

azbil

MagneW PLUS+
HART Communicator

User's Manual

Azbil Corporation

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1 : Preparation for communication, verification and cautions on use

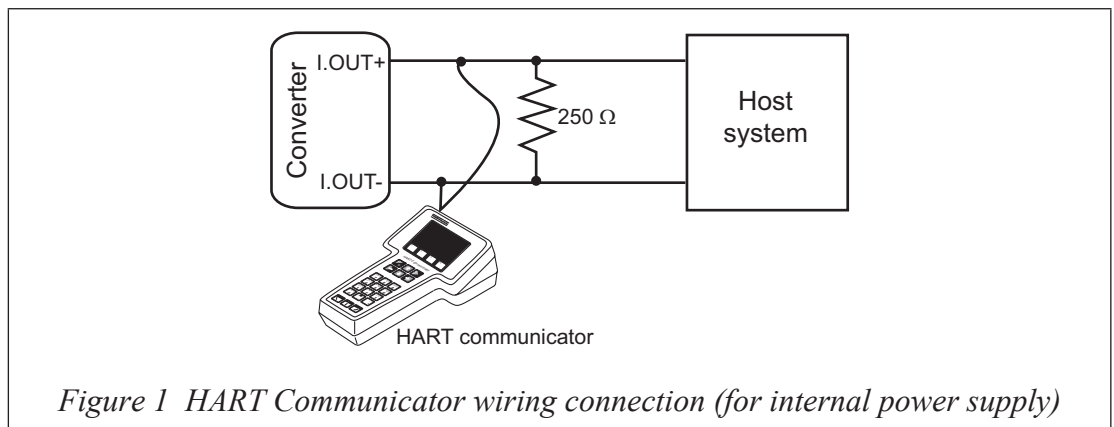
This section describes the preparation necessary for communication between a MagneW and a HART Communicator. This section also covers the procedure to verify communication. The first step for preparation is to perform wiring between the converter and the HART Communicator. After wiring has been completed, turn the power on and verify that communications are functioning properly.

1-1 : Wiring between converter and HART Communicator

There are two different methods of wiring for an internal power supply and external power supply.

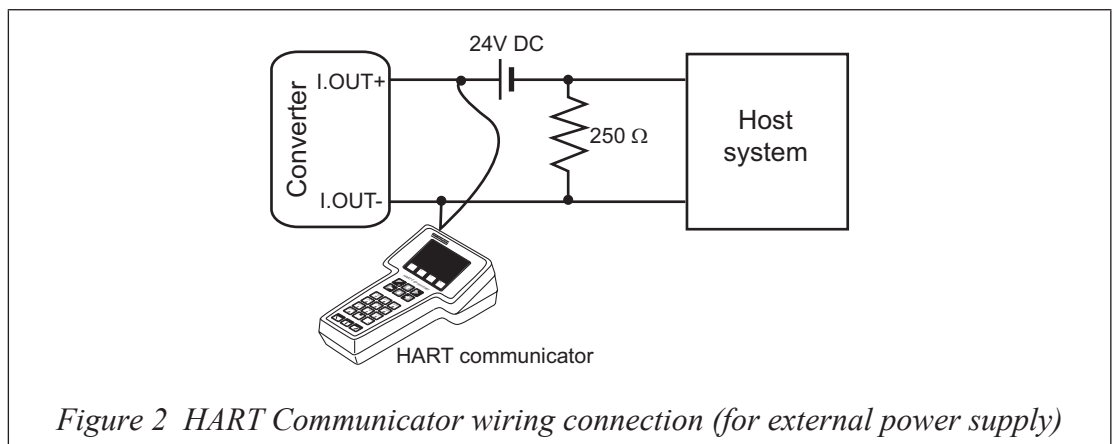
1-1-1 : For internal power supply

Connect the HART Communicator as shown in Figure 1. A $250\ \Omega$ resistor must be installed on the receiving end of the output current. There is no polarity on the HART Communicator terminal.



1-1-2 : For external power supply

Connect the HART Communicator as shown in Figure 2. A $250\ \Omega$ resistor must be installed on the receiving end of the output current. There is no polarity on the HART Communicator terminal.



1-2 : Verifying communication

After the HART Communicator has been properly interconnected, turn the device's power on. For the external power supply model, turn on the external power supply before turning the device power on.

Once the setting and wiring connections are correct, the HART Communicator's display shows an online menu as shown below and a HART mark will flicker in the upper right hand corner of the display.

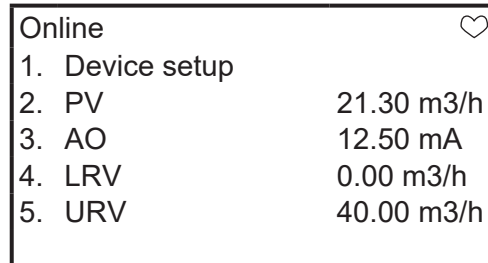


Figure 3 Online menu

If the display is not as shown in Figure 3 but as shown in Figure 4 below, no communications are being made. Recheck the HART Communicator connections and the setting of converter. (The setting of the converter is described below.)

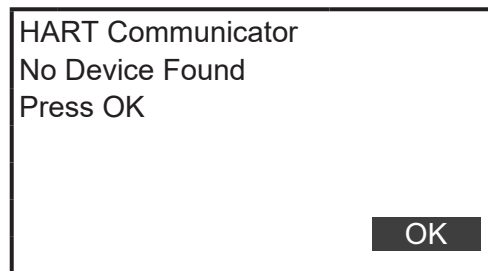


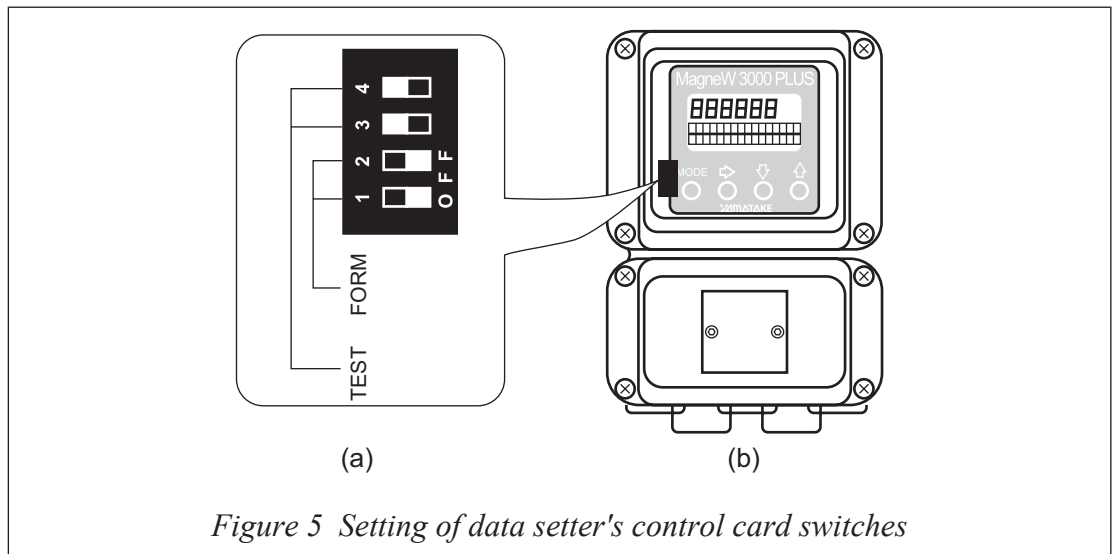
Figure 4 Communication not available

1-3 : Setting the converter

For the converter to communicate with the HART Communicator, two kinds of switches need to be set. One kind is located on the data setter's control card and the other on the main card. (These switches are factory set.)

1-3-1 : Setting data setter control card switches

The data setter's control card switches are located as shown by the black rectangular blocks in Figure 5(b). Set these switches as illustrated in Figure 5(a). Switches 1 and 2 should be ON and 3 and 4 should be OFF.



1-3-2 : Setting main card switches

The switches that require setting are located in the locations shown by the black rectangular blocks in Figure 6(b) and Figure 7(b). (The same switches are shown in both figures.) There are two types of switch settings: for internal power supply for current output or external supply for the output.

For internal power supply type

Set the switches as shown in Figure 6(a). Move the switches in the direction of black block in the figure.

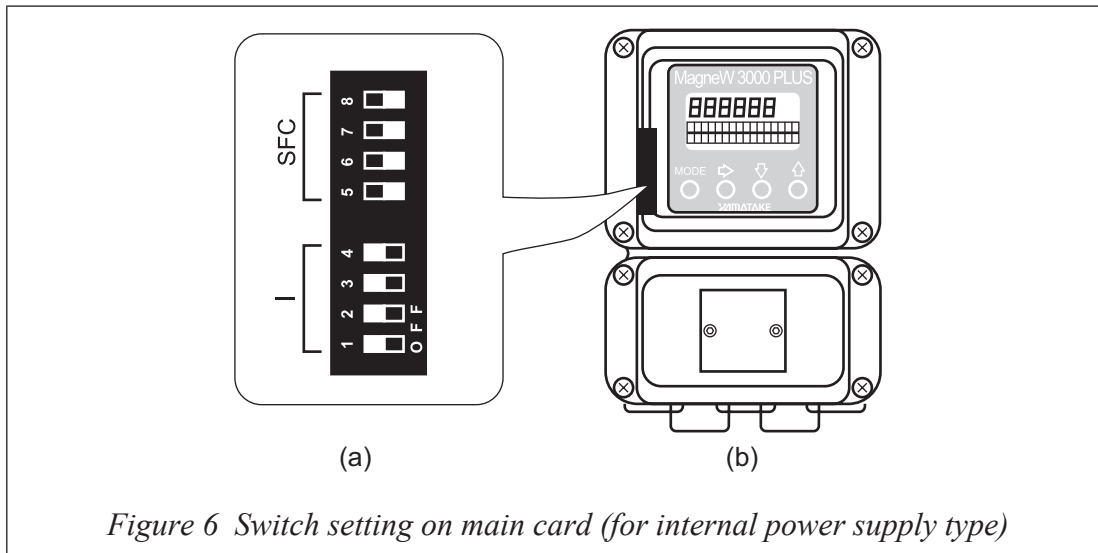


Figure 6 Switch setting on main card (for internal power supply type)

For external power supply type

Set the switches as shown in Figure 7 (a). Move the switches to the direction of black blocks in the figure.

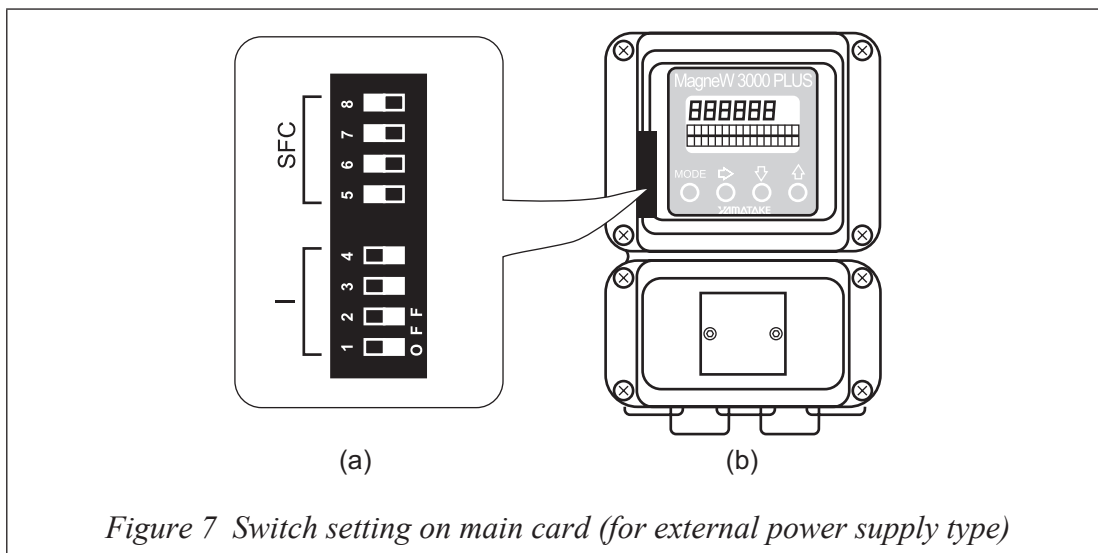


Figure 7 Switch setting on main card (for external power supply type)

 **CAUTION**

Do not remove the HART Communicator cable from the converter while executing communication. If the cable is disconnected during data setting transmission there will be no data transfer to converter.

2 : Setting and calibrating devices using the HART Communicator

The HART Communicator enables the user to set a MagneW PLUS+ device as well as allowing them to adjust and check the output of the device and to inspect the device. The following values can be set using the HART Communicator:

- Flow unit
- Range
- Dumping constants
- Detector diameter
- Low flow cut
- Unit of pulse weight
- Pulse width
- Reset value of the integral counter
- Tag

Also, the following calibrations and inspection can be made:

- Zero point adjustment
- Current output calibration at 4mA and 20mA
- Pulse output inspection

For a detailed list of all the menus, see the HART Communicator's menu table for the MagneW PLUS+ at the back of this manual.

2-1 : Setting procedures

The procedures to set various device values are described in this section.

2-1-1 : Flow units

The unit for the flow is to be set as follows:

1. Select "1. Device setup" from online menu 1 (Figure 3). The device setup menu will then be displayed. (Figure 8)

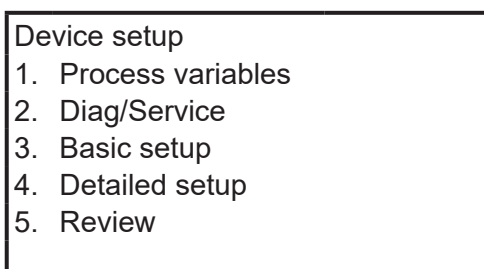


Figure 8 Device setup menu

2. Select “3. Basic setup” from the menu and then the basic setup menu will be displayed. (Figure 9)

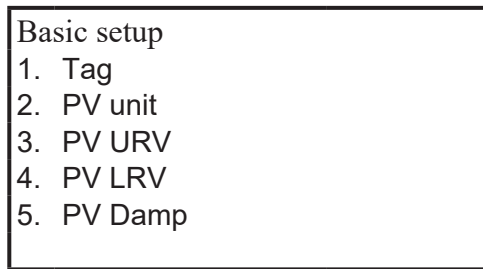


Figure 9 Basic setup menu

3. Select “2. PV unit” from the basic setup menu.
4. Once the display as shown in Figure 10 appears, move the arrow key up or down to select a flow unit. After making a selection, press F4 (ENTER). If F3 (ESC) is pressed here, the selection will be canceled and the display will return to the basic menu.

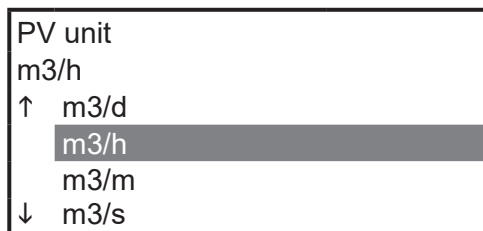


Figure 10 Selection of flow rate unit

5. After pressing F4 (ENTER) and returning to the basic menu, press F2 (SEND). The HART mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 11)
Once communication is complete, the HART mark will disappear.

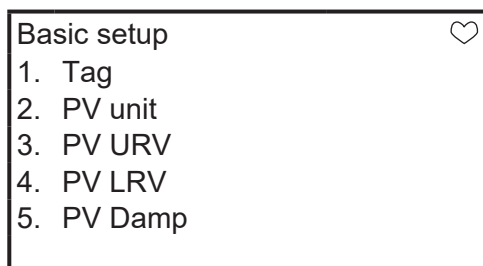


Figure 11 Transmitting the setting

2-1-2 : Range

The upper limit of the flow range is set as follows:

1. Select “3. PV URV” from basic setup menu.
2. Use the numeric keys to enter a new range value in the value input display. Up to six digits including a decimal point can be entered. (Figure 12)

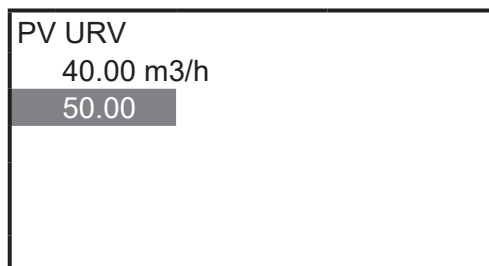


Figure 12 Range input

3. Once a new value is entered, press F4 (ENTER) to return to the basic setup menu. If F3 (ESC) is pressed, the change is canceled and the display returns to the basic setup menu.
4. After returning to the basic setup menu, press F2 (SEND). The HART Communicator mark will appear on the upper right hand corner while HART is communicating with the device. (Figure 11) The mark will disappear once communication has properly completed.

The low limit of the range is always 0 and cannot be changed. Do not select “PVLRV” from the basic setup menu. If selected, the display will show an input value for the low limit of the range as shown in Figure 12. Any input other than 0 cannot be set to converter. Doing so will result in an error.

2-1-3 : Damping constant

To change the dumping constant, proceed as follows:

1. Select “5. PV Damp” from the basic setup menu. (Figure 9)
2. Once the display (Figure 13) appears, enter a range value using the numeric keys. The range value that can be entered must be from 0.5s to 1.99s in increments of 0.1. Any other value is unacceptable and will result in an error message being displayed.

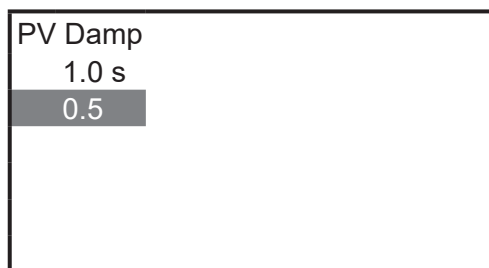


Figure 13 Damping constant input

3. After the value has been entered, press F4 (ENTER) to return to the basic menu. If F3 (ESC) is pressed here, the change will be aborted and the display returns to the basic setup menu.

4. After returning to the basic setup menu, press F2 (SEND). The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 11) The mark will disappear once communication is properly completed.

2-1-4 : Detector diameter

Proceed as follows to change the detector diameter setting for the converter:

1. Select “4. Detailed setup” from the device setup menu. (Figure 8)
2. Select “1. Sensor” from the detailed setup menu. (Figure 14)

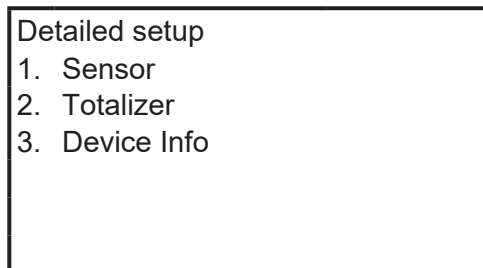


Figure 14 Detailed setup menu

3. From the sensor menu (Figure 15), select “2. Sensor config”.

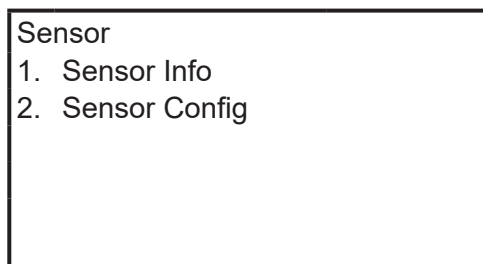


Figure 15 Sensor menu

4. From the Sensor Config menu (Figure 16), select “1. Flow tube size”.

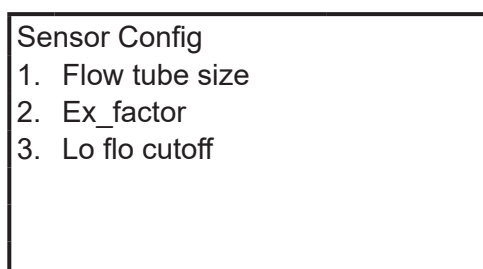


Figure 16 Sensor config menu

- When the display as shown in Figure 17 appears, use the up/down arrow keys to select a detector diameter. After making a selection, press F4 (ENTER) to return to the Sensor Config menu. If F3 (ESC) is pressed here, the change will be aborted and the display will return back to the basic setup menu.

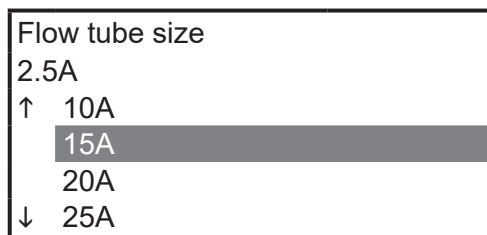


Figure 17 Selecting a detector diameter

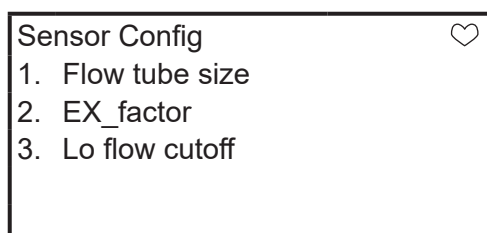


Figure 18 Transmitting the setting

- Once returning to the Sensor Config menu, select F2 (SEND) to transmit the change to the converter. The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 18) The mark will disappear once communication is properly completed.

2-1-5 : Detector constants

To change detector time constant, follow the steps described below:

- From the Sensor Config menu (Figure 16), select “2. Ex_factor”.
- A numerical value input display (Figure 19) will then appear. Use the numeric keys to input a detector constant. Once the input has been completed, press F4 (ENTER) to return to the Sensor Config menu. If F3 (ESC) is pressed here, the change will be aborted and you will be taken back to the original menu

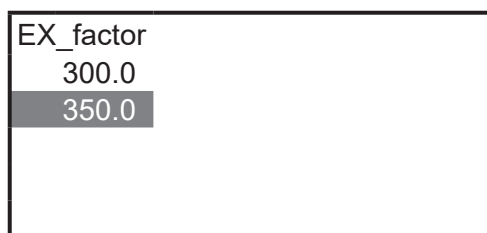


Figure 19 Input of detector constant

- After returning to the Sensor Config menu, select F2 to transmit the change to the converter. The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 18) The mark will disappear once communication is properly completed.

2-1-6 : Low flow cutoff

To set the low flow cutoff, proceed as follows:

1. From the Sensor Config menu (Figure 16), select “3. Lo flo cutoff”.
2. Once the display as in Figure 20 appears, use the up or down keys to select “OFF” or a value from 0% to 10%. After a selection has been made, press F4 (ENTER) to return to the Sensor Config menu. If F3 (ESC) is pressed here, the change will be aborted and you will be returned to the Sensor Config menu.

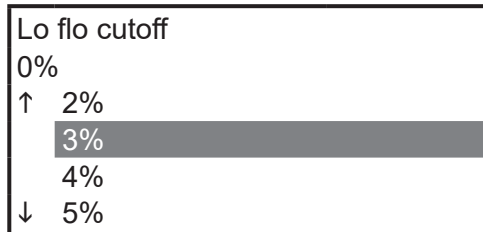


Figure 20 Setting of low flow cutoff

2-1-7 : Unit of pulse weight

The pulse weight unit is set as follows:

1. Select “2. Totalizer” from the detailed setup menu. (Figure 14)
2. Select “1. Pulse output config.” from the totalizer menu. (Figure 21)

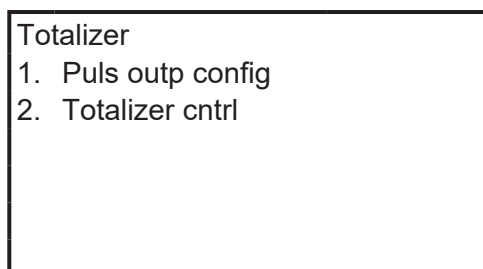


Figure 21 Totalizer menu

3. Select “1. Puls out unit” from the puls outp config menu.

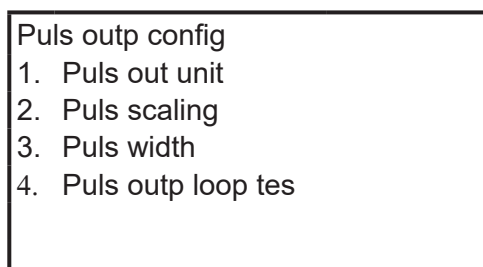


Figure 22 Puls outp config menu

- When the display as that shown in Figure 23 appears, use the up or down arrow to select the required unit from the six types listed. (kg/P, g/p, t/P, cm³/P, l/P, m³/P)

After making a selection, press F4 to return to the puls outp config menu. If F3 (ESC) is pressed here, the change will be aborted and you will be taken back to the original menu.

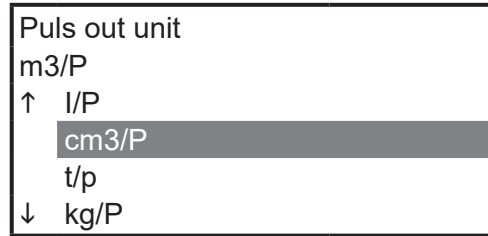


Figure 23 Selection of pulse weight unit

- After returning to the Puls outp config menu, select F2 (SEND) to transmit the change to the converter. The HART communicator mark will appear in the upper right hand corner of the display while HART is communicating with device. (Figure 24) The mark will disappear once communication has been properly completed.

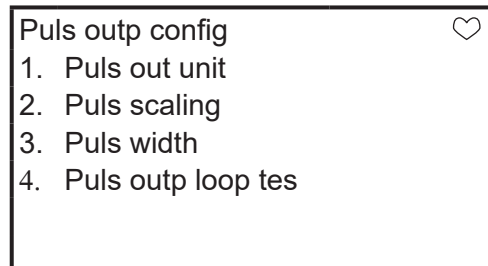


Figure 24 Transmitting the setting

2-1-8 : Pulse weight

The pulse weight is set as follows:

- Select “2. Puls scaling” from the Puls outp confi menu. (Figure 22) If the pulse weight has been changed prior to this step but the change has not been transmitted to the converter, a message demanding the transfer will appear on the display. (Figure 25) Press F4 (OK) here.

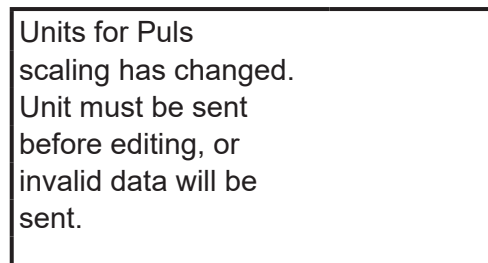


Figure 25 Demand for data transfer

- A display to input a value for the pulse weight then appears. (Figure 26) Enter a 7-digit number including the decimal point. Once a value has been inputted, press

F4 (ENTER) to return to the Puls outp config menu. If F3 (ESC) is pressed here, the change is aborted

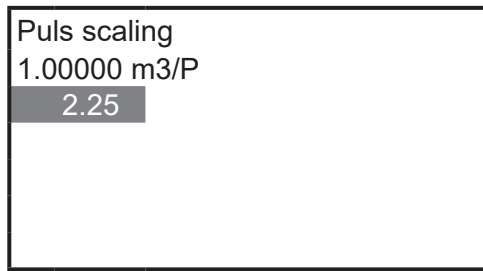


Figure 26 Setting the pulse weight

3. After returning to the Puls outp config menu, select F2 (SEND) to transmit the change to the converter. The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 18) The mark will disappear once communication has been properly completed.

2-1-9 : Pulse width

The pulse width is set as follows:

1. Select "3. Puls width" from the Puls outp config menu. (Figure 22)
2. A display for numerical value entry will then appear. (Figure 27) Enter a six-digit number including a decimal point for the pulse width. Once the number has been inputted, press F4 (ENTER) to return to the Puls outp config menu. If F3 (ESC) is pressed here, the change will be aborted and you will be returned to the original menu.

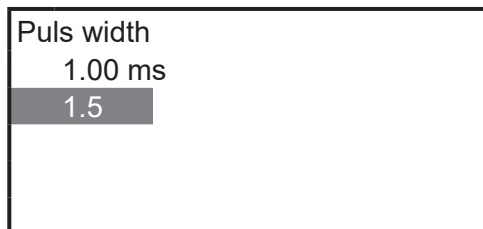


Figure 27 Pulse width input

3. After returning to the Puls output config menu, select F2 (SEND) to transmit the change to the converter. The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 24) The mark will disappear once communication has been properly completed.

2-1-10 : Reset value of integral counter

The integral counter's start value for integration is set as follows:

1. Select “2. Totalizer cntl” from the totalizer menu. (Figure 21)
2. A ten-digit number can be entered. Use the numeric keys to input a new value. Once a new value has been inputted, press F4 (ENTER) to return to the Totalizer menu. If F3 (ESC) is pressed here, the change will be aborted.

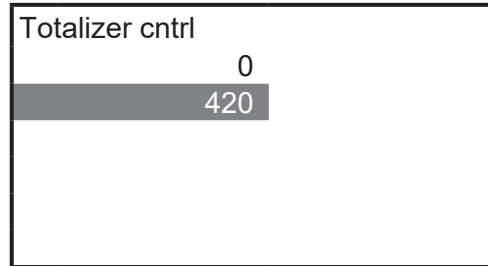


Figure 28 Integral counter reset value input

3. After returning to the totalizer menu, press F2 (SEND) to transmit the change to the converter. The HART Communicator mark will appear in the upper right hand corner while HART is communicating with the device. (Figure 24) The mark will disappear once communication has been properly completed.

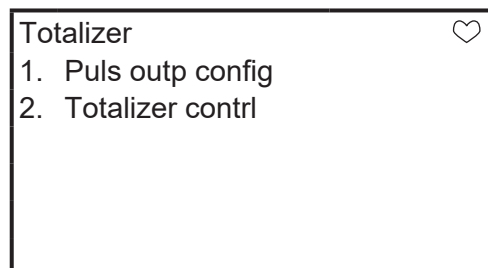


Figure 29 Setting data transfer

2-2 : Calibrating and inspecting the device

Device calibration and inspection procedures using the HART Communicator are described here.

2-2-1 : Zero point adjustment

Follow the steps described below to set the momentarily flow of static pressure to zero.

1. Stop and make static the fluid in the flowmeter to be calibrated.
2. Select “2. Diag/Service” from the device set up menu. (Figure 8) The Diag/Service menu will then be displayed as shown in Figure 30.

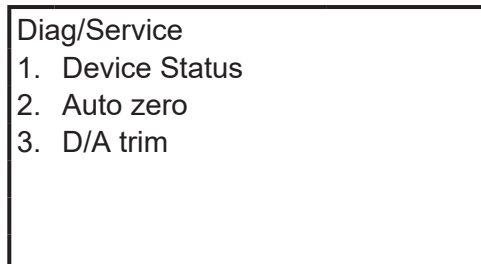


Figure 30 Diag/Service menu

3. Select “2. Auto zero” from the Diag/Service menu.
4. When Auto zero is selected, a “Please wait” message will momentarily appear. (Figure 31) The display then changes to that shown in Figure 32. To adjust the zero point, press F4 (OK). The zero point is then adjusted. By pressing F3 (ABORT), the procedure is canceled and you are returned back to the Diag/Service menu.

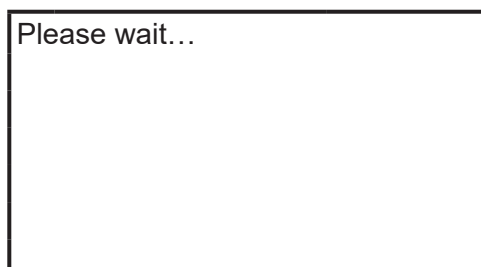


Figure 31 Please wait message

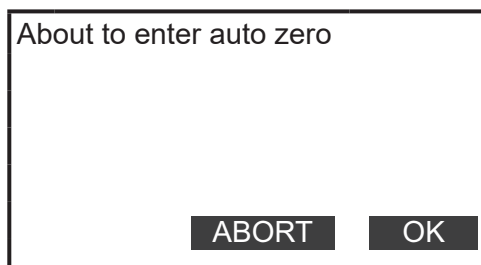


Figure 32 Zero point adjustment start message

5. While zero point adjustment is in progress, the screen remains unchanged. (Figure 33) If F3 (ABORT) is pressed here, zero point adjustment is canceled

and you will be returned to the Diag/Service menu. Once zero point adjustment is completed, the Diag/Service menu automatically is displayed.

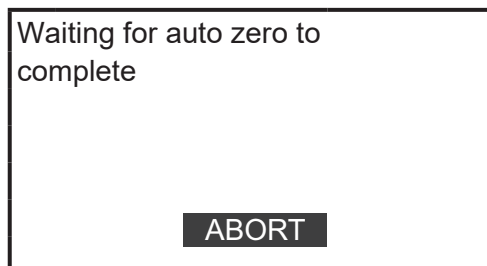


Figure 33 Zero point adjustment in progress message

6. If there was malfunction during zero point adjustment, a message stating that the applied process is too high will appear. (Figure 34) Select either “OK” or “ABORT” to return to the Diag/Service menu and verify that the flow fluid is completely static.

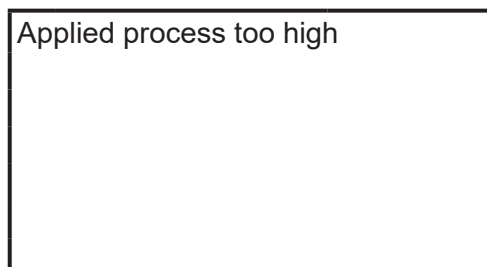


Figure 34 Zero point adjustment failure

2-2-2 : 4 mA and 20 mA current output adjustment

During current output adjustment, the converter outputs current signals of either 0% or 100% of the flow range. If this affects the higher hierarchy control system, take measures so that the converter output is not sent to the control system. Actual measurement of current output is necessary for calibration. Proceed with the following steps to adjust the current output.

1. Select “3. D/A trim” from the Diag/Service menu. (Figure 30)
2. After a brief pause, a message 'WARN-Loop should be removed from automatic control' will appear. (Figure 35) If the control system is not affected by the forcible change of the current signal, press F4 (OK). Otherwise, press F4 (ABORT) to return to Diag/Service menu.

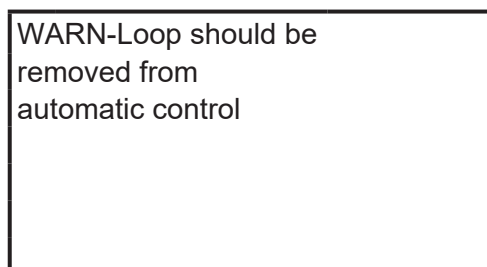


Figure 35 Warning for current adjustment

3. A message stating 'Connect reference meter' will then appear. (Figure 36) At this time, connect a meter to output terminals to measure the current and then press F4 (OK). To abort, press F3 (ABORT) and proceed on to step 11.

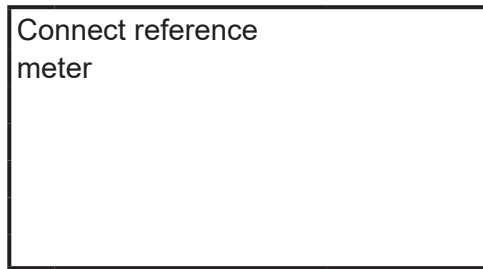


Figure 36 Message stating to connect meter

4. A message stating 'Setting fld dev to 4mA' will then appear. (Figure 37) By pressing F4 (OK), current adjustment will start and the converter will output a current corresponding to 0% of the flow range. To cancel, press F3 (ABORT) and proceed to step 11



Figure 37 Message to start current adjustment

5. By selecting F4 (OK) in the above step, the converter's indicator will flicker and I.OUT OUTPUT MODE display will appear. The HART Communicator displays on its screen the present current input value. (Figure 38) Measure the output current from the converter and enter it into the device. Once the input has been completed, press F4 (ENTER). To cancel, press F3 (ABORT) and proceed to step 10.

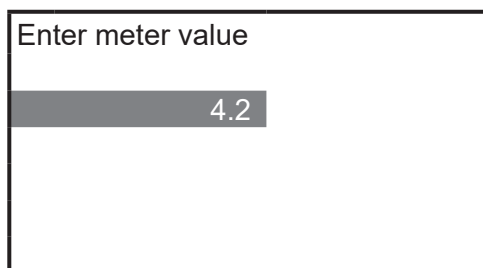


Figure 38 Current value input display

6. Press F4 (ENTER). The converter will start to accurately output 4mA based on the input value. The display as shown in Figure 39 will then appear. Measure the current manually and verify that it is 4mA. After this is verified, select "1. Yes"

and proceed on to the next step. By choosing “2. No”, the display of that shown in Figure 38 to show the current input will appear. Pressing F3 (ABORT) takes you back to the Diag/Service menu where you should proceed to step 10.

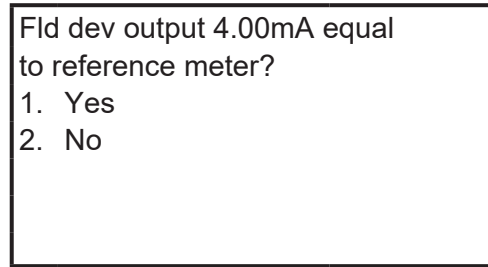


Figure 39 Verification of current output

7. Next a message stating 'Setting fld dev output to 20mA' will appear. (Figure 40) By pressing F4 (OK), current adjustment will start and the device will commence outputting a current corresponding to 100% of the flow. To cancel, press F3 (ABORT) and proceed on to step10.

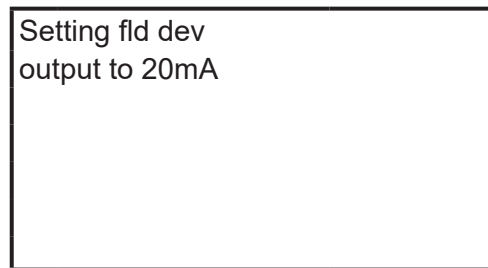


Figure 40 Message to start current adjustment

8. By selecting F4 (OK) in the above step, the converter's indicator will flicker and the _IN I.OUTPUT MODE display will appear. The HART Communicator shows on the display the present current input value. (Figure 38) Measure the output current from the converter and enter this value into the device. Once this is completed, press F4 (ENTER). To cancel, press F3 (ABORT) and proceed to step10.

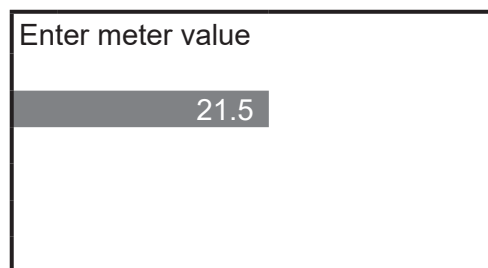
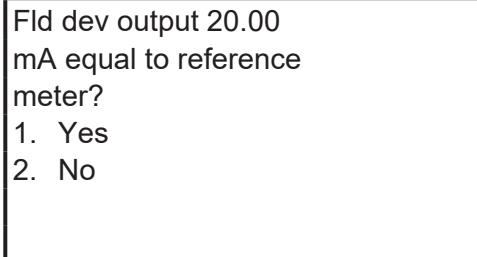


Figure 41 Current value input

9. By pressing F4 (ENTER), the converter will accurately output 20mA in reference to the input value. (Figure 42) Measure the current output and verify that it is 20mA. After this is verified, choose “1. Yes” and proceed on. By selecting “2.

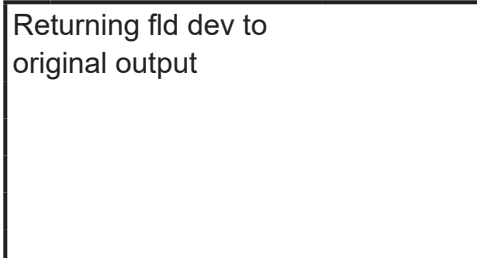
No”, the current input display (Figure 41) will appear. Pressing F3 (ABORT) here returns you to the Diag/Service menu where you should proceed on to step10.



Fld dev output 20.00
mA equal to reference
meter?
1. Yes
2. No

Figure 42 Verification of current output

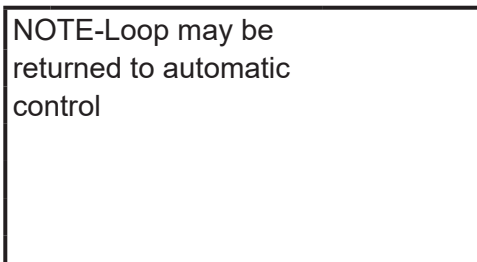
10. The converter transmits a forcible current output and the HART Communicator's display will show a message stating 'returning fld dev to original output'. (Figure 43) This message will disappear automatically.



Returning fld dev to
original output

Figure 43 Forcible current output release message

11. A message stating 'NOTE-Loop may be returned to automatic control' will then appear. (Figure 44) If the converter has been disconnected, reconnect it now. If everything is acceptable, press F4 (OK). Adjustment work is now complete. The display returns to the Diag/Service menu.



NOTE-Loop may be
returned to automatic
control

Figure 44 Message to urge connection between device and system

2-2-3 : Pulse output check

Proceed with the following steps to check the pulse output.

1. Choose “4. Puls outp loop tst” from the Puls outp config menu. (Figure 22)
2. A message stating 'About to enter fixed freq. Mode test' as shown in Figure 45 will then appear. Press F4 (OK) to proceed. If F3 (ABORT) is pressed here, proceed on to step 7.

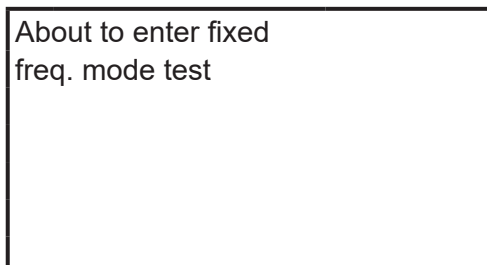


Figure 45 Message to start pulse output check

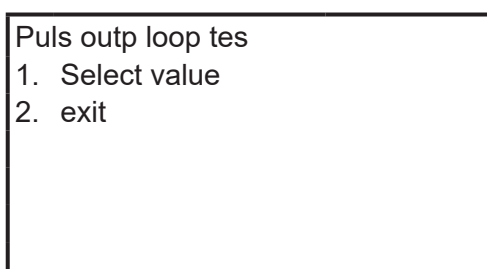


Figure 46 Selection display for pulse output check

3. The display as that shown in Figure 46 will then appear. For pulse output inspection, select “1. Select value”. If “2. exit” is selected, the display is returned back to the original menu. If F3 (ABORT) is pressed here, proceed to step 7.
4. Next the numerical value input display will appear. (Figure 47) Here, a ratio for the flow range is input. A pulse corresponding to the input value will be then output. After the value has been entered, press F4 (ENTER). If F3 (ABORT) is pressed here, the display returns back to the menu where you should proceed on to step 7.
5. After F4 (ENTER) is pressed, a pulse corresponding to [(pulse span frequency) x (ratio as input in 4. above)] is forcibly output. The converter will show a flickering “_IN PULSE OUTPUT MODE” message. The HART Communicator display returns to that shown in Figure 46 again. To change the output pulse, select “1. Select value” and reenter the numerical value. To finish, press “2.exit”.

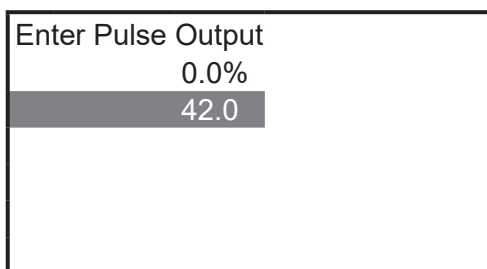
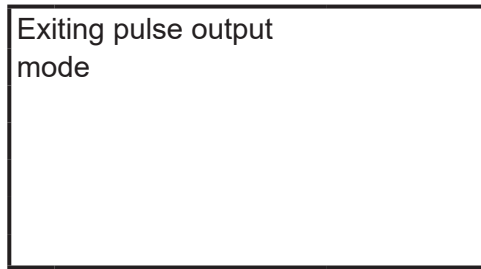


Figure 47 Pulse output entry

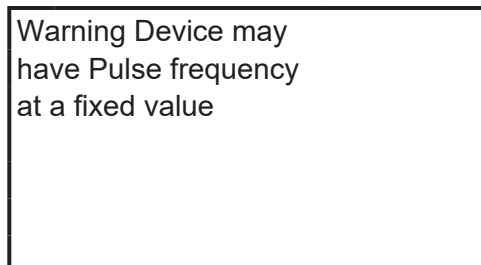
6. If exit is selected, the HART Communicator display will show a message stating 'Exiting pulse output mode'. (Figure 48) After a short while, a forcible pulse output is released and the display returns to the menu. If F3 (ABORT) is pressed here, the display returns to the menu where you should proceed to step 7.



Exiting pulse output
mode

Figure 48 Forcible pulse output release message

7. If F3 (ABORT) is pressed, a message stating 'Warning Device may have Pulse frequency at a fixed value' will appear. (Figure 49) Verify that the pulse output corresponds to the flow output. This message automatically disappears after a short while and then the display will return to the menu.



Warning Device may
have Pulse frequency
at a fixed value

Figure 49 Forcible pulse output warning

3 : Other functions of HART Communicator

The HART Communicator not only facilitates output setting but also verifies the present status of the device. It also facilitates the setting of a tag number and other functions that are not directly related to the output. This chapter describes the HART Communicator functions other than those related to output settings.

3-1 : Settings not related to output

There are four settings that are not directly related to output. These are tag, descriptor, message and date. Follow the steps described below to set these.

1. Select “Device Info” from the detailed setup menu. (Figure 14)
2. The device info menu (Figure 50) shows you a list including tag, description, message and date. Select the one that you want to change. Figures for these are shown respectively in Figure 51 to Figure 54.

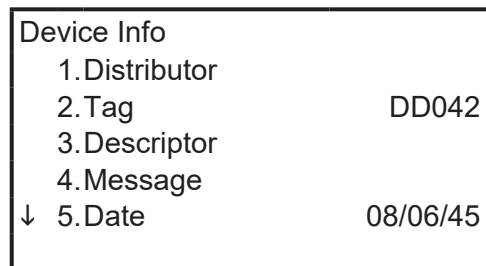


Figure 50 Device info menu

3. The date is written as month, day and year. The year can be entered as four digits. For years of the 1900's, only the last two digits are displayed and saved. For the 2000's, all four digits are displayed and saved. Tags can also be changed from the basic setup menu.

Tag
DD042
FIC-0001

Figure 51 Setting the tag

Descriptor
DEV-420
LINE-2024

Figure 52 Setting the descriptor

Message
XXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXX
FLUID WATER

Figure 53 Setting the message

Date
08/06/45
12/25/2000

Figure 54 Setting the date

3-2 : Verifying the device status and other menus

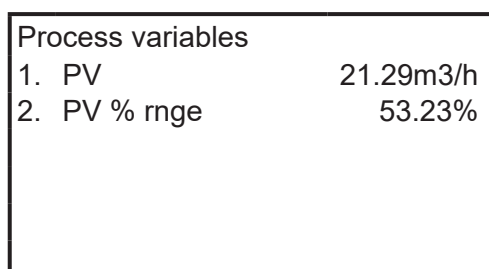
The methods to verify the status and setting of the device and those other menus which have not been explained are described here.

3-2-1 : Online

From the menu shown in Figure 3, present flow (PV), analog output (AO) and upper limit of range (URV) all can be verified. If these values are not completely displayed, the digits exceed the limit of display so use the right hand arrow key and the single item can be displayed for verification.

3-2-2 : Process variables

By selecting “Process variables” from the device setup menu (Figure 8), a display as shown in Figure 55 will appear. This display allows you to verify the output of the device for ratio to range and in a flow unit.

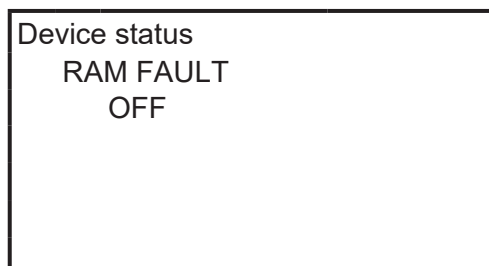


Process variables	
1. PV	21.29m3/h
2. PV % rng	53.23%

Figure 55 Process variables

3-2-3 : Device status

By selecting “Device status” from the Diag/Service menu (Figure 30), a display as shown in Figure 56 will appear which enabling you to verify the present status of the device. Use F2 (PREV) or F3 (NEXT) to choose an item to verify.



Device status	
RAM FAULT	
OFF	

Figure 56 Device status

The device is normal if the status of each item is OFF. If the status is listed as ON, normal measurement cannot be made. Verify the setting and status of the device. The items that are to be checked are as listed in Table 1. However, if there is any abnormality in the device, an error will be displayed as shown below.

If an error is transmitted to the HART Communicator while the device status is being displayed, the HART Communicator's will display a transmitted error as shown in Figure 57.

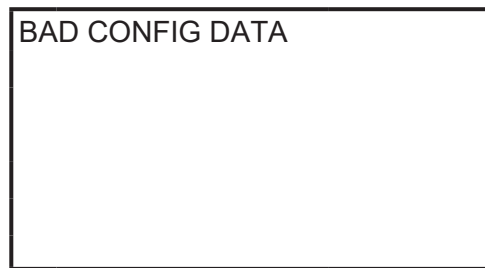


Figure 57 Error

By pressing F3 (NEXT), the transmitted error can be read. By pressing F2 (PREV), the previous error is displayed. Keep pressing F3 (NEXT) to view all the errors that occurred. The last display will be that as shown in Figure 58.

By pressing F1 (YES) here, up to fifty errors will be ignored and will not be sent to HART Communicator. HART Communicator's display will be as shown in Figure 56. Thus the condition of the device can be verified by using the device setup function until the 51st error is sent. However, once the 51st error has been transmitted, the display as shown in Figure 57 will pop up. Since an error experienced by the converter is always transmitted to the HART Communicator, display shown in Figure 57 will reappear even if no action is taken in the display shown in Figure 56.

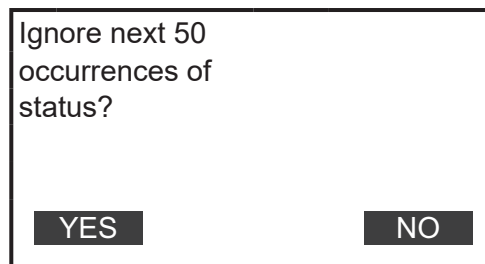


Figure 58 Inquiring to ignore error

If F2 (NO) is selected in Figure 58, the HART Communicator's display will change to that shown in Figure 56. However, unless the device is set back into its normal condition, the display shown in Figure 57 will appear immediately upon the next error message from the converter.

Table 1 Items of device status

Item	Description
EXCCITE COIL FAULT	Faulty excitation by coil
A.C. POWER LOSS	Power supply failure
NVM fault	Faulty non-volatile memory
RAM FAULT	Faulty RAM
ROM FAULT	Faulty ROM
A/D FAULT	Faulty A/D converter
BAD CONFIG DATA	Existence of invalid data
DI/DO SATATUS	Contact output loop being checked
FIXED PULSE MODE	Pulse output being checked
OUTPUT MODE	Analog output being checked
LOCAL MODE	Setting being changed from display
CORRECT RESET	Unadjusted
EXCIT CHECK MODE	Exciting current being checked
EMPTY PIPE	Empty pipe detected
EXT ZERO ACTIVE	In zero adjustment mode
TYPE-DIA ERROR	Detector type and diameter incompatible
HIGH<LOW ERROR	Abnormal upper/lower limit alarms
SPAN OVER ERROR	Span exceeds 12m/s
PULSE WEIGHT ERROR	Frequency exceeds 200 Hz because of pulse weight, frequency is under 0.00006 Hz or different unit systems for range and pulse weights.
PULSE WIDTH ERROR	Duty ratio exceeds 70% because of pulse width
HYSTERISIS ERROR	Hysteresis exceeds 20%

3-2-4 : Sensor Info

By selecting “1. Sensor info” from the sensor menu (Figure 15), the available upper limit of the setting range (PV USV), the lower limit (PV LSV) and the minimum span width of the range can be verified.

Sensor info	
1. PV LSL	0.00 m3/h
2. PV USL	54.29 m3/h
3. PV Min span	

Figure 59 Sensor info

3-2-5 : Device info

As already described in section 3.1, settings that do not affect the output such as tag and others can be set from the device info menu (Figure 50). This menu also enables the user to verify such information as distributor, write protect, etc.

The value of write protect is YES only if the protect level is set at 3. For levels 0 to 2, it is NO.

3-2-6 : Review

By selecting “Review” from the device setup menu (Figure 8), the condition of the device can be verified. Use F2 (PREV) to choose an item for verification. The items that can be verified are listed in Table 2.

Table 2 Review

Item	Description
Model	Model of device (MagneW)*
Distributor	Sales agent*
PV Unit	Unit of flow
PV URV	Upper limit of flow range
PV LRV	Lower limit of flow range (Fixed at 0m ³ /hr)
PV USV	Maximum value of range available for setting*
PV LSV	Minimum value of range for setting*
PV Min span	Minimum range width*
Xfer fcnctn	Transfer function of detector output to analog output
Lo flo cutoff	Low flow cut off
Flow tube size	Size of detector diameter
Puls scaling	Pulse weight
Puls width	Pulse width
PV Damp	Damping constant
AO Alrm type	Direction of abnormal alarm processing
Write protect	Write protect*
Manufacturer	Manufacturer*
Tag	Tag*
Descriptor	Descriptor*
Message	Message*
Date	Date*

* These values do not affect setting

4 : Table of HART Communicator menus for MagneW PLUS+

Online Menu				
1. Device setup 2. PV 3. PV LRV 4. PV URV	1. Process variables	1. PV units 2. PV% range		
	2. Diag/Service	1. Device status 2. Auto zero 3. D/A trim		
	3. Basic setup	1. Tag 2. PV unit 3. PV URV 4. PV LRV 5. PV Damp		
	4. Detailed setup	1. Sensor	1. Sensor info	1. PV LSV 2. PV USV 3. PV Min span
			2. Sensor Config	1. Flow tube size 2. EX_factor 3. Lo flo cutoff
2. Totalizer		1. Puls outp con-fig	1. Puls out unit 2. Puls scaling 3. Puls width 4. Puls outp loop tes	
	3. Device Info	1. Distributor 2. Tag 3. Descriptor 4. Message 5. Date 7. Write protect		
	5. Review			

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

Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).

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.

In addition,

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
[For use outside nuclear energy controlled areas] [For use of Azbil Corporation's Limit Switch For Nuclear Energy]
 - * 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. 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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