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Field Communication Software Model: CFS100

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



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, MT-G15A, 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.

CommStaff - [Online]			_ _ ×
Device View Window Help			- 6 ×
D 2 2 2 2 2 X X			
🖻 🗀 Main	Item	Value Units	
e ₽ Online	Device setup		
🖻 🗀 Device setup	PV PV	0.02 m3/h	
Process variables	PV AO	4.03 mA	
Diag/Service	PV LRV	0.00 m3/h	
Device Status	PV URV	10.00 m3/h	
- Loop test			
- Calibration			
🗀 Manual zero			
- Basic setup			
Detailed setup			
Detector config			
Conf outputs			
- Noise immunity			
Device info			
- Revision No			
Review			
CommStaff (0x36) (0x08) Dev Rev 02.03	2	O HART Beat	CAP

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] \rightarrow [Basic setup] \rightarrow [Tag].

CommStaff - [Basic setup]			- D - X
Device View Window Help			- 8
Main Online Device setup Process variables Diag/Service Device Status Detailed setup Detailed setup Detector config Review	Item Solution Tag PV URV Gravity PV URV PV Damp Auto zero trim Disp select Func set Coefficient	Value FIC-0003 m3/h 10.00 3.0 % Pulse 1.0000	Units de la constant
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	CAP

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.

S CommStaff - [Basic setup] ■ Device V: Window Help □ ฌ () ♪ ♪ ♪ ♪ ★			X
Main Online Device setup Process variables Diag/Service Device Status Loop test Calibration Manual zero Basic setup Detailed setup Detactor config Conf outputs Noise immunity Device info Revision No. Review	Item Tag PV unit PV URV Gravity PV Damp Auto zero trim Disp select Func set Coefficient	Value Units FIC-0004 m3/h 10.000 m3/h 1.0000 3.0 s % Pulse 1.0000	
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	VP /

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] \rightarrow [Basic setup] \rightarrow [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.

CommStaff - [Basic setup]			- • ×
Device View Window Help			_ 6 X
D 2 4 4 2 2 4 4			
🖻 🗀 Main	Item	Value Units	
🖻 🖨 Online	Tag	FIC-0004	
🖻 🗀 Device setup	PV unit	m3/h	
Process variables	PV URV	10.00 m3/h	
Diag/Service	Gravity	1.0000	
Device Status	PV Damp	3.0 s	
Loop test	Auto zero trim		
🖻 🗀 Calibration	Disp select	%	
Manual zero	Func set	Pulse	
- Basic setup	^e Coefficient	1.0000	
Detailed setup			
Detector config			
E Confoutputs			
Noise immunity			
Device info			
- Bevision No			
Review			
- Review			
CommStaff (0x36) (0x08) Dev Rev 02.03	2	O HART Beat CA	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, and correct the error by changing the flow rate unit.

CommStaf	f		X
	Pulse error; S Continue?	See status group 3 (Cmd: 2	234 RC: 6)
		Yes	No

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] \rightarrow [Basic setup] \rightarrow [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.

CommStaff - [Basic setup]				- • ×
Device View Window Help				- 6 ×
D 🔊 📾 🖑 🛣 🚳 🕂 🔺				
🖻 🗀 Main	Item	Value	Units	
🖻 🖨 Online	[®] Tag	FIC-0004		
🖻 🗀 Device setup	PV unit	m3/h		
Process variables	PV URV	10.00	m3/h	
Diag/Service	[®] Gravity	1.0000		
Device Status	PV Damp	3.0	S	
- Loop test	Auto zero trim			
Calibration	^{ee} Disp select	%		
Manual zero	^{ee} Func set	Pulse		
- Basic setun	Coefficient	1.0000		
Detector config				
Revision No.				
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	CAP	

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] \rightarrow [Basic setup] \rightarrow [Gravity].

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

CommStaff - [Basic setup]		-	_ 0 <u>_ X</u>
Device View Window Help			_ 8 ×
 Main Online Process variables Diag/Service Device Status Loop test Calibration Manual zero Basic setup Detailed setup Detailed setup Conf outputs Noise immunity Device info Revision No. Review 	Item Tag PV Unit PV URV Gravity PV Damp Auto zero trim Disp select Func set Coefficient	Value Units FIC-0004 m3/h 10.00 m3/h 1.0000 3.0 s % Pulse 1.0000	
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat CAP	,

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] \rightarrow [Basic setup] \rightarrow [PV Damp].

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

S CommStaff - [Basic setup]			_ _ ×
Device View Window Help			_ & ×
Main Calibration Conformation Conformatio	Item Tag PV unit PV URV Gravity V Damp Auto zero trim Isp select Func set Coefficient	Value Units FIC-0004 m3/h 10.00 m3/h 1.0000 3.0 s % Pulse 1.0000	
CommStaff (0x36) (0x08) Dev Rev 02.03	2	O HART Beat	AP

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] \rightarrow [Basic setup] \rightarrow [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] \rightarrow [Basic setup] \rightarrow [Disp select].

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

CommStaff - [Basic setup]		
Device View Window Help		_ 6
D 🗿 📾 🖑 🐒 🗛 🖌		
D ■ @ @ @ @ @ A ▲ ▲ Main Device setup Process variables Diag/Service Device Status Loop test Calibration Manual zero Basic setup Detailed setup Detector config	Item Tag PV unit PV URV Gravity PV Damp Auto zero trim Disp select Func set Coefficient	Value Units FIC-0004 m3/h 10.00 m3/h 1.0000 3.0 s % Pulse 1.0000
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat

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] \rightarrow [Basic setup] \rightarrow [Func set].

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

CommStaff - [Basic setup]				• ×
Device View Window Help				- 8 ×
D 2 2 2 2 2 4 ×				
🖻 🗀 Main	Item	Value	Units	
Online Device setup Diag/Service Diag/Service Device Status Calibration Detailed setup Detailed setup Detailed setup Detector config Conf outputs Noise immunity Device info Revision No. Review	© Tag © PV unit © PV URV © Gravity © PV Damp © Auto zero trim © Disp select © Func set © Coefficient	FIC-0004 m3/h 10.00 1.0000 3.0 % Pulse 1.0000	m3/h s	
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	CAP	

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] \rightarrow [Basic setup] \rightarrow [Coefficient].

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

ⓒ CommStaff - [Basic setup] ■ Device View Window Help D- 創 @		- 6 x
Main Main Online Process variables Diag/Service Device Status Conformation Device Status Calibration Manual zero Basic setup Detailed setup Detector config Conf outputs Noise immunity Device info Revision No. Review	Item Tag PV unit PV URV Gravity PV Damp Auto zero trim Disp select Func set Coefficient	Value Units FIC-0004 m3/h m3/h 10.000 m3/h 10.000 3.0 s % Pulse 1.0000 1.0000
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat CAP

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] \rightarrow [Detailed setup] \rightarrow [Detector config] \rightarrow [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

CommStaff - [Detector config]			_ D
Device View Window Help			_ & ×
A in Device setup Diag/Service Diag/Service Diag/Service Calibration Device Status Calibration Device setup Detailed setup Detector config Detector config Device info Noise immunity Device info Revision No. Review	Item [®] Tube size [®] Detector type [®] EX value [®] C2 value R/W	Value Units 50 A MTG	
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	AP

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] \rightarrow [Detailed setup] \rightarrow [Detector config] \rightarrow [Detector type].

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

TST is used for adjustments and loop checks.

CommStaff - [Detector config]			_ _ x
Device View Window Help			- 6 ×
D 🗿 📾 🖑 와 🖓 🕂 🗸			
🖻 🗀 Main	Item	Value Units	
🖻 🖨 Online	Tube size	50 A	
🖮 🗀 Device setup	Detector type	MTG	
Process variables	EX value		
🖻 🗀 Diag/Service	C2 value R/W		
Device Status			
Loop test			
🖻 🗀 Calibration			
🗀 Manual zero			
Basic setup			
🖻 🗀 Detailed setup			
😑 Detector config			
🗉 🗀 Conf outputs			
Noise immunity			
□ □ Device info			
Revision No.			
Review			
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	CAP

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] \rightarrow [Detailed setup] \rightarrow [Detector config] \rightarrow [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.

CommStaff - [Detector config]	and the second s		- • ×
Device view Window Help			- 6' X
Main Main Constraints Main Main Manu Manual zero Basic setup Detailed setup Calibration Detailed setup	Item Tube size Detector type EX value C2 value R/W	Value Units 50 A MTG	
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Best CAP	8

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] \rightarrow [Detailed setup] \rightarrow [Detector config] \rightarrow [C2 value R/W].

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

CommStaff - [Detector config]			
Device View Window Help			_ 8 ×
D 🗿 🗟 🖑 🛣 🙆 🛧 🗡			
🖻 🚨 Main	Item	Value Units	
Online Device setup	Tube size Detector type	50 A MTG	
Process variables	[®] EX value		
 Diag/Service Device Status Loop test Calibration Manual zero Basic setup Detailed setup Detailed setup Conf outputs Noise immunity Device info Revision No. Review 	[®] C2 value R/W		
CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat CAP	

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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Analog output] \rightarrow [PV unit].

G CommStaff - [Analog output] Device View Window Help - 8 × D: 2 🗟 🖑 🛣 🔕 👫 🗡 🖻 🗀 Main Value Units Item - Online PV unit
PV URV m3/h 4.06 m3/h 🖻 🗀 Device setup Process variables PV I RV 0.00 m3/h Lo flo cutoff 🗉 🗀 Diag/Service 6 % Basic setup 🕙 Burn out AO Low Output check AO 🖻 🗀 Detailed setup Detector config Conf outputs 🖻 Analog output Pulse output Totalizer Digital output Hart output Noise immunity Device info Review CommStaff (0x36) (0x08) Dev Rev 02.03 O HART Beat NUM

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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Analog output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Analog output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Analog output] \rightarrow [Burn out AO].

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

🗀 Main	Item	Value Units
Online Device setup Process variables Diag/Service Basic setup Detailed setup Detector config Conf outputs Analog output Pulse output Digital output Hart output Noise immunity Device info Revision No. Review	 PV unit PV URV PV LRV Lo flo cutoff Burn out AO Output check AO 	m3/h 10.00 m3/h 0.00 m3/h 2 % Low

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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Analog output] \rightarrow [Output check AO].

S CommStaff - [Analog output]		
Device View Window Help		_ 8 ×
D 2 4 2 5 5 4 5		
🖻 🗀 Main	Item	Value Units
🖻 🖨 Online	PV unit	m3/h
🖻 🗀 Device setup	PV URV	10.00 m3/h
Process variables	PV LRV	0.00 m3/h
Diag/Service	Lo flo cutoff	2 %
Basic setup	Burn out AO	Low
Detailed setup	¹⁰ Output check AO	
Detector config		
Totalizer		
Keview		
		•
CommStarr (UX36) (UXU8) Dev Rev 02.03		O HART Beat

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.

Dutput check AO
Choose analog output level 0 % 25 % 50 % 75 % 100 % Other End
Press OK button to continue method execution or Abort button to abort method execution.

• 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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [Pulse caling].

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.

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🖻 🗀 Main	Item	Value Units
🖥 🗗 Online	Puls out unit	cm3/P
🖻 🗀 Device setup	Puls scaling	27.7764 cm3/P
Process variables	Pulse width	
🖲 🗀 Diag/Service	Drop out	2 %
Basic setup	Burn out Pls	Off
🖻 🗀 Detailed setup	Output check Pls	
Detector config		
Conf outputs		
🕒 Analog output		
Pulse output		
- Totalizer		
Digital output		
- Hart output		
Noise immunity		
Device info		
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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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [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.

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🖻 🗀 Main	Item	Value Units
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Process variables	Pulse width	
Diag/Service	Drop out	2 %
Basic setup	Burn out Pls	Off
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- Pulse output		
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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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [Drop out].

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

🌀 CommStaff - [Pulse output]		
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🖻 🗀 Main	Item	Value Units
Process variables Process variables Diag/Service Basic setup Detailed setup Detector config Conf outputs Analog output Pulse output Digital output Hart output Noise immunity Device info Review	Meulis out unit Pulis exaling Pulise width Pulise width Burn out Pls © Output check Pls	cm3/P 27.7764 cm3/P 2 % Off
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CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat

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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [Burn out Pls].

Select a burnout setting from among Off and Hold.

CommStaff - [Pulse output]		-	
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Conf output Analog output Pulse output Digital output Hart output Noise immunity Device info Revision No. Review			
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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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Pulse output] \rightarrow [Output check Pls].

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🖻 🗀 Main	Item	Value Units	
🖻 🗗 Online	Puls out unit	cm3/P	
🖻 🗀 Device setup	Puls scaling	27.7764 cm3/P	
Process variables	Pulse width		
Diag/Service	Prop out	2 %	
Basic setup	Burn out Pls	Off	
Detailed setup	^{ee} Output check Pls		
Detector config			
Totalizer			
Hart output			
Noise immunity			
Device info			
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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.

Output check PIs
Choose Pulse output level
0 % 25 % 50 % 75 % 100 % Other End
Press OK button to continue method execution or Abort button to abort method execution.
Help Abort OK

• 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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Totalizer] \rightarrow [Totalizer display].

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🖻 🗀 Main	Item	Value	Units
🖻 🖨 Online	arr display	2640	0
🖻 🗀 Device setup	Total restart val	0	
Process variables	Reset totalizer		
🖲 🗀 Diag/Service			
Basic setup			
🖻 🗀 Detailed setup			
Detector config			
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Pulse output			
- 🗃 Totalizer			
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Hart output			
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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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Totalizer] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Totalizer] \rightarrow [Reset totalizer].

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

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🖻 🗀 Main	Item	Value Units
🖻 🗗 Online	Totlizer display	2640
🖻 🗀 Device setup	Total restart val	0
Process variables	😬 Reset totalizer	
Diag/Service	November 1994 Forth Hill	
Basic setup		
Detailed setup		
Detector config		
Conf outputs		
Digital output		
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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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Digital output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Digital output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Digital output] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Conf outputs] \rightarrow [Digital output] \rightarrow [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.

S CommStaff - [Digital output]		
Device View Window Help		_ 8 ×
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🖻 🗀 Main	Item	Value Units
🖻 🖻 Online	🎱 Hi alarm	115
🖶 🗀 Device setup	Low alarm	0
Process variables	Burn out DO	Close
🗉 🗀 Diag/Service	[®] Output check DO	
- Basic setup		
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Detector config		
🖦 🗅 Conf outputs		
🗅 Analog output		
Pulse output		
- Totalizer		
- Digital output		
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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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [PV Damp].

CommStaff - [Noise immunity] Device View Window Help - 5 > D: 2 🗟 🖑 🛣 🔕 👫 🗸 🖃 🗀 Main Value Units Item 🕙 PV Damp 🗄 🗗 Online 1.5 s Auto spike cut Off 🖻 🗀 Device setup Moving average Process variables On 🌯 Mvng av time Diag/Service 2.0 s Lo flo cutoff 6 % 2 % - Basic setup 🕙 Drop out 🖻 🗀 Detailed setup HIGH Electro... Detector config Electro... OFF Conf outputs 😑 Noise immunity 🗄 🗀 Device info Review CommStaff (0x36) (0x08) Dev Rev 02.03 O HART Beat NUM

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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [Moving average].

Select On or Off for moving average processing.

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Device View Window Help		- 6 ×
D 2 2 2 2 2 x x C Main C Dovice setup C Process variables C Device Status C Device St	Item PV Damp Auto spike cut Moving average Mvng av time Lo flo cutoff Drop out	Value Units 3.0 s Off Off 1.0 s 2 % 2 %
Calibration Calib	Electrode status sensitivity Electrode status output mode	OFF ZERO
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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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [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.

Commstarr - [Noise immunity]		
© commoth? © bolte View Window Help © © © © © © © © © © © © ©	Item PV Damp Auto spike cut Moving average Mvng av time Lo flo cutoff Drop out Electrode status sensitivity Electrode status output mode	Value Units 3.0 s Off Off 1.0 s 2 % 2 % OFF ZERO
Review		
ommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat CAP

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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [Lo flo cutoff].

For details, refer to section 2.4.3, "Low flow cutoff."

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Main Main Contract of the set o	Item PV Damp Auto spike cut Moving average Myng av time Co flo cutoff Prop out Electrode Electrode	Value 1.5 Off 0n 2.0 6 % 2 % HIGH OFF	Units S S
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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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [Drop out].

For details, refer to section 2.5.4, "Dropout."

Main Item Value Units Doline PV Damp 1.5 s Device setup Auto spike cut Off Diag/Service Moving average On Basic setup Lo flo cutoff 6 % Detector config Detector config Electrode Detector config Electrode HIGH Pulse output Poligital output OFF Noise immunity Polycic info Noise immunity	Device View Window Help D・ 刻 協 怨 気 る 本 本			_ 6
	Main Main Configure Main Process variables Diag/Service Diag/Service Detailed setup Conf outputs Analog output Pulse output Digital output Noise immunity Review	Item PV Damp Auto spike cut Moving average Myng av time Lo flo cutoff Drop out Electrode Electrode	Value Units 1.5 s Off On 2.0 s 6 % 2 % HIGH OFF	

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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [Electrode status sensitivity].

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

S CommStaff - [Noise immunity]		
Device View Window Help		_ <i>6</i> ×
D 2 4 4 2 2 5 4 4		
🖻 🗀 Main	Item	Value Units
Online Online	 PV Damp PV Damp Auto spike cut Moving average Mvng av time Lo flo cutoff Drop out Electrode status sensitivity Electrode status output mode 	3.0 s Off Off 1.0 s 2 % 2 % OFF ZERO
 Detailed setup Detector config Conf outputs Noise immunity Device info Revision No. Review 	e [
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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] \rightarrow [Detailed setup] \rightarrow [Noise immunity] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Device info] \rightarrow [Tag].

For details, refer to section 2.2.1, "Tag setup."

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Device View Window Help			_ <i>8</i> ×
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□ □ □ ■ ▲ ▲ □ ■ Main □ </th <th>Item Manufacturer Model Tag Descriptor Message PV Snsr s/n Final asmbly num Write protect Revision No.</th> <th>Value 1 Az FIC-0004 X Y 0 0 0 No</th> <th>Units</th>	Item Manufacturer Model Tag Descriptor Message PV Snsr s/n Final asmbly num Write protect Revision No.	Value 1 Az FIC-0004 X Y 0 0 0 No	Units
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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] \rightarrow [Detailed setup] \rightarrow [Device info] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Device info] \rightarrow [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] \rightarrow [Detailed setup] \rightarrow [Device info] \rightarrow [Revision No.].

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🖻 🗀 Main	Item	Value Units
🖻 🖨 Online	Universal rev	5
🖻 🗀 Device setup	Pld dev rev	2
Process variables	Software rev	8.2
🖻 🗀 Diag/Service		
Device Status		
Loop test		
- Calibration		
🗀 Manual zero		
- Basic setup		
🖻 🗀 Detailed setup		
Detector config		
🖷 🗀 Conf outputs		
Noise immunity		
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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] \rightarrow [Diag/Service] \rightarrow [Device Status] \rightarrow [Status group].

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Device View Window Help		_ <i>6</i> ×
D 2 4 4 2 6 4 5		
🖻 🗀 Main	Item	Value Units
🖻 🖨 Online	[®] Status group 1	0x00
🖻 🗀 Device setup	Status group 2	0×00
Process variables	Status group 3	0×00
🖻 🗀 Diag/Service		
- Device Status		
- Loop test		
🖻 🗀 Calibration		
🗀 Manual zero		
Basic setup		
🖻 🗀 Detailed setup		
Detector config		
🗉 🗀 Conf outputs		
Noise immunity		
Device info		
Revision No.		
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Status items can be checked on a group basis as shown below.

Group	Item	
	B/O simulation	
1	NVM FAULT	
	CPU FAULT	
	IN LOCAL MODE	
2	DO OUTPUT MODE	
2	PLS OUTPUT MODE	
	AO OUTPUT MODE	
	EMPTY OR SCALE ERROR,	
	IN OUTPUT CHECK MODE w/CALIB	
2	HI <lo alm="" error<="" td=""></lo>	
5	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] \rightarrow [Diag/Service] \rightarrow [Loop test] \rightarrow [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] \rightarrow [Diag/Service] \rightarrow [Loop test] \rightarrow [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] \rightarrow [Diag/Service] \rightarrow [Loop test] \rightarrow [Output check Pls].

For details, refer to section 2.5.4, "Pulse output check."

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Device View Window Help				- 6	F ×
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Main Device setup Diag/Service Calibration Basic setup Review	Item 환 Loop check mode 환 Output check AO 환 Output check PIs 환 Output check DO	Value	Units		
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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] \rightarrow [Diag/Service] \rightarrow [Loop test] \rightarrow [Output check DO].

For details, refer to section 2.7.4, "Contact output check."

🎯 CommStaff - [Loop test]				
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Main Porces setup Process variables Device Setup Device Status Device Status Coop test Basic setup Detailed setup Review	Item ④ Loop check mode ④ Output check AO ④ Output check PIs ④ Output check DO	Value	Units	
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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] \rightarrow [Diag/Service] \rightarrow [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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Auto zero trim].

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

S CommStaff - [Calibration]		
Device View Window Help		_ @ X
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 Main Online Device setup Process variables Diag/Service Device Status Loop test Calibration Manual zero Basic setup Detailed setup Detector config Conf outputs Noise immunity Device info Revision No. Review 	Item D/A trim Auto zero trim Manual zero Gain trim Pulse trim EX current trim Shipping RCVR	Value Units
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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Gain trim].

S CommStaff - [Calibration]		-	_ _ _ ×
Device View Window Help			_ 8 ×
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Device Ver Vidow Hep Device Ver Vidow Hep Device setup Device setup Device setup Device Status Diag/Service Diag/Service Diag/Service Diag/Service Diag/Service Device Status Diag/Service Device Status Diag/Service Device Status Diag/Service Device Status Diag/Service Device Device	Item D/A trim Auto zero trim Manual zero Sain trim Pulse trim EX current trim Shipping RCVR		Value Units
Review		m	Þ
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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Manual zero] \rightarrow [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.

Commistan - [Manual zero]			
Device View Window Help			_ 6 X
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🖻 🗀 Main	Item	Value Unit	s
🖮 🗗 Online	[®] Manual zero 1 trim		
🖻 🗀 Device setup	Manual zero 2 trim		
Process variables	Manual zero 3 trim		
Diag/Service			
Device Status			
Loop test			
Calibration			
Manual zero			
Basic setup			
Detailed setup			
Detector config			
Conf outputs			
Noise immunity			
Device info			
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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Manual zero]. \rightarrow [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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Manual zero]. \rightarrow [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.

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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [Pulse trim].

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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [EX current trim].

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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] \rightarrow [Diag/Service] \rightarrow [Calibration] \rightarrow [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.

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CommStaff (0x36) (0x08) Dev Rev 02.03		O HART Beat	CAP

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	ltem
	SPAN OVER ERROR
3	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;
- 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, antiflame 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.

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Azbil Corporation