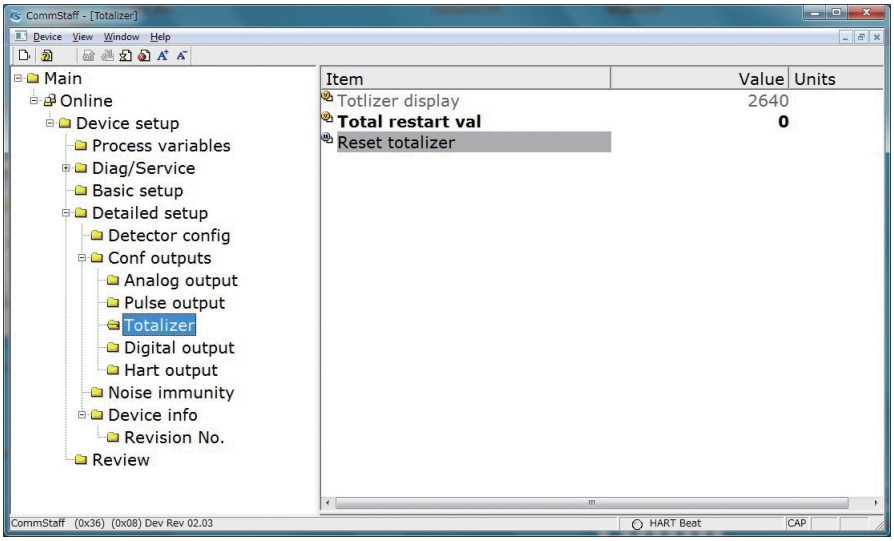
Enter the value at which the count will be reset (will restart from the initial value). The setting range for the totalized restart value is from 0 to 99,999,999.



2.6.3 Resetting the totalized value

This section explains how to reset the totalized value. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Totalizer] → [Reset totalizer].

To reset the totalized value, select YES and then press OK.



2.7 Contact output setup

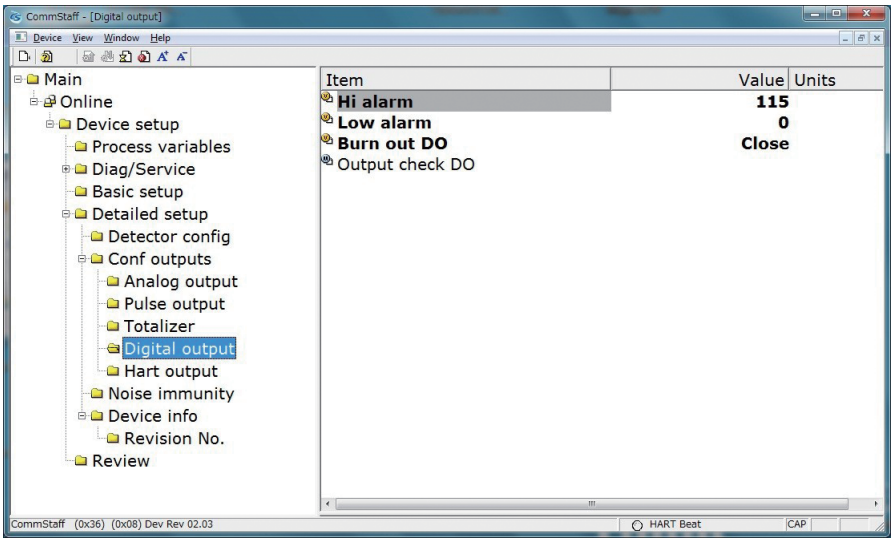
2.7.1 High limit alarm setup

This section explains how to set up the high limit alarm for contact output. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Digital output] → [Hi alarm].

Enter a value for the high limit alarm. The setting range for the high limit alarm is from 0 to +115 %.

Set the value so that the high limit alarm is larger than the low limit alarm.

If the value does not meet the configuration conditions, an error indication is displayed. Enter another value.



Note. When the communication protocol is SFN, if the low flow cutoff value is set to lower than the low limit, a configuration error occurs.

Make sure that the conditions for setting the low flow cutoff mentioned in section 2.4.3 are satisfied, and then configure again.

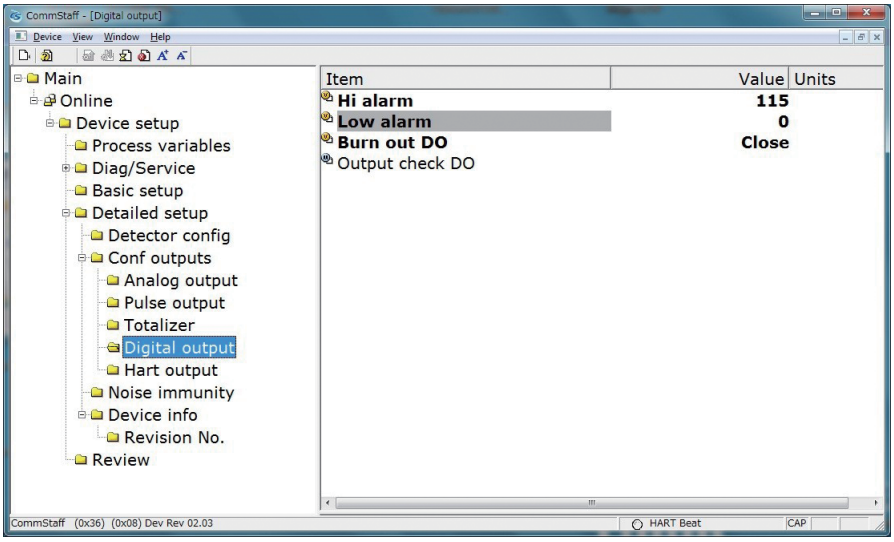
2.7.2 Low limit alarm setup

This section explains how to set up the high limit alarm for contact output. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Digital output] → [Low alarm].

Enter a value for the low limit alarm. The setting range for the low limit alarm is from 0 to +115 %.

Set the value so that the high limit alarm is larger than the low limit alarm.

If the value does not meet the configuration conditions, an error indication is displayed. Enter another value.



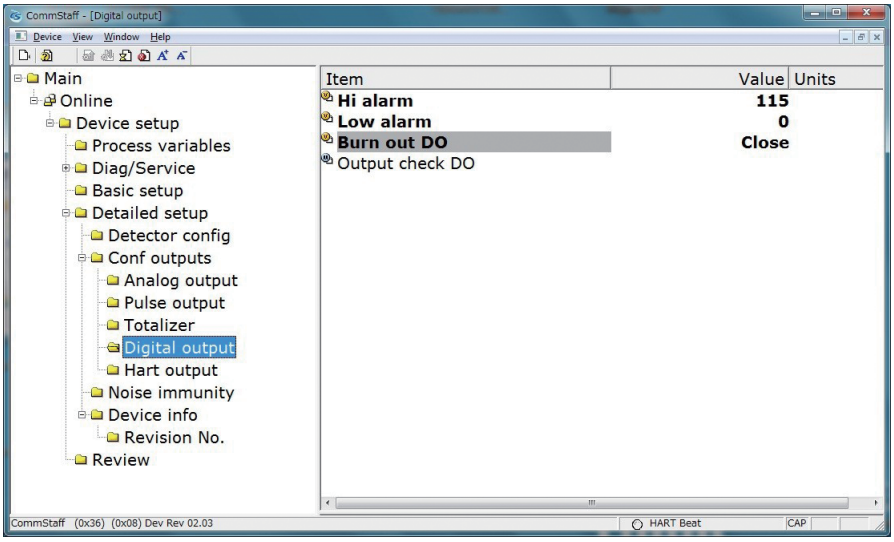
Note. When the communication protocol is SFN, if the low flow cutoff value is set to lower than the low limit, a configuration error occurs.

Make sure that the conditions for setting the low flow cutoff mentioned in section 2.4.3 are satisfied, and then reconfigure.

2.7.3 Contact output setup

This section explains how to set the contact output so that it opens/closes in the case of burnout during normal operation. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Digital output] → [Burn out DO].

Select Close or Open for the contact output status.

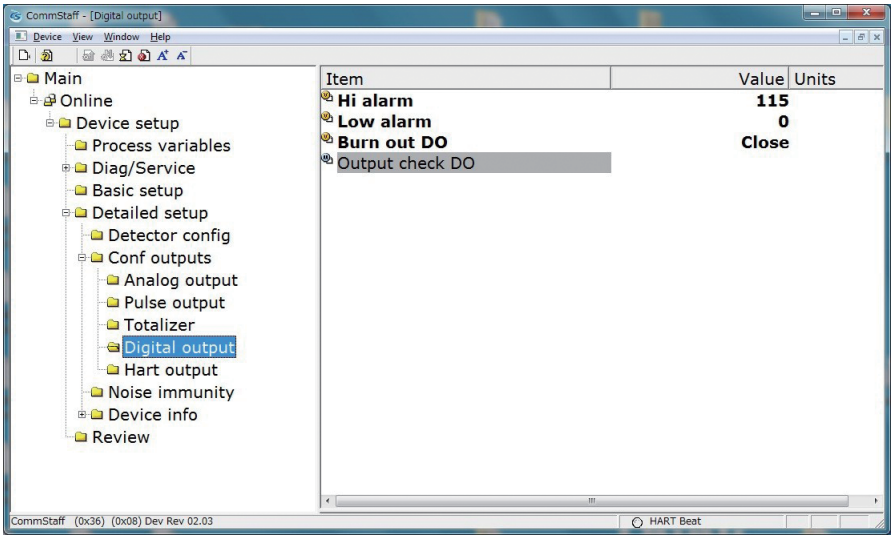


2.7.4 Contact output check

This section explains how to switch open/close of the contact output. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Conf outputs] → [Digital output] → [Output check DO].

Output method

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Choose output check DO” appears. Press OK.
- The message “Select another value” appears. Select Open or Close.
- To end the operation, press ABORT.

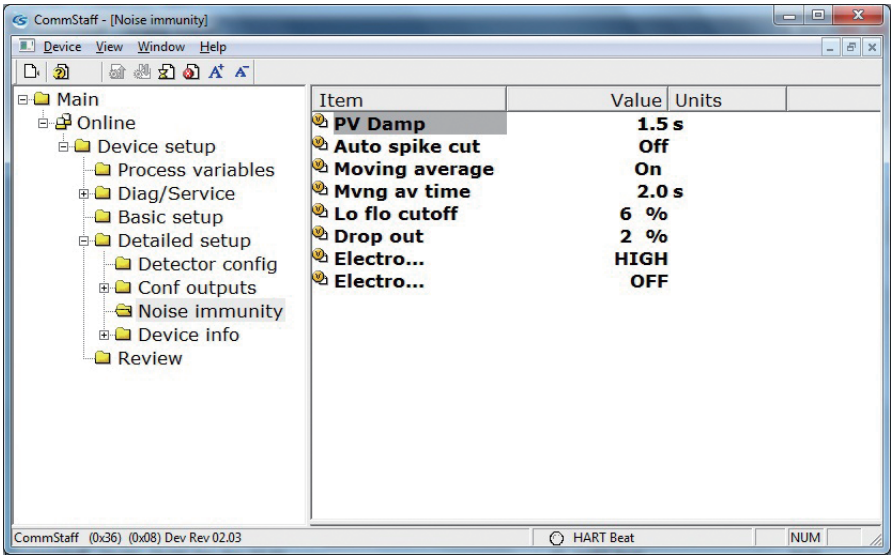


2.8 Noise suppression

2.8.1 Damping time constant

This section explains how to set the damping time constant. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [PV Damp].

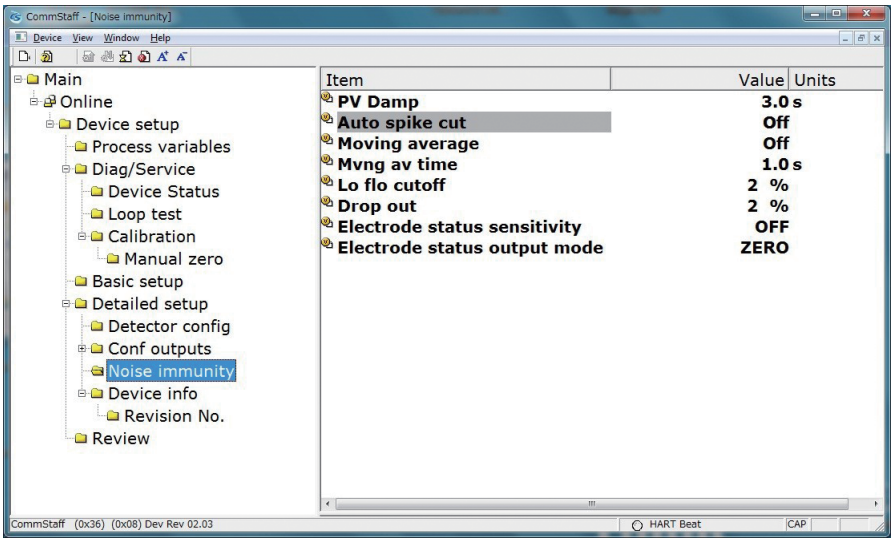
For details, refer to section 2.2.5, "Damping time constant."



2.8.2 Auto spike cut

This section explains how to set up the auto spike cut. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Auto spike cut].

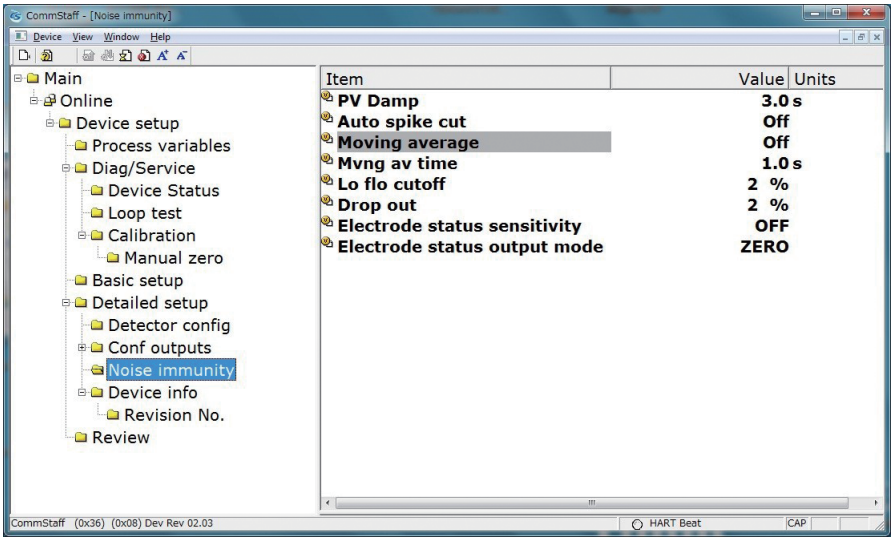
Select On or Off for the auto spike cut.



2.8.3 Moving average processing setup

This section explains how to set up moving average processing. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Moving average].

Select On or Off for moving average processing.

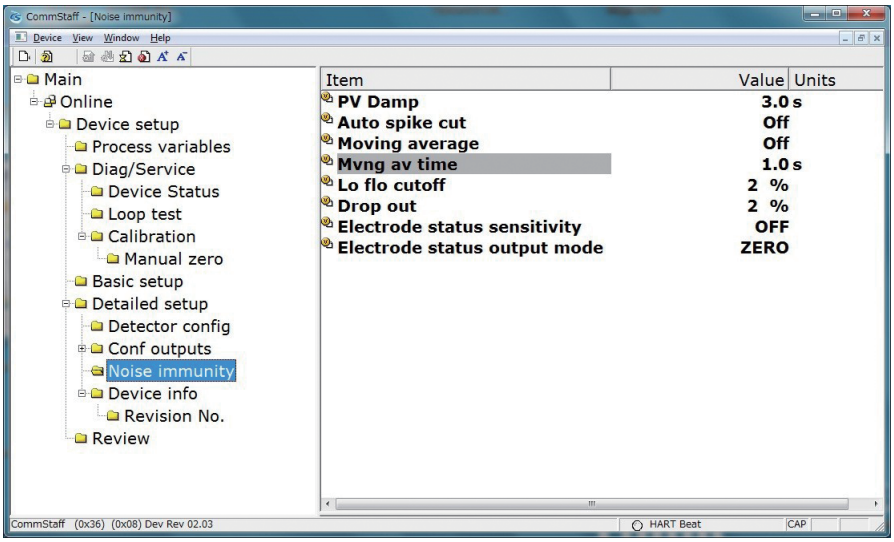


2.8.4 Moving average processing time setup

This section explains how to set the moving average processing time. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Mvng av time].

Set a moving average processing time. The setting range is from 1.0 to 30.0 s.

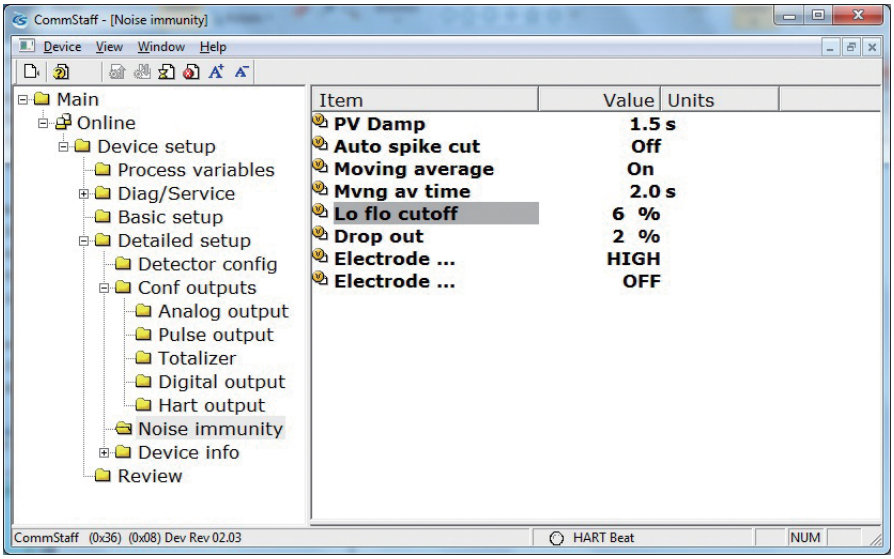
This setting is enabled only if moving average processing is set to On.



2.8.5 Low flow cutoff

This section explains how to set up the low flow cutoff. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Lo flo cutoff].

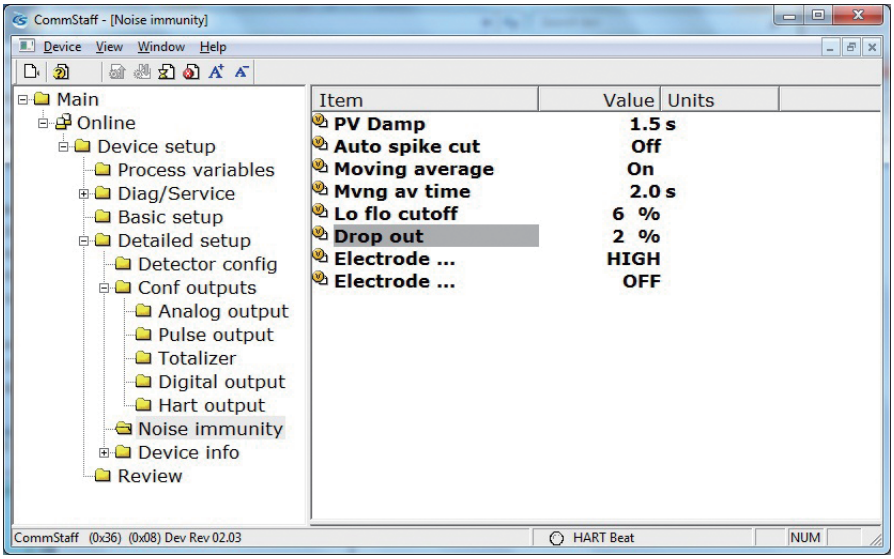
For details, refer to section 2.4.3, “Low flow cutoff.”



2.8.6 Dropout

This section explains how to set up the dropout. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Drop out].

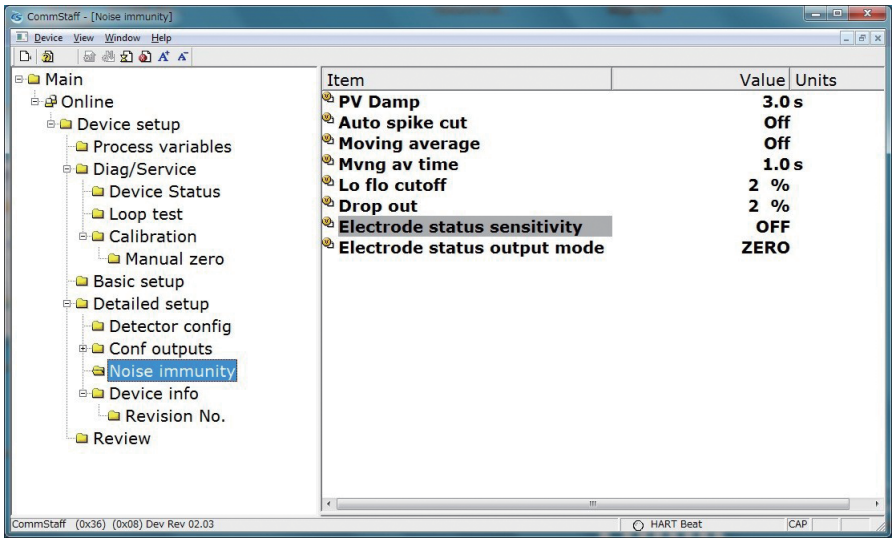
For details, refer to section 2.5.4, “Dropout.”



2.8.7 Electrode diagnosis sensitivity level

This section explains how to set the sensitivity for the diagnosis of electrode status. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Electrode status sensitivity].

Select the sensitivity for the diagnosis of electrode status from among OFF, HIGH, MID, LOW, LL, and LLL.

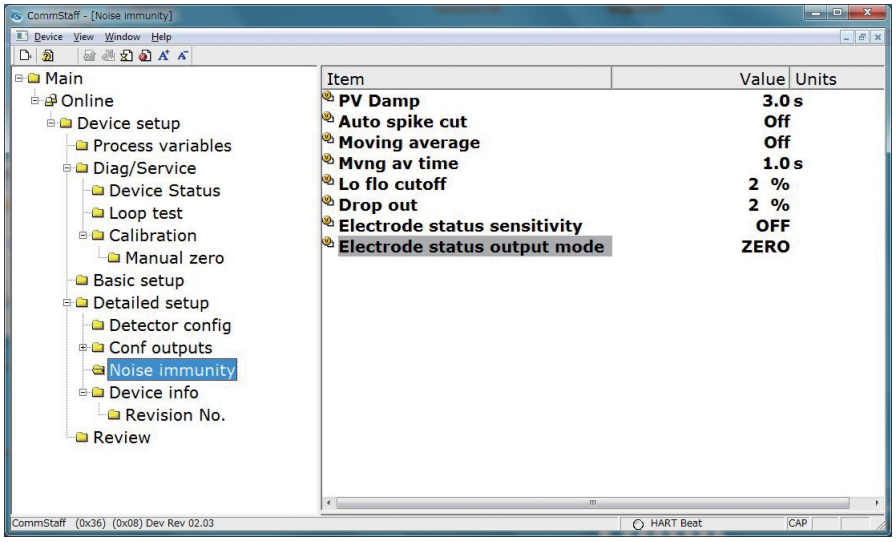


Note. This function is not displayed for MTG software Ver. 6.4 or earlier.

2.8.8 Output mode for electrode status diagnosis

This section explains how to set the output mode for the diagnosis of electrode status. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Noise immunity] → [Electrode status output mode].

Select an output mode for the diagnosis of electrode status from among ZERO, HOLD, and OFF.

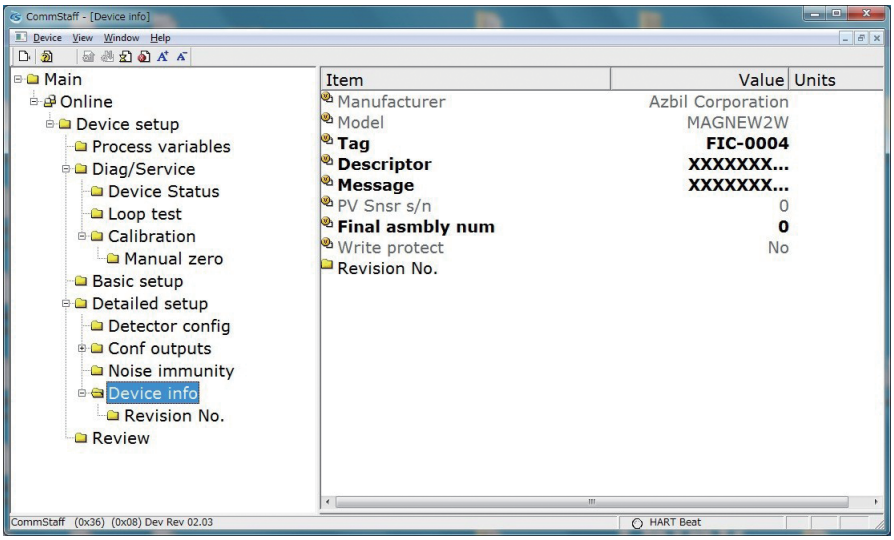


Note. This function is not displayed for MTG software Ver. 6.4 or earlier.

2.9 Device information

2.9.1 Device information check

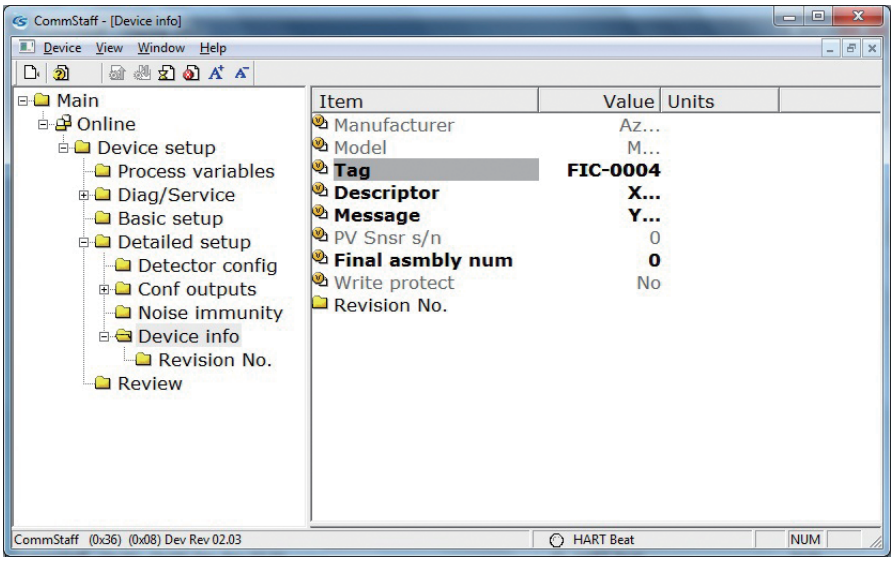
This section explains how to check the device information. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Device info].



2.9.2 Device information (Tag)

This section explains how to set up the device tag. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Device info] → [Tag].

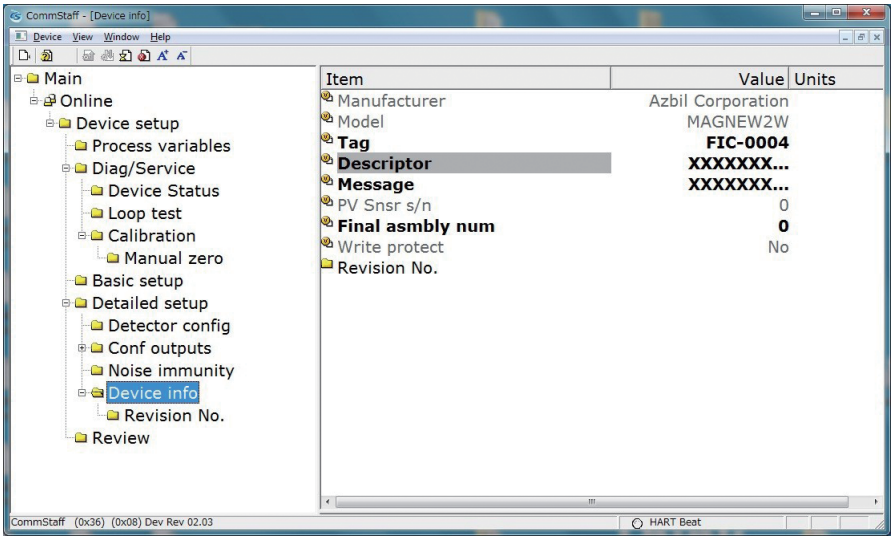
For details, refer to section 2.2.1, “Tag setup.”



2.9.3 Device information (Descriptor)

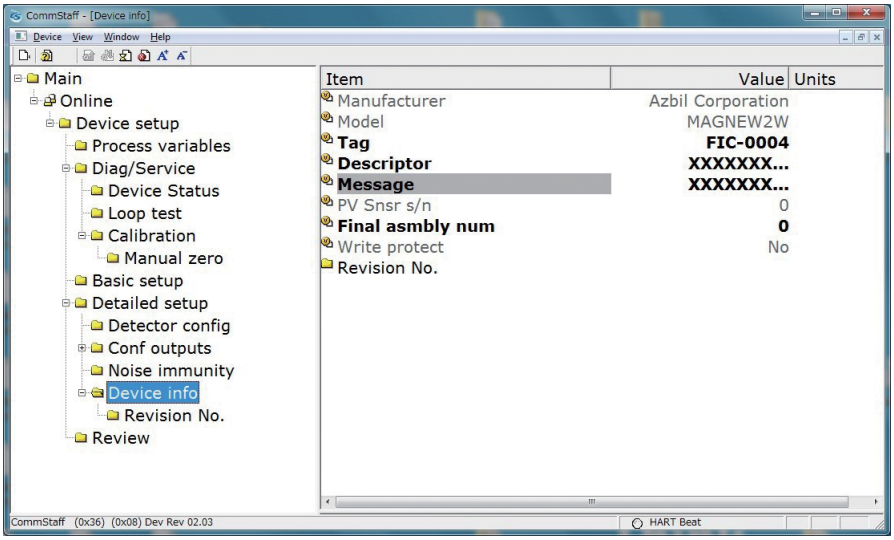
This section explains how to set the descriptor. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Device info] → [Descriptor].

Configure a descriptor.



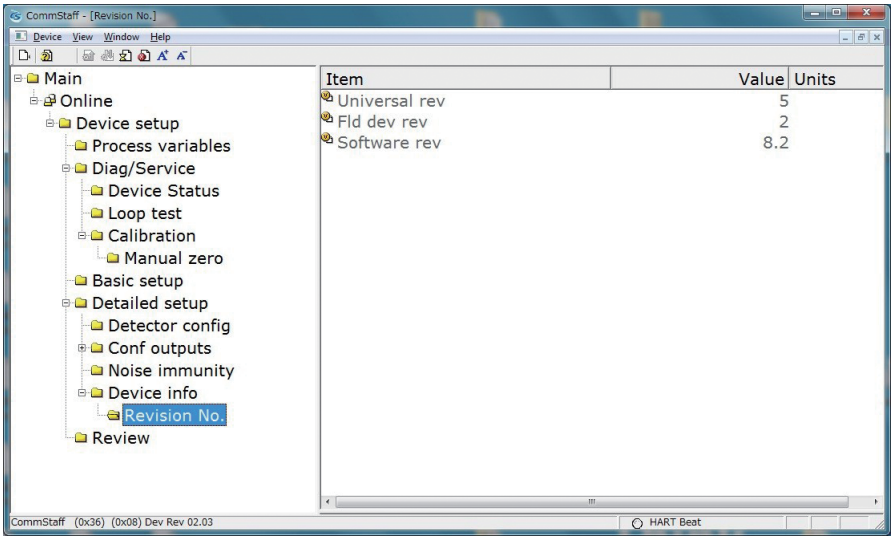
2.9.4 Device information (Message)

This section explains how to set up the device message. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Device info] → [Message]. Input a message.



2.9.5 Revision No.

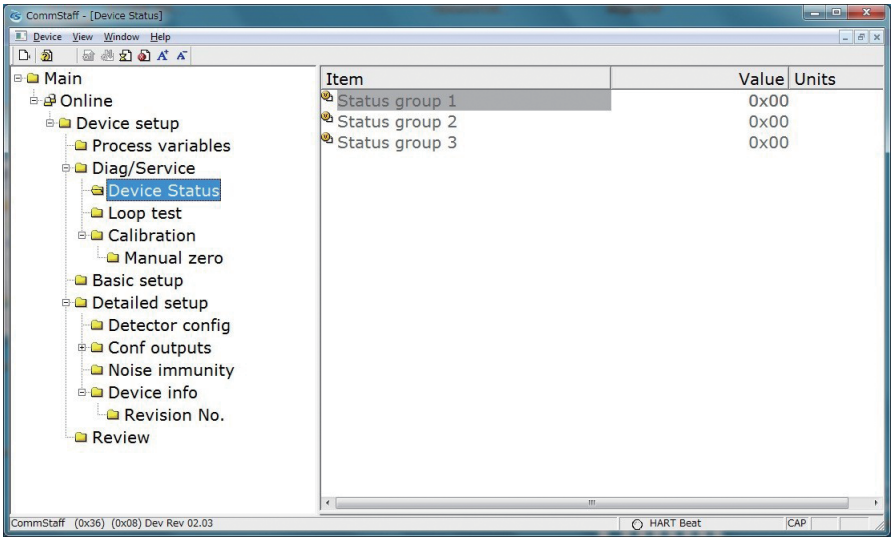
This section explains how to check the revision No. In the menu tree in the left pane of the window, select [Device setup] → [Detailed setup] → [Device info] → [Revision No.].



Chapter 3. Device adjustment, testing, etc., using a HART communicator

3.1 Device status check

This section explains how to check the converter status. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Device Status] → [Status group].



Status items can be checked on a group basis as shown below.

Group	Item
1	B/O simulation
	NVM FAULT
	CPU FAULT
2	IN LOCAL MODE
	DO OUTPUT MODE
	PLS OUTPUT MODE
	AO OUTPUT MODE
3	EMPTY OR SCALE ERROR,
	IN OUTPUT CHECK MODE w/CALIB
	HI<LO ALM ERROR
	SPAN OVER ERROR
	PLS SCALE ERROR
	PLS WIDTH ERROR

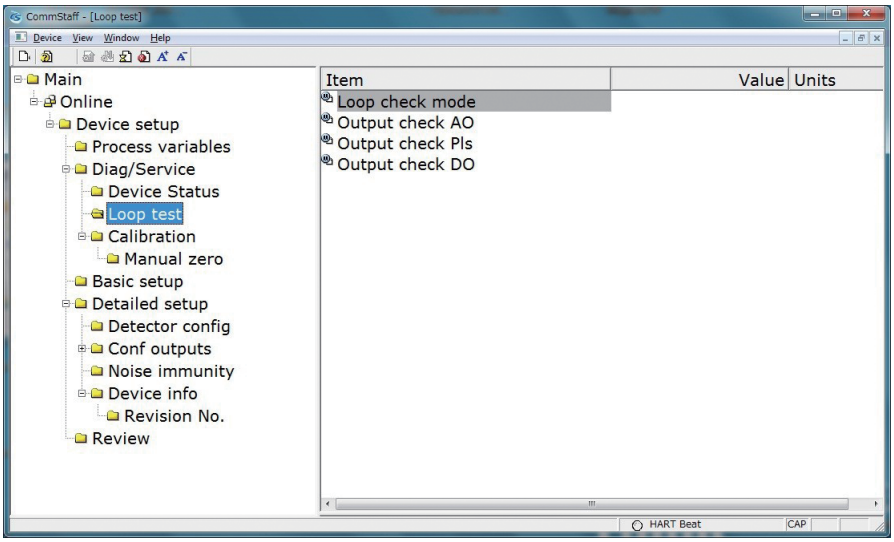
3.2 Device check

3.2.1 Loop check mode

In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Loop test] → [Loop check mode].

If checking the output with a connected calibrator, set this function to On.

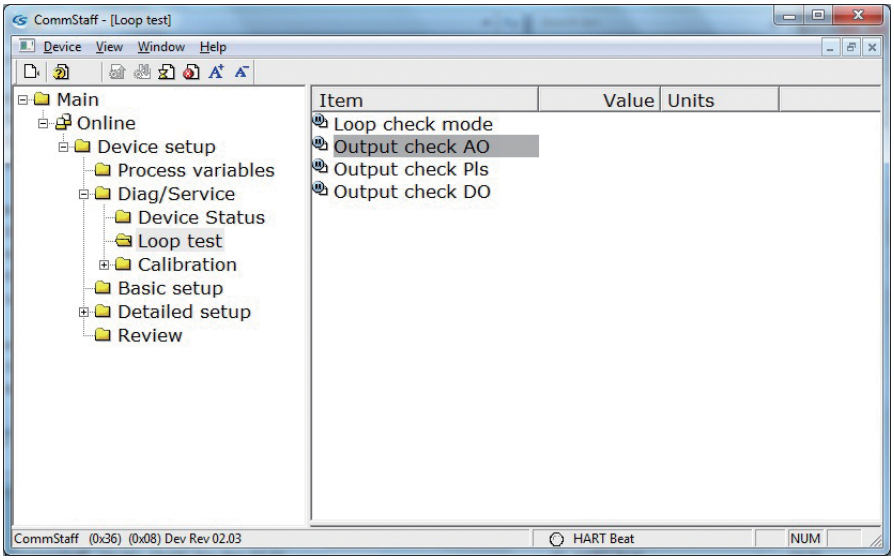
After the check, set it to Off.



3.2.2 Analog output check

This section explains how to output a fixed-value analog current. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Loop test] → [Output check AO].

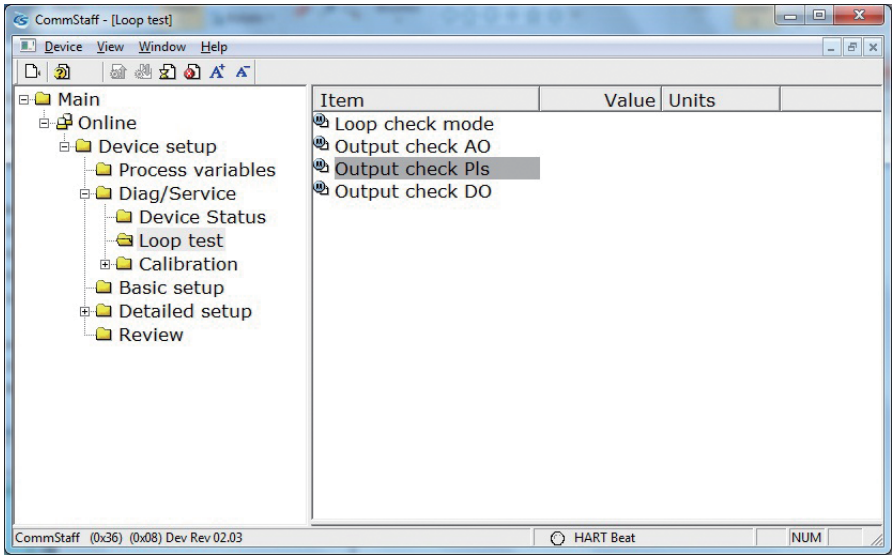
For details, refer to section 2.5.4, “Analog output check.”



3.2.3 Pulse output check

This section explains how to output a fixed pulse. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Loop test] → [Output check Pls].

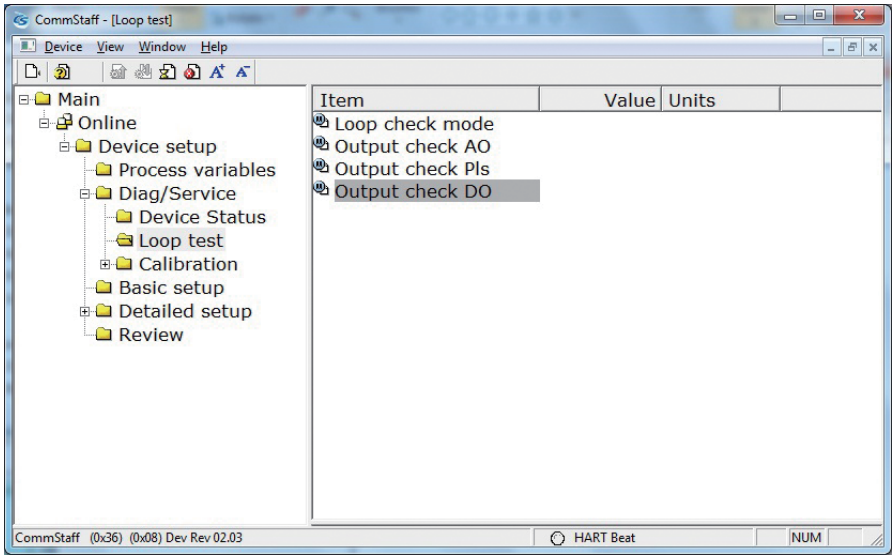
For details, refer to section 2.5.4, “Pulse output check.”



3.2.4 Contact output check

This section explains how to switch open/close of the contact output. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Loop test] → [Output check DO].

For details, refer to section 2.7.4, “Contact output check.”



3.3 Device adjustment

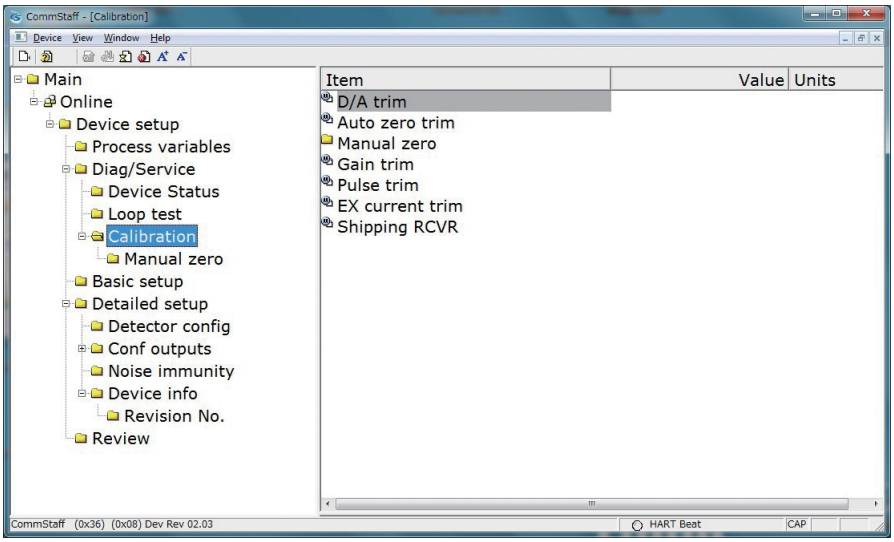
If a device adjustment mentioned in this chapter (except zero adjustment) is made incorrectly, the result may affect the accuracy of the flowmeter. For adjustment, please contact Azbil Corporation.

This section explains how to execute device adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration].

3.3.1 Adjustment of analog current output

If this adjustment is made incorrectly, the result may affect the accuracy of the flowmeter. For adjustment, please contact Azbil Corporation.

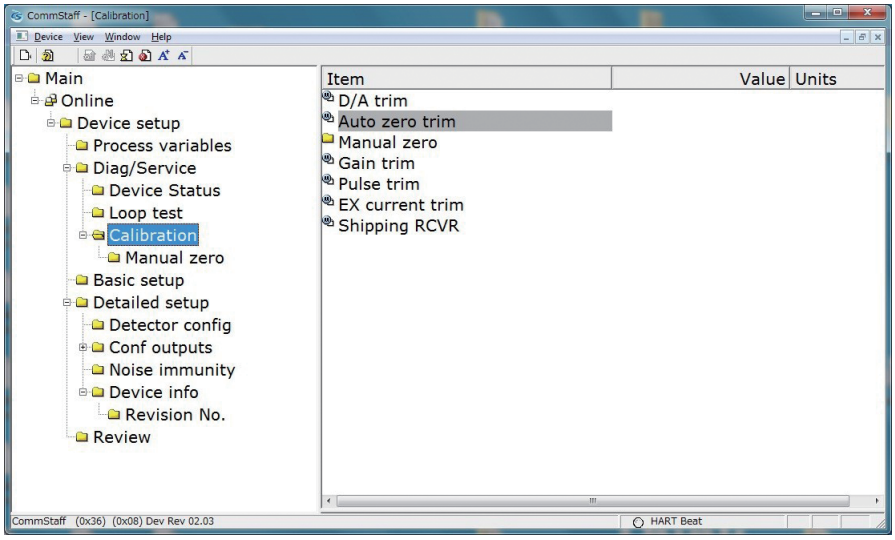
This section explains how to execute analog current output adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [D/A trim].



3.3.2 Auto zero adjustment

This section explains how to execute auto zero adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Auto zero trim].

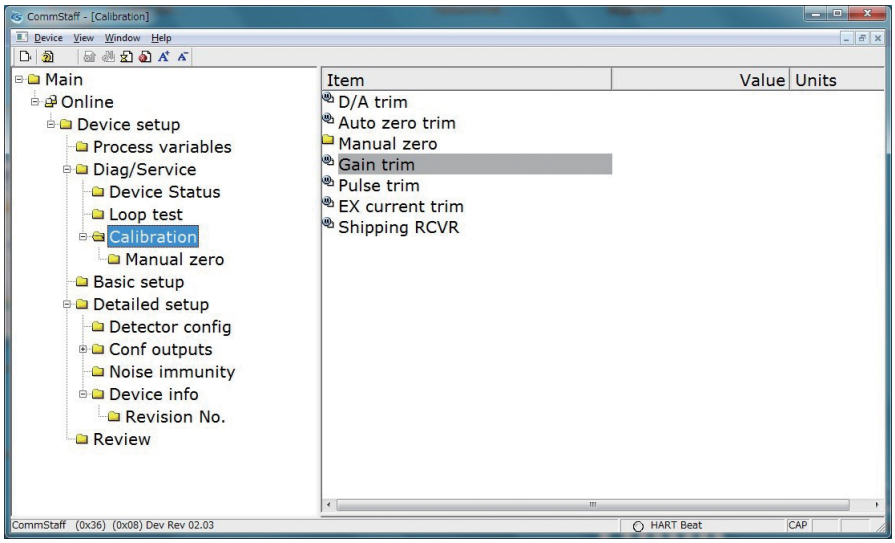
For details, refer to section 2.2.6, "Auto zero adjustment."



3.3.3 Gain adjustment

If this adjustment is made incorrectly, the result may affect the accuracy of the flowmeter. For adjustment, please contact Azbil Corporation.

This section explains how to execute gain adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Gain trim].



3.3.4 Manual zero adjustment

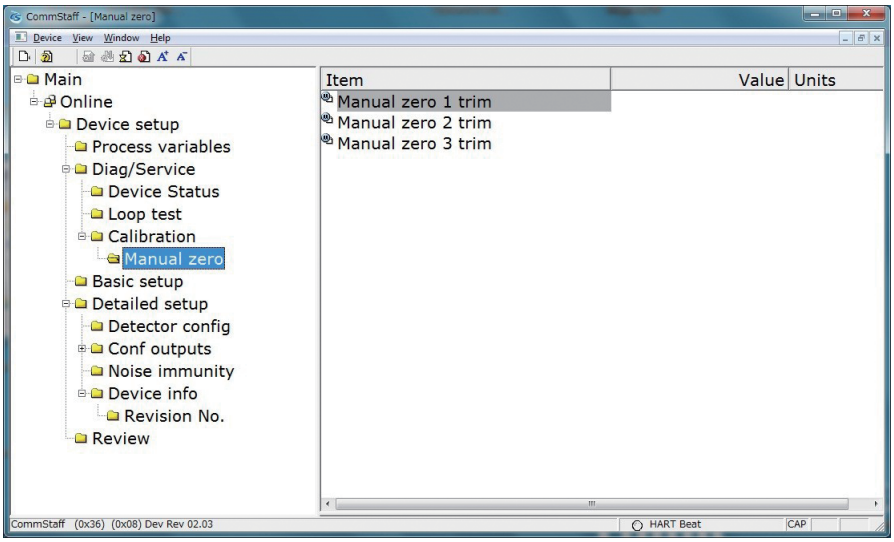
3.3.4.1 Manual zero adjustment 1

This section explains how to execute manual zero adjustment 1. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Manual zero] → [Manual zero 1 trim].

Adjustment procedure

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Wait working time about 20sec” appears. Press OK.
- About 20 seconds later, the message “Select menu” will appear. Then select Up or Down to adjust the zero point.

To end the operation, press ABORT.



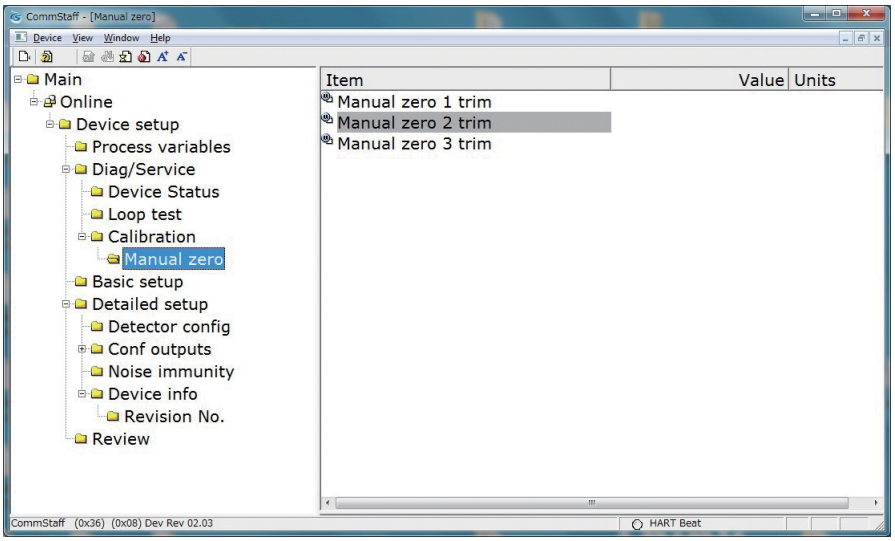
3.3.4.2 Manual zero adjustment 2

This section explains how to execute manual zero adjustment 2. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Manual zero]. → [Manual zero 2 trim].

Adjustment procedure

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Wait working time about 20sec” appears. Press OK.
- About 20 seconds later, the message “Select menu” will appear. Then select Up or Down to adjust the zero point.

To end the operation, press ABORT.



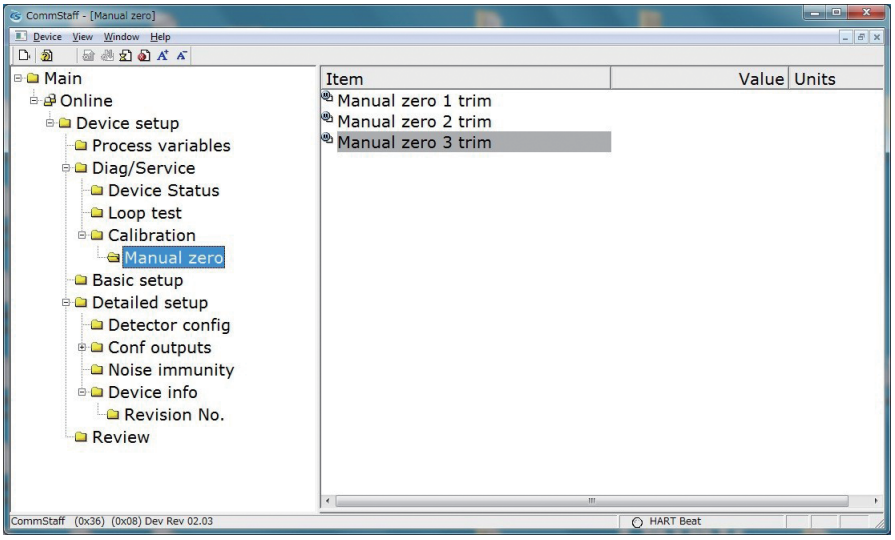
3.3.4.3 Manual zero adjustment 3

This section explains how to execute manual zero adjustment 3. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Manual zero]. → [Manual zero 3 trim].

Adjustment procedure

- The message “WARN-Loop should be removed from automatic control” appears. If a forced output change will not affect the control system, press OK. To abort the operation, press ABORT.
- The message “Wait working time about 20sec” appears. Press OK.
- About 20 seconds later, the message “Select menu” will appear. Then select Up or Down to adjust the zero point.

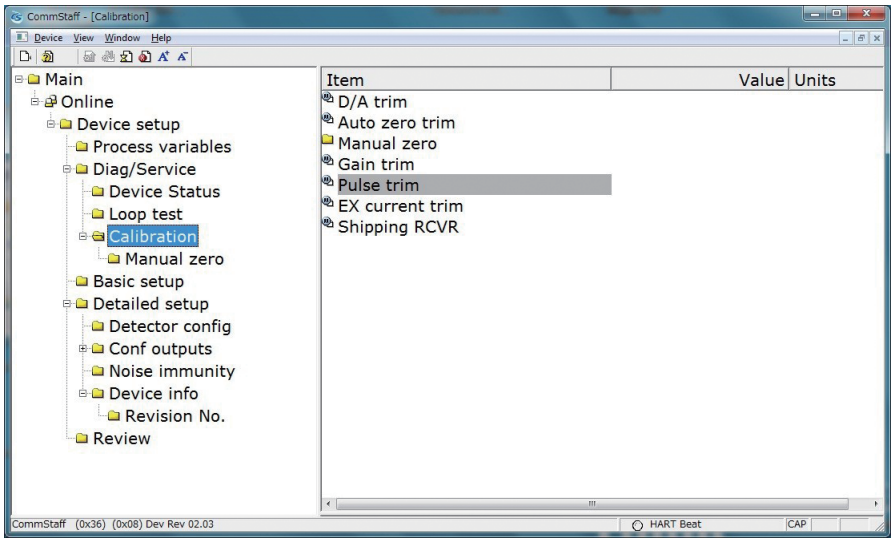
To end the operation, press ABORT.



3.3.5 Pulse output adjustment

If this adjustment is made incorrectly, the result may affect the accuracy of the flowmeter. For adjustment, please contact Azbil Corporation.

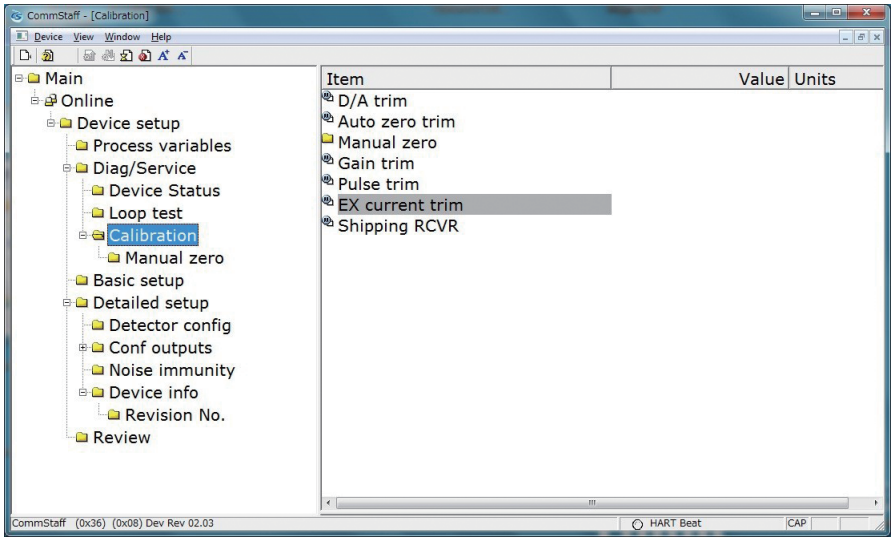
This section explains how to execute pulse output adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Pulse trim].



3.3.6 Excitation current adjustment

If this adjustment is made incorrectly, the result may affect the accuracy of the flowmeter. For adjustment, please contact Azbil Corporation.

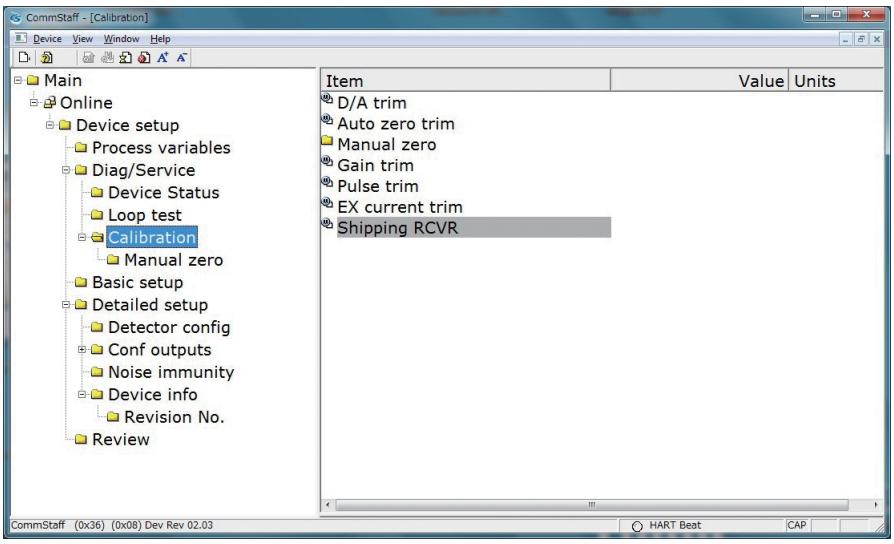
This section explains how to execute excitation current adjustment. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [EX current trim].



3.3.7 Restoration of factory settings

This section explains how to reset settings to their factory default values. In the menu tree in the left pane of the window, select [Device setup] → [Diag/Service] → [Calibration] → [Shipping RCVR].

- The message “Device will be reboot, please connect again” appears. If resetting all settings to default values and restarting the flowmeter will not affect the control system, press OK. To abort the reset, press ABORT.
- The message “Shipping data recovery Ready?” appears. To restore the default settings, select YES and then press OK.
- The message “CAUTION:Shipping data recovery will be soon, DO NOT RETRY. Quit and re-connect 20 seconds later” appears. The flowmeter restarts.
- Because CommStaff must read the data again, restart it and let it communicate with the flowmeter.



Chapter 4. Setting errors

In an electromagnetic flowmeter, the flow rate unit of measurement, range URV. pulse weight unit, pulse weight, etc., are related to each other. If one of them is changed, an error may occur because the changed setting is inconsistent with others.

This chapter describes configuration errors.

Each of these errors can be checked by referring to status group 3 in section 3.1, “Device status check.”

Group	Item
3	SPAN OVER ERROR
	PLS SCALE ERROR
	PLS WIDTH ERROR

4.1 SPAN OVER ERROR

This error occurs when the range that is determined by the flow rate unit of measurement, range URV, and detector size exceeds 12 m/s in flow speed.

Change any of the settings so that the range is less than 12 m/s.

4.2 PLS SCALE ERROR

This error occurs in the following 2 cases.

- The pulse frequency that is determined by the range URV, pulse weight unit of measurement, and pulse weight is outside the range limits (0.0005 to 200 Hz).
- The units for flow rate and pulse weight are not the same (volumetric/mass flow units).

Change any of the settings so that the pulse frequency is within the range.

4.3 PLS WIDTH ERROR

This error occurs when the pulse duty that is determined by the pulse frequency and pulse width exceeds 70 %.

Change either of them so that the duty is less than 70 %.

4.4 If the configuration error cannot be corrected

A configuration error arises from a mismatch between multiple settings. If the error cannot be corrected, take one of the following actions.

- Restart the flowmeter. The previous data will be restored. Restart CommStaff and connect it to the flowmeter.
- Change the settings using the data setting card.

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

8. Discontinuance of the supply of products/parts

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

AAS-511A-014-10

Document Number:	CM2-CFS100-2012
Document Name:	Field Communication Software Model: CFS100 Instruction Manual (Smart two-wire electromagnetic flow meter MagneW^{TM} Neo^{+}/MagneW Two-wire PLUS^{+})
Date:	1st edition: Feb. 2013 4th edition: Oct. 2023
Issued/Edited by:	Azbil Corporation

Azbil Corporation