User's Manual

ADMAG TI Series
AXG, AXW Magnetic Flowmeter
PROFIBUS PA Communication Type

IM 01E21A02-04EN

YOKOGAWA
Yokogawa Electric Corporation

IM 01E21A02-04EN
3rd Edition

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AXG, AXW Magnetic Flowmeter
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1. Introduction

This manual explains basic operations of ADMAG TI Series AXG, AXW magnetic flowmeters with PROFIBUS PA protocol.
For items which are not covered in this manual, read the applicable user's manuals listed in "Table 1.1 Manual and General Specifications List" in the ADMAG TI Series Installation Manual. These documents can be downloaded from the YOKOGAWA website. To ensure the correct use of the product, read these manuals thoroughly and fully understand how to operate the product before operating it. To confirm the model name and specifications of the product, refer to the general specifications.
Website address: http://www.yokogawa.com/fld/doc/

Precautions Related to the Protection, Safety, and Alteration of the Product

The following safety symbol marks are used in this manual and the product.



WARNING

A WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition, or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.



CAUTION

A CAUTION sign denotes a hazard. It calls attention to a procedure, practice, condition, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

IMPORTANT

An IMPORTANT sign denotes that attention is required to avoid damage to the product or system failure.

NOTE

A NOTE sign denotes information necessary for essential understanding of operation and features.

The following symbols are used in the product and the manual to indicate the accompanying safety precautions:

Protective grounding terminal

Functional grounding terminal
(This terminal should not be used as a protective grounding terminal.)

Alternating current

Direct current

Caution
This symbol indicates that the operator must refer to an explanation in the user's manual in order to avoid the risk of injury or death of personnel or damage to the product.

For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that are stated in user's manual whenever you handle the product. Take special note that if you handle the product in a manner that violates these instructions, the protection function of the product may be damaged or impaired, or may not be fully demonstrated. In such a case, YOKOGAWA does not guarantee the quality, performance, function, or safety of the product.

Regarding This User's Manual

- This manual should be provided to the end user.
- The contents of this manual are subject to change without prior notice.
- No part of this manual may be reproduced in any form without YOKOGAWA's written permission.
- YOKOGAWA makes no warranty of any kind with regard to this manual, including, but not limited to, implied warranty of merchantability and fitness for a particular purpose.
- If any questions arise or errors are found, or if any information is missing from this manual, inform the nearest YOKOGAWA sales office.
- The specifications covered by this manual are limited to those for the standard type under the specified model number break-down and do not cover custom-made products.
- Note that changes in the specifications, construction, or component parts of the product may not immediately be reflected in this manual at the time of change, provided that postponement of revisions will not cause difficulty to the user from a functional or performance standpoint.
- This manual is intended for the following personnel:

  Engineers responsible for the installation and wiring of the product.

  Personnel responsible for the normal daily operation of the product (operator).
- To ensure correct use, read this manual and the applicable manuals thoroughly before starting operation. Read the general specifications for specifications of the product.

Trademarks

- All the brands or names of Yokogawa Electric's products used in this manual are either trademarks or registered trademarks of Yokogawa Electric Corporation.
- All other company and product names mentioned in this manual are trade names, trademarks or registered trademarks of their respective companies.
- In this manual, trademarks and registered trademarks are not marked with "™" or "®".
- PROFIBUS is a registered trademark of PROFIBUS Nutzerorganisation e.V., Karlsruhe, Germany.

1.1 For Safe Use of Product

For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that are stated in user's manual whenever you handle the product. Take special note that if you handle the product in a manner that violates these instructions, the protection function of the product may be damaged or impaired. In such a case, YOKOGAWA shall not be liable for any indirect or consequential loss incurred by either using or not being able to use the product.

General

WARNING

- Do not open the cover in wet weather or humid environment. When the cover is open, the stated enclosure protection is not applicable.
- When opening the cover, wait for more than 20 minutes after turning off the power. Only an expert engineer or skilled personnel is permitted to open the cover.

Operation

WARNING

Be sure to enable the write protection function to prevent parameters from being overwritten after finishing parameter setting.
In rare cases, the IR switches may respond unexpectedly to water drops or extraneous substances sticking on the surface of the display panel due to characteristics of the operating principles. The possibility of malfunction arises after rain or cleaning near the place where the flowmeter is installed. Repeatedly turning a flashlight, etc. on and off in the direction of the IR switch may also be a cause of malfunction.
Read the installation manual for the hardware write lock function, and Section 5.12 for the software write lock function.

Maintenance

WARNING

- If dirt, dust or other substances adhere to the glass of the display, wipe them clean with a soft dry cloth.
- Maintenance of this product should be implemented in a maintenance service shop where necessary devices and environment condition are provided. The required environmental condition is that the ambient temperature should be 5 to 40 °C (humidity of which maximum relative humidity is 80% for temperatures 5 to 31 °C, and of which relative humidity linearly decreases to 50% at a temperature of 40 °C when the temperature is over 31 °C).

microSD card

IMPORTANT

- Do not store or use the microSD card in places with static electricity near electrically charged objects or where electrical noise is present. Doing so can result in electric shock or damage to the microSD card.
- Do not disassemble or modify the microSD card.
- Do not physically shock, bend, or twist the microSD card.
- While reading/writing data, do not turn off the power, apply vibration or shock or pull out the card. Data can be corrupted or permanently lost.
- Use only the microSD cards specified by YOKOGAWA. The operation cannot be guaranteed when other cards are used.
- When inserting the microSD card into the product, make sure to orient the microSD card correctly (face up or down) and insert it securely. If not inserted correctly, the microSD card will not be recognized by the product.
- Do not touch the microSD card with wet hands.
- Do not use the microSD card if it is dusty or dirty.
- The microSD card comes formatted. If you would like to format the microSD card, use the product's Format function.
- YOKOGAWA provides no warranty for damage to, or loss of data recorded on the microSD card, regardless of the cause of such damage or loss. We recommend regularly making backup copies of your data.

1.2 Warranty

- The warranty shall cover the period described in the quotation presented to the purchaser at the time of purchase. Problems that may occur during the warranty period shall be repaired free of charge.
- In case of problems, the customer should contact the YOKOGAWA representative from which the product was purchased or the nearest YOKOGAWA office.
- If a problem arises with this product, please inform YOKOGAWA of the nature of the problem and the circumstances under which the problem developed, including the model specification and serial number. Any diagrams, data and other information you can include in your communication will also be helpful.
- Responsible part for repair costs of the problems shall be determined by YOKOGAWA based on our investigation.
- The purchaser shall bear the responsibility for repair costs, even during the warranty period, if the malfunction is due to:
  - Failure due to improper and/or inadequate maintenance by the purchaser.
  - Failure or damage due to improper handling, use, or storage which does not conform to design conditions.
  - Use of the product in question in a location not conforming to the standards specified by YOKOGAWA, or problems due to improper maintenance of the installation location.
  - Failure or damage due to modification or repair by any party except YOKOGAWA or an approved representative of YOKOGAWA.
  - Malfunction or damage from improper relocation of the product in question after delivery.
  - Reason of force majeure such as fires, earthquakes, storms/floods, thunder/lightning, or other natural disasters, as well as disturbances, riots, warfare, or radioactive contamination.

2. About PROFIBUS PA

2.1 Overview

PROFIBUS PA is a widely used bi-directional digital communication protocol for field devices that enable the simultaneous output to many types of data to the process control system.

The ADMAG TI Series PROFIBUS PA communication type employs the specifications standardized by PROFIBUS Nutzerorganisation e.V. and provides interoperability between Yokogawa devices and those produced by other manufacturers. PROFIBUS PA comes with software consisting of AI, TOT, DI, and AO function blocks that enable the flexible implementation of systems.

2.2 Internal Structure

This product contains eight blocks that share the following functions:

(1) Physical block (PB)

- Manages the status of hardware.
- Automatically informs the host of any detected faults or other problems.

(2) Flow transducer block (FTB)

- Converts sensor output to flow rate signal and transfers to AI function block.
- Obtains the adhesion resistance, electrode potential, flow noise and conductivity from the sensor output, and transfers them to the AI function blocks.

(3) Diagnosis transducer block (DTB)

Has functions to set verification functions, alarm, warning and to monitor them.

(4) Local Display transducer block (LTB)

- Controls the display.

(5) Maintenance transducer block (MTB1, MTB2)

- Is related to settings for detailed device information and manufacturing.
- Has functions to display device information (detailed version of the device, serial No. information, etc.), information related to event management (backup/restore, data logging function), application for service/factory/expert (for debugging, manufacturing) and alarm/error log.

(6) AI function block (AIFB)

- Outputs various flow rates (including flow velocity).
- For AXG, output the calorie, adhesion resistance, electrode potential, flow noise and conductivity.
- Performs processing such as the SIMULATE function, damping (first-order lag filter), scaling, etc.

(7) DI function block (DIFB)

- Performs discrete output for the alarm and warning of DTB.

(8) AO function block

- Inputs a temperature value from other device.

(9) IT function block (TOTFB)

- Totalization of raw data from the Transducer block.

Slots of each block are shown below:

Block	Slot
Physical block	0
AI1 function block	1
AI2 function block	2
TOT1 function block	3
TOT2 function block	4
TOT3 function block	5
DI1 function block	6
DI2 function block	7
AO function block	8
Flow transducer Block	9
Local Display transducer block	10
Diagnosis transducer block	11
Maintenance transducer block 1	12
Maintenance transducer block 2	13

2.3 Logical Structure of Each Block

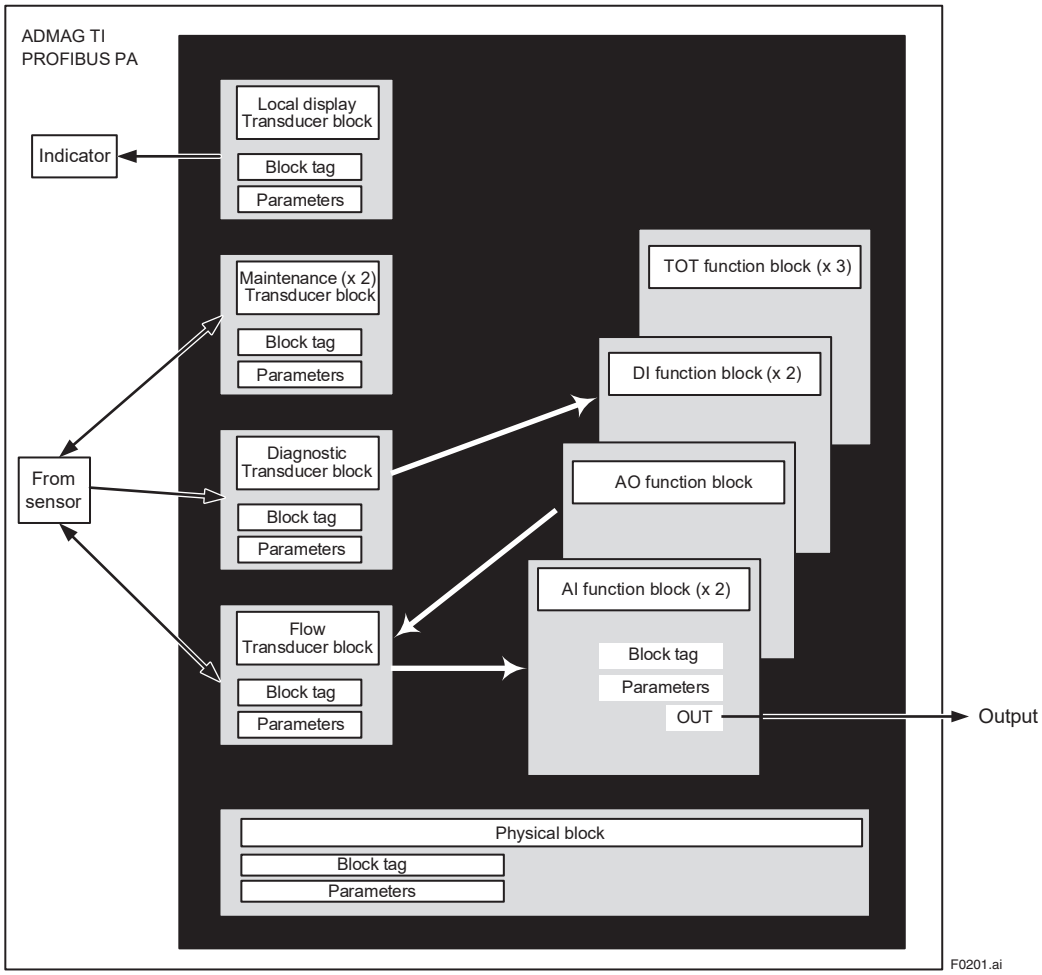


Figure 2.1 Logical Structure of Each Block

Setting of various parameters and node address shown in Figure 2.1 is required before starting operation. For setting method, refer to “Getting Started” in Chapter 3 and later.

3. Getting Started

PROFIBUS PA fully adopts digital communication protocol and differs in operation from conventional 4 to 20 mA transmission. It is recommended that those novice users who use field devices for the first time should use the device in accordance with the procedures described in this section. The procedures assume that field devices will be set up on a bench.

3.1 Connection of Devices

The following devices are required to use PROFIBUS PA devices:

- **Power supply:**

  PROFIBUS PA requires a dedicated power supply. It is recommended that current capacity be well over the total value of the maximum current consumed by all devices. Power is supplied by a DP/PA coupler.

- **Terminator:**

  PROFIBUS PA requires two terminators. A terminator shall be located at each end of the trunk cable.

- **Field device:**

  Connect the PROFIBUS PA communication type product. This product or other devices can be connected.

  In order to smoothly start PROFIBUS PA, please use the devices that has passed the interoperability test of the PROFIBUS PA.

- **Master (Class1,Class2):**

  Used for accessing field devices. A dedicated host (such as PLC) is used for an instrumentation line while dedicated communication tools are used for experimental purposes. For the operation of the host, refer to the instruction manual for each host. No other details on the host are given in this manual. At least one device with the bus control function is necessary.

  - DP/PA Couplers:

    PROFIBUS PA requires DP/PA couplers which convert the RS-485 signals to the IEC 61158-2 signal level and power the field devices via the PROFIBUS PA.

- **Cable:**

  Refer to Figure 3.1.

Table 3.1 PROFIBUS PA Cables and Transmissible Length

Type of cable	Cable specifications	Max. length of cable (reference value)
Type A: Individually-shielded twisted pair cable	#18AWG ($0.82\ mm^2$)	1,900 m
Type B: Overall-shielded twisted pair cable	#22AWG ($0.32\ mm^2$)	1,200 m
Type C: Unshielded twisted pair cable	#26AWG ($0.13\ mm^2$)	400 m
Type D: Overall-shielded non-twisted cable	#16AWG ($1.25\ mm^2$)	200 m

NOTE

Yokogawa recommends the use of Type A. Usage of Type B and D is restricted. Yokogawa does not recommend the use of Type C.

Before using a PROFIBUS PA configuration tool other than the existing class 1 and class 2 Masters, confirm it does not affect the loop functionality in which all devices are already installed in operation. Disconnect the relevant control loop from the bus if necessary.

Connect devices as shown in Figure 3.1. Connect the terminators at both ends of the trunk, with the minimum length of the spur laid for connection. The polarity of signal and power must be maintained.

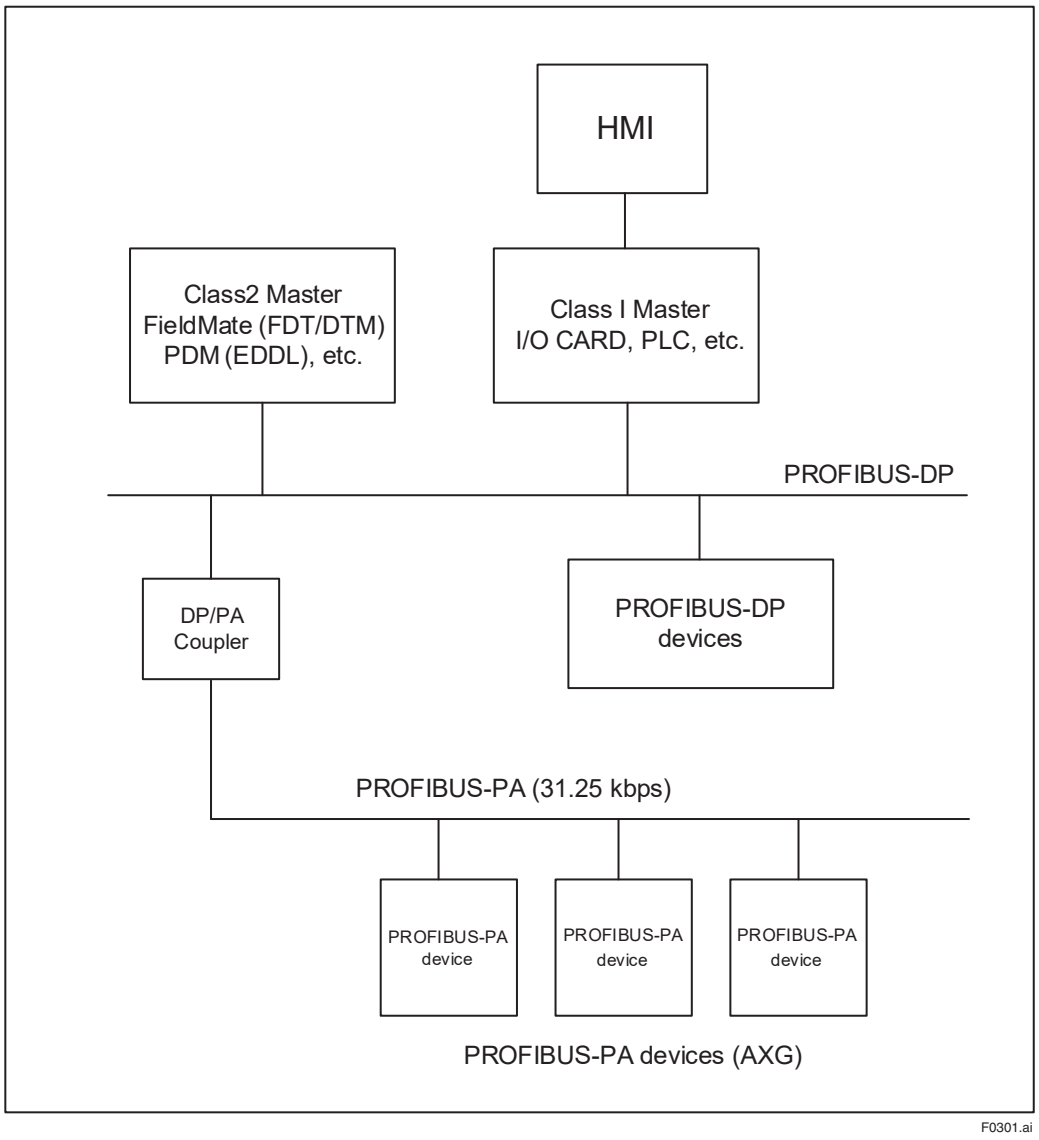


Figure 3.1 Connection of Devices

NOTE

No CHECK terminal is used for this product. Do not connect the field indicator and check meter.

IMPORTANT

If the flowmeter is connected with a parameter-setting tool, such as a PC, while being connected with the upper system, it may disturb the communication operation on the bus, and cause the operational failure of the system. Use the parameter-setting tool after taking preventive measures of setting the related loop offline in advance.

3.2 Master Settings

To activate PROFIBUS PA, the following bus parameters must be set for the master.

IMPORTANT

Do not turn off the power immediately after setting.
When the parameters are saved to the EEPROM, the redundant processing is executed for an improvement of reliability.
If the power is turned off within 60 seconds after setting is made, the modified parameters are not saved, and the settings may return to the original values.

Table 3.2 Operation Parameters

Symbol	Parameter Name	Description
Transmission rate	Transmission Rate	The transmission rate of PROFIBUS PA matches that of the segment coupler. e.g. P+F: 93.75 kbps, Siemens: 45.45 kbps
T_{SL}	Slot Time	The maximum time a master station must wait for the complete reception of the first octet of a response (11 bits). e.g.: 4095
min T_{SDR}	Min. Station Delay Timer	Sets the minimum time at which a slave can send the first bit of a response back.
max T_{SDR}	Max. Station Delay Time	Sets the maximum time at which a slave can send the first bit of a response back.
T_{QUI}	Quiet Time	Controls the time at which the bus electronics or software of the sender is set to receive mode after a message is sent.
T_{SET}	Setup Time	Sets the maximum allowable time for parameter setting and response by the slave.
HAS	Highest Station Address	Sets the highest station address in the network.
G	Gap update factor	Sets the number of token cycles after which the master will search for a new master.
max. retry limit	Max Retry Limit	Sets the number of retries that are performed after a receiver does not respond to a message.

3.3 Integration of GSD

A PROFIBUS PA system requires a GSD file containing device parameters such as the supported transmission rate, input data, output data, data format and data length.
The following GSD files are available for the AXG and AXW.

Table 3.3 GSD files

Profile Ident-Number	0x9740
Profile GSD file	PA139740.GSD (AIx1, TOTx1)
Device Specific Ident-Number	0x4591 for AXG 0x4592 for AXW
Device Specific GSD file	YEC_4591.GSD for AXG YEC_4592.GSD for AXW

Download GSD for AXG and AXW from the following website.
https://www.yokogawa.com/solutions/products-platforms/field-instruments/#Downloads

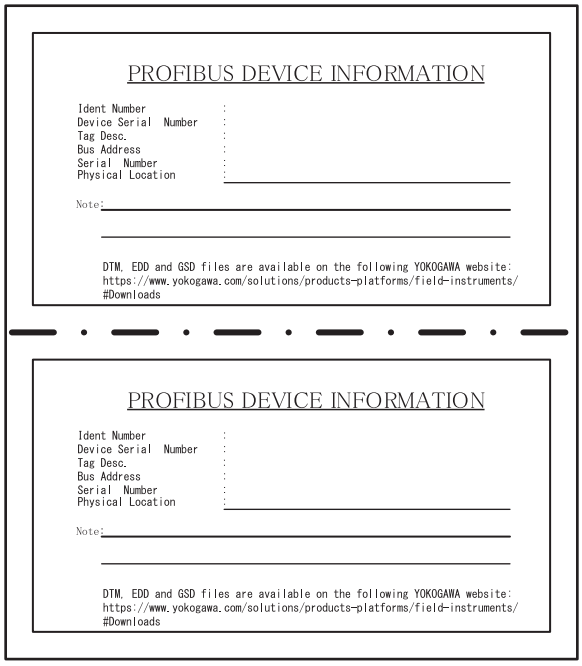
IMPORTANT

Do not change contents in the GSD file from the factory default. The AXG and AXW may be given a serious problem in its operation if do so.

3.4 Bus Power ON

Address setting Switch

A setup of bus address is possible by the change with a parameter, or the hardware switch.
The set address which is done by hardware is higher priority than by software.
Refer to section 4.1 when the bus address is set by software. Refer to installation manual when the bus address is set by hardware slide switch.
This product must turn off the power supply when the bus address is changed by hardware switch.
The device information, including Tag Desc., Bus address, and Ident Number, is described on the sheet attached to the product. The device information is given in duplicate on this sheet.
Confirm the bus address written in the device information.
The default bus address is set as 126 (hexadecimal 7E) at the factory unless otherwise specified when ordered.



F0303.ai

Figure 3.2 Device Information Attached to This Product.

IMPORTANT

To preserve the safety, do not touch the electrical circuit and the cables except the Bus address switch.

Bus Power ON

Firstly, turn on the power of the host, and then, the bus and also the power for the AXG/AXW. Where the AXG/AXW is equipped with the LCD indicator, then the display begins to operate. If the display is not turned on, or abnormal current flows, check the polarity of power.

Using the host device display function, check that the AXG/AXW is in operation on the bus.
If no AXG/AXW is detected, check the available address range.
If the Bus address and Tag Desc. are not specified when ordering, default value is factory set. If two or more AXG/AXWs are connected at the same time with default value, only one AXG/AXW will be detected from the host as AXG/AXWs have the same initial address.
Separately connect each AXG/AXW and set a different address for each.

3.5 Engineering Tools

Engineering of the AXG/AXW PROFIBUS PA can be performed with the following two tools.

3.5.1 FieldMate for DTM

Yokogawa's FieldMate is a configuration/management tool for devices based on FDT/DTM technology. DTM is software for the adjustment, configuration, calibration and testing of devices. For further information on AXG/AXW configuration using FieldMate, see chapter 5.

Download DTM for AXG/AXW from the following website.
https://www.yokogawa.com/solutions/products-platforms/field-instruments/#Downloads

3.5.2 SIMATIC PDM for EDDL

Electronic Device Description Language (EDDL) defines field device information, and can be used independently of vendors. EDDL files can be read by engineering tools, and the software is used to conduct adjustment, configuration, calibration and tests of devices.
For information on AXG/AXW configuration using SIMATIC PDM, refer to the SIMATIC PDM user's manual.

Download EDD for AXG and AXW from the following website.
https://www.yokogawa.com/solutions/products-platforms/field-instruments/#Downloads

3.6 Starting FieldMate

The following section describes how to run DTM with FieldMate R3.04.
For the detailed information on FieldMate, see its User's manual.

IMPORTANT

- Before running the program, log-in to Windows as an Administrator or as a user with administrative authority.
- When comm. DTM is connected to the PROFIBUS network with class 1 master running, set the same busparameters of class 1 master.
- The FieldMate R3.04 or later has the DTM for AXG PROFIBUS PA as its standard package. Hence, it is recommended to use the R3.04 or later with AXG.
  If the AXG connects to the FieldMate R3.04 or later, the DTM for AXG is necessary to download from the following web-site and combine to the FieldMate R3.04 or later by DTM Setup tool at first.

FieldMate R3.04 by DTM Setup tool at first.
https://partner.yokogawa.com/japan/fieldmate/

Start FieldMate
Start FieldMate as followings:
Click [Start] → [All Programs] → [YOKOGAWA FieldMate] → [FieldMate]
Select [PROFIBUS] and then click [START] in the Login Window.

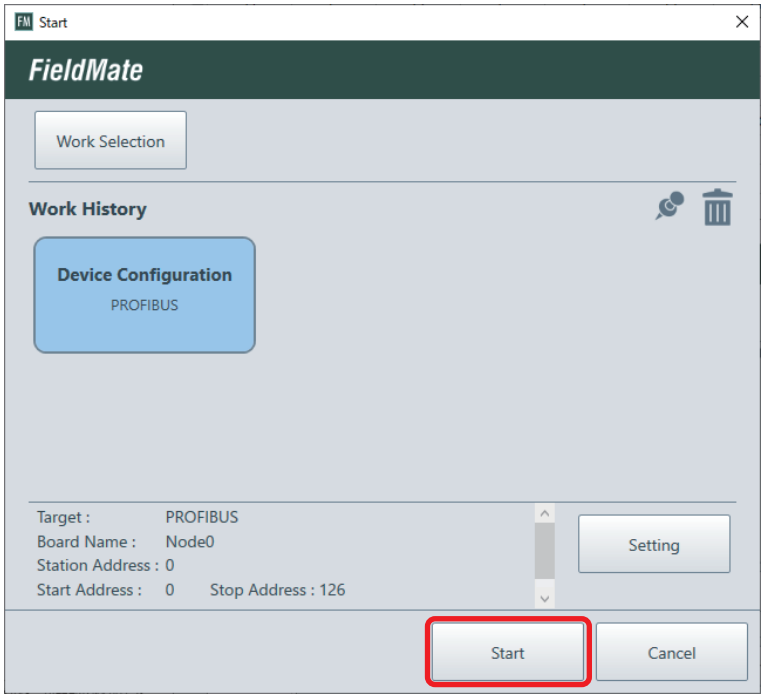
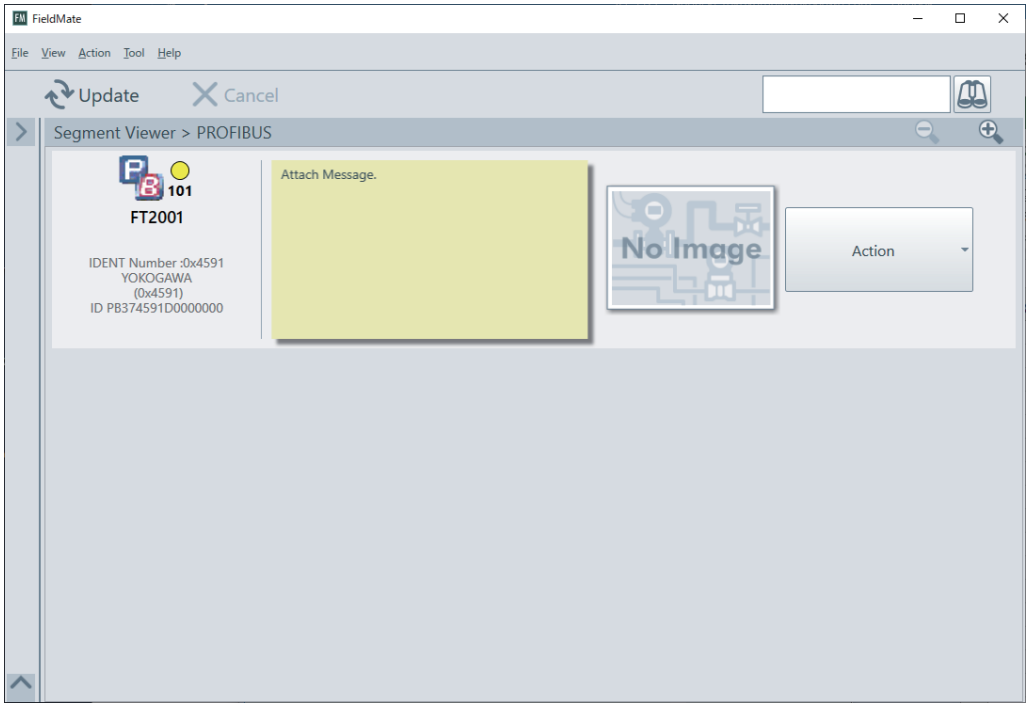


Figure 3.3 FieldMate R3.04

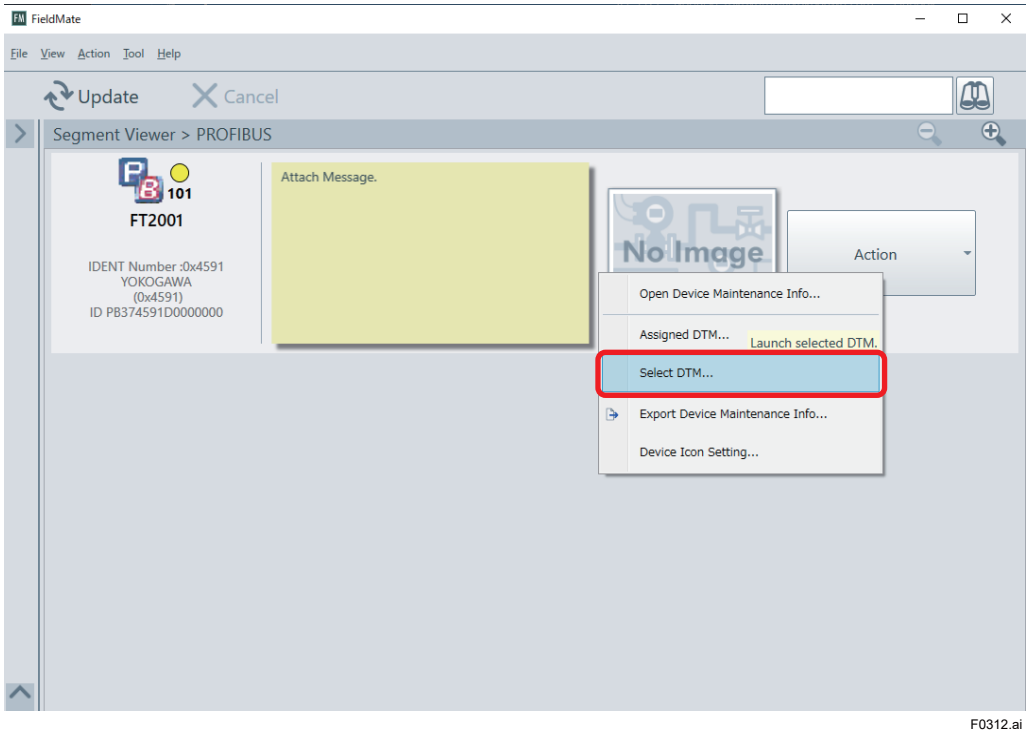
The FieldMate starts to communicate, and the following window is appeared when this action was finished.
The device is detected automatically.



F0311.ai

Figure 3.4 Search the device

Click [Action] and then click [Select DTM…], then Figure 3.6 is displayed.



F0312.ai

Figure 3.5 Launch selected DTM.

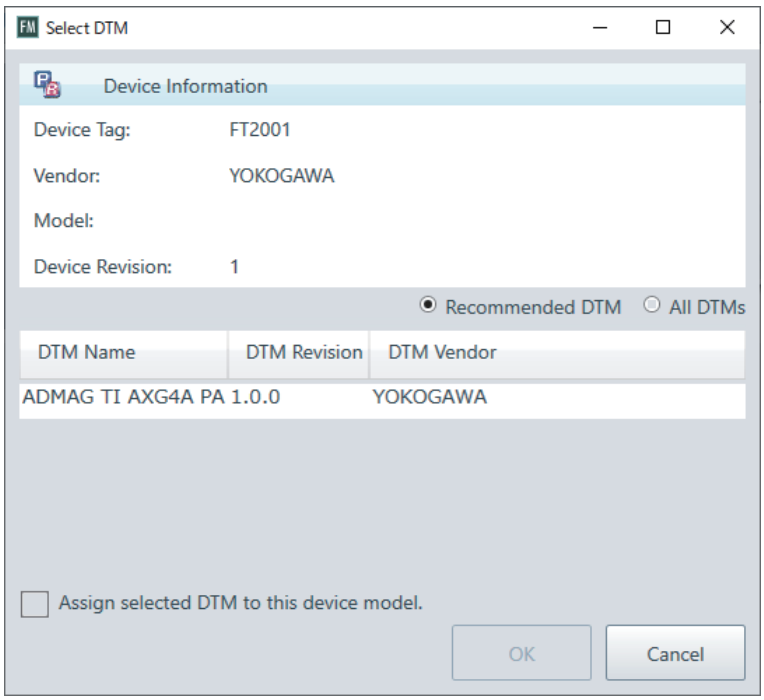


Figure 3.6 Select DTM

Select [ADMAG TI AXG4A PA] and then click [OK]. Then Confirm form is displayed, click [YES].

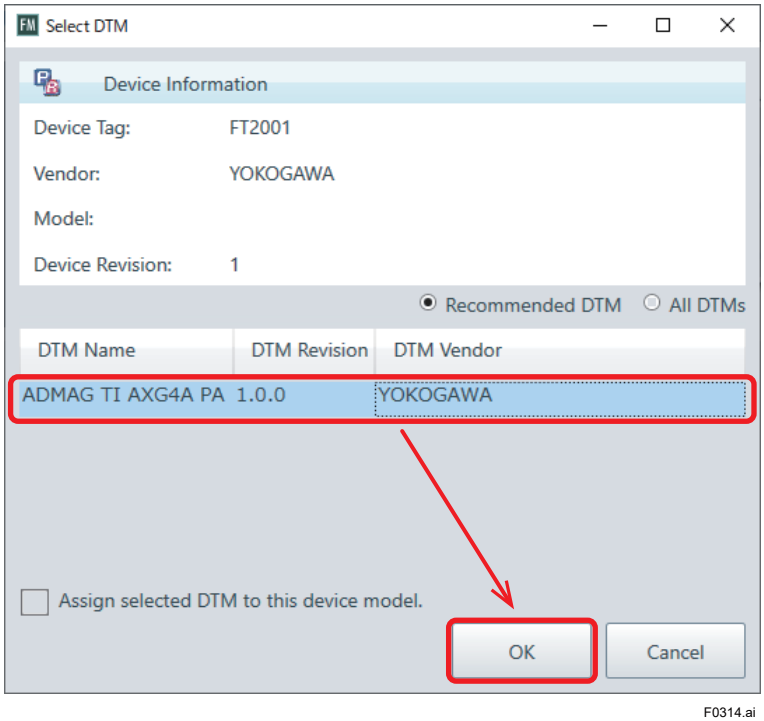
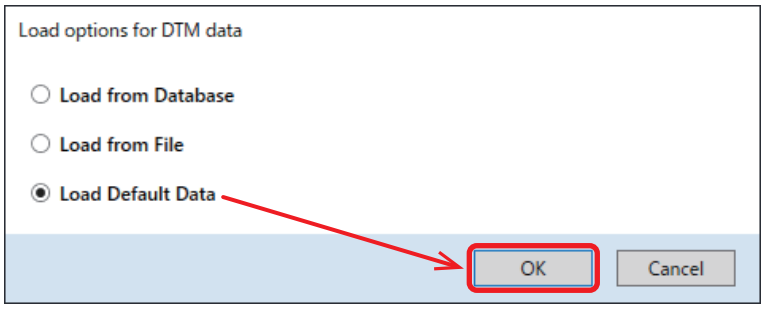


Figure 3.7 Selected the device

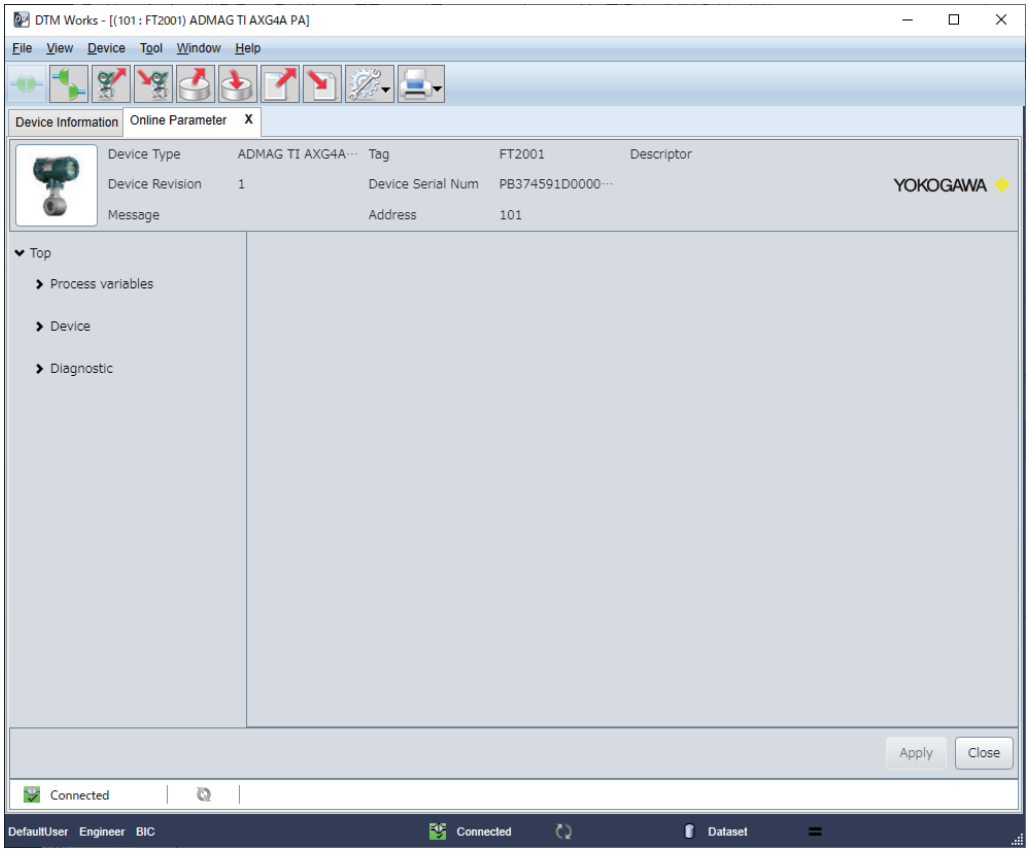
DTM Works starts to open. And the following new window is appeared.
Select [Load Default Data] and then click [OK].



F0315.ai

Figure 3.8 Load Default Data

When the data load is complete, the DTM works is appeared.
It is able to set parameters of the AXG in detail.



F0316.ai

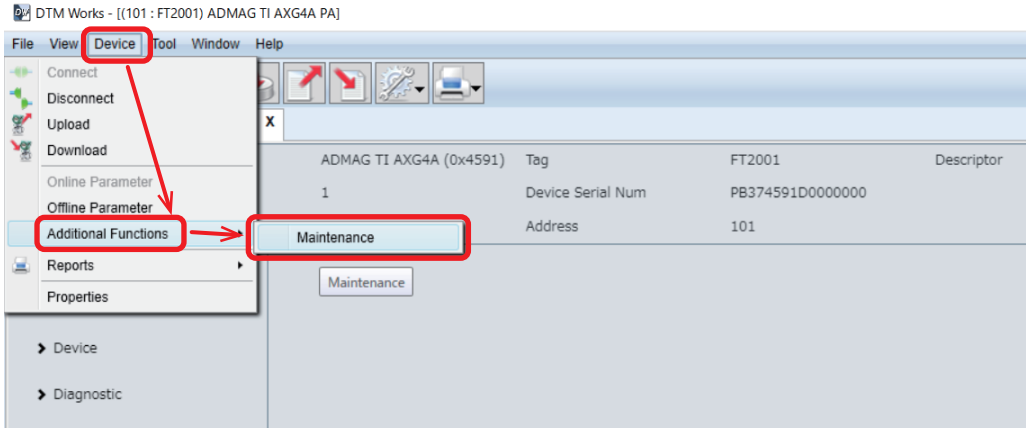
Figure 3.9 DTM Works

Refer to Chapter 5 how to operate the AXG in the FieldMate R3.04 for detail.

How to enter Maintenance

The following section describes how to enter Maintenance with FieldMate R3.04.

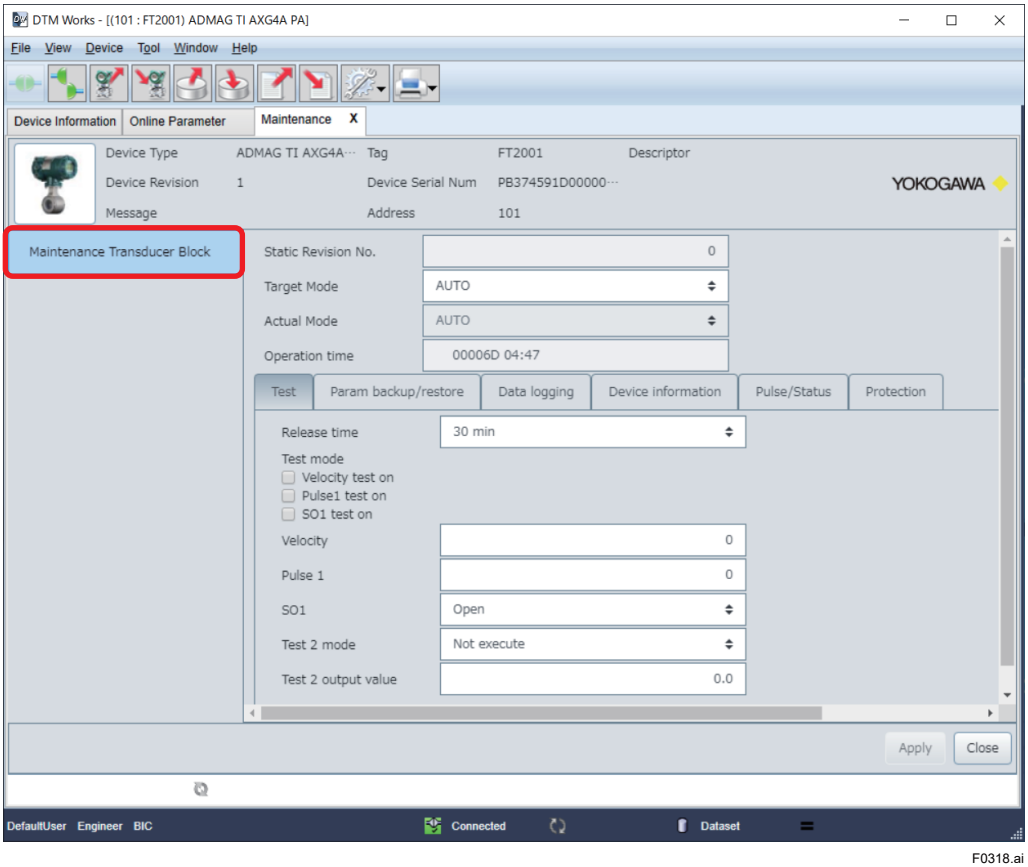
Click [Device] → [Additional Functions] →[Maintenance], as shown below Figure 3.11. Then the maintenance tab is appeared.



F0317.ai

Figure 3.10 Path of Maintenace

Click [Maintenance Transducer Block] to display the parameter details as shown below.



F0318.ai

Figure 3.11 Maintenance Transducer Block

4. Configuration

4.1 Bus Address Setup

This section explains how to set addresses from software.
When position 7 of the hardware address switch is set to OFF, you can set the address from software.
The parameters for addressing from software are shown below.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► PB ► (see below)
PROFIBUS PA	Device ► Physical Block ► Configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
PB	34	SET_ADDRESS	Set Address	Set the Bus Address.

4.2 Easy Setup

Easy Setup tracks parameters that often need to be configured or changed.

Menu path

Display	--
PROFIBUS PA	Device ► Easy setup ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
PB	2	--	TAG	The user description of the intended application of the block.
PB	20	--	Descriptor	User definition text (a string) to describe the device within the application.
PB	21	--	Message	User definable MESSAGE (a string) to describe the device within the application or in the plant.

■ LCD Transducer Block

Menu path

Display	Device setup ► Easy setup wizard ► Display set
PROFIBUS PA	Device ► Easy setup ► LCD Transducer Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	5	--	Target Mode	TARGET_MODE indicates what mode of operation is desired for LTB block.
LTB	6	--	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.
LTB	8	Line 1	Display setting ► Display select 1	Set the item to be displayed in the 1 line of the display unit. See 5.7.2.
LTB	9	Line 2	Display setting ► Display select 2	Set the item to be displayed in the 2 line of the display unit. See 5.7.2.
LTB	10	Line 3	Display setting ► Display select 3	Sets the item to be displayed in the 3 line of the display unit. See 5.7.2.

From the table below, select the Target Mode, Actual Mode

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the TOT block does not operate.

Flow Transducer Block

Menu path

Display	Device setup ► Easy setup wizard ► Volume
PROFIBUS PA	Device ► Easy setup ► Flow Transducer Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	5	--	Target Mode	TARGET_MODE indicates what mode of operation is desired for FTB block.
FTB	6	--	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.
FTB	59	--	Velocity ► Velocity unit	Displays the physical unit of the flow velocity. See 5.1.8.
FTB	62	--	Velocity ► Velocity damping AO/frequency	Specifies the damping time constant of the flow velocity value/frequency output. See 5.1.10.
FTB	63	--	Velocity ► Velocity damping pulse/total	Specifies the damping time constant of the flow velocity pulse/ totalized value. See 5.1.10.
FTB	60	--	Velocity ► Velocity flow cut off	Set the Velocity flow low cut range value. This value must be set to the lower switching point because this function has a hysteresis.
FTB	79	--	Velocity ► Velocity Span	Specifies the span of the flow velocity. See 5.1.9.
FTB	18	--	Volume flow ► Volume flow unit	Displays the physical unit of the volumetric flow rate. See 5.1.8.
FTB	19	--	Volume flow ► Volume flow LRV	This parameter is used in order to enter the lower range value for volumetric flow.
FTB	20	--	Volume flow ► Volume flow URV	This parameter is used in order to enter the lower range value for volumetric flow.
FTB	53	Damp AO/F	Volume flow ► Volume flow damping AO/ frequency	Specifies the damping time constant of the volumetric flow rate value/frequency output. See 5.1.10.
FTB	54	Damp pls/ttl	Volume flow ► Volume flow damping pulse/ total	Specifies the damping time constant of the volumetric flow rate pulse/totalized value. See 5.1.10.
FTB	9	--	Volume flow ► Volume flow cut off	Set the Volume flow low cut range value. This value must be set to the lower switching point because this function has a hysteresis.
FTB	80	Span	Volume flow ► Volume Flow Span	Specifies the span of volumetric flow rate. See 5.1.9.
FTB	22	--	Mass flow ► Mass flow unit	Displays the physical unit of the mass flow rate. See 5.1.8.
FTB	55	--	Mass flow ► Mass flow damping AO/frequency	Specifies the damping time constant of the mass flow rate value/ frequency output. See 5.1.10.
FTB	56	--	Mass flow ► Mass flow damping pulse/total	Specifies the damping time constant of the mass flow rate pulse/ totalized value. See 5.1.10.
FTB	57	--	Mass flow ► Mass flow cut off	Set the Mass flow low cut range value. This value must be set to the lower switching point because this function has a hysteresis.
FTB	81	--	Mass flow ► Mass Flow Span	Specifies the span of the mass flow rate. See 5.1.9.
FTB	76	--	Flow Tube ► Select Flow Tube	Set the type of detector.
FTB	77	--	Flow Tube ► Dual Frequency Mode	Sets the excitation mode.

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	8	--	Flow Tube ► CALIBR_FACTOR	Gain compensation value for the detector, so that flow indication is accurate. This parameter means the meter factor of low frequency side (LOW_MF). This parameter must not be downloaded by the operator.
FTB	73	--	Flow Tube ► High MF	Set the meter factor for the high frequency side of standard dual frequency excitation.
FTB	74	--	Flow Tube ► Low MF EDF	Sets the meter factor for the low frequency side of extended dual frequency excitation.
FTB	75	--	Flow Tube ► High MF EDF	Sets the meter factor on the high-frequency side of extended dual-frequency excitation.
FTB	61	--	Velocity check	AI1.CHANNEL Indicates the flow velocity for the SPAN of the flow rate selected in CHANNEL.

From the table below, select the Target Mode, Actual Mode

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the TOT block does not operate.

■ Analog input 1 function block

Menu path

Display	--
PROFIBUS PA	Device ► Easy setup ► Analog input 1 function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI1	5	--	Target Mode	TARGET_MODE indicates what mode of operation is desired for AI1 block.
AI1	6	--	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.
AI1	14	--	Channel	Selects CHANNEL number used in the AI1 function block.
AI1	16	--	Filter Time Const	Specifies the damping time constant of the AI FB output. See 5.1.10.
AI1	11	--	PV Scale ► Lower Value	Valid range of the lower limit
AI1	11	--	PV Scale ► Upper Value	Valid range of the upper limit
AI1	12	--	Output Scale ► Lower Value	Valid range of the lower limit
AI1	12	--	Output Scale ► Upper Value	Valid range of the upper limit
AI1	12	--	Output Scale ► Unit	the code number of the engineering unit of Process Variable
AI1	12	--	Output Scale ► Decimal Point	Specifies a decimal point position.

From the table below, select the Target Mode, Actual Mode

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the TOT block does not operate.

5. Functions

This chapter describes each function of the product. The overview of each function is as follows.

NOTE

PROFIBUS PA items found in the following menu path tables indicate a case where FieldMate, Yokogawa Electric's adjusting and setting tool for field device/environmental device, is used.

NOTE

For various setting changes, there is a mode which allows each parameter to be written.
If the parameter cannot be rewritten, check for write mode columns in parameter lists in Chapter 6.

Basic settings

This product can measure process values of the flow velocity, volumetric flow rate, mass flow rate, calorie, and flow noise at the same time. A damping time constant can also be specified for each process value.
For details about how to check measured results and the setting procedures, refer to Section 5.1.

Totalization function

Two totalizers are mounted to totalize selected process values. In addition to the totalized value display function, the product has a totalization counter function to scale totalized values with the conversion factor and to count a specific flow rate. The product also has the totalization switch function that compares a specified target value with a totalized value to output the result as the status output, and the totalization preset function that starts totalization with the value specified in advance.
For details about the totalization function and setting procedures, refer to Section 5.2.

Discrete input Function

This is the function to transmit 0 and 1 as a parameter by judging whether the selected process value is above or below the threshold.
For details about each output and the setting procedures, refer to Section 5.3.

Inputting external temperature

As a temperature value for the temperature correction of the mass flow rate, a temperature value can be imported from an external device.
For details about inputting external temperature, refer to Section 5.4.

Auxiliary calculation function

This function is used to calculate the temperature correction for density or the calorie by inputting the temperature from an external device. The accuracy of mass flow rate measurement is improved with the temperature correction for density.
For details about the auxiliary calculation function, refer to Section 5.5.

Alarm

A detected error can be notified as an alarm or warning. This function can show the error status based on NAMUR NE107 by setting parameters. It is also possible to keep alarms that occurred in the past as a record and mask unnecessary alarms so that they are hidden on the display.
For details about the alarm contents and setting procedures, refer to Section 5.6.

Display

This display supports multiple languages, and the language to show on the display can be selected. This function can also show the time changes of the selected parameter in a trend graph.
For details about settings of the display, refer to Section 5.7.

NOTE

The language on the display is set to English at shipment from the manufacturing factory. If necessary, select the adequate language referring to Subsection 5.7.1.
The menu pass of the display on this manual is set to “English”.

Device information

The user can check parameters specified at the time of ordering, model name and suffix code of this product.
For details about how to check the device information, refer to Section 5.8.

Self check function

The self check function can be used to diagnose failures of the product or the process state. For example, this function is useful for diagnosing the health of the product by using the electrode adhesion detecting function, sensor empty check function, or verification function.
For details about the self check functions, refer to Section 5.9.

Test mode

It is possible to arbitrarily specify the flow velocity and the value to be output from the pulse/status terminal (IO2) and to test a response from the product.
For details about the test mode, refer to Section 5.10.

Event management function

The backup function can store parameter settings in the built-in memory of the display. If the optional code MC is selected, setting parameters can be stored in the microSD card supplied with this product in addition to the built-in memory in the display (display board).
The backup data can be used to restore settings of the product for which data is backed up or duplicate settings to another product.
Due to the data logging function, up to four process values can be stored in the microSD card.
For details about each function of the backup, restore, and duplicate, and the data logging function, refer to Section 5.11.

Write lock function

A write lock can be changed with two methods; the hardware write lock switch and the parameter settings (software write lock).
For details about the software write lock function, refer to Section 5.12.

Simulation function

The simulation function is to imitate function block input. This function makes it possible to test the function block and alarm-processing system on the downstream side.
For details about the simulation function, refer to Section 5.13.

Pulse output, frequency output, and status output

This product has terminals for outputting pulse or status for calibration. The pulse/status terminal should be always used offline. When the pulse output is used, the pulse width or pulse rate can be selected. When a frequency output is used, outputs at 0% and 100% can be specified for the span of the process value. When the status output is used, the product status can be output as the status output. For both pulse output and frequency output, the low-cut values can be set.
For details about each output and the setting procedures, refer to Section 5.14.

NOTE

The pulse output, frequency output and status output should be used only at calibrating, and not used when normally running.

5.1 Basic Settings

5.1.1 Overview

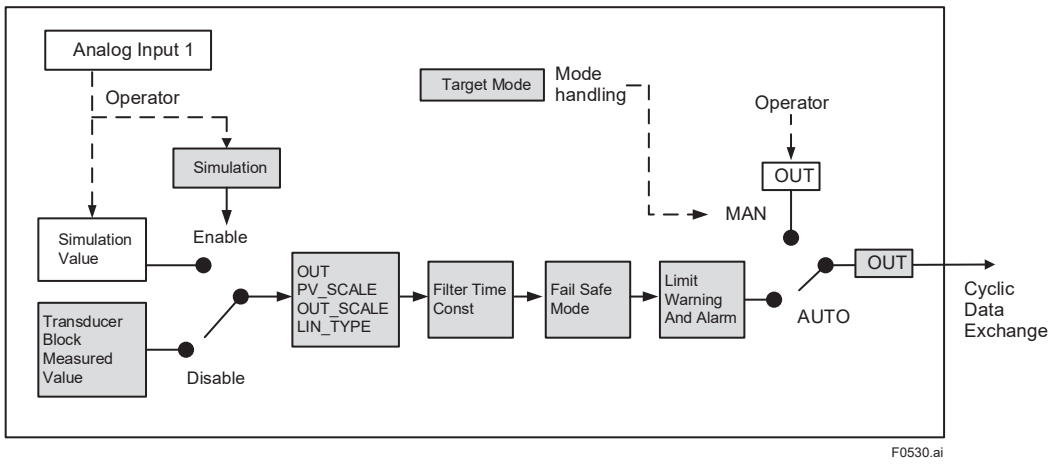
This product can measure the flow velocity, volumetric flow rate, mass flow rate, calorie, and various diagnostic values.
Refer to the table below for the specification codes for communication/input-output and connection terminals, and input and output for each terminal.

Communication and I/O code		Connection Terminal			
		I/O1 +/-	I/O2 +/-	I/O3 +/-	I/O4 +/-
G0	-G	PROFIBUS PA	P/Sout (Passive)	-	-

P/Sout: Pulse output or status output
The position of Communication and I/O code:
Integral Type: AXG□□□-□□□□□□□□□□□□□□□-□■■□□
AXW □□□ - □□□□□□□□□□□□□□□ - □■■□□
AXW □□□ G - ■□□□□□ - □□□□ - □□□
Remote transmitter: AXG4A-□□□□□□□■■□□
AXW4A-□□□□□□□■■□□

5.1.2 Analog input function

AXG/AXW contains two AI blocks and transfers the calculated processing values generated by the transducer block.



5.1.3 Mode Setting for Analog input function(TARGET_MODE, MODE_BLK)

■ TARGET_MODE

Indicates the three types of function block modes;
Out of Service (O/S), Manual, and Auto.
TARGET_MODE indicates what mode of operation is desired for the block. In Out of Service (O/S) mode, the AI block does not operate. The Manual mode does not allow values to be updated. The Auto mode causes the measured value to be updated. Under normal circumstances, set the Auto mode to take effect. The Auto mode is the factory default.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AI(1-2)FB ► (see below)
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	5	TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for AI block.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the AI block does not operate.

■ MODE_BLK

The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode.

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	6	-	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.

5.1.4 Operation of Analog input function at Alarm Occurrence (FSAFE_TYPE, FSAFE_VAL)

This is the parameter which defines the operation of the function block if a fault is detected.

■ FSAFE_TYPE

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	17	-	Fail Safe Mode	Sets the behavior of OUT when a fault is detected.

Selection		Description
Display	PROFIBUS PA	
-	Default value is used as output value.	Output the value of FSAFE_VALUE to OUT.
-	Storing last valid Output Value.	Display the last valid OUT value.
-	The calculated output value is incorrect	Display the current OUT.

FSAFE_VALUE

This is the parameter which sets the default value for the OUT parameter, if sensor or sensor electric fault is detected.
This item is only displayed if “Default value is used as output value.” is selected in “Fail Safe Mode”.

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	18	-	Fail Safe Default Value	Set the value that will be output to OUT when a failure is detected with FSAFE_ TYPE set to 0.

5.1.5 PV Scale, Out Scale for Analog input function (PV_ SCALE, OUT_SCALE)

Conversion of the external value into the high and low scale values and unit. In ADMAG TI, to set the same ranges and unit for PV_SCALE and OUT_SCALE are recommended.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AI(1-2)FB ► (see below)
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	11	-	PV Scale ► Lower Value	Valid range of the lower limit
		-	PV Scale ► Upper Value	Valid range of the upper limit
AI(1-2)	12	OUT_SCALE EU at 0%	Output Scale ► Lower Value	Valid range of the lower limit
		OUT_SCALE EU at 100%	Output Scale ► Upper Value	Valid range of the upper limit
		OUT_SCALE Units index	Output Scale ► Unit	the code number of the engineering unit of Process Variable
		-	Output Scale ► Decimal Point	Specifies a decimal point position.

5.1.6 Connection of Process Value to AI Function (CHANNEL)

The process value calculated by FTB are output to a specific channel, respectively. By selecting the channel used in the AI function block, a process value is obtained from FTB.
The relation of the channel for each process value and the channel which can be selected from each AI function block is shown in the figure below.

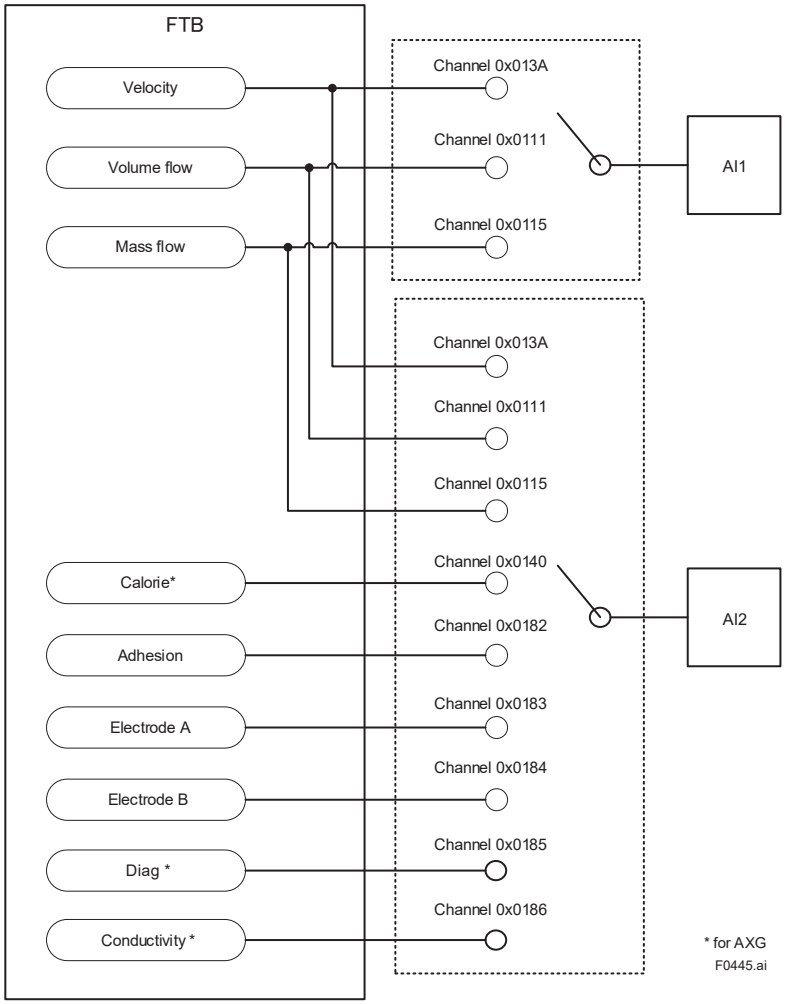


Figure 5.1.6.1 Relation of Process Value of FTB and AI Function Block

The information of the figure above can be organized below.

Table 5.1.6.1 List of Relation of Process Value and AI Function Block

CHANNEL number	Selection		Model	Supported AI function block
	Display	PROFIBUS PA		
0x013A	Velocity	Velocity	AXG / AXW	AI1 AI2
0x0111	Volume flow	Volume	AXG / AXW	
0x0115	Mass flow	Mass	AXG / AXW	
0x0140	Calorie	Calorie	AXG	AI2
0x0182	Adhesion	Adhesion	AXG / AXW	
0x0183	Electrode A	Electrode A	AXG / AXW	
0x0184	Electrode B	Electrode B	AXG / AXW	
0x0185	Diag	Diag	AXG	
0x0186	Conductivity	Conductivity	AXG	

A channel can be selected in each AI function block with the following parameters. Please note that it needs to change to the O/S mode to change the channel.

Display	Device setup ► Detailed setup ► PROFIBUS PA ► AI(1-2)FB ► (see below)
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	14	CHANNEL	Channel	Selects CHANNEL number used in the AI function block. Refer to Table 5.1.2.1 for selection.

By selecting the channel selected in AI1, a process is displayed as PV (Primary Variable) in Selected Flow for FTB

Display	Device setup ► Detailed setup ► Pro var ► (see below)
PROFIBUS PA	Device ► Query Device ► Flow Transducer Block ► index 69-166 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	125	PV flow select	Selected flow	Displays the target process for PV.

Setting example: When the magnetic flowmeter is used by outputting the volumetric flow rate from AI1 and setting the volumetric flow rate span at 100 m^3/h, set the parameters as shown below.

AI1: CHANNEL="Volume(0x0111)"
AI1: OUT_SCALE.Units Index="m^3/h(1394)"
AI1: OUT_SCALE.EU at 100%="100.000"
AI1: OUT_SCALE.EU at 0%="0.0"
FTB: VOLUME_FLOW_SPAN="100.0"

Setting example: When the magnetic flowmeter is used by outputting the mass flow rate from AI1 and setting the mass flow rate span at 10000 kg/h and the density at 1000 kg/m^3, set the parameters as shown below.

FTB: DENSITY_UNIT="kg/m^3"
FTB: FIXED_DENS="1000.0"
AI1: CHANNEL="Mass flow"
AI1: OUT_SCALE.Units Index="kg/h"
AI1: OUT_SCALE.EU at 100%="10000.0"
AI1: OUT_SCALE.EU at 0%="0.0"
FTB: MASS_FLOW_SPAN="10000.0"

5.1.7 Display of the Process Value

The flow rate (PV), flow velocity, volumetric flow rate, mass flow rate, totalized value, calorie, flow noise, electrode adhesion, electrode potential, and conductivity can be checked with the following parameters. However, calorie, flow noise and conductivity are parameters which can be checked only with AXG, and they are hidden with AXW.

■ Flow rate (PV), flow velocity, volumetric flow rate, mass flow rate, totalized value, calorie AUX Temperature

Menu path

Display	Device setup ► Process variables ► (see below)
PROFIBUS PA	Process variables ► Device variables ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
-	-	Flow rate(%)	-	Displays the percentage to the range for the process value set to the Primary Value.
-	-	Flow rate	-	Displays the process value set to the Primary Value.
FTB	58	-	Velocity ► Condensed Status (Velocity ► Status,Quality)	Displays the status of the flow velocity.
		Velocity	Velocity ► Value	Displays the value of the flow velocity.
FTB	59	-	Volume flow ► Condensed Status (Volume flow ► Status,Quality)	Displays the status of volumetric flow rate.
		Volume	Volume flow ► Value	Displays the value of the volumetric flow rate.
FTB	21	-	Mass flow ► Condensed Status (Mass flow ► Status,Quality)	Displays the status of the mass flow rate.
		Mass	Mass flow ► Value	Displays the value of the mass flow rate.
FTB	64	-	Calorific value ► Condensed Status (Calorific value ► Status,Quality)	Displays the status of calorie (only available for AXG, not for AXW).
		Calorie	Calorific value ► Value	Displays the value of calorie (only available for AXG, not for AXW).
TOT1	10	-	Totalizer 1 ► Condensed Status (Totalizer 1 ► Status,Quality)	Displays the status of totalizer 1.
		Totalizer ►Totalizer 1	Totalizer 1 ► Value	Displays the value of totalizer 1.
TOT2	10	-	Totalizer 2 ► Condensed Status (Totalizer 2 ► Status,Quality)	Displays the status of totalizer 2.
		Totalizer ►Totalizer 2	Totalizer 2 ► Value	Displays the value of totalizer 2.
TOT3	10	-	Totalizer 3 ► Condensed Status (Totalizer 3 ► Status,Quality)	Displays the status of totalizer 3.
		Totalizer ►Totalizer 3	Totalizer 3 ► Value	Displays the value of totalizer 3.

AUX Temperature

Menu path

Display	Device setup ▶ Detailed setup ▶ Pro var ▶ Temperature ▶ (see below)
PROFIBUS PA	Process variables ▶ Device variables ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	29	-	AUX temperature ▶ Condensed Status (AUX temperature ▶ Status,Quality)	Displays the status of temperature
		Meas Temperature	Aux temperature ▶ Value	Displays the value of temperature

Flow noise

Menu path

Display	Device setup ▶ Diag/Service ▶ Diagnosis ▶ Flow noise ▶ Result ▶ (see below)
PROFIBUS PA	Process variables ▶ Device variables ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	133	-	Flow noise value ▶ Condensed Status (Flow noise value ▶ Status,Quality)	Status of the flow noise value
		Value	Flow noise value ▶ Value	Displays the flow noise value.

This parameter can be used only for AXG, not for AXW.

Electrode adhesion detection

Menu path

Display	Device setup ▶ Diag/Service ▶ Diagnosis ▶ Adhesion ▶ Result ▶ (see below)
PROFIBUS PA	Diagnostic ▶ Diagnosis ▶ Adhesion ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	130	-	Adhesion value ▶ Condensed Status (Adhesion value ▶ Status,Quality)	Status of the resistance value of the electrode
		Value	Adhesion value ▶ Value	Displays the resistance value of the electrode.

Electrode potential

Menu path

Display	Device setup ▶ Diag/Service ▶ Diagnosis ▶ Empty check ▶ (see below)
PROFIBUS PA	Diagnostic ▶ Diagnosis ▶ Empty ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	131	-	Electrode voltage A value ► Condensed Status (Electrode voltage A value ► Status,Quality)	Status of voltage value between electrode A and electrode C
		Electrode voltage A	Electrode voltage A value ► Value	Displays the voltage value between electrode A and electrode C.
FTB	132	-	Electrode voltage B value ► Condensed Status (Electrode voltage B value ► Status,Quality)	Status of voltage value between electrode B and electrode C
		Electrode voltage B	Electrode voltage B value ► Value	Displays the voltage value between electrode B and electrode C.

■ Conductivity

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► Conductivity ► Result ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Conductivity ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	134	-	Conductivity value ► Condensed Status (Conductivity value ► Status,Quality)	Displays the status of the calculated conductivity.
		Value	Conductivity value ► Value	Displays the calculated conductivity.

This parameter can be used only for AXG, not for AXW.

5.1.8 Engineering Unit Setting

The unit of the process value set for the AI channel (see 5.1.6) can be set with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AI(1-2)FB ► (see below)
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► Output Scale ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	12	OUT_SCALE Units index	Unit	Specifies the unit of the process value selected in the AI.

The settings for this parameter is also reflected to the following parameters for FTB.
(Only the unit of the process value selected in the AI channel is reflected.)

■ Flow velocity, volumetric flow rate, mass flow rate, calorie

Menu path

Display	Device setup ► Detailed setup ► Pro var ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	59	Velocity ► Unit	Velocity ► Velocity unit	Displays the physical unit of the flow velocity.
FTB	18	Volume ► Unit	Volume flow ► Volume flow unit	Displays the physical unit of the volumetric flow rate.
FTB	22	Mass ► Unit	Mass flow ► Mass flow unit	Displays the physical unit of the mass flow rate.
FTB	65	Calorie ► Unit	Calorie ► Calorific unit	Displays the physical unit of the calorie (only available for AXG, not for AXW).

NOTE

Units can be specified for the flow velocity, volumetric flow rate, mass flow rate, and calorie. However, note that the time unit is common to all flow rates.

Example) To set the volumetric flow rate unit to “m3/h” The volumetric unit can be set to “m3/h”. At this time, the time unit for the mass flow rate and calorie are also set to “/h”.

5.1.9 Span Setting

The flow velocity, volumetric flow rate, mass flow rate, and calorie can be set from Sensor TB. However, the unit of the span is the unit set in Subsection 5.1.8.
If the flow rate unit is changed, the span value is converted in conjunction with the changed unit.
The setting can be configured with the following parameters.

■ Flow velocity, volumetric flow rate, mass flow rate, calorie

Menu path

Display	Device setup ► Detailed setup ► Pro var ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	79	Velocity ► Span	Velocity ► Velocity span	Specifies the span of the flow velocity.
FTB	80	Volume ► Span	Volume flow ► Volume flow span	Specifies the span of volumetric flow rate.
FTB	81	Mass ► Span	Mass flow ► Mass flow span	Specifies the span of the mass flow rate.
FTB	82	Calorie ► Span	Calorie ► Calorific span	Specifies the span of the calorie. (Only available for AXG, not for AXW).

NOTE

Pay attention to the following points when setting the flow rate span.

- For a line with a significant flow rate change, set the flow rate span to the maximum flow rate. If the flow rate exceeds the flow rate span, the error of the flow rate% increases.
- For a line with a stable flow rate, set the flow rate span to approximately 1.5 to 2.0 times the normal flow rate.
- Set the flow rate for which the flow velocity is comparable to the range from 0.3 to 10 m/s. Check the flow velocity using the sizing data described in the general specifications. If the flow velocity is checked using the parameter, it displays the value obtained by converting the specified flow rate span to the flow velocity.

NOTE

Be sure to set the flow rate unit first when the flow rate unit and its span value are changed at the same time.

5.1.10 Damping Time Constant Setting

The flow rate-related process value (flow velocity, volumetric flow rate, mass flow rate and calorie), the damping time constant for flow noise (63.2% response) and the damping time constant for process value output can be specified. To reduce an output fluctuation or change the response speed, change the damping time constant (default value, 3.0 seconds).
For a piston pump, etc., the pulsing flow of up to 1 Hz can be measured with an output damping of 0.1 seconds.
The setting can be configured with the following parameters.

■ Flow rate-related process values/frequency

Menu path

Display	Device setup ► Detailed setup ► Pro var ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	62	Velocity ► Damp AO/F	Velocity ► Velocity damping AO/frequency	Specifies the damping time constant of the flow velocity value/frequency output.
FTB	53	Volume ► Damp AO/F	Volume flow ► Volume flow damping AO/frequency	Specifies the damping time constant of the volumetric flow rate value/frequency output.
FTB	55	Mass ► Damp AO/F	Mass flow ► Mass flow damping AO/frequency	Specifies the damping time constant of the mass flow rate value/ frequency output.
FTB	68	Calorie ► Damp AO/F	Calorie ► Calorific value damping AO/frequency	Specifies the damping time constant of the calorie value/frequency output (only available for AXG, not for AXW).

Pulse output/totalization

Menu path

Display	Device setup ▶ Detailed setup ▶ Pro var ▶ (see below)
PROFIBUS PA	Device ▶ Input ▶ Flow Transducer Block ▶ Process variables ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	63	Velocity ▶ Damp pls/ttl	Velocity ▶ Velocity damping pulse/total	Specifies the damping time constant of the flow velocity pulse/totalized value.
FTB	54	Volume ▶ Damp pls/ttl	Volume flow ▶ Volume flow damping pulse/total	Specifies the damping time constant of the volumetric flow rate pulse/totalized value.
FTB	56	Mass ▶ Damp pls/ttl	Mass flow ▶ Mass flow damping pulse/total	Specifies the damping time constant of the mass flow rate pulse/totalized value.
FTB	69	Calorie ▶ Damp pls/ttl	Calorie ▶ Calorific value damping pulse/total	Specifies the damping time constant of the calorie pulse/totalized value (only available for AXG, not for AXW).

Flow noise

Menu path

Display	Device setup ▶ Diag/Service ▶ Diagnosis ▶ Flow noise ▶ (see below)
PROFIBUS PA	Diagnostic ▶ Diagnosis ▶ Flow noise ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	148	Damp	Flow noise damping	Specifies the damping time constant of flow noise (only available for AXG, not for AXW).

AI FB output

Menu path

Display	Device setup ▶ Detailed setup ▶ PROFIBUS info ▶ AI(1-2)FB ▶ (see below)
PROFIBUS PA	Device ▶ Output ▶ Analog input (1-2) function block ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	16	PV_FTIME	Filter Time Const	Specifies the damping time constant of the AI FB output.

NOTE

The output fluctuation increases if the damping time constant is set to a lower value.
Set the damping time constant to 5 seconds or longer for using the constant for control purpose.

5.1.11 Low-cut Function Setting

A low-cut value can be set for the frequency output, pulse output and totalizer.
If the low-cut function is used, the flow rate below setpoints can be stopped from being output.
This function helps reduce erroneous output when the flow rate is “0”.
However, the unit of the low-cut value is the unit set in Subsection 5.1.8. If the unit is changed, the low-cut value is changed to the converted value in conjunction with the unit.
Set the low-cut value to “0” if the low-cut function is not used.
The setting can be configured with the following parameters.

■ Cut off

Menu path

Display	-
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	60	-	Velocity ► Velocity flow cut off	Specifies the output low cut value of Velocity flow.
FTB	9	-	Volume flow ► Volume flow cut off	Specifies the output low cut value of Volume flow.
FTB	57	-	Mass flow ► Mass flow cut off	Specifies the output low cut value of Mass flow.
FTB	70	-	Calorie ► Calorific flow cut off	Specifies the output low cut value of Calorie flow.

■ Frequency output/pulse output

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Device ► Query Device►Maintenance Transducer Block►index 24-99 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	69	Low cut	Pulse1 low cut	Specifies the low-cut value of the frequency output and pulse output.

An actual value which makes low cutting effective has ± 0.5% hysteresis from the set lowcut value.
The hysteresis width on the negative side (going into the low cut when flow rate is decreasing) and the positive side (going out of low cut when flow rate is increasing) are as follows:

(1) Negative side

= Low-cut setpoint - (Span set range x 0.5%)

(2) Positive side

= Low-cut setpoint + (Span set range x 0.5%)

Example: When setting to span of volumetric flow rate = 10.0 m^3/h,
Low-cut value = 1.0 m^3/h

(1) Negative side

= 1.0 [m^3/h] – (10.0 [m^3/h] x 0.5 [%])

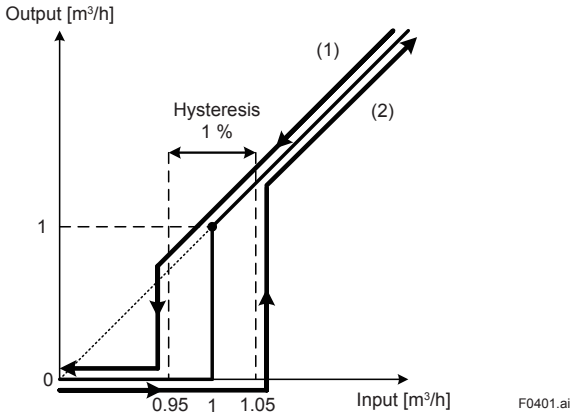
= 0.95 [m^3/h]

(2) Positive side

= 1.0 [m^3/h] + (10.0 [m^3/h] x 0.5 [%])

= 1.05 [m^3/h]

When a flow rate is decreasing and an actual flow rate goes below 0.95 [m^3/h], the output flow rate is reduced to 0.0 [m^3/h] with the low-cut function. On the other hand, when a flow rate is increasing and the actual flow rate goes over 1.05 [m^3/h], a flow rate is output.



NOTE

Note that the totalization might be counted due to the influence of the output fluctuation near 0% output if a small low-cut value is set.
In particular, if the value of the flow rate span, damping time constant or conductivity is low, the totalization is easily counted when the flow rate is zero. In such a case, increase the flow rate span, damping time constant, or low-cut value.

NOTE

If the output process value to be output is changed, it is necessary to specify the low-cut value again.

5.1.12 Sensor's Nominal Size Setting

To combine the remote transmitter with other remote sensor, the nominal size of the remote sensor must be set.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Sensor ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	15	Nominal size	Nominal size	Specifies the nominal size.
FTB	16	Nominal size unit	Nominal size unit	Specifies the unit of the nominal size.

NOTE

For the integral type, do not change the nominal size and its unit since they are set at factory shipment.

5.1.13 Density Setting

The density must be set in order to measure the mass flow rate. The density can be selected from the fixed density or density corrected with temperature.
For details about how to measure the mass flow rate or correct the density by temperature, refer to Subsection 5.5.5.
If density is set to "0" while the mass flow rate is mapped to PV, a setting error will result.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Pro var ► Density ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► Density ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	95	Value select	Density value select	Selects one of the following temperature-based density corrections. • Fixed value : Uses the fixed density • Correction value : Uses the corrected density (Only available for AXG, not for AXW).
FTB	96	Unit	Density unit	Specifies the unit of the density.
FTB	97	Fixed density	Density fixed value	Specifies the value of the fixed density.
FTB	98	Std density	Standard density	Specifies the reference standard density value to use the temperature-based density correction function (only available for AXG, not for AXW).
FTB	103	Correct density	Correct density	Displays the corrected density (only available for AXG, not for AXW).

5.1.14 Temperature Setting

The temperature setting is required when calculating the calorie based on the temperature difference from the temperature that is taken in via MAO FB.
For details about the calorie measurement, refer to Subsection 5.5.6.
This parameter can be used only for AXG, not for AXW.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Pro var ► Temperature ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► Temperature ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
STB	99	Std temperature	Standard temperature	Specifies the reference standard temperature for using the temperature-based density correction function.
STB	105	Fixed temperature	Calorific fix temp	Specifies the reference temperature to use for the calorie calculation with temperature difference from the temperature which is input from the outside.

5.1.15 Zero Adjustment

The zero adjustment is to set the output for zero flow velocity to 0%. Although the adjustment to zero is performed at the manufacturing factory prior to shipment, this procedure must be carried out once again following the installation of piping to match the magnetic flowmeter to its operating conditions.
This subsection describes zero adjustment procedures using the display.

IMPORTANT

- The zero adjustment should be carried out before the actual operation. Note that other parameters cannot be set and changed during the zero adjustment (for approximately 30 seconds).
- The zero adjustment should be executed only after the sensor is filled with fluid to measure and the fluid velocity is reduced to zero by closing the valve.
- Each time the measuring fluid is changed, be sure to perform the zero adjustment for the changed fluid.

■ Execution of zero adjustment

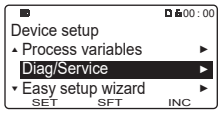
Zero adjustment using the display can be executed with the following parameter.

Menu path

Display	Device setup ▶ Diag/Service ▶ Autozero ▶ (see below)
PROFIBUS PA	Device ▶ Calibration ▶ (see below)

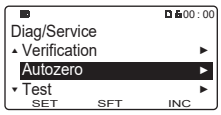
Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	13	Execute	Autozero Exe	Executes zero adjustment.

When executing zero adjustment from the display, follow procedures below.



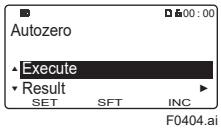
F0402.ai

Select “Diag/Service” in accordance with the menu path above.



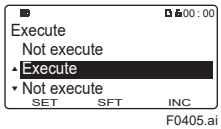
F0403.ai

Select “Autozero”.



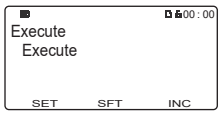
F0404.ai

Select “Execute”.



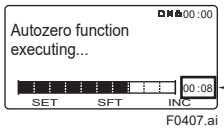
F0405.ai

Select “Execute”.



F0406.ai

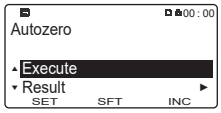
When “Execute” blinks, touch [SET] to execute.



F0407.ai

The zero adjustment starts, and the progress is displayed with the remaining time and a bar graph. Wait for the zero adjustment to complete.

The time remaining until the end.



F0408.ai

After the zero adjustment is finished, the display returns to “Autozero” menu.

When executing zero adjustment from PROFIBUS PA, zero adjustment is set with the procedures of the interactive operation guide called DD Method. Follow procedures on the operation screen.

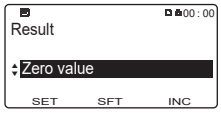
Confirmation of zero adjustment result

The zero adjustment result using the display can be confirmed with the following parameter.

Menu path

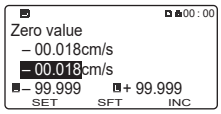
Display	Device setup ► Diag/Service ► Autozero ► Result ► (see below)
PROFIBUS PA	Device ► Calibration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	12	Zero value	Zero point offset	Refer to the following confirmation methods for results of zero adjustment and the display.



F0409.ai

For the result of the zero adjustment, select “Result” and then “Zero value”.



F0410.ai

The result of zero adjustment is displayed as on the left of the screen.

NOTE

When the zero adjustment result exceeds the defined value, the warning [092:AZ warn] is displayed.

5.1.16 Sensor Type Setting

When only transmitter is ordered, or when the remote sensor to combine with, the type of the remote sensor must be specified.
This setting can be configured with the following parameters. When the customer orders transmitter and the remote sensor at the same time as a combination,the type of the remote sensor to combine with is set to transmitter at the factory before shipment.
So,the customer is not required to set the sensor type.

Menu path

Display	Device setup ► Detailed setup ► Sensor ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Flow Tube ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	76	Flow sensor sel	Select Flow Tube	Set the type of detector.

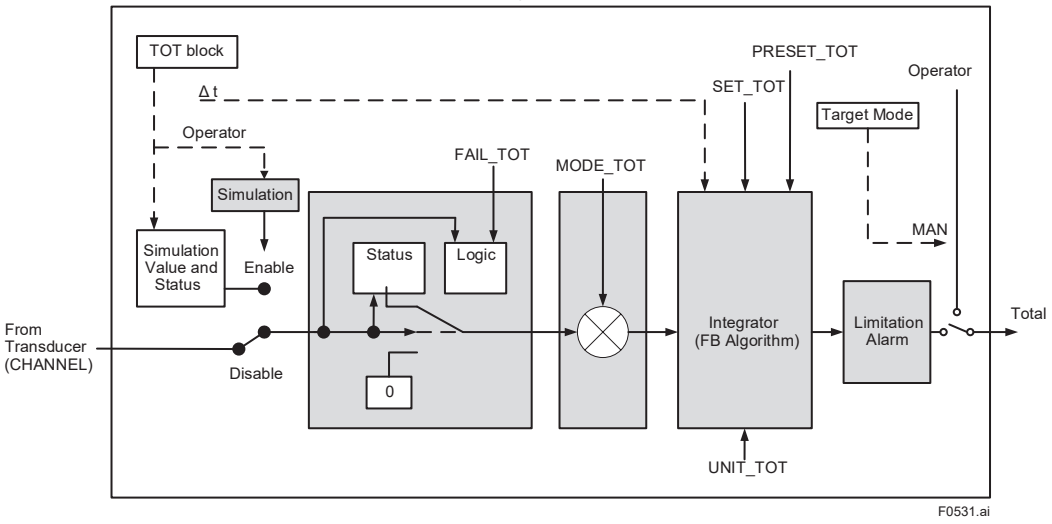
Selection		Description
Display	PROFIBUS PA	
ADMAG AXG	ADMAG AXG	Configure to use the ADMAG AXG Series remote sensor.
ADMAG AXW	ADMAG AXW	Configure to use the ADMAG AXW Series remote sensor.
ADMAG AXF	ADMAG AXF	Configure to use the ADMAG AXF Series remote sensor.
ADMAG AE	ADMAG AE	Configure to use the ADMAG AE Series remote sensor.
Calibrator	Calibrator	Configure to use the AM012 (calibrator) .
Other 1	Other 1	Configure to use another remote sensor.
Other 2	Other 2	
Other 3	Other 3	

IMPORTANT

When changing the combination of the sensors, the meter factor needs to be re-adjusted based on actual flow calibration to secure the accuracy. When using another remote sensor, such as other companies' products, contact a Yokogawa sales office or representative.

5.2 Totalization Function

ADMAG TI has three totalizer function blocks. Totalizer block parameters can be read or set from the host.
For a list of the parameters of blocks held by the ADMAG TI, see Chapter 6.



5.2.1 Totalized Value and Unit Setting (CHANNEL, UNIT_TOT)

A process value which can be set for the totalizer on the TB side is a volumetric flow rate, mass flow rate, and calorie.
The set unit can be displayed with the following parameters.

■ Channel Setting

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT1	12	TOT1FB ► CHANNEL	Channel	Selects CHANNEL number used in the TOT function block.
TOT2	12	TOT2FB ► CHANNEL	Channel	Selects CHANNEL number used in the TOT function block.
TOT3	12	TOT3FB ► CHANNEL	Channel	Selects CHANNEL number used in the TOT function block.

Selection		Description
Display	PROFIBUS PA	
Volume flow	Volume	Displays the value of volume flow
Mass flow	Mass	Displays the value of Mass flow
Calorie	Calorie	Displays the value of Calorie

■ Unit Setting

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	11	TOT1FB ► TOT_UNIT	Totalizer Unit	Displays the unit of totalizer 1.
		TOT2FB ► TOT_UNIT		Displays the unit of totalizer 2.
		TOT3FB ► TOT_UNIT		Displays the unit of totalizer 3.

5.2.2 Totalized Value Display and Totalization Counter Function (TOTAL)

The totalization result can be displayed with a totalized value or a totalized value which is scaled with the conversion factor (totalized count value). When the totalized value is scaled with the conversion factor, a specific flow rate is totalized in 1-count increments, which can be used as a totalizer counter.
The totalized value can be displayed and configured with the following parameters.

■ Displaying totalized value

Menu path

Display	Device setup ► Process variables ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	10	-	Totalizer value ► Condensed Status (Totalizer value ► Status,Quality)	Status of totalizer 1.
		Totalizer 1	Totalizer value ► Value	Displays the value of totalizer 1.
		-	Totalizer value ► Condensed Status (Totalizer value ► Status,Quality)	Status of totalizer 2.
		Totalizer 2	Totalizer value ► Value	Displays the value of totalizer 2.
		-	Totalizer value ► Condensed Status (Totalizer value ► Status,Quality)	Status of totalizer 3.
		Totalizer 3	Totalizer value ► Value	Displays the value of totalizer 3.

■ Setting conversion factor for scaling

Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	36	Totalizer 1 ► Conv factor	Total Conversion Factor	Specifies the conversion factor of totalizer 1.
		Totalizer 2 ► Conv factor		Specifies the conversion factor of totalizer 2.
		Totalizer 3 ► Conv factor		Specifies the conversion factor of totalizer 3.

■ Display of the totalized count value that is scaled with the conversion factor

Menu path

Display	Device setup ► Process variables ► Totalizer ►(see below)
PROFIBUS PA	Process variables ► Totalizer count ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	37	Totalizer 1 count	Totalizer 1 count	Displays the scaled totalized value of totalizer 1.
		Totalizer 2 count	Totalizer 2 count	Displays the scaled totalized value of totalizer 2.
		Totalizer 3 count	Totalizer 3 count	Displays the scaled totalized value of totalizer 3.

Example:
Set the unit of totalizer 2 to “m^3” and the conversion factor to “2”.
->If the totalized value of totalizer 2 is “10.123 m^3”, the totalized value is scaled to “10.123÷2 = 5”.

5.2.3 Totalization Switch Function

When a target value (threshold) to totalize is specified, it can be used as a totalization switch function. The totalization switch function can compare the specified target value with the totalized value and output the result in status output and DI function blocks.
The status output is active while the totalized value exceeds the specified target value.
For details about the status output, active direction, and status output function setting for each terminal, refer to Section 5.14. However, the status output function can be used only when disconnected offline from the control loop. For details about the DI function blocks output refer to Section 5.3.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Query Device ► Flow Transducer Block ► index 69-166 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	127	Totalizer 1 ► Set point	Total 1 set point	Specifies the target value of totalizer 1.
FTB	128	Totalizer 2 ► Set point	Total 2 set point	Specifies the target value of totalizer 2.
FTB	129	Totalizer 3 ► Set point	Total 3 set point	Specifies the target value of totalizer 3.

5.2.4 Operation of Totalizer Function at Alarm Occurrence (FAIL_TOT)

The operation of the totalizer can be specified when an alarm that affects the totalization function occurs (See 5.6.3 Operation at the Time of Error “Follows settings (see 5.2.4)”).
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	15	Totalizer 1 ► Failure opts	Fail Safe Mode	Specifies the totalizer 1 operation to be performed when an alarm occurs.
		Totalizer 2 ► Failure opts		Specifies the totalizer 2 operation to be performed when an alarm occurs.
		Totalizer 3 ► Failure opts		Specifies the totalizer 3 operation to be performed when an alarm occurs.

From the table below, select the operation of the totalization function.

Selection		Description
Display	PROFIBUS PA	
Measured value	Run	Continues the totalization function with an instantaneous value at that time even while an alarm is occurring.
Stop	Hold	Displays the totalized value up to that point by immediately stopping the totalizer if an alarm occurs.
Last valid	Memory	Continues the totalization function with the last instantaneous value right before an alarm occurs (monotonical increasing).

5.2.5 Mode Setting for Totalization Function (TARGET_MODE, MODE_BLK)

Indicates the three types of function block modes; Out of Service (O/S), Manual, and Auto. TARGET_MODE indicates what mode of operation is desired for Totalizer block. In Out of Service (O/S) mode, the TOT block does not operate. The Manual mode does not allow values to be updated. The Auto mode causes the measured value to be updated. Under normal circumstances, set the Auto mode to take effect. The Auto mode is the factory default.

■ TARGET_MODE setting

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT1	5	TOT1FB ► TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for Totalizer block.
TOT2	5	TOT2FB ► TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for Totalizer block.
TOT3	5	TOT3FB ► TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for Totalizer block.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the TOT block does not operate.

■ MODE_BLK setting

Menu path

Display	Device setup ► Block mode ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	6	Actual mode ► TOT(1-3)FB	Actual Mode	Indicates the current operating condition.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the TOT block does not operate.

5.2.6 Totalization Direction Setting (MODE_TOT)

The totalization direction can be specified when using the totalization function.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	14	Totalizer 1 ► Options	Totalizer Mode	Specifies the totalization direction of totalizer 1.
		Totalizer 2 ► Options		Specifies the totalization direction of totalizer 2.
		Totalizer 3 ► Options		Specifies the totalization direction of totalizer 3.

From the table below, select the totalization direction.

Selection		Description
Display	PROFIBUS PA	
Balanced	Pos. and neg. values	Totalizes the flow rate (difference) of the forward and reverse directions.
Only positive	Positive values only	Totalizes only the flow rate in the forward direction.
Only negative	Negative values only	Totalizes only the flow rate in the reverse direction.
Hold	Hold Count	Stops totalization processing (holding the current totalized value).

5.2.7 Totalized Value Reset/Preset Function (SET_TOT, PRESET_TOT)

The reset/preset function can be specified for the totalized value. If the reset function is used, the function resets the totalized value to “0”. If the preset function is used, it sets the preset value specified in advance to the totalized value. The preset function is used when starting to count totalization from the specified value.
The setting can be configured with the following parameters.

■ Use of the reset/preset function

Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	13	Totalizer 1 ► Reset/Preset	Totalizer Reset ► Totalizer Set	Uses the reset/preset function of totalizer 1.
		Totalizer 2 ► Reset/Preset		Uses the reset/preset function of totalizer 2.
		Totalizer 3 ► Reset/Preset		Uses the reset/preset function of totalizer 3.

From the table below, select the reset/preset function. In the communication access of PROFIBUS PA, the communication access is set with the procedures of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Not execute	Totalize	Does not use the reset/preset function of the totalized value.
Reset	Reset	Uses the reset function of the totalized value.
Preset	Preset	Uses the preset function for the totalized value.

■ Preset value setting

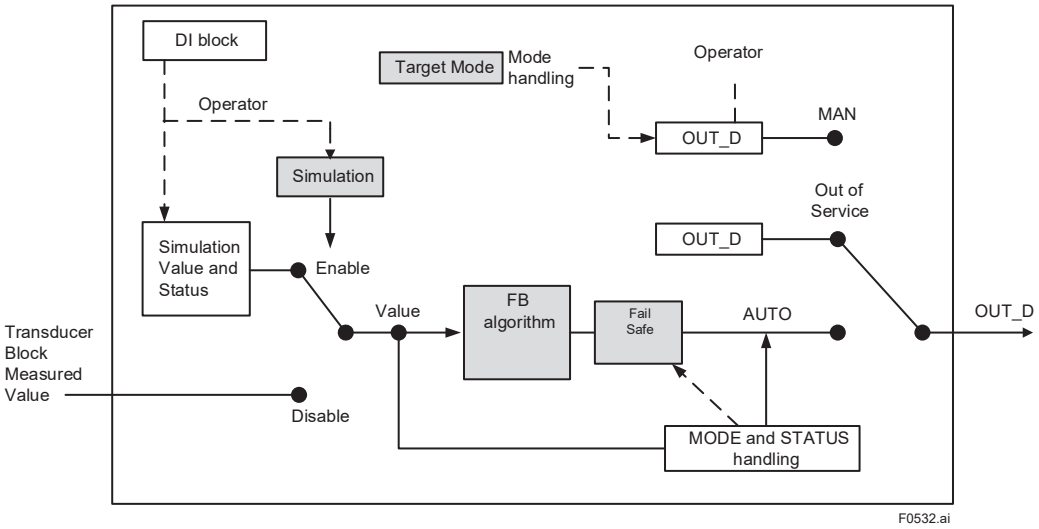
Menu path

Display	Device setup ► Detailed setup ► Totalizer ► (see below)
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	16	Totalizer 1 ► Preset value	Totalizer Reset ► Preset Value	Specifies the preset value of totalizer 1.
		Totalizer 2 ► Preset value		Specifies the preset value of totalizer 2.
		Totalizer 3 ► Preset value		Specifies the preset value of totalizer 3.

5.3 Discrete input Function

The AXG/AXW contains two DI blocks, which individually transfer the “High Limit”, “Low Limit”, “Adhesion Alarm” and “Adhesion warning” generated by the transducer block. For a list of the parameters of blocks held by the AXG/AXW, refer to Chapter 6.



5.3.1 Mode Setting for DI Function (TARGET_MODE, MODE_BLK)

■ TARGET_MODE

Indicates the three types of function block modes;
Out of Service (O/S), Manual, and Auto.
TARGET_MODE indicates what mode of operation is desired for the block. In Out of Service (O/S) mode, the DI block does not operate. The Manual mode does not allow values to be updated. The Auto mode causes the measured value to be updated. Under normal circumstances, set the Auto mode to take effect. The Auto mode is the factory default.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► (see below)
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	5	DI(1-2)FB► TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for DI block.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the DI block does not operate.

■ MODE_BLK

The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode.

Menu path

Display	Device setup ► Block mode ► Actual mode ► (see below)
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	6	DI(1-2)FB	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the DI block does not operate.

5.3.2 Output Direction Setting (INVERT)

This is the parameter which indicates whether the input value from the transducer block should be logically inverted before it is stored in the OUT_D.

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	6	-	Invert Input Value	Used to reverse the output value of OUT_D.

Selection		Description
Display	PROFIBUS PA	
Normal	Not inverted	Do not invert the output value of OUT_D.
Invert	Inverted	Invert the output value of OUT_D.

5.3.3 Operation of DI function at Alarm Occurrence (FSAFE_TYPE, FSAFE_VAL)

This is the parameter which defines the operation of the function block if a fault is detected.

■ FSAFE_TYPE

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	20	-	Fail Safe Mode	Sets the behavior of OUT_D when a fault is detected.

Selection		Description
Display	PROFIBUS PA	
-	Default value is used as output value.	Output the value of FSAFE_VALUE_D to OUT_D.
-	Storing last valid Output Value.	Display the last valid OUT_D value.
-	The calculated output value is incorrect	Display the current OUT_D.

■ FSAFE_VAL_D

This is the parameter which sets the default value for the OUT_D parameter, if sensor or sensor electric fault is detected.

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	21	-	Fail Safe Default Value	Set the value that will be output to OUT_D when a failure is detected with FSAFE_TYPE set to 0.

5.3.4 Connection of Contact Point Output to DI Function (CHANNEL)

The contact point outputs at DTB are output to specific channels, respectively. By selecting the channel to use in the DI function block, it is connected to the contact point.
The relation of the channel for each contact point output and the channel which can be selected from each DI function block is shown in the figure below.

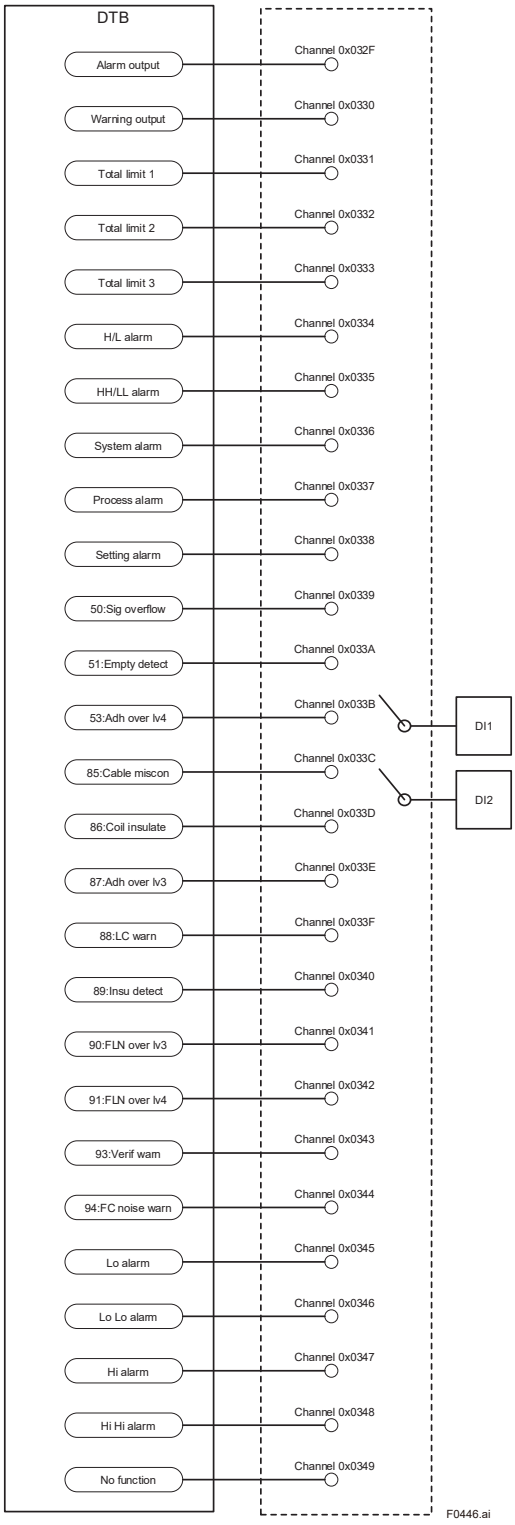


Figure 5.3.4 Relation of Process Value of DTB and DI Function Block

The information of the figure above can be organized below.

Table 5.3.1 List of Relation of Contact Point Output and DI Function Block

CHANNEL number	Channel Selection	
	Display	PROFIBUS PA
0x032F	Alarm output	Alarm output
0x0330	Warning output	Warning output
0x0331	Total limit 1	Total limit 1
0x0332	Total limit 2	Total limit 2
0x0333	Total limit 3	Total limit 3
0x0334	H/L alarm	H/L alarm
0x0335	HH/LL alarm	HH/LL alarm
0x0336	System alarm	System alarm
0x0337	Process alarm	Process alarm
0x0338	Setting alarm	Setting alarm
0x0339	Sig overflow	50:Sig overflow
0x033A	Empty detect	51:Empty detect
0x033B	Adh over lv4	53:Adh over lv4
0x033C	Cable miscon	85:Cable miscon
0x033D	Coil insulate	86:Coil insulate
0x033E	Adh over lv3	87:Adh over lv3
0x033F	LC warn	88:LC warn
0x0340	Insu detect	89:Insu detect
0x0341	FLN over lv3	90:FLN over lv3
0x0342	FLN over lv4	91:FLN over lv4
0x0343	Verif warn	93:Verif warn
0x0344	FC noise warn	94:FC noise warn
0x0345	Lo alarm	Lo alarm
0x0346	Lo Lo alarm	Lo Lo alarm
0x0347	Hi alarm	Hi alarm
0x0348	Hi Hi alarm	Hi Hi alarm
0x0349	No function	No function

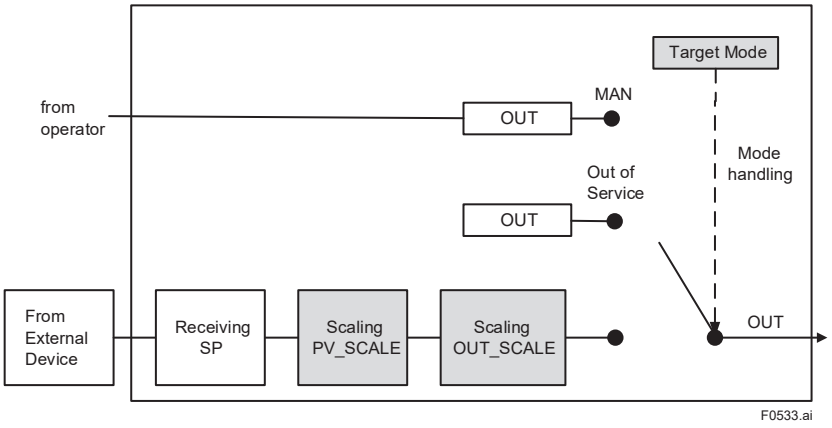
A channel can be selected in each DI function block with the following parameter.

Display	Device setup ► Detailed setup ► PROFIBUS info ► DI(1-2)FB ► (see below)
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	14	CHANNEL	Channel	Selects CHANNEL number used in the DI function block. Refer to Table 5.3.1 for Selection.

5.4 Inputting External Temperature (AO Function Block)

By using the external temperature input, external temperature can be used for temperature-base density correction calculation and calorie calculation. For details about the temperature-input density correction calculation and calorie calculation, refer to Subsections 5.5.5 and 5.5.6.
This function can be used by AO function block.AO function block can be basically used also for Actuator and valve, but ADMAG TI can use the block only to receive the value from external device.
Therefore, it does not use parameters such as RCAS_OUT that are used by actuators and valves.The AO function block is connected to Flow Transducer Block via Channel.
The following figure presents the AO function block for ADMAG TI.



External input temperature is set with the following parameters.

Display	Device setup ► Detailed setup ► Temperature ►(see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► Temperature ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	83	Function	Temperature function	Specifies as what value the device should handle the external temperature input internally.
FTB	30	Unit	Temperature unit	Specifies the unit of the external temperature input.
FTB	31	LRV	Temperature LRV	Specifies the low limit of the range value of the external temperature input.
FTB	32	URV	Temperature URV	Specifies the high limit of the range value of the external temperature input.

From the table below, select the function.

Selection		Description
Display	PROFIBUS PA	
No function	No function	Disables the external input function.
Monitoring	Monitoring	Though the external input function is enabled, it does not influence flow rate calculation.
Diff temperature	Diff temperature	Uses the external input as temperature difference. Calorie calculation is enabled if selected.
Ext temperature	Ext temperature	Uses the external input as temperature. The density correction calculation and calorie calculation of mass flow rate are enabled if selected.

5.4.1 Mode Setting for Analog output function (TARGET_MODE, MODE_BLK)

The target modes permitted for the AO function block are Automatic (Auto), Manual (Man), and Out of Service (O/S).
In Out of Service (O/S) mode, the AO function block does not operate.
The Manual mode does not allow values to be updated.
The Auto mode causes the measured value to be updated.
Under normal circumstances, set the Auto mode to take effect.
The Auto mode is the factory default.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AOFB ► (see below)
PROFIBUS PA	Device ► Input ► Analog Output Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AO1	5	TARGET_MODE	Target Mode	TARGET_MODE indicates what mode of operation is desired for AO block.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the AO block does not operate.

■ MODE_BLK

The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode.

Menu path

Display	Device setup ► Block mode ► Actual mode ► (see below)
PROFIBUS PA	Device ► Input ► Analog Output Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AO1	6	AOFB	Actual Mode	The actual mode is set (calculated) by the block during its execution to reflect the mode used during execution.

Selection		Description
Display	PROFIBUS PA	
Auto	AUTO	The Auto mode causes the measured value to be updated.
Man	MAN	The Manual mode does not allow values to be updated.
O/S	Out of Service (O/S)	In Out of Service (O/S) mode, the AO block does not operate.

5.4.2 PV Scale, Out Scale for Analog output function (PV_ SCALE, OUT_SCALE)

Conversion of the external value into the high and low scale values and unit. In ADMAG TI, to set the same ranges and unit for PV_SCALE and OUT_SCALE are recommended.

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AOFB ► (see below)
PROFIBUS PA	Device ► Input ► Analog Output Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AO1	11	PV_SCALE EU at 0%	PV Scale ► Lower Value	Valid range of the lower limit
		PV_SCALE EU at 100%	PV Scale ► Upper Value	Valid range of the upper limit
		PV_SCALE Units index	PV Scale ► Units	the code number of the engineering unit of Process Variable
		-	PV Scale ► Decimal Point	Specifies a decimal point position.
AO1	38	-	Output Scale ► Lower Value	Valid range of the lower limit
			Output Scale ► Upper Value	Valid range of the upper limit
			Output Scale ► Units	the code number of the engineering unit of Process Variable
			Output Scale ► Decimal Point	Specifies a decimal point position.

5.4.3 Channel setting for Analog output function (IN_ CHANNEL, OUT_CHANNEL)

Sets the kind of external value(0x011d:Temperature only).

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► AOFB ► (see below)
PROFIBUS PA	Device ► Input ► Analog Output Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AO1	21	-	Input Channel	0x011d:Temperature only
AO1	22	CHANNEL	Output Channel	0x011d:Temperature only

5.5 Auxiliary Calculation Function

5.5.1 Fluid Flow Direction Setting

The arrow indicated on the surface of the sensor indicates a fluid flow direction. At shipment from the manufacturing factory, a flow rate is measured assuming that the arrow direction is forward. By changing the parameter settings, this product can measure the flow rate, assuming that the reverse direction is forward against the arrow direction.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	11	Flow direct	Flow direction	Specifies the fluid flow direction.

From the table below, select the fluid flow direction.

Selection		Description
Display	PROFIBUS PA	
Forward	+Direction	The arrow direction of the sensor is forward.
Reverse	-Direction	The reverse direction of the arrow of the sensor is forward.

5.5.2 Rate Limit Function Setting

If the rate limit function is used, it becomes possible to reduce noises that cannot be all cleared only by lengthening the damping time constant. When a step signal or a sudden signal due to a slurry fluid is input, this function judges whether the signal is a flow rate signal or a noise signal. This judgment is made based on the high/low limit value (rate limit value) and the rate limit function continuation time (dead time), causing the noise signal over the rate limit value to be cut off.
The rate limit value should be specified with the percentage (%) for the span of the process value PV-mapped in Subsection 5.1.6. If the rate limit function is not used, set “0” to the dead time.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► AUX ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	87	Rate limit	Rate limit	Specifies the rate limit value.
FTB	88	Dead time	Dead time	Specifies the dead time.
FTB	89	Noise filter	Noise filter	Specifies the noise filter (rate limit value and dead time).*1

*1: From the table below, select the noise filter (rate limit value and dead time).

Selection		Rate limit value	Dead time
Display	PROFIBUS PA		
Manual	Manual	The value is specified in the parameter “Rate limit”.	The value is specified in the parameter “Dead time”.
Level 1	Level 1	0.5%	0.5s
Level 2	Level 2	1.0%	1.0s
Level 3	Level 3	5.0%	3.0s

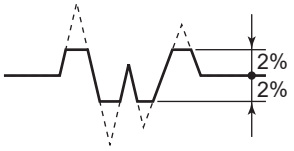
NOTE

If either the rate limit value or the dead time is specified, the noise filter is set to “Manual”.

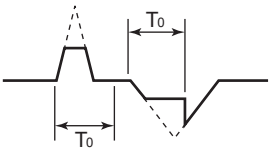
NOTE

Determining the rate limit value and dead time

The Rate limit value:
Determine the level which should be cut the output fluctuation. For example, if its level is 2%, the noise of 2% or larger would be cut as shown in the following figure.



The Dead time (T_0):
Determine the value depending on the width of the output fluctuation. Choose the larger value when the noise which is over the dead time as shown in the following figure.



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NOTE

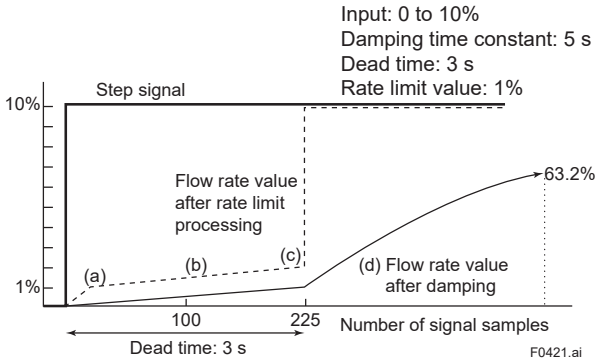
For the rate limit function, the dead time is set to “0” at shipment from the manufacturing factory. Be sure to set the dead time when the rate limit function is used.

Signal processing for rate limit function

The product calculates to set the specific rate limit value to the primary delay response value of the previously sampled flow rate value. If the flow rate value sampled at this time exceeds the rate limit value above, its high or low limit is set to the flow rate value at this time. Furthermore, if the sampling count occurs within the dead time while the signal over the high/low limit is in the same direction, this signal is judged to be a flow rate signal.

Example:

(1) When input = 0 to 10%, Damping time constant = 5 seconds, Dead time = 3 seconds, and Rate limit value = 1%, the output for the step input is obtained as shown below.

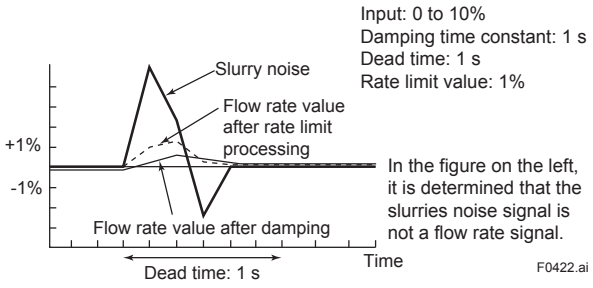


- In the condition above (1), the signal exceeds the rate limit value as compared with the previous value; therefore, the response is set to 1%.

  The actual output, which is damped, is processed as indicated with the solid line.
- Then, the flow rate value in the dead time is set to the “flow rate after damping calculation + signal of rate limit value (1%)”.
- The input signal does not return to the rate limit value or less within the dead time; therefore, it is judged to be a flow rate signal at the time of (3).
- The output signal starts following the step signal along the damping curve.

The figure below shows an output example when a slurry noise occurs.

(2) When input = 0 to 10%, Damping time constant = 1 second, Dead time = 1 seconds, and Rate limit value = 1%, the output for a slurry noise is obtained as shown below.



5.5.3 Pulsing Flow Support Function Setting

If a pump, etc. is used, it may cause an error in the average of the flow rate due to the pulsing flow. If the pulsing flow support function is used, an error due to a pulsing flow can be reduced by following a flow rate change while controlling the flow rate calculation.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ►(see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ►AUX ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	90	Pulsing flow	Pulsing flow	Specifies the use of the pulsing flow support function.

From the table below, select the use of the pulsing flow support function.

Selection		Description
Display	PROFIBUS PA	
No	No	Do not use the pulsing flow support function.
Yes	Yes	Use the pulsing flow support function.

5.5.4 Power Frequency Synchronization Setting

This function can be specified whether the excitation frequency (internal signal processing frequency) and power frequency are synchronous or asynchronous.
When setting the excitation frequency and power frequency to asynchronous, the excitation frequency is determined with the setpoint of the power frequency.
The power frequency synchronous/asynchronous mode and the power frequency can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► AUX ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	91	Power sync	Power synchronize	Sets the excitation frequency and power frequency to synchronous.*1
FTB	92	Set power freq	Set power frequency	Specifies the power frequency when the excitation frequency and power frequency are asynchronous.

*1: Sets the synchronous/asynchronous mode of power frequency from the table below.

Selection		Description
Display	PROFIBUS PA	
No	No	Sets the excitation frequency and power frequency asynchronous.
Yes	Yes	Sets the excitation frequency and power frequency synchronous.

IMPORTANT

When using the DC power as the transmitter power, set the commercially available power frequency of the place where the transmitter will be used.
Set “Power sync” to Off and then set “Set power freq”.

The excitation frequency and power frequency can be checked with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► AUX

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	93	Iex power frequency	IEX power frequency	Displays the power frequency (synchronous with the excitation frequency).
FTB	94	Meas power freq	Measured power frequency	Displays the measured power frequency.

5.5.5 Density Correction Calculation

When the temperature from other product (temperature transmitter, etc.) is obtained from MAO, the density correction calculation can be performed based on temperature. The measurement accuracy for the mass flow rate is improved by using this function.

The mass flow rate is calculated using the following formula.

$V_m = V_f \times \rho$

V_m: Mass flow rate [kg/s]
V_f: Volumetric flow rate [m^3/s]
ρ: Density [kg/m^3]

When the density correction calculation is performed based on temperature, the density is obtained using the following formula. The density compensating rates must be specified based on applications that use this product.

$\rho_r = \rho_n \times \{1 + a_1 \times (T_r - T_n) \times 10^{-2} + a_2 \times (T_r - T_n)^2 \times 10^{-6}\}$

ρ_r: Density corrected based on the measured temperature [kg/m^3]
ρ_n: Standard density [kg/m^3]
T_r: Measured temperature [°C]
T_n: Standard state temperature [°C]
a_1: Primary compensating rate
a_2: Secondary compensating rate

This function can be used only for AXG, not for AXW. The standard temperature and the compensating rates can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Pro var ► Temperature ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► Temperature ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	100	Coef A1	Temp coef A1	Specifies the primary compensating rate.
FTB	101	Coef A2	Temp coef A2	Specifies the secondary compensating rate.

The density correction calculation can be set using the following procedure.

(1) Set to the use of the temperature-corrected density by referring to Subsection 5.1.13.

(2) Set the function of the external temperature input function to the temperature by referring to Section 5.4.

(3) Set the range high limit and low limit of the external temperature input by referring to Section 5.4.

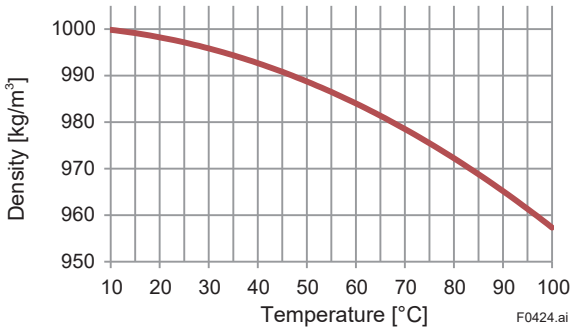
(4) Set the standard temperature and standard density by referring to Subsections 5.1.14 and 5.1.13.

(5) Set the primary and secondary compensating rates of the compensation formula.

NOTE

The density correction calculation is performed only when items (1) and (2) above are specified. If they are not specified, the density is assigned to the fixed value that is specified in Subsection 5.1.13.

Example:
If the water density is corrected based on the temperature in the following conditions, the result is obtained as shown below.
Ext temperature input range = 0.0 to 100.0°C,
Standard density = 1000 kg/m^3,
Standard temperature = 20°C,
Primary compensating rate = -0.02, Secondary compensating rate = -3.9



5.5.6 Calorie Calculation

By obtaining the absolute temperature or the temperature difference from other product (temperature transmitter, etc.) from MAO, the calorie calculation is executable.

The calorie is obtained using the following formula.
$Q = c \times V_m \times \Delta t$
Q: Calorie [J/s]
c: Specific heat [J/kg•K]
V_m: Mass flow rate [kg/s]
Δt: Temperature difference [K]

The temperature difference of Δt varies depending on the MAO function set in Section 5.4. If the temperature difference is selected, the temperature obtained in MAO is used. If the absolute temperature is selected, a difference between the temperature obtained in MAO and the reference temperature set in Subsection 5.1.14 is used.
[“Temperature acquired by MAO” – “Set reference temperature”]

This function can be used only for AXG, not for AXW. The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Pro var ► Calorie ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Process variables ► Calorie ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	104	Specific heat	Specific heat	Specifies the specific heat.

The calorie calculation can be configured using the following procedures.

• When the temperature is selected as the external temperature input function:

(1) Set the function of the external temperature input function to the temperature by referring to Section 5.4.

(2) Set the range high limit and low limit of the external temperature input by referring to Section 5.4.

(3) Set the reference temperature by referring to Subsection 5.1.14.

(4) Set the specific heat.

• When the temperature difference is selected as the external temperature input function:

(1) Set the external temperature input function to the temperature difference by referring to Section 5.4.

(2) Set the range high limit and low limit of the external temperature input by referring to Section 5.4.

(3) Set the specific heat.

5.5.7 0% Signal Lock

If this function is enabled, the flow rate is fixed at 0. The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► AUX calculation ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	78	0% signal lock	Signal Lock	Specifies specifications for 0% signal lock.

From the table below, select the specifications of 0% signal lock.

Selection		Description
Display	PROFIBUS PA	
Unlock	Unlock	Does not use 0% Signal Lock
Lock	Lock	Uses 0% signal lock

5.6 Alarm

5.6.1 Alarm Display

If a failure of the device is detected with the self check function of this product, an alarm (device alarm) is notified from the resource block. If the error of each function block (block error) or the error of the process value (process alarm) is detected, an alarm is notified from each block. When the display is mounted, an error no. is displayed as AL.XX. When multiple alarms are notified, the error nos. of the multiple errors are alternatively displayed. Refer to Subsection 5.6.2 for alarm no. and alarm contents.

5.6.2 Errors and Countermeasures

Explanation of NE107 status:

NE107 status		Status of the device
F	Failure	Device malfunction, Parts malfunction
C	Function Check	The output signal is temporarily invalid for the local operation or manual operation input.
S	Out of specification	The device works in out of specifications. The output signal is uncertain for the process or the ambiance.
M	Maintenance required	The maintenance is required in the near future.
N	No Effect	State other than mentioned above

■ System alarm

The device breaks down and causes abnormal measurement.
Device replacement is needed.

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
F	010:Main CPU FAIL	10:Main board CPU failure	CPU (main board) failure was detected.	Contact Yokogawa service center.	1	0
F	011:Rev calc FAIL	11:Reverse calculation failure	Failure of reverse calculation was detected.	Contact Yokogawa service center.	1	1
F	012:Main EEP FAIL	12:Main board EEPROM failure	Failure of EEPROM (main board) was detected.	Turn on the power again within the range of the temperature specifications. If the situation does not improve, contact Yokogawa service center.	1	2
F	013:Main EEP dflt	13:Main board EEPROM default	EEPROM (main board) was reset to default values.	Contact Yokogawa service center.	1	3
F	014:Snsr bd FAIL	14:Sensor board failure	Failure of sensor board was detected.	Contact Yokogawa service center.	1	8
F	015:Snsr comm ERR	15:Sensor communication error	Communication error of the sensor was detected.	Contact Yokogawa service center.	1	9
F	016:AD 1 FAIL[Sig]	16:A/D1 failure[Signal]	Failure of A/D transmitter 1 (flow velocity signal) was detected.	Contact Yokogawa service center.	1	10
F	017:AD 2 FAIL[Excit]	17:A/D2 failure[Exciter]	Failure of A/D transmitter 2 (exciting current) was detected.	Contact Yokogawa service center.	1	11

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
F	018:Coil open	18:Coil open	Coil of sensor was disconnected.	Turn off the power, check coil of sensor and excitation cable.	1	12
F	019:Coil short	19:Coil short	Coil of sensor was shorted.	Contact Yokogawa service center.	1	13
F	020:Exciter FAIL	20:Exciter failure	Failure of the excitation circuit was detected.	Contact Yokogawa service center.	1	14
F	027:Restore FAIL	27:Parameter restore incomplete	Restore of parameters was failed.	Retry parameter restoration.	1	24
F	028:Ind bd FAIL	28:Indicator board failure	Failure of display board was detected.	Check that the ambient temperature of display is within the range. If the situation does not improve, contact Yokogawa service center.	1	25
F	029:Ind bd EEP FAIL	29:Indicator board EEPROM failure	Failure of EEPROM (display board) was detected.	Turn on the power again within the range of the temperature specifications. If the situation does not improve, contact Yokogawa service center.	1	26
F	030:LCD drv FAIL	30:LCD driver failure	Failure of display driver was detected.	Contact Yokogawa service center.	1	27
F	031:Ind bd mismatch	31:Indicator board mismatch	Mismatch of display board was detected.	Contact Yokogawa service center.	1	28
F	032:Ind comm ERR	32:Indicator communication error	Communication error of display board was detected.	Check the connection of the display and main board.	1	29
F	033:microSD FAIL	33:microSD card failure	Failure of the microSD card was detected.	Change microSD card.	1	30

Process alarm

The device works normally, but some issue of the process causes abnormal measurement.
Maintenance work is needed.

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
S	050:Signal overflow	50:Signal overflow	Failure of input signal was detected.	Check whether signal cable is correct.	2	0
S	051:Empty detect	51:Empty pipe detection	Inside of sensor was detected to be empty. (Empty pipe detection)	Fill a sensor with fluid.	2	1
N	052:H/L HH/LL alm	52:H/L or HH/LL alarm	Flow rate is above H/L or HH/LL threshold.	Check flow rate and setting value.	2	2
S	053:Adh over lv 4	53:Adhesion over level 4	The resistance value of the electrodes exceeded Level 4. (Adhesion detection of insulation to the electrode)	Clean electrodes.	2	3
N	500:AI1 LL Alarm	500:AI1 Lo Lo alarm	Flow rate is above AI1 Lo Lo alarm threshold.	Check output value or parameter setting.	5	0
N	501:AI1 HH Alarm	501:AI1 Hi Hi alarm	Flow rate is above AI1 Hi Hi alarm threshold.	Check output value or parameter setting.	5	1
N	502:AI2 LL Alarm	502:AI2 Lo Lo alarm	Flow rate is above AI2 Lo Lo alarm threshold.	Check output value or parameter setting.	5	2
N	503:AI2 HH Alarm	503:AI2 Hi Hi alarm	Flow rate is above AI2 Hi Hi alarm threshold.	Check output value or parameter setting.	5	3

Setting alarm

The device works normally, but the parameter setting error occurs.
Parameter setting is needed.

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
S	060:Span cfg ERR	60:Span configuration error	Setting error of span flow rate was detected. (fulfill “0.05 m/s < span flow rate < 16 m/s”)	Check or change span parameter settings.	2	4
N	065:H/L cfg ERR	65:H/L HH/LL configuration error	The setting of the H/L or HH/LL threshold is incorrect.	Change H/L, HH/LL parameter setting.	2	13
S	066:Density cfg ERR	66:Density configuration error	The setting error of density value was detected when PV was set to mass flow rate.	Check the parameter settings related to density.	2	14
S	067:Pls 1 cfg ERR	67:Pulse output 1 configuration error	Setting error of pulse output 1 was detected.	Check Pulse1-related parameter settings.	2	16
C	069:Nomi size cfg	69:Nominal size configuration error	Configuration error of nominal size was detected. (fulfill “0.99 mm < nominal size of sensor < 3000.10 mm (0.01 inch < nominal size of sensor < 120.10 inch)”)	Check the parameter settings related to nominal size.	2	18
C	070:Adh cfg ERR	70:Adhesion configuration error	Setting error of electrode adhesion detection function was detected. (fulfill “Level1 < Level2 < Level3 < Level4”)	Check the parameter settings related to adhesion detection.	2	19

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
C	071:FLN cfg ERR	71:Flow noise configuration error	Setting error of flow noise verification function was detected. (fulfill “Level1 < Level2 < Level3 < Level4”)	Change flow noise parameter settings.	2	20
C	072:Log not start	72:Data logging not started	Data logging failed to start.	Insert microSD card.	2	21
C	504:TOT1 Unit ERR	504:TOT1 unit error	The flow rate selected in CHANNEL and the unit selected in TOT1 unit are combined incorrectly.	Check unit parameter setting.	5	4
C	505:TOT2 Unit ERR	505:TOT2 unit error	The flow rate selected in CHANNEL and the unit selected in TOT2 unit are combined incorrectly.	Check unit parameter setting.	5	5
C	506:TOT3 Unit ERR	506:TOT3 unit error	The flow rate selected in CHANNEL and the unit selected in TOT3 unit are combined incorrectly.	Check unit parameter setting.	5	6
C	507:PB O/S Mode	507:PB in O/S mode	The PB block is in the O/S mode.	Change the PB block mode.	5	8
C	508:AI1 O/S Mode	508:AI1 in O/S mode	The AI1 block is in the O/S mode.	Change the AI1 block mode.	5	9
C	509:AI2 O/S Mode	509:AI2 in O/S mode	The AI2 block is in the O/S mode.	Change the AI2 block mode.	5	10
C	510:TOT1 O/S Mode	510:TOT1 in O/S mode	The TOT1 block is in the O/S mode.	Change the TOT1 block mode.	5	11
C	511:TOT2 O/S Mode	511:TOT2 in O/S mode	The TOT2 block is in the O/S mode.	Change the TOT2 block mode.	5	12
C	512:TOT3 O/S Mode	512:TOT3 in O/S mode	The TOT3 block is in the O/S mode.	Change the TOT3 block mode.	5	13
C	513:DI1 O/S Mode	513:DI1 in O/S mode	The DI1 block is in the O/S mode.	Change the DI1 block mode.	5	14
C	514:DI2 O/S Mode	514:DI2 in O/S mode	The DI2 block is in the O/S mode.	Change the DI2 block mode.	5	15
C	515:AO O/S Mode	515:AO1 in O/S mode	The AO1 block is in the O/S mode.	Change the AO1 block mode.	5	16
C	516:FTB O/S Mode	516:FTB in O/S mode	The FTB block is in the O/S mode.	Change the FTB block mode.	5	17
C	517:LTB O/S Mode	517:LTB in O/S mode	The LTB block is in the O/S mode.	Change the LTB block mode.	5	18
C	518:DTB O/S Mode	518:DTB in O/S mode	The DTB block is in the O/S mode.	Change the DTB block mode.	5	19
C	519:M1TB O/S Mode	519:MTB1 in O/S mode	The MTB1 block is in the O/S mode.	Change the MTB1 block mode.	5	20
C	520:M2TB O/S Mode	520:MTB2 in O/S mode	The MTB2 block is in the O/S mode.	Change the MTB2 block mode.	5	21
C	521:PB Simulate Act	521:PB simulation active	PB simulations is running.	Disable SIMULATE. Simulate En/Disable of the PB block.	5	22
C	522:AI1 Simulate Act	522:AI1 simulation active	AI1 simulations is running.	Disable SIMULATE. Simulate En/Disable of the AI1 block.	5	23
C	523:AI2 Simulate Act	523:AI2 simulation active	AI2 simulations is running.	Disable SIMULATE. Simulate En/Disable of the AI2 block.	5	24
C	527:DI1 Simulate Act	527:DI1 simulation active	DI1 simulations is running.	Disable SIMULATE. Simulate En/Disable of the DI1 block.	5	28

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
C	528:DI2 Simulate Act	528:DI2 simulation active	DI2 simulations is running.	Disable SIMULATE. Simulate En/Disable of the DI2 block.	5	29
C	529:AO Simulate Act	529:AO1 simulation active	AO1 simulations is running.	Disable SIMULATE. Simulate En/Disable of the AO1 block.	5	30
C	530:AI1 Man Mode	530:AI1 in Man mode	The AI1 block is in the MAN mode.	Change the AI1 block mode.	6	0
C	531:AI2 Man Mode	531:AI2 in Man mode	The AI2 block is in the MAN mode.	Change the AI2 block mode.	6	1
C	532:TOT1 Man Mode	532:TOT1 in Man mode	The TOT1 block is in the MAN mode.	Change the TOT1 block mode.	6	2
C	533:TOT2 Man Mode	533:TOT2 in Man mode	The TOT2 block is in the MAN mode.	Change the TOT2 block mode.	6	3
C	534:TOT3 Man Mode	534:TOT3 in Man mode	The TOT3 block is in the MAN mode.	Change the TOT3 block mode.	6	4
C	535:DI1 Man Mode	535:DI1 in Man mode	The DI1 block is in the MAN mode.	Change the DI1 block mode.	6	5
C	536:DI2 Man Mode	536:DI2 in Man mode	The DI2 block is in the MAN mode.	Change the DI2 block mode.	6	6
C	537:AO Man Mode	537:AO1 in Man mode	The AO1 block is in the MAN mode.	Change the AO1 block mode.	6	7

Warning

The device works normally and measurement is also normal but warning occurs.

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
S	082:Pls 1 saturate	82:Pulse output 1 saturated	Saturation of pulse output 1 was detected.	Check process value and pulse output 1 parameter settings.	2	26
C	085:Cable miscon	85:Cable misconnect	Misconnection of cable was detected.	Check the signal cable and excitation cable connection.	2	29
C	086:Coil insulation	86:Coil insulation warning	Insulation deterioration of the coil was detected.	Contact Yokogawa service center.	2	30
M	087:Adhesion lv 3	87:Adhesion over level 3	The resistance value of the electrodes exceeded Level 3. (Adhesion detection of insulation to the electrode)	Recommend cleaning electrode.	3	0
N	088:LC warn	88:Low conductivity Warning	Decrease of conductivity was detected.	Check fluid conductivity.	3	1
M	089:Insu detect	89:Insulation detection	Insulation deterioration of electrode was detected.	Contact Yokogawa service center.	3	2
N	090:FLN over lv 3	90:Flow noise over level 3	Flow noise exceeded Level 3. (Detection of flow noise)	Check if the fluid has a problem (conductivity and bubble).	3	3
N	091:FLN over lv 4	91:Flow noise over level 4	Flow noise exceeded Level 4. (Detection of flow noise)	Check if the fluid has a problem (conductivity and bubble).	3	4
C	092:AZ warn	92:Autozero warning	Result of zero adjustment exceeded 10 cm/s.	Check fluid is stopped when executing zero adjustment.	3	5

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
C	093:Verif warn	93:Verification warning	Interruption of verification function was detected.	Execute the Verification function again.	3	6
C	094:Fact noise warn	94:Factory noise warning	The fluctuation of flow became larger.	Check the fluid.	3	7
C	095:Simulate active	95:Simulation active	The test mode for any of the flow velocity, volumetric flow rate, mass flow rate, calorie, pulse output, status input, or status output was executed.	Release simulation or test mode.	3	8
S	098:Pls 1 fix	98:Pulse output 1 fixed	It was detected that pulse output 1 is fixed.	Check whether pulse output 1 is in the test mode or not.	3	11
C	101:Param restore run	101:Parameter restore running	The restore function of the parameter was executed.	-	3	16
N	102:Disp over	102:Display over warning	The number of digits available for display exceeded the limit.	Check and change the display parameter.	3	17
N	103:SD size warn	103:microSD card size warning	Free space of the microSD card decreased to less than 10%.	microSD card may run out of memory space.	3	18
M	104:Bkup incmplt	104:Parameter backup incomplete	Parameter backup failed.	Retry parameter backup.	3	19
S	105:SD mismatch	105:microSD card mismatch	Mismatch of the microSD card was detected.	Change microSD card.	3	20
M	106:SD removal ERR	106:microSD card removal procedure error	Removal of the microSD card failed.	Remove the microSD card in appropriate procedures.	3	21
N	131:Trans mismatch	131:Transmitter type mismatch	Mismatch of sensor and transmitter was detected.	Contact Yokogawa service center.	2	31

Information

The device works normally and measurement is also normal.
These messages are just reference information.

NE 107	Error Message		Error Description	Countermeasure	DEVICE_ STATUS	Bit
	Display	PROFIBUS PA				
N	120:Watchdog	120:Watchdog	Error of Watchdog timer was detected.	Contact Yokogawa service center.	3	24
N	121:Power off	121:Power off	Power-off was detected.	-	3	25
N	122:Inst power FAIL	122:Instant power failure	Instantaneous power failure was detected.	-	3	26
N	123:Param bkup run	123:Parameter backup running	Parameter backup function is running.	-	3	27
N	124:Data log run	124:Data logging running	Data-logging function is running.	-	3	28
N	133:G/A mismatch	133:G/A mismatch error	As a result of self-test, inconsistency of internal circuit was detected.	Contact Yokogawa service center.	4	10
N	560:Id Num Violation	560:Ident Number Violation	Ident number is wrong.	Contact Yokogawa service center.	6	30

DIAGNOSIS and DIAGNOSIS_EXTENSION

Diagnostic information and failures of the AXG are indicated by using parameter DIAGNOSIS (slot 0, index 29) and DIAGNOSIS_EXTENSION (slot:0, index 30) in Physical Block. Each diagnostic information is supported when the corresponding bit in DIAGNOSIS_MASK and DIAGNOSIS_EXTENSION is set. Diagnosis and Diagnosis Extension are listed in Contents of DIAGNOSIS(Clasic), Contents of DIAGNOSIS(Condensed)

Contents of DIAGNOSIS(Clasic)

Octet	Bit	Description	Remarks	Mask
1	0	DIA_HW_ELECTR Hardware failure electronics.	10:Main board CPU failure 11:Reverse calculation failure 14:Sensor board failure 15:Sensor communication error 16:A/D1 failure[Signal] 17:A/D2 failure[Exciter] 20:Exciter failure 28:Indicator board failure 30:LCD driver failure 31:Indicator board mismatch 32:Indicator communication error 33:microSD failure 133:G/A mismatch error	1
	1	DIA_HW_MECH Hardware failure mechanics.	18:Coil open 19:Coil short	1
	2	DIA_TEMP_MOTOR Motor temperature too high.	-	0
	3	DIA_TEMP_ELECTR Electronics temperature too high.	-	0
	4	DIA_MEM_CHKSUM Memory checksum error.	12:Main board EEPROM failure 29:Indicator board EEPROM failure	1
	5	DIA_MEASUREMENT Failure in measurement.	50:Signal overflow	1
	6	DIA_NOT_INIT Device not initialized.	13:Main board EEPROM default	1
	7	DIA_INIT_ERR	-	0
2	0	DIA_ZERRO_ERR Zero point error (limit position).	92:Autozero warning	1
	1	DIA_SUPPLY Power supply failed.	-	0
	2	DIA_CONF_INVAL Configuration not valid.	60:Span configuration error 66:Density configuration error 67:Pulse output 1 configuration error 69:Nominal size configuration error 70:Adhesion configuration error 71:Flow noise configuration error	1
	3	DIA_WARMSTART New start-up (warm startup) carried out.	If any of the blocks is ST_REV!=0, it will be 1.	1
	4	DIA_COLDSTART Restart (cold startup) carried out.	Set to 1 when ST_REV=0 for all blocks.	1
	5	DIA_MAINTENANCE Maintenance required.	51:Empty pipe detection 85:Cable misconnect 53:Adhesion over level 4 93:Verification warning	1
	6	DIA_CHARACT Characterization invalid.	-	0
	7	IDENT_NUMBER_VIOLATION Ident Number Violation.	560:Ident Number Violation	1
3	0-7	Reserved	-	0
4	0-6	Reserved	-	0
	7	EXTENSION_AVAILABLE More information available.	When anything Bit is standing in DIAGNOSIS_EXTENSION, it becomes 1.	1

Contents of DIAGNOSIS(Condensed)

Octet	Bit	Description	Remarks	Mask
1	0-7	Reserved	-	0
2	0	Reserved	-	0
	1	Reserved	-	0
	2	Reserved	-	0
	3	DIA_WARMSTART New start-up (warm startup) carried out.	If any of the blocks is ST_REV!=0, it will be 1.	1
	4	DIA_COLDSTART Restart (cold startup) carried out.	Set to 1 when ST_REV=0 for all blocks.	1
	5	DIA_MAINTENANCE	51:Empty pipe detection 53:Adhesion over level 4 85:Cable misconnect 86:Coil insulation warning 87:Adhesion over level 3 88:Low conductivity Warning 89:Insulation detection 90:Flow noise over level 3 91:Flow noise over level 4 92:Autozero warning 93:Verification warning 94:Factory noise warning 131:Transmitter type mismatch	1
	6	Reserved	-	0
	7	IDENT_NUMBER_VIOLATION Ident Number Violation.	560:Ident Number Violation	1

Octet	Bit	Description	Remarks	Mask
3	0	DIA_MAINTENANCE_ALARM Failure of the device or armature	10:Main board CPU failure 11:Reverse calculation failure 12:Main board EEPROM failure 13:Main board EEPROM default 14:Sensor board failure 15:Sensor communication error 16:A/D1 failure[Signal] 17:A/D2 failure[Exciter] 18:Coil open 19:Coil short 20:Exciter failure 27:Parameter restore incomplete 28:Indicator board failure 29:Indicator board EEPROM failure 30:LCD driver failure 31:Indicator board mismatch 32:Indicator communication error 33:microSD failure	1
	1	DIA_MAINTENANCE_DEMANDED Maintenance demanded	87:Adhesion over level 3 89:Insulation detection 104:Parameter backup incomplete 106:microSD card removal procedure error	1
	2	DIA_FUNCTION_CHECK Function check	69:Nominal size configuration error 70:Adhesion configuration error 71:Flow noise configuration error 72:Data logging not started 85:Cable misconnect 86:Coil insulation warning 92:Autozero warning 93:Verification warning 94:Factory noise warning 95:Simulation active 101:Parameter restore running 522:AI1 simulation active 523:AI2 simulation active 527:DI1 simulation active 528:DI2 simulation active 529:AO1 simulation active 530:AI1 in Man mode 531:AI2 in Man mode 532:TOT1 in Man mode 533:TOT2 in Man mode 534:TOT3 in Man mode 535:DI1 in Man mode 536:DI2 in Man mode 537:AO1 in Man mode	1
	3	DIA_INV_PRO_COND Invalid process condition	50:Signal overflow 51:Empty pipe detection 53:Adhesion over level 4 60:Span configuration error 66:Density configuration error 67:Pulse output 1 configuration error 82:Pulse output 1 saturated 98:Pulse output 1 fixed 105:microSD card mismatch	1
	4	Reserved	-	0
	5	Reserved	-	0
	6	Reserved	-	0
	7	Reserved	-	0
3	0-7	Reserved	-	0
4	0-6	Reserved	-	0
	7	EXTENSION_AVAILABLE More information available.	When anything Bit is standing in DIAGNOSIS_EXTENSION, it becomes 1.	1

Contents of DIAGNOSIS_EXTENSION

Octet	Bit	Description	Remarks	Mask
1	0	Electronics failure	10:Main board CPU failure 11:Reverse calculation failure 12:Main board EEPROM failure 14:Sensor board failure 15:Sensor communication error 16:A/D1 failure[Signal] 17:A/D2 failure[Exciter] 20:Exciter failure 28:Indicator board failure 29:Indicator board EEPROM failure 30:LCD driver failure 32:Indicator communication error 33:microSD failure 133:G/A mismatch error	1
	1	Sensor/Actuator failure	18:Coil open 19:Coil short	1
	2	Failure which requires investigation	53:Adhesion over level 4 93:Verification warning	1
	3	Compatibility failure	31:Indicator board mismatch 131:Transmitter type mismatch	1
	4-7	Reserved	-	0
2	0	Reserved	-	0
	1	Non operating state	101:Parameter restore running	1
	2	Calibration warning	-	0
	3	Instrument configuration error	60:Span configuration error 66:Density configuration error 67:Pulse output 1 configuration error 69:Nominal size configuration error 70:Adhesion configuration error 71:Flow noise configuration error 72:Data logging not started 504:TOT1 unit error 505:TOT2 unit error 506:TOT3 unit error	1
	4	Function restricted	-	0
	5	Simulation mode	95:Simulation active 521:PB simulation active 522:AI1 simulation active 523:AI2 simulation active 527:DI1 simulation active 528:DI2 simulation active 529:AO1 simulation active	1
	6	Manual mode	530:AI1 in Man mode 531:AI2 in Man mode 532:TOT1 in Man mode 533:TOT2 in Man mode 534:TOT3 in Man mode 535:DI1 in Man mode 536:DI2 in Man mode 537:AO1 in Man mode	1
	7	Function Block notification	507:PB in O/S mode 508:AI1 in O/S mode 509:AI2 in O/S mode 510:TOT1 in O/S mode 511:TOT2 in O/S mode 512:TOT3 in O/S mode 513:DI1 in O/S mode 514:DI2 in O/S mode 515:AO1 in O/S mode 516:FTB in O/S mode 517:LTB in O/S mode 518:DTB in O/S mode 519:MTB1 in O/S mode 520:MTB2 in O/S mode	1

Octet	Bit	Description	Remarks	Mask
3	0	Process variable adjusted	-	0
	1	Reserved	-	0
	2	Sensor value/Actuator value out of specification	98:Pulse output 1 fixed 82:Pulse output 1 saturated	1
	3	Environment out of specification	105:microSD card mismatch	1
	4	Reserved	-	0
	5	Reserved	-	0
	6	Temporal decrease of value quality	-	0
	7	Deteriorate estimation by counter	-	0
4	0	Deteriorate estimation by anomaly detection	13:Main board EEPROM default 27:Parameter restore incomplete 85:Cable misconnect 87:Adhesion over level 3 86:Coil insulation warning 88:Low conductivity Warning 89:Insulation detection 90:Flow noise over level 3 91:Flow noise over level 4 94:Factory noise warning 104:Parameter backup incomplete 106:microSD card removal procedure error	0
	1	Decrease of value quality by process environment	51:Empty pipe detection	1
	2	Adjustment failure by process environment	92:Autozero warning	1
	3	Reserved	-	0
	4	Optional function configuration error	-	0
	5	Alarm related information	102:Display over warning 103:microSD card size warning 123:Parameter backup running 124:Data logging running	1
	6	Process alarm	50:Signal overflow 500:AI1 Lo Lo alarm 501:AI1 Hi Hi alarm 502:AI2 Lo Lo alarm 503:AI2 Hi Hi alarm	1
	7	Reserved	-	0
5	0-7	Reserved	-	0
6	0-7	Reserved	-	0

5.6.3 Operation at the Time of Error

The following table shows outputs at the time of error and actions of the outputs.

■ System alarm

Error		Process value*	Totalizer	Display
No	Message			
10	Main board CPU failure	STOP	Totalizer stop	Undefined
11	Reverse calculation failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
12	Main board EEPROM failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
13	Main board EEPROM default	Normal calculation	Follows settings (see 5.2.4).	Alarm
14	Sensor board failure	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
15	Sensor communication error	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
16	A/D1 failure[Signal]	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
17	A/D2 failure[Exciter]	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
18	Coil open	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
19	Coil short	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
20	Exciter failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
27	Parameter restore incomplete	Normal calculation	Follows settings (see 5.2.4).	Alarm
28	Indicator board failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
29	Indicator board EEPROM failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
30	LCD driver failure	Normal calculation	Follows settings (see 5.2.4).	Alarm
31	Indicator board mismatch	Normal calculation	Follows settings (see 5.2.4).	Alarm
32	Indicator communication error	Normal calculation	Follows settings (see 5.2.4).	Alarm
33	microSD card failure	Normal calculation	Follows settings (see 5.2.4).	Alarm

■ Process alarm

Error		Process value*	Totalizer	Display
No	Message			
50	Signal overflow	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
51	Empty pipe detection	Hold Prior setting	Follows settings (see 5.2.4).	Alarm
52	H/L or HH/LL alarm	Normal calculation	Totalizer processing continue	Alarm
53	Adhesion over level 4	Normal calculation	Follows settings (see 5.2.4).	Alarm
500	AI1 Lo Lo alarm	-	-	-
501	AI1 Hi Hi alarm	-	-	-
502	AI2 Lo Lo alarm	-	-	-
503	AI2 Hi Hi alarm	-	-	-

■ Setting alarm

Error		Process value*	Totalizer	Display
No	Message			
60	Span configuration error	Normal calculation	Follows settings (see 5.2.4).	Alarm
65	H/L HH/LL configuration error	Normal calculation	Follows settings (see 5.2.4).	Alarm
66	Density configuration error	Normal calculation	Follows settings (see 5.2.4).	Alarm
67	Pulse output 1 configuration error	Normal calculation	Totalizer processing continue	Alarm
69	Nominal size configuration error	Normal calculation	Totalizer processing continue	Alarm
70	Adhesion configuration error	Normal calculation	Follows settings (see 5.2.4).	Alarm
71	Flow noise configuration error	Normal calculation	Totalizer processing continue	Alarm
72	Data logging not started	Normal calculation	Totalizer processing continue	Alarm
504	TOT1 unit error	--	--	Normal
505	TOT2 unit error	--	--	Normal
506	TOT3 unit error	--	--	Normal
507	PB in O/S mode	--	Totalizer stop	Alarm
508	AI1 in O/S mode	--	--	Normal
509	AI2 in O/S mode	--	--	Normal
510	TOT1 in O/S mode	--	--	Normal
511	TOT2 in O/S mode	--	--	Normal
512	TOT3 in O/S mode	--	--	Normal
513	DI1 in O/S mode	--	--	Normal
514	DI2 in O/S mode	--	--	Normal
515	AO1 in O/S mode	--	--	Normal
516	FTB in O/S mode	--	Totalizer stop	Normal
517	LTB in O/S mode	--	--	Normal
518	DTB in O/S mode	--	--	Normal
519	MTB1 in O/S mode	--	--	Normal
520	MTB2 in O/S mode	--	--	Normal
521	PB simulation active	--	--	Normal
522	AI1 simulation active	--	--	Normal
523	AI2 simulation active	--	--	Normal
527	DI1 simulation active	--	--	Normal
528	DI2 simulation active	--	--	Normal
529	AO1 simulation active	--	--	Normal
530	AI1 in Man mode	--	--	Normal
531	AI2 in Man mode	--	--	Normal
532	TOT1 in Man mode	--	--	Normal
533	TOT2 in Man mode	--	--	Normal
534	TOT3 in Man mode	--	--	Normal
535	DI1 in Man mode	--	--	Normal
536	DI2 in Man mode	--	--	Normal
537	AO1 in Man mode	--	--	Normal

■ Warning

Error		Process value*	Totalizer	Display
No	Message			
82	Pulse output 1 saturated	Normal calculation	Totalizer processing continue	Warning
85	Cable misconnect	Normal calculation	Totalizer processing continue	Warning
86	Coil insulation warning	Normal calculation	Totalizer processing continue	Warning
87	Adhesion over level 3	Normal calculation	Totalizer processing continue	Warning
88	Low conductivity Warning	Normal calculation	Totalizer processing continue	Warning
89	Insulation detection	Normal calculation	Totalizer processing continue	Warning
90	Flow noise over level 3	Normal calculation	Totalizer processing continue	Warning
91	Flow noise over level 4	Normal calculation	Totalizer processing continue	Warning
92	Autozero warning	Normal calculation	Totalizer processing continue	Warning
93	Verification warning	Normal calculation	Totalizer processing continue	Warning
94	Factory noise warning	Normal calculation	Totalizer processing continue	Warning
95	Simulation active	Normal calculation	Totalizer processing continue	Warning
98	Pulse output 1 fixed	Normal calculation	Totalizer processing continue	Warning
101	Parameter restore running	Normal calculation	Totalizer processing continue	Execute
102	Display over warning	Normal calculation	Totalizer processing continue	Warning
103	microSD card size warning	Normal calculation	Totalizer processing continue	Warning
104	Parameter backup incomplete	Normal calculation	Totalizer processing continue	Warning
105	microSD card mismatch	Normal calculation	Totalizer processing continue	Warning
106	microSD card removal procedure error	Normal calculation	Totalizer processing continue	Warning
131	Transmitter type mismatch	Normal calculation	Totalizer processing continue	Warning

■ Information

Error		Process value*	Totalizer	Display
No	Message			
120	Watchdog	Normal calculation	Totalizer processing continue	Normal
121	Power off	Normal calculation	Totalizer processing continue	Normal
122	Instant power failure	Normal calculation	Totalizer processing continue	Normal
123	Parameter backup running	Normal calculation	Totalizer processing continue	Execute
124	Data logging running	Normal calculation	Totalizer processing continue	Icon
133	G/A mismatch error	--	--	--
560	Ident Number Violation	--	--	--

* When a diagnosis-related process (adhesion resistance, electrode A potential, electrode B potential, flow noise and conductivity) is assigned to AI, a value may be updated even if set to “Hold Prior setting”.

5.6.4 Alarm Display Setting

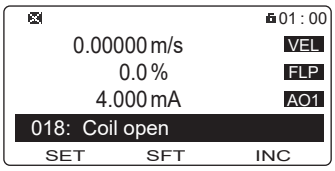
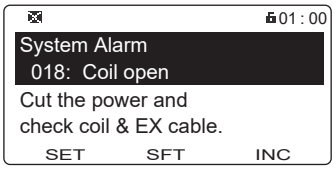
(1) Alarm display

If an error occurs on this product, an alarm appears on the display. The alarm display modes are classified into two types: one mode to display a process value and alarm name, and another mode to display an alarm name and action.
If multiple alarms occur on this product, they will be displayed in sequence on the display.
The setting can be configured with the following parameter.

Display	Device setup ► Detailed setup ► Display set ► Optional config
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	24	Alarm display	Display alarm	Specifies the alarm display.

From the table below, select the alarm display.

Selection		Description
Display	PROFIBUS PA	
Normal	Normal	Displays the process value and alarm name.  F0425.ai
Detail	Detail	Displays the alarm name and action.  F0426.ai

(2) Alarm display based on NAMUR NE107

A prefix can be assigned to the alarm name based on NAMUR NE107.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	23	NE107 display	Display NE107	Sets the alarm display based on NAMUR NE107.

From the table below, select the alarm display.

Selection		Description
Display	PROFIBUS PA	
Normal	Normal	Sets to the normal alarm display.
NE107	NE107	Sets the alarm display based on NAMUR NE107.

5.6.5 Alarm Record Function

The alarm record function can record an alarm that occurred in the past as history.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Sts/Self test ► Alarm ► Alarm record ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block►Alarm record ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	115	Record alarm 1	Alarm record 1	Displays the name of the first new alarm.
FTB	116	Record time 1	Alarm record time 1	Displays the operation time when the first new alarm occurs.
FTB	117	Record alarm 2	Alarm record 2	Displays the name of the second new alarm.
FTB	118	Record time 2	Alarm record time 2	Displays the operation time when the second new alarm occurs.
FTB	119	Record alarm 3	Alarm record 3	Displays the name of the third new alarm.
FTB	120	Record time 3	Alarm record time 3	Displays the operation time when the third new alarm occurs.
FTB	121	Record alarm 4	Alarm record 4	Displays the name of the fourth new alarm.
FTB	122	Record time 4	Alarm record time 4	Displays the operation time when the fourth new alarm occurs.

The operation time when an alarm occurred is displayed in the format of “dddddD hh:mm”.
“dddddD” indicates the day, “hh” indicates the hour, and “mm” indicates the minute.
Example:
“00031D 12:34” is displayed.
This example shows that an alarm has occurred when the product has been operating for 31 days, 12 hours, and 34 minutes.

5.6.6 Alarm Mask Function

The alarm mask function can mask a specified alarm, hide an alarm notification, and record no alarm history. The mask function can be set for both the alarm notification and alarm record, respectively. This function is only for alarm whose FD is 2, 3, 4 or 5 in the Alarm List, 5.6.2 Errors and Countermeasures. Only this target alarm is described below.
The setting can be configured with the following parameters.

■ Alarm notification mask

If the alarm notification mask function is turned “On”, it disables alarm notification.
Setting example for alarm “Signal overflow”:
To disable the alarm notification, set “Signal overflow” of FTB: Alarm out mask 2 to “On”.
To enable the alarm notification, set “Signal overflow” of FTB: Alarm out mask 2 to “Off”.

Menu path

Display	Device setup ► Diag/Service ► Sts/Self test ► Alarm ► Alarm out mask ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Mask alarm ► Alarm out mask ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	106	Mask 1-1	Alarm out mask 1	Specifies the mask function for alarm notification 1-1.
		Mask 1-2		Specifies the mask function for alarm notification 1-2.
FTB	107	Mask 2-1	Alarm out mask 2	Specifies the mask function for alarm notification 2-1.
		Mask 2-2		Specifies the mask function for alarm notification 2-2.
FTB	108	Mask 3-1	Alarm out mask 3	Specifies the mask function for alarm notification 3-1.
		Mask 3-2		Specifies the mask function for alarm notification 3-2.
FTB	109	Mask 4-1	Alarm out mask 4	Specifies the mask function for alarm notification 4-1.
FTB	110	-	Alarm out mask 5	Specifies the mask function for alarm notification 5.
FTB	111	-	Alarm out mask 6	Specifies the mask function for alarm notification 6.

Alarm record mask

If the alarm record mask function is turned “On”, it disables the alarm record.
Setting example for alarm “Empty pipe detection”:
To disable the alarm record, set “Empty detect on” of FTB: Alarm Record Mask2 to “On”.
To enable the alarm record, set “Empty detect on” of FTB: Alarm Record Mask2 to “Off”.

Menu path

Display	Device setup ► Diag/Service ► Sts/Self test ► Alarm ► Alarm record mask ► (see below)
PROFIBUS PA	Device ► Input ► Flow Transducer Block ► Mask alarm ► Alarm record mask ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	112	Mask 1-1	Alarm record mask 1	Specifies the mask function for alarm record 1-1.
		Mask 1-2		Specifies the mask function for alarm record 1-2.
FTB	113	Mask 2-1	Alarm record mask 2	Specifies the mask function for alarm record 2-1.
		Mask 2-2		Specifies the mask function for alarm record 2-2.
FTB	114	Mask 3-1	Alarm record mask 3	Specifies the mask function for alarm record 3-1.

NOTE

Note that an alarm masked with the alarm notification mask function is not recorded in the alarm record.

The alarm mask function setting is as follows.

Parameter Name	Indicates the name of the mask setting parameter.
Alarm Name	Indicates the alarm name. The strings of alarm name are not exactly the same as those on the configuration tool.
Default Value	Indicates the default setting values (at shipment from the manufacturing factory). (✓: Masked, -: Not masked)
Attribute	Indicates whether the mask setting is enabled or disabled. (✓: Setting enabled, -: Setting disabled)

Alarm notification mask function

Display		PROFIBUS PA		Default Value	Attribute
Parameter Name	Alarm Name	Parameter Name	Alarm Name		
-	010:Main CPU FAIL	-	10:Main board CPU failure	-	-
-	011:Rev calc FAIL	-	11:Reverse calculation failure	-	-
-	012:Main EEP FAIL	-	12:Main board EEPROM failure	-	-
Mask 1-1	013:Main EEP dflt	Alarm out mask 1	13:Main board EEPROM default	-	✓
-	014:Snsr bd FAIL	-	14:Sensor board failure	-	-
-	015:Snsr comm ERR	-	15:Sensor communication error	-	-
-	016:AD 1 FAIL[Sig]	-	16:A/D1 failure[Signal]	-	-
-	017:AD 2 FAIL[Excit]	-	17:A/D2 failure[Exciter]	-	-
-	018:Coil open	-	18:Coil open	-	-
-	019:Coil short	-	19:Coil short	-	-
-	020:Exciter FAIL	-	20:Exciter failure	-	-

Display		PROFIBUS PA		Default Value	Attribute
Parameter Name	Alarm Name	Parameter Name	Alarm Name		
-	027:Restore FAIL	-	27:Parameter restore incomplete	-	-
Mask 1-2	028:Ind bd FAIL	Alarm out mask 1	28:Indicator board failure	✓	✓
Mask 1-2	029:Ind bd EEP FAIL	Alarm out mask 1	29:Indicator board EEPROM failure	-	✓
Mask 1-2	030:LCD drv FAIL	Alarm out mask 1	30:LCD driver failure	-	✓
Mask 1-2	031:Ind bd mismatch	Alarm out mask 1	31:Indicator board mismatch	-	✓
Mask 1-2	032:Ind comm ERR	Alarm out mask 1	32:Indicator communication error	-	✓
Mask 1-2	033:microSD FAIL	Alarm out mask 1	33:microSD card failure	-	✓
Mask 2-1	050:Signal overflow	Alarm out mask 2	50:Signal overflow	-	✓
Mask 2-1	051:Empty detect	Alarm out mask 2	51:Empty pipe detection	-	✓
Mask 2-1	052:H/L HH/LL alm	Alarm out mask 2	52:H/L or HH/LL alarm	✓	✓
Mask 2-1	053:Adh over lv 4	Alarm out mask 2	53:Adhesion over level 4	✓	✓
Mask 2-1	060:Span cfg ERR	Alarm out mask 2	60:Span configuration error	-	✓
Mask 2-1	065:H/L cfg ERR	Alarm out mask 2	65:H/L HH/LL configuration error	-	✓
Mask 2-1	066:Density cfg ERR	Alarm out mask 2	66:Density configuration error	-	✓
Mask 2-2	067:Pls 1 cfg ERR	Alarm out mask 2	67:Pulse output 1 configuration error	-	✓
Mask 2-2	069:Nomi size cfg	Alarm out mask 2	69:Nominal size configuration error	-	✓
Mask 2-2	070:Adh cfg ERR	Alarm out mask 2	70:Adhesion configuration error	-	✓
Mask 2-2	071:FLN cfg ERR	Alarm out mask 2	71:Flow noise configuration error	-	✓
Mask 2-2	072:Log not start	Alarm out mask 2	72:Data logging not started	-	✓
Mask 2-2	082:Pls 1 saturate	Alarm out mask 2	82:Pulse output 1 saturated	✓	✓
Mask 2-2	085:Cable miscon	Alarm out mask 2	85:Cable misconnect	-	✓
Mask 2-2	086:Coil insulation	Alarm out mask 2	86:Coil insulation warning	✓	✓
Mask 2-2	131:Trans mismatch	Alarm out mask 2	131:Transmitter type mismatch	-	✓
Mask 3-1	087:Adhesion lv 3	Alarm out mask 3	87:Adhesion over level 3	✓	✓
Mask 3-1	088:LC warn	Alarm out mask 3	88:Low conductivity Warning	✓	✓
Mask 3-1	089:Insu detect	Alarm out mask 3	89:Insulation detection	✓	✓
Mask 3-1	090:FLN over lv 3	Alarm out mask 3	90:Flow noise over level 3	✓	✓
Mask 3-1	091:FLN over lv 4	Alarm out mask 3	91:Flow noise over level 4	✓	✓
Mask 3-1	092:AZ warn	Alarm out mask 3	92:Autozero warning	-	✓
Mask 3-1	093:Verif warn	Alarm out mask 3	93:Verification warning	✓	✓
Mask 3-1	094:Fact noise warn	Alarm out mask 3	94:Factory noise warning	✓	✓
Mask 3-1	095:Simulate active	Alarm out mask 3	95:Simulation active	-	✓
Mask 3-1	098:Pls 1 fix	Alarm out mask 3	98:Pulse output 1 fixed	-	✓
Mask 3-2	101:Param restore run	Alarm out mask 3	101:Parameter restore running	✓	✓
Mask 3-2	102:Disp over	Alarm out mask 3	102:Display over warning	✓	✓
Mask 3-2	103:SD size warn	Alarm out mask 3	103:microSD card size warning	✓	✓
Mask 3-2	104:Bkup incmplt	Alarm out mask 3	104:Parameter backup incomplete	-	✓
Mask 3-2	105:SD mismatch	Alarm out mask 3	105:microSD card mismatch	✓	✓
Mask 3-2	106:SD removal ERR	Alarm out mask 3	106:microSD card removal procedure error	✓	✓
Mask 3-2	120:Watchdog*1	Alarm out mask 3	120:Watchdog*1	✓	✓
Mask 3-2	121:Power off*1	Alarm out mask 3	121:Power off*1	✓	✓
Mask 3-2	122:Inst power FAIL*1	Alarm out mask 3	122:Instant power failure*1	✓	✓
Mask 3-2	123:Param bkup run	Alarm out mask 3	123:Parameter backup running	✓	✓
Mask 3-2	124:Data log run	Alarm out mask 3	124:Data logging running	✓	✓
Mask 4-1	133:G/A mismatch	Alarm out mask 4	133:G/A mismatch error	-	✓
-	-	Alarm out mask 5	500:AI1 Lo Lo alarm	-	✓
-	-	Alarm out mask 5	501:AI1 Hi Hi alarm	-	✓
-	-	Alarm out mask 5	502:AI2 Lo Lo alarm	-	✓
-	-	Alarm out mask 5	503:AI2 Hi Hi alarm	-	✓
-	-	Alarm out mask 5	504:TOT1 unit error	-	✓
-	-	Alarm out mask 5	505:TOT2 unit error	-	✓
-	-	Alarm out mask 5	506:TOT3 unit error	-	✓

Display		PROFIBUS PA		Default Value	Attribute
Parameter Name	Alarm Name	Parameter Name	Alarm Name		
-	-	Alarm out mask 5	507:PB in O/S mode	-	✓
-	-	Alarm out mask 5	508:AI1 in O/S mode	-	✓
-	-	Alarm out mask 5	509:AI2 in O/S mode	-	✓
-	-	Alarm out mask 5	510:TOT1 in O/S mode	-	✓
-	-	Alarm out mask 5	511:TOT2 in O/S mode	-	✓
-	-	Alarm out mask 5	512:TOT3 in O/S mode	-	✓
-	-	Alarm out mask 5	513:DI1 in O/S mode	-	✓
-	-	Alarm out mask 5	514:DI2 in O/S mode	-	✓
-	-	Alarm out mask 5	515:AO1 in O/S mode	-	✓
-	-	Alarm out mask 5	516:FTB in O/S mode	-	✓
-	-	Alarm out mask 5	517:LTB in O/S mode	-	✓
-	-	Alarm out mask 5	518:DTB in O/S mode	-	✓
-	-	Alarm out mask 5	519:MTB1 in O/S mode	-	✓
-	-	Alarm out mask 5	520:MTB2 in O/S mode	-	✓
-	-	Alarm out mask 5	521:PB simulation active	-	✓
-	-	Alarm out mask 5	522:AI1 simulation active	-	✓
-	-	Alarm out mask 5	523:AI2 simulation active	-	✓
-	-	Alarm out mask 5	527:DI1 simulation active	-	✓
-	-	Alarm out mask 5	528:DI2 simulation active	-	✓
-	-	Alarm out mask 5	529:AO1 simulation active	-	✓
-	-	Alarm out mask 6	530:AI1 in Man mode	-	✓
-	-	Alarm out mask 6	531:AI2 in Man mode	-	✓
-	-	Alarm out mask 6	532:TOT1 in Man mode	-	✓
-	-	Alarm out mask 6	533:TOT2 in Man mode	-	✓
-	-	Alarm out mask 6	534:TOT3 in Man mode	-	✓
-	-	Alarm out mask 6	535:DI1 in Man mode	-	✓
-	-	Alarm out mask 6	536:DI2 in Man mode	-	✓
-	-	Alarm out mask 6	537:AO1 in Man mode	-	✓
-	-	Alarm out mask 6	560:Ident Number Violation	-	✓

*1: Recorded in the alarm record regardless of the settings of the alarm notification mask function.

Alarm record mask function

Display		PROFIBUS PA		Default Value	Attribute
Parameter Name	Alarm Name	Parameter Name	Alarm Name		
-	010:Main CPU FAIL	-	10:Main board CPU failure	-	-
-	011:Rev calc FAIL	-	11:Reverse calculation failure	-	-
-	012:Main EEP FAIL	-	12:Main board EEPROM failure	-	-
Mask 1-1	013:Main EEP dflt	Alarm record mask 1	13:Main board EEPROM default	-	✓
-	014:Snsr bd FAIL	-	14:Sensor board failure	-	-
-	015:Snsr comm ERR	-	15:Sensor communication error	-	-
-	016:AD 1 FAIL[Sig]	-	16:A/D1 failure[Signal]	-	-
-	017:AD 2 FAIL[Excit]	-	17:A/D2 failure[Exciter]	-	-
-	018:Coil open	-	18:Coil open	-	-
-	019:Coil short	-	19:Coil short	-	-
-	020:Exciter FAIL	-	20:Exciter failure	-	-
-	027:Restore FAIL	-	27:Parameter restore incomplete	-	-
Mask 1-2	028:Ind bd FAIL	Alarm record mask 1	28:Indicator board failure	-	✓
Mask 1-2	029:Ind bd EEP FAIL	Alarm record mask 1	29:Indicator board EEPROM failure	-	✓
Mask 1-2	030:LCD drv FAIL	Alarm record mask 1	30:LCD driver failure	-	✓
Mask 1-2	031:Ind bd mismatch	Alarm record mask 1	31:Indicator board mismatch	-	✓
Mask 1-2	032:Ind comm ERR	Alarm record mask 1	32:Indicator communication error	-	✓
Mask 1-2	033:microSD FAIL	Alarm record mask 1	33:microSD card failure	-	✓
Mask 2-1	050:Signal overflow	Alarm record mask 2	50:Signal overflow	-	✓
Mask 2-1	051:Empty detect	Alarm record mask 2	51:Empty pipe detection	-	✓
Mask 2-1	052:H/L HH/LL alm	Alarm record mask 2	52:H/L or HH/LL alarm	-	✓
Mask 2-1	053:Adh over lv 4	Alarm record mask 2	53:Adhesion over level 4	-	✓
-	060:Span cfg ERR	-	60:Span configuration error	✓	-
-	065:H/L cfg ERR	-	65:H/L HH/LL configuration error	-	-
-	066:Density cfg ERR	-	66:Density configuration error	✓	-
-	067:Pls 1 cfg ERR	-	67:Pulse output 1 configuration error	✓	-
-	069:Nomi size cfg	-	69:Nominal size configuration error	✓	-
-	070:Adh cfg ERR	-	70:Adhesion configuration error	✓	-
-	071:FLN cfg ERR	-	71:Flow noise configuration error	✓	-
-	072:Log not start	-	72:Data logging not started	✓	-
-	082:Pls 1 saturate	-	82:Pulse output 1 saturated	✓	-
Mask 2-2	085:Cable miscon	Alarm record mask 2	85:Cable misconnect	-	✓
-	086:Coil insulation	-	86:Coil insulation warning	✓	-
-	131:Trans mismatch	-	131:Transmitter type mismatch	✓	-
-	087:Adhesion lv 3	-	87:Adhesion over level 3	✓	-
-	088:LC warn	-	88:Low conductivity warning	✓	-
-	089:Insu detect	-	89:Insulation detection	✓	-
-	090:FLN over lv 3	-	90:Flow noise over level 3	✓	-
-	091:FLN over lv 4	-	91:Flow noise over level 4	✓	-
-	092:AZ warn	-	92:Autozero warning	✓	-
-	093:Verif warn	-	93:Verification warning	✓	-
-	094:Fact noise warn	-	94:Factory noise warning	✓	-
-	095:Simulate active	-	95:Simulation active	✓	-
-	098:Pls 1 fix	-	96:Pulse output 1 fixed	✓	-
-	101:Param restore run	-	101:Parameter restore running	✓	-
-	102:Disp over	-	102:Display over warning	✓	-
-	103:SD size warn	-	103:microSD card size warning	✓	-
-	104:Bkup incmplt	-	104:Parameter backup incomplete	✓	-
-	105:SD mismatch	-	105:microSD card mismatch	✓	-
-	106:SD removal ERR	-	106:microSD card removal procedure error	✓	-

Display		PROFIBUS PA		Default Value	Attribute
Parameter Name	Alarm Name	Parameter Name	Alarm Name		
-	120:Watchdog	-	120:Watchdog	-	-
-	121:Power off	-	121:Power off	-	-
-	122:Inst power FAIL	-	122:Instant power failure	-	-
-	123:Param bkup run	-	123:Parameter backup running	✓	-
-	124:Data log run	-	124:Data logging running	✓	-
Mask 3-1	133:G/A mismatch	Alarm record mask 3	133:G/A mismatch error	✓	✓

5.7 Display

5.7.1 Language Setting

The language for the display can be selected from nine languages.
Set the desired display language from the languages that are included in the language package specified at the time of ordering.
The setting can be configured with the following parameter.

■ Selecting language

Menu path

Display	Device setup ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	28	Language	Language	Specifies the language to be shown on the display.

From the table below, select the language to be shown on the display.

Selection		Description
Display	PROFIBUS PA	
English	English	Package 1: Japanese, English, French, German, Italian, Spanish, Portuguese, Russian Package 2: English or Chinese
French	French	
German	German	
Italian	Italian	
Spanish	Spanish	
Portuguese	Portuguese	
Russian	Russian	
Chinese	Chinese	
Japanese	Japanese	

■ Display of language package

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	39	Language package	Language package	Displays the language package for the display.

5.7.2 Display Item Setting

This product can show up to eight items on the display by scrolling it. Set each display item to the eight display line.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Line select ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Line select ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	8	Line 1	Display select 1	Specifies item 1 to be shown on the display.
LTB	9	Line 2	Display select 2	Specifies item 2 to be shown on the display.
LTB	10	Line 3	Display select 3	Specifies item 3 to be shown on the display.
LTB	11	Line 4	Display select 4	Specifies item 4 to be shown on the display.
LTB	12	Line 5	Display select 5	Specifies item 5 to be shown on the display.
LTB	13	Line 6	Display select 6	Specifies item 6 to be shown on the display.
LTB	14	Line 7	Display select 7	Specifies item 7 to be shown on the display.
LTB	15	Line 8	Display select 8	Specifies item 8 to be shown on the display.

From the table below, select the items to be shown on the display.

Selection		Description
Display	PROFIBUS PA	
None	None	Does not display items (item 1 is not selectable).
Flow rate(%)	Flow rate(%)	Displays the flow rate for the span of the process value PV-mapped in Subsection 5.1.6.
PV	PV	Displays the PV-mapped process value in Subsection 5.1.6.
Velocity	Velocity	Displays the flow velocity.
Volume flow	Volume flow	Displays the volumetric flow rate.
Mass flow	Mass flow	Displays the mass flow rate.
Flow rate(%Bar)	Flow rate(%Bar)	Displays the flow rate for the span of the process value PV-mapped in Subsection 5.1.6 by using a bar graph.
Calorie	Calorie	Displays the calorie (only available for AXG, not for AXW).
Totalizer 1	Totalizer 1	Displays the totalized value of totalizer 1.
Totalizer 2	Totalizer 2	Displays the totalized value of totalizer 2.
Totalizer 3	Totalizer 3	Displays the totalized value of totalizer 3.
Tag number	Long Tag	Displays Tag number
Commun protocol	Communication Protocol	Displays the communication protocol.
Adhesion	Adhesion	Displays the adhesion level of the electrode adhesion detecting function.
Flow noise level	Flow noise level	Displays the flow noise level (only available for AXG, not for AXW).
Totalizer 1 count	Totalizer 1 count	Displays the count value of totalizer 1.
Totalizer 2 count	Totalizer 2 count	Displays the count value of totalizer 2.
Totalizer 3 count	Totalizer 3 count	Displays the count value of totalizer 3.
AI1.OUT	AI1.OUT	Displays OUT of AI1FB.
AI2.OUT	AI2.OUT	Displays OUT of AI2FB.
TOT1.TOTAL	TOT1.TOTAL	Displays TOTAL of TOT1.
TOT2.TOTAL	TOT2.TOTAL	Displays TOTAL of TOT2.
TOT3.TOTAL	TOT3.TOTAL	Displays TOTAL of TOT3.

5.7.3 Decimal-Point Position Setting

The number of decimal places can be set to the automatic adjustment or fix mode for the totalized value or process value PV-mapped in Subsection 5.1.6.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Disp format ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display format ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	16	Format PV	Display format PV	Specifies the decimal-point position for the process value PV-mapped in Subsection 5.1.6.
LTB	17	Format total 1	Display format total 1	Specifies the decimal-point position for the totalized value of totalizer 1.
LTB	18	Format total 2	Display format total 2	Specifies the decimal-point position for the totalized value of totalizer 2.
LTB	19	Format total 3	Display format total 3	Specifies the decimal-point position for the totalized value of totalizer 3.

From the table below, select the position of the decimal point.
Process value

Selection		Description
Display	PROFIBUS PA	
Auto	Auto	Automatically adjusts the number of decimal places.
0 digit	0 digit	Fixes the number of decimal places to “0”.
1 digit	1 digit	Fixes the number of decimal places to “1”.
2 digit	2 digit	Fixes the number of decimal places to “2”.
3 digit	3 digit	Fixes the number of decimal places to “3”.
4 digit	4 digit	Fixes the number of decimal places to “4”.
5 digit	5 digit	Fixes the number of decimal places to “5”.
Auto 2	Auto 2	Automatically adjusts the number of decimal places in conjunction with the span.

Totalized value

Selection		Description
Display	PROFIBUS PA	
Auto	Auto	Automatically adjusts the number of decimal places.
0 digit	0 digit	Fixes the number of decimal places to “0”.
1 digit	1 digit	Fixes the number of decimal places to “1”.
2 digit	2 digit	Fixes the number of decimal places to “2”.
3 digit	3 digit	Fixes the number of decimal places to “3”.
4 digit	4 digit	Fixes the number of decimal places to “4”.
5 digit	5 digit	Fixes the number of decimal places to “5”.
6 digit	6 digit	Fixes the number of decimal places to “6”.
7 digit	7 digit	Fixes the number of decimal places to “7”.

5.7.4 Display Line Count and Scroll Settings

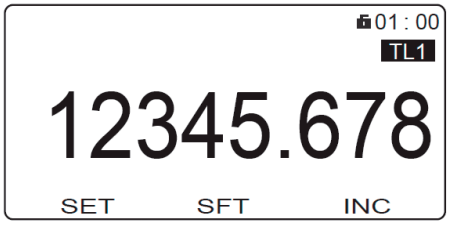
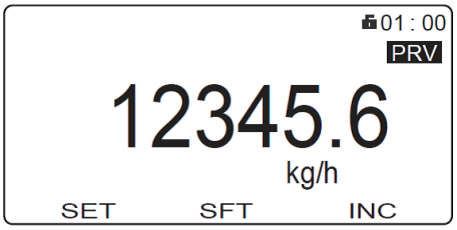
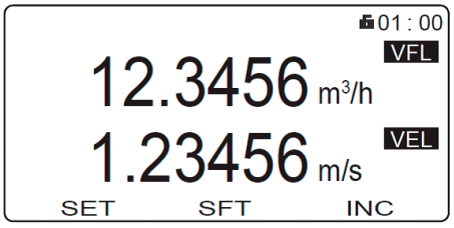
This product can show up to eight items on the display by scrolling, with four lines max. shown at a time. The scroll method can be selected from the automatic display switching or the display switching using the IR switch.
The setting can be configured with the following parameters.

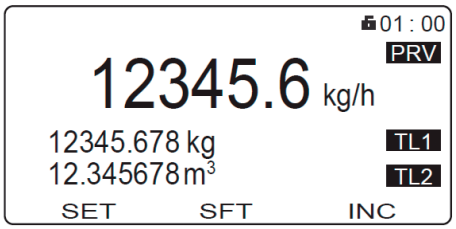
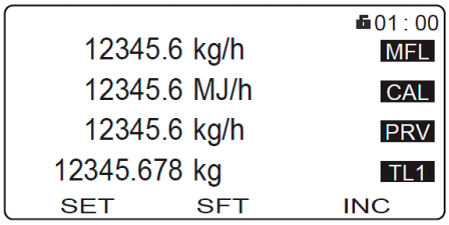
Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	21	Line mode	Display line	Specifies the number of lines to be shown on the display.*1
LTB	25	Scroll mode	Display scroll	Specifies the display scroll method.*2

*1: From the table below, select the number of display lines.
The font size is automatically adjusted based on the number of the displayed line.

Selection		Description
Display	PROFIBUS PA	
1 line(big)	1 Line(Big)	1-line display without unit. The numeric value is displayed in a large font.  F0427.ai
1 line	1 Line	1-line display with unit.  F0428.ai
2 line	2 Line	2-line display with units.  F0429.ai

Selection		Description
Display	PROFIBUS PA	
3 line	3 Line	3-line display with units.  F0430.ai
4 line	4 Line	4-line display with units.  F0431.ai

*2 Select the scroll method from the table below.

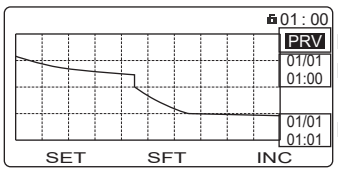
Selection		Description
Display	PROFIBUS PA	
Off	Off	Does not scroll.
Manual	Manual	Sets to the scroll using the IR switch.
Auto(2 s)	Auto(2s)	Specifies to the automatic scroll at 2-second intervals.
Auto(4 s)	Auto(4s)	Specifies to the automatic scroll at 4-second intervals.
Auto(8 s)	Auto(8s)	Specifies to the automatic scroll at 8-second intervals.

NOTE

The default value of the scroll method (LTB: Display Scroll/Scroll mode) is “Off”.
If the value of the scroll method is set to “Off”, the 5th line and beyond cannot be checked on the display.
To display the 5th line and beyond, set an option other than “Off”.

5.7.5 Trend Graph Setting

The trend graph display function displays the time change of the selected item as a trend graph. Up to four items can be selected for the trend graph. The trend graph is scaled automatically, and the time axis flows from the left to the right.



Process value
Display start time
Display end time
F0432.ai

(1) Trend graph display setting

The process value and high/low limit that can be shown in the trend graph are as follows:

Process value	Display	Low limit	High limit
Flow rate (%)	FLP	0%	100%
PV	PRV	0	Span value specified in Subsection 5.1.9
Flow velocity	VEL		
Volumetric flow rate	VFL		
Mass flow rate	MFL		
Calorie*	CAL		
Totalizer 1	TL1	Preset value specified in Subsection 5.2.7	Target value of the totalizer specified in Subsection 5.2.3
Totalizer 2	TL2		
Totalizer 3	TL3		

*Only available for AXG, not for AXW.

The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	29	Display mode	Display measure mode	Specifies the display of a trend graph.

From the table below, select the trend graph display.

Selection		Description
Display	PROFIBUS PA	
Normal	Normal	Does not display a trend graph (normal display).
Trend	Trend	Displays a trend graph.

(2) Trend graph display item setting

The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Trend select ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Trend select ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	32	Trend 1	Trend select 1	Specifies item 1 to be shown in a trend graph.
LTB	33	Trend 2	Trend select 2	Specifies item 2 to be shown in a trend graph.
LTB	34	Trend 3	Trend select 3	Specifies item 3 to be shown in a trend graph.
LTB	35	Trend 4	Trend select 4	Specifies item 4 to be shown in a trend graph.

From the table below, select the display item of trend graph.

Selection		Description
Display	PROFIBUS PA	
None	None	Does not set any items (item 1 is not selectable).
Flow rate(%)	Flow rate(%)	Specifies the flow rate for the span of the process value that is mapped with PV in Subsection 5.1.6.
PV	PV	Specifies the process value PV-mapped in Subsection 5.1.6.
Velocity	Velocity	Sets the display item to the flow velocity.
Volume flow	Volume flow	Specifies the display item to the volumetric flow rate.
Mass flow	Mass flow	Specifies the display item to the mass flow rate.
Calorie	Calorie	Sets the display item to the calorie (only available for AXG, not for AXW).
Totalizer 1	Totalizer 1	Specify the totalized value of totalizer 1.
Totalizer 2	Totalizer 2	Specify the totalized value of totalizer 2.
Totalizer 3	Totalizer 3	Specify the totalized value of totalizer 3.

(3) Update period setting

The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	22	Period	Display period	Specifies the trend graph update period on the display.

From the table below, select the trend graph update period.

Selection		Description
Display	PROFIBUS PA	
0.2 s	0.2s	Sets the update period to 0.2 seconds
0.4 s	0.4s	Sets the update period to 0.4 seconds
1.0 s	1.0s	Sets the update period to 1 second
2.0 s	2.0s	Sets the update period to 2 seconds
4.0 s	4.0s	Sets the update period to 4 seconds
8.0 s	8.0s	Sets the update period to 8 seconds

5.7.6 Other Settings

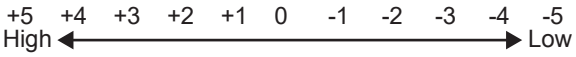
(1) Display contrast (graduations) setting

The contrast of the display can be changed to 11 levels (+5 to -5).
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	20	Contrast	Display contrast	Specifies the contrast of the display.



NOTE

How the contrast of the display looks changes a little depending on ambient temperature.
Set the contrast of the display by taking into account the ambient temperature of the environment where the display is used.

(2) Display damping time constant setting

This function can specify the damping time constant for the display independently of that specified in Subsection 5.1.10.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	26	Damp	Display damping	Specifies the damping time constant of the display.

NOTE

The damping time constant of the display is effective only for the display. Refer to Subsection 5.1.10. to specify the damping time constant for the output of the physical quantity.

NOTE

The damping time constant of the display is not applied to the following display item.
AI1.OUT, AI2.OUT
For details about the display item, refer to Subsection 5.7.2.

(3) Date display format setting

The date display format can be set.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	27	Format date	Display format date	Specifies the date display format.

From the table below, set the date display format.

Selection		Description
Display	PROFIBUS PA	
MM/DD/YYYY	MM/DD/YYYY	Displays the date as “month/day/year”.
DD/MM/YYYY	DD/MM/YYYY	Displays the date as “day/month/year”.
YYYY/MM/DD	YYYY/MM/DD	Displays the date as “year/month/day”.

(4) Display black/white inverse setting

The black/white inverse is available for the display.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	36	Inversion	Display inversion	Specifies the display black/white inverse mode.

From the table below, select the display black/white inverse mode.

Selection		Description
Display	PROFIBUS PA	
Normal	Normal	Does not set the display to the black/white inverse mode. Character color: Black, Background color: White
Invert	Invert	Specifies the display to the black/white inverse mode. Character color: White, Background color: Black

(5) Display squawk setting (squawk)

The back light of the display can be blinked (squawked) at 4-second intervals to identify a communicating product if a number of the same instrument is installed.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Diag/Service ► Disp indicator ► (see below)
PROFIBUS PA	Device ► Query Device ► LCD Transducer Block ► index 24-58 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	38	Squawk	Squawk	Specifies the blinking operation of the display.

From the table below, select whether or not to blink the display. In the communication access of PROFIBUS PA, the communication access is set with the procedure of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Off	Off	Does not blink the display.
On	On	Blinks the display (continuously).
Squawk once	Squawk once	Blinks the display (only once).

(6) Low-cut value setting

The low-cut value can be set for the PV value displayed on the display.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Display set ► Optional config ► (see below)
PROFIBUS PA	Device ► Input ► LCD Transducer Block ► Display operation configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
LTB	41	Low cut	Display low cut	Specifies the low-cut value to the PV value shown on the display.
LTB	42	-	Display low cut unit	Indicates the unit of the low cut.

NOTE

If the output process value to be output is changed, it is necessary to specify the low-cut value again.

(7) All block target mode

When setting a parameter, it is necessary to set a parameter by setting appropriate MODE_BLK. Target of PB/FTB/DTB/LTB/MTB1/MTB2/FB(AI1-2,TOT1-3,DI1-2,AO) to O/S for each parameter. The parameter to simplify it on the display is “All block target mode”. This parameter makes it possible to set PB/FTB/DTB/LTB/MTB1/MTB2/FB(AI1-2,TOT1-3,DI1-2,AO) to O/S at a time and to reset them to the original mode. Use this parameter to set a parameter in the following procedures.

1. Set “All block target mode” to O/S.
2. Set the required parameter from the display.
3. Set “All block target mode” to “Restore”.

The default value of “All block target mode” and the value right after “Restore” is “Not execute”.

Menu path (at the following five points on the menu tree of the display)

Display	Device setup ► Block mode ► (see below)
	Device setup ► Diag/Service ► (see below)
	Device setup ► Easy setup wizard ► (see below)
	Device setup ► Detailed setup ► (see below)
	Device setup ► Detailed setup ► PROFIBUS info ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
-	-	All block target mode	-	Switch the target mode of PB/FTB/DTB/LTB/MTB1/MTB2/FB(AI1-2,TOT1-3,DI1-2,AO) at once.

Select from the table below.

Selection		Description
Display	PROFIBUS PA	
O/S	-	Set the target mode of each block to O/S. If this value is written twice or more before [Restore], O/S mode is stored in the transmitter.
Restore		Restore each block to the target mode before executing this function.
Not execute		Not execute

(8) IR switch function

The IR switch function is a function to drive the IR switch for display operation. For the basic operations of the IR switch, refer to Subsection 2.2.1.
This setting can be configured with the following parameters.

Menu path

Display	-
PROFIBUS PA	Device ► Physical Block ► Configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
PB	23	-	Local Operation Enable	Specifies whether writing of parameters from the indicator is prohibited or allowed.

Selection		Description
Display	PROFIBUS PA	
-	Disable	Indicates that writing of the parameter is prohibited.
-	Enable	Indicates that writing of the parameter is allowed.

5.7.7 microSD Card Setting

If the optional code MC is selected, the backup parameters and logging data can be used by inserting the dedicated microSD card into the display.
For details about backing up parameters and logging data, refer to Section 5.11.

(1) Removing the microSD card

IMPORTANT

If “Unmount” is not executed on the software when removing the microSD card, it may cause data stored on the microSD card to be erased or the device to operate abnormally.

The microSD card can be removed with the following parameter.

Menu path

Display	Device setup ► microSD ► (see below)

Parameter	Description
Unmount	Specifies the removal of the microSD card.

From the table below, select whether to remove the microSD card.

Selection	Description
Cancel	Cancels the removal of the microSD card.
Execute	Makes it possible to remove the microSD card in safety.

(2) microSD card format

IMPORTANT

If the format function of this product is not used to format the microSD card, it may cause a device operation failure.

Formatting is possible with the following parameter.

Menu path

Display	Device setup ► microSD ► (see below)

Parameter	Description
Format	Specifies the format of the microSD card.

From the table below, select whether to format the microSD card.

Selection	Description
Cancel	Cancels formatting.
Execute	Executes formatting.

(3) Checking contents of the microSD card

Data on the microSD card can be checked with the following parameter.

Menu path

Display	Device setup ► microSD ► Contents

(4) Checking the property of the microSD card

The total space, available space and file system of the microSD card can be checked with the following parameter.

● Displaying total space

Menu path

Display	Device setup ► microSD ► Property ► Total space

● Displaying available space

Menu path

Display	Device setup ► microSD ► Property ► Available space

● Displaying file system

Menu path

Display	Device setup ► microSD ► Property ► File system

5.8 Device Information

5.8.1 Order Information

Order information can be specified for this product. If a particular parameter is specified at the time of ordering, this product is shipped with the parameter specified. If a parameter is not specified at the time of ordering, that parameter needs to be set by the customer.
The format of the model and suffix code is as shown below.

Sensor:

AXG□□□ - □□□□□□□□□□□□□□□ - □□□□□ / □
(1) (2) (3)

AXW □□□ - □□□□□□□□□□□□□□□ - □□□□□ / □
(1) (2) (3)

AXW □□□ G - □□□□□□ - □□□□ - □□□ / □
(1) (2) (3)

AXW □□□ W - □□□□□□ - □□□□ - □□□ / □
(1) (2) (3)

Transmitter:

AXG□A - □□□□□□□□□□□ / □
(1) (2) (3)

AXW □ A - □□□□□□□□□□□ / □
(1) (2) (3)

(1) Model code, (2) Suffix code, (3) Optional code

The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Device info ► Order info ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Order information ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
-	-	Tag No	-	Displays Tag No Max. 32 characters
MTB1	12	MS code ► Model code	Basic model code	Specifies the model code of the integral flowmeter or remote transmitter.
MTB1	13	MS code ► Suffix config 1	Suffix config 1	Specifies the suffix code of the integral flowmeter or remote transmitter.
MTB1	14	MS code ► Suffix config 2	Suffix config 2	
MTB1	15	MS code ► Option 1	Option 1	Specifies the optional code of the integral flowmeter or remote transmitter.
MTB1	16	MS code ► Option 2	Option 2	
MTB1	17	MS code ► Option 3	Option 3	
MTB1	18	MS code ► Option 4	Option 4	
MTB1	19	RS MS code ► Model code	Remote sensor basic model code	Specifies the model code of the remote sensor.

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	20	RS MS code ► Suffix config 1	Remote sensor suffix config 1	Specifies the suffix code of the remote sensor.
MTB1	21	RS MS code► Suffix config 2	Remote sensor suffix config 2	
MTB1	22	RS MS code ► Option 1	Remote sensor option 1	Specifies the optional code of the remote sensor.
MTB1	23	RS MS code ► Option 2	Remote sensor option 2	
MTB1	24	RS MS code ► Option 3	Remote sensor option 3	
MTB1	25	RS MS code ► Option 4	Remote sensor option 4	

Menu path

Display	Device setup ► Detailed setup ► Device info ► Ver/Num info ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Version/Number information ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	26	Trans serial No	Transmitter serial No	Displays the serial number (device No.) of the transmitter.
MTB1	27	Sensor serial No	Sensor serial No	Displays the serial number (device No.) of the sensor.

NOTE

When any parameter related to the order information about the device is changed, the order information at shipment from the manufacturing factory cannot be referred to.
To store the order information defined at shipment from the manufacturing factory, it is recommended to refer to Section 5.11 to make a backup.

5.8.2 Device Revision

The revision of the software used for this product can be checked.
This information can be checked with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Device info ► Ver/Num info ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Version/Number information ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	9	Transmitter type	Transmitter type	Displays the type of the transmitter.
MTB1	31	Main soft rev	Main board revision	Displays the software revision of the main board.
MTB1	32	Snsr soft rev	Sensor board revision	Displays the software revision of the sensor board.
MTB1	33	Ind soft rev	Indicator board revision	Displays the software revision of the display board.

5.8.3 Memo Function

Three parameters can be used as a memo function. The memo function can be set to up to 16 characters.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Device info ► Memo ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Memo ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	28	Memo 1	Memo 1	Specifies memo 1.
MTB1	29	Memo 2	Memo 2	Specifies memo 2.
MTB1	30	Memo 3	Memo 3	Specifies memo 3.

5.8.4 Explosion Protection Setting

Whether the product is a standard product or an explosion protection product can be set.
When using an explosion protection sensor, set the following parameter to “Yes”.

Menu path

Display	Device setup ► Detailed setup ► Device info ► Order info ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	11	Explosion protection	Order information ► Explosion protection	Selects an explosionprotective product or standard product.

Selection		Description
Display	PROFIBUS PA	
No	No	No explosion protection setting.
Yes	Yes	Explosion protection.

5.8.5 Date and Time Information

The present date and time can be set. The display format for date and time is the format set in Subsection 5.7.6.
This setting can be displayed and configured with the following parameters.

■ Displaying date and time

Menu path

Display	Device setup ► Diag/Service ► Time stamp ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Date Time ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB	8	Op time	Operation Time	Displays operation time. Operation time refers to the operation time up to the present from the time when the power was turned on for the first time. However, time is not counted when power is not turned on.
MTB	168	Date	Current date	Displays current date.
MTB	169	Time	Current time	Displays current time.

Setting date and time

Menu path

Display	-
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Device information ► Date Time ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB	170	-	Set current day	Sets the current day(1-31).
MTB	171	-	Set current month	Sets the current month(1-12).
MTB	172	-	Set current year	Sets the current year(1900-2155).
MTB	173	-	Set current hour	Sets the current hour(0-23).
MTB	174	-	Set current minute	Sets the current minute(0-59).
MTB	175	-	Set current sec	Sets the current sec(0-59).

5.9 Self-check Function

5.9.1 Types of Diagnosis Functions

This product has the self-check functions to diagnose device failures or process states.
The diagnosis functions of this instrument are as follows:

Diagnosis function	Description
High/low limit alarm notification	Displays an alarm when the specified value is exceeded and outputs it as the status output.
Electrode adhesion detection	Diagnoses an electrode adhesion from the resistance value of the electrode, and displays a warning or alarm if adhesion is detected.
Sensor empty check	Checks whether the sensor is in the empty pipe state, and displays an alarm if the empty pipe state is detected.
Misconnection detection	Checks whether the transmitter signal line and the excitation line are correctly connected, and displays a warning if a misconnection is detected.
Verification (device health diagnosis) function	Diagnoses the health of the product, and displays its result.
Electrode insulation deterioration diagnosis	Diagnose the deterioration of insulation from the resistance value of the electrode, and displays a warning if it is detected. (Only available for AXG, not for AXW).
Flow noise diagnosis	Measures a flow noise detected in the sensor, and displays a warning if the measured value exceeds the specified value. (Only available for AXG, not for AXW).
Diagnosing low conductivity	Obtains the conductivity from the resistance value and size of the electrode, and displays a warning if the conductivity falls below the specified value. (Only available for AXG, not for AXW).
Coil insulation diagnosis	By diagnosing the current value of exciting current, a warning is displayed when the insulation is deteriorated.

5.9.2 Alarm High/Low Limit Function

When the physical quantity of Subsection 5.1.6 exceeds the set value, the alarm can be displayed with the high/low limit function of the alarm.
As a value to judge an alarm, the following four values can be set: high limit, high-high limit, low limit, and low-low limit.
The setting can be configured with the following parameters.

■ Analog input function Alarm

Menu path

Display	--
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► Warning and Alarm ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	21	-	Upper Limit Alarm	Specifies the high-high limit to judge an alarm.
AI(1-2)	23	-	Upper Limit Warning	Specifies the high limit to judge an alarm.
AI(1-2)	25	-	Lower Limit Warning	Specifies the low limit to judge an alarm.
AI(1-2)	27	-	Lower Limit Alarm	Specifies the low-low limit to judge an alarm.

When the high and low limit alarms are reset, each has a hysteresis. The hysteresis in each case can be specified with the following parameter.

Menu path

Display	--
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► Warning and Alarm ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	19	-	Limit Hysteresis	Specifies the hysteresis width for the alarm occurrence and resetting.

(1) Hysteresis value = Limit Hysteresis

(2) Value that causes a high or high-high limit alarm to be reset

= Set high limit or high-high limit - Hysteresis value

(3) Value that causes a low or low-low limit alarm to be reset

= Specified low limit or low-low limit value + Hysteresis value

Example:
High limit value = 250 m^3/h, Low limit value = 50 m^3/h,
High-high limit = 300 m^3/h, Low-low limit = 25 m^3/h,
If Hysteresis width is set to 15 [m^3/h]
In this case, each value is obtained as shown below.

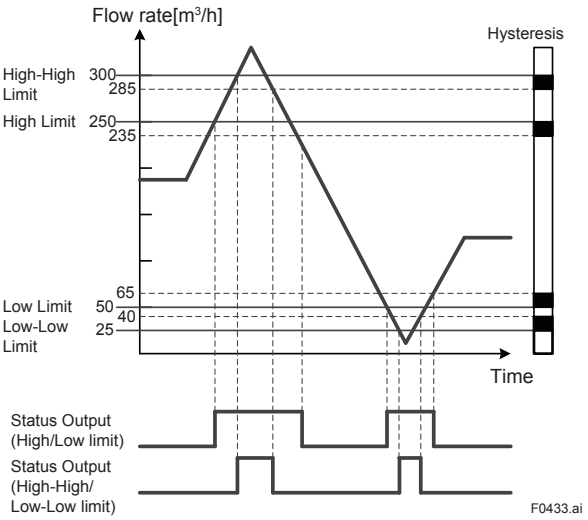
(1) Hysteresis value = Limit Hysteresis = 15 [m^3/h]

(2-1) Value that causes a high-high limit alarm to be reset
= 300 [m^3/h] – 15 [m^3/h]
= 285 [m^3/h]

(2-2) Value that causes a high limit alarm to be reset
= 250 [m^3/h] – 15 [m^3/h]
= 235 [m^3/h]

(3-1) Value that causes a low limit alarm to be reset
= 50 [m^3/h] + 15 [m^3/h]
= 65 [m^3/h]

(3-2) Value that causes a low-low limit alarm to be reset
= 25 [m^3/h] + 15 [m^3/h]
= 40 [m^3/h]



NOTE

When the physical quantity to be output is changed, set the high/low limits to judge an alarm again.

■ Totalizer Alarm

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► Warning and Alarm ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	18	-	Upper Limit Alarm	Specifies the high-high limit to judge an alarm.
TOT(1-3)	19	-	Upper Limit Warning	Specifies the high limit to judge an alarm.
TOT(1-3)	20	-	Lower Limit Warning	Specifies the low limit to judge an alarm.
TOT(1-3)	21	-	Lower Limit Alarm	Specifies the low-low limit to judge an alarm.

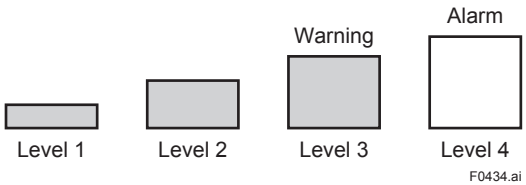
Menu path

Display	-
PROFIBUS PA	Device ► Output ► Totalizer (1-3) Function Block ► Warning and Alarm ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
TOT(1-3)	17	-	Limit Hysteresis	Specifies the hysteresis width for the alarm occurrence and resetting.

5.9.3 Electrode Adhesion Detection

The electrode adhesion detecting function diagnoses an electrode adhesion with the resistance value of the electrode, and displays a warning or alarm if an adhesion is detected.
The electrode adhesion detection is displayed on the display in four levels: level 1 to level 4.
A value to judge each level can be specified individually. Display a warning when adhesion exceeds level 3, and an alarm when adhesion exceeds level 4.
For details about the alarm and warning, refer to Subsection 5.6.1. Also, for the resistance value of the electrode, refer to Subsection 5.1.7.



The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► Adhesion ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Adhesion ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	135	Function	Adhesion function	Specifies the use of the electrode adhesion detecting function.*1
FTB	136	Threshold level 1	Adhesion level 1	Specifies the value to judge level 1.
FTB	137	Threshold level 2	Adhesion level 2	Specifies the value to judge level 2.
FTB	138	Threshold level 3	Adhesion level 3	Specifies the value to judge level 3.
FTB	139	Threshold level 4	Adhesion level 4	Specifies the value to judge level 4.
FTB	140	Result ► Status	Adhesion level	Displays the electrode adhesion detection level.
FTB	141	Check cycle	Adhesion check cycle	Specifies the data update cycle for electrode adhesion detection.

*1: From the table below, select the use of the electrode adhesion detection function.

Selection		Description
Display	PROFIBUS PA	
Disable	Disable	Does not use the electrode adhesion detecting function.
Enable	Enable	Uses the electrode adhesion detecting function.

NOTE

If the electrode adhesion detecting function is not used, the electrode resistance value and level are cleared.

NOTE

Before using the electrode adhesion detecting function, be sure to make sure that the sensor is in the full pipe state. If the sensor is in the empty pipe state, the function to detect adhesion may not run normally.

NOTE

The electrode adhesion detecting function is restricted by the conductivity of fluid. The recommended conductivities are as follows.

Size	Conductivity
2.5 to 10 mm	30 µS/cm or larger
15 to 450 mm (0.5 to 18 in.)	10 µS/cm or larger
500 mm	20 µS/cm or larger

NOTE

If the data update cycle for the adhesion detection is shortened, the error of the electrode resistance value increases. Do not change the default value unless especially specified.

5.9.4 Sensor Empty Check

The sensor empty check function checks whether the sensor is in the empty pipe state, and displays an alarm if the empty pipe state is detected.
For details about the alarm and warning, refer to Subsection 5.6.1.
This information can be checked with the following parameter.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► Empty check ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Empty ► Result ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	151	Empty status	Empty status	Displays the result of the sensor empty check function.

From the table below, check the result of the sensor empty check function.

Selection		Description
Display	PROFIBUS PA	
Full	Full	Indicates that the sensor is in the full pipe state.
Empty	Empty	Indicates that the sensor is in the empty pipe state.

IMPORTANT

- If the sensor is in the empty pipe state, output fluctuation or empty check alarm may occur. Be sure to use the magnetic flowmeter being filled with liquid fully.
- The empty check is determined by measuring the resistance between the electrode and the ground. For that reason, the empty pipe state may not be detected due to the piping condition, electrode condition, and environmental noise. In particular, note that the empty check function may not operate properly for high-viscosity fluids and adhesive fluids.
- It takes 10 to 15 minutes to diagnose the empty pipe state. Other process alarms may occur before the empty check alarm occurs after the pipe is in the empty pipe state.

5.9.5 Wiring Connection Diagnosis

The wiring connection diagnostic function diagnoses whether the signal line and the excitation line between the remote type sensor and transmitter are correctly connected, and displays a warning if a misconnection is detected.
For example, if there are two sets (A and B) of remote type sensors and transmitters, this function checks whether the signal line of transmitter A is misconnected to the signal terminal of sensor B, or the excitation line of transmitter A is misconnected to the excitation terminal of sensor B.
It takes approximately 10 seconds to diagnose the wiring connection.
For details about the alarm and warning, refer to Subsection 5.6.1.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DTB	29	Diagnostic execute	Diagnostic Exe	Specifies the use of the wiring connection diagnostic function.*1
DTB	35	Diagnostic output	Diagnostic output	Specifies the output to use the wiring connection diagnostic function.*2

*1: From the table below, select the use of the wiring connection diagnostic function. In the communication access of PROFIBUS PA, the communication access is set with the procedures of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Not execute	Not execute	Not execute diagnosis.
Electrode insul exe	Elec ins exe	Execute electrode insulation deterioration diagnosis.
Connect check exe	Conn check exe	Starts the wiring connection diagnostic function.

*2: From the table below, select the output while executing wiring connection diagnostic function.

Selection		Process value	Totalizer	Pulse output	Frequency output
Display	PROFIBUS PA				
Zero	Zero	0% output	Input 0 (Output fixed)	0 pps	0% output
Measured value	Measured value	Output of calculated value (Undefined)	Totalization of calculated value (Undefined)	Output of calculated value (Undefined)	Output of calculated value (Undefined)
Hold	Hold	Fixes the last valid value before the diagnosis starts.	Totalizes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.

IMPORTANT

- Before using the wiring connection diagnostic function, be sure to disconnect this product from the control loop.
- While the wiring connection diagnostic function is used, the pulse output is not output correctly.

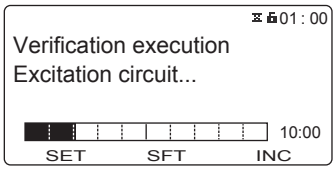
NOTE

When using the wiring connection diagnostic function, the following conditions must be satisfied. If the conditions are not satisfied, the magnetic flowmeter may not correctly diagnose the wiring connection state.

- The sensor is in the full pipe state.
- No influence of noise.
- The magnetic flowmeter transmitter and AM012 (calibrator) are not connected.

5.9.6 Verification (Device Health Diagnosis) Function

The verification function diagnoses the health of the product and displays the diagnosis result. It takes about 15 minutes to complete the verification function, and the progress of the verification function can be checked via the bar graph and the remaining time shown on the display.



This function can inspect each condition of the magnetic circuit, excitation circuit, and calculation circuit, and executes the device health diagnosis of the product based on their internal alarm record along with their wiring misconnection. This function evaluates the diagnosis result based on the conditions of the product and shows “Passed” if no problem is found or “Failed” if a problem is found on the display.
The following execution results are shown on the display.

- **Examples of “Passed” results**

VF check results	Passed
VF Operation time	00001D 10:01
Magnetic circuit result	Passed
Exciting circuit result	Passed
Calculation circuit result	Passed
Device status result	Passed
Connection status result	Passed

- **Examples of “Failed” results**

VF check results	Failed
VF Operation time	00001D 10:01
Magnetic circuit result	Passed
Exciting circuit result	Passed
Calculation circuit result	Failed
Device status result	Passed
Connection status result	Passed

Contact Yokogawa service center if the “Failed” message is displayed for items from “Magnetic circuit result” to “Device status result”.
If “Failed” is displayed for “Connection status result”, check for wiring misconnection between the sensor and transmitter (refer to Subsection 5.9.5 for detail) and damage on the cables.

The verification function can be used in two ways depending on the state of the fluid; one state where a fluid is flowing and another state where no fluid is flowing.
The two diagnosis results (current and previous) are stored in the device memory, and they can be checked later.
If the verification function is used, the following results can be displayed.

Total judgment result	Calculation circuit diagnosis result
Device operation time at the start of verification execution	Device alarm diagnosis result
Magnetic circuit diagnosis result	Wiring connection diagnosis result
Excitation circuit diagnosis result	

The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Verification ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	35	Diagnostic output	Diagnostic output	Specifies the output to execute the verification function.*1

Menu path

Display	Device setup ► Diag/Service ► Verification ►(see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Verification ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DTB	37	Mode	VF mode	Specifies the fluid status to execute the verification function.*2
DTB	38	Execute	Verification Exe	Specifies the execution of the verification function.*3
DTB	39	VF No	VF No	Specifies the diagnosis result display time.*4
DTB	36	VF target select	VF target select	Specifies the target for diagnosis.*5

*1: From the table below, select the output to execute the verification function.

Selection		Process value	Totalizer	Pulse output	Frequency output
Display	PROFIBUS PA				
Zero	Zero	0% output	Input 0 (Output fixed)	0 pps	0% output
Measured value	Measured value	Output of calculated value (Undefined)	Totalization of calculated value (Undefined)	Output of calculated value (Undefined)	Output of calculated value (Undefined)
Hold	Hold	Fixes the last valid value before the diagnosis starts.	Totalizes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.

*2: From the table below, select the fluid state to execute the verification function.

Selection		Description
Display	PROFIBUS PA	
No flow	No flow	Executes the verification function with the fluid not flowing.
Flow	Flow	Executes the verification function with the fluid flowing.

*3: From the table below, select whether or not to execute the verification function. In the communication access of PROFIBUS PA, the communication access is set with the procedures of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Not execute	Not execute	Does not execute the verification function.
Execute	Execute	Executes the verification function.

*4: From the table below, select the execution result of the verification function.

Selection		Description
Display	PROFIBUS PA	
Factory	Factory	Displays the result obtained at shipment from the manufacturing factory.
Previous	Previous	Displays the previous result.
Present	Present	Displays the result at this time.

*5: Select the target for diagnosis from the table below (All of them are set to diagnosis target at the time of shipment).

Selection		Description
Display	PROFIBUS PA	
Magnetic circuit	Magnetic	Magnetic circuit diagnosis
Excite circuit	Excitation	Excitation circuit diagnosis
Calc circuit	Calculation	Calculation circuit diagnosis
Device status	Device status	Device alarm diagnosis
Connect status	Conn status	Wiring misconnection check

In the default state, all of the diagnosis results are reflected in the final results of the verification. Even if set with “VF target select” so as not to reflect the diagnosis results to the final results of the verification, execution time for the verification does not change because the diagnosis itself is executed. In addition, the diagnosis results selected to “0” with Verification Target are displayed as “Skip”.
Note that verification itself cannot be executed if all diagnoses are unchecked in the check box of Verification Target (0x0000).
The diagnosis result is displayed as shown below.

Display	Device setup ► Diag/Service ► Verification ► Result ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Verification ► Result ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DTB	40	Failed/Passed	VF check result	Execution result
DTB	41	VF operate time	VF operation time	The time at the start of verification execution (displays the device operation time at that time)
DTB	42	Magnetic circuit	Magnetic circuit result	Magnetic circuit diagnosis result
DTB	43	Excite circuit	Excitation circuit result	Excitation circuit diagnosis result
DTB	44	Calc circuit	Calculation circuit result	Calculation circuit diagnosis result
DTB	45	Device status	VF device status result	Device alarm diagnosis result
DTB	46	Connect status	Connection status result	Wiring connection diagnosis result

The diagnosis result is judged as shown below.

Result		Description
Display	PROFIBUS PA	
Passed	Passed	There are no problems concerning the diagnosis result.
Failed	Failed	There is a problem concerning the diagnosis result.
Canceled	Canceled	Cancels the diagnosis.
No data	No Data	No diagnosis result data (The verification function is not used.)
Unknown	Unknown	Cannot perform a diagnosis.
Skip	Skip	Out of verification target

IMPORTANT

- Before using the verification function, be sure to disconnect this product from the control loop.
- While the verification function is used, the pulse output is not output correctly.
- Note that parameters cannot be changed while the verification function is executed.

NOTE

- Be sure to use the verification function when the sensor is in the full pipe state. If the sensor is in the empty pipe state, the function to detect adhesion may not run normally.
- When using the verification function, correctly specify the fluid status with the parameter.
- If there is a problem with the result of the verification function, refer to the Maintenance Manual.

5.9.7 Electrode Insulation Deterioration Diagnosis (only available for AXG, not for AXW)

The electrode insulation deterioration diagnosis function diagnoses the deterioration of insulation with the resistance value of the electrode and displays a warning if the deterioration of insulation is detected. It takes approximately 5 minutes to complete this diagnosis.
For details about the alarm and warning, refer to Subsection 5.6.1.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	29	Diagnostic execute	Diagnostic Exe	Specifies the execution of the electrode insulation deterioration diagnostic function.*1
FTB	35	Diagnostic output	Diagnostic output	Specifies the output to execute the electrode insulation deterioration diagnostic function.*2

*1: The electrode insulation deterioration diagnosis can be configured with the following parameters. In the communication access of PROFIBUS PA, the communication access is set with the procedure of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Electrode insul exe	Elec Ins exe	Starts the electrode insulation deterioration diagnosis function (only available for AXG, not for AXW).

*2: From the table below, select the output required to execute the diagnosis function.

Selection		Process value	Totalizer	Pulse output	Frequency output
Display	PROFIBUS PA				
Zero	Zero	0% output	Input 0 (Output fixed)	0 pps	0% output
Measured value	Measured value	Output of calculated value (Undefined)	Totalization of calculated value (Undefined)	Output of calculated value (Undefined)	Output of calculated value (Undefined)
Hold	Hold	Fixes the last valid value before the diagnosis starts.	Totalizes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.	Fixes the last valid value before the diagnosis starts.

IMPORTANT

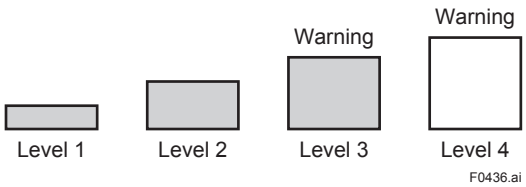
- Before using the electrode insulation deterioration diagnosis function, be sure to disconnect this product from the control loop.
- While the electrode insulation deterioration diagnosis function is used, the pulse output is not output correctly.

NOTE

Before using the electrode insulation deterioration diagnosis function, always make sure that the sensor is in the full pipe state. If the sensor is in the empty pipe state, the function to detect adhesion may not run normally.

5.9.8 Diagnosing Flow Noise (only available for AXG, not for AXW)

The flow noise diagnostic function measures a generated flow noise with the sensor, and displays a warning if the flow noise exceeds the specified value.
The flow noise diagnosis is shown on the display in four levels: level 1 to level 4. A value to judge each level can be specified individually. If an output exceeds the level 3 or level 4 value, a warning message is displayed.
For details about the alarm and warning, refer to Subsection 5.6.1. Also, for the flow noise value, refer to Subsection 5.1.7.
For details about the flow noise span and damping time constant, refer to Subsections 5.1.9 and 5.1.10.



The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► Flow noise ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► Flow noise ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	142	Function	Flow noise function	Specifies the use of the flow noise diagnosis function.*1
FTB	143	Threshold level 1	Flow noise level 1	Specifies the value to judge level 1.
FTB	144	Threshold level 2	Flow noise level 2	Specifies the value to judge level 2.
FTB	145	Threshold level 3	Flow noise level 3	Specifies the value to judge level 3.
FTB	146	Threshold level 4	Flow noise level 4	Specifies the value to judge level 4.
FTB	147	Result ► Status	Flow noise level	Displays the flow noise level.

*1: From the table below, select the use of the flow noise function.

Selection		Description
Display	PROFIBUS PA	
Disable	Disable	Does not use the flow noise diagnosis function.
Enable	Enable	Uses the flow noise diagnosis function.

NOTE

If the flow noise diagnosis function is set to “Disable”, the flow noise value and level are cleared.

5.9.9 Diagnosing Low Conductivity (only available for AXG, not for AXW)

The low conductivity diagnosis function calculates conductivity from the resistance value and size of the electrode and displays a warning if the conductivity falls below the specified value.
For details about the alarm and warning, refer to Subsection 5.6.1. Also, for the conductivity value, refer to Subsection 5.1.7.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ▶ Diag/Service ▶ Diagnosis ▶ Conductivity ▶ (see below)
PROFIBUS PA	Diagnostic ▶ Diagnosis ▶ Conductivity ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
FTB	149	Function	Low conductivity function	Specifies the use of the low conductivity diagnosis function.*1
FTB	150	Low limit	Conductivity low limit	Specifies the value used to judge the low conductivity.

Menu path

Display	Device setup ▶ Detailed setup ▶ Device info ▶ Order info ▶ (see below)
PROFIBUS PA	Maintenance ▶ Maintenance Transducer Block ▶ Device information ▶ Order information ▶ (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	10	Electrode size	Electrode size	Displays the electrode size.

*1: From the table below, select the use of the low conductivity diagnosis function.

Selection		Description
Display	PROFIBUS PA	
Disable	Disable	Does not use the low conductivity diagnosis function.
Enable	Enable	Uses the low conductivity diagnosis function.

NOTE

The electrode size is specified at shipment from the manufacturing factory.
When any parameter related to the order information about the device is changed, the order information at shipment from the manufacturing factory cannot be referred to.
To store the order information defined at shipment from the manufacturing factory, it is recommended to refer to Section 5.11 to make a backup.

NOTE

Before using the low conductivity diagnosis function, always make sure that the sensor is in the full pipe state. If the sensor is in the empty pipe state or the transmitter is connected with AM012 (calibrator), the function to diagnose low conductivity may not run normally.

NOTE

If this function is set to “Disable”, the low conductivity value is cleared.

5.9.10 Coil Insulation Diagnosis

Coil insulation diagnosis is the function to display a warning when the insulation is deteriorated by diagnosing a current value of the exciting current. For details about the alarm and warning, refer to Subsection 5.6.1.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DTB	31	IEX compare	IEX compare	Displays the current value of Exciting current to judge coil insulation.
DTB	30	Coil insul threshold	Coil insulation threshold	Specifies the value to judge coil insulation.

5.9.11 Other Setting

In addition, the maximum voltage values of the flow rate signal and coil resistance value are displayed as diagnostic information.
This information can be checked with the following parameters.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Diagnosis ► (see below)
PROFIBUS PA	Diagnostic ► Diagnosis ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DTB	32	V peak hold	V peak hold value	Displays the maximum voltage value of the flow rate signal (only available for AXG, not for AXW).
DTB	33	IEX resistance	IEX coil resistance	Displays the coil resistance value.

5.10 Test Mode

5.10.1 Test Mode Setting

If the test mode is executed, the flow velocity or the value to be output from a connection terminal can be arbitrarily set, and a response from the device can be tested.
A warning is displayed to indicate that the test mode is in use while this test mode is used.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Diag/Service ► Test ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Test ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	58	Test mode	Test mode	Selects the test item.

From the table below, select the test terminal and process value.

Display:

Selection		Description
Display	PROFIBUS PA	
Off	-	Turns off the test mode
Velocity test	Velocity test on	Starts testing the flow velocity.
PO1 test	Pulse 1 test on	Starts testing pulse output or frequency output 1 of the I/O2 terminal.
SO1 test	SO 1 test on	Starts testing status output 1 of the I/O2 terminal.

If the flow velocity is set as a test value, the volumetric flow rate and calorie can be obtained from the test value.

NOTE

Set the output function of the pulse/status terminal (I/O2) in Subsection 5.14.1. If the set output function is different from the output function to perform testing, the test mode cannot be used. For example, if the I/O2 terminal is set as the frequency output, and the test output function is set to the status output, the test cannot be started.

5.10.2 Test Value Setting

It is necessary to set a test value for the terminal output value (pulse/status) and the process value.
The setting can be configured with the following parameters.
However, the unit of the process value to test is the unit specified in Subsection 5.1.7. If the unit is changed, the process value is also changed in conjunction with the changed unit.

Menu path

Display	Device setup ► Diag/Service ► Test ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Test ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	59	Velocity	Velocity	Sets the display item to the flow velocity.
MTB1	60	PO1	Pulse 1	Specifies the frequency of pulse output or frequency output 1 for the I/O2 terminal.
MTB1	61	SO1	SO 1	Specifies the status of status output 1 for the I/O2 terminal.

5.10.3 Test 2 Mode

Test 2 Mode is the function to perform a test to the process value, analog output, totalized value and pulse at once.
The test value can be set in the range between -10.0% and 110.0%.
Input test values (%) are tested with a scale value in response to the span of each process value.

Menu path

Display	Device setup ► Diag/Service ► Test ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Test ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	62	Test 2 mode	Test 2 mode	Setting Test 2 mode
MTB1	63	Test 2 value	Test 2 output value	Setting Test 2 mode value

From the table below, select the setting for Test 2 mode.

Selection	
Display	**PROFIBUS PA**
Normal	Not execute
Test	Execute

5.10.4 Test Mode Auto Reset

If the specified time lapses with no parameters changed while the test mode is enabled, the test mode is reset automatically. When any test mode parameter is changed, the test mode reset time is extended.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Diag/Service ► Test ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Test

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	57	Release time	Release time	Specifies the time to automatically reset the test mode.

From the table below, select the test mode auto reset time.

Selection		Description
Display	PROFIBUS PA	
10 min	10 min	Sets the reset time to 10 min.
30 min	30 min	Sets the reset time to 30 min.
1 h	1 h	Sets the reset time to 1 hour.
3 h	3 h	Sets the reset time to 3 hours.
12 h	12 h	Sets the reset time to 12 hours.

5.11 Event Management Function

5.11.1 Storing Parameter (Backup)

The backup function can store parameter settings in the display's built-in memory (display board) or microSD card (with the optional code MC selected). If the backup data is restored, the parameter settings can be duplicated to another product. The display's built-in memory can store data for three backups and the microSD card can store as much data as the capacity allows. There are three backup methods available: Backup from the main board of this product to the memory on the display board, backup from the main board of the product to the microSD card, and backup from the memory on the display board to the microSD card. The file name, backup name, and date can be specified using the backup function.
The data backed up to the microSD card is stored in the "YOKOGAWA" folder as a ".PAR" file.

The setting can be configured with the following parameters.
For details about the backup parameters, refer to Subsection 5.11.3.

Menu path

Display	Device setup ► Diag/Service ► Param bkup/restore ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Param backup/restore ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	34	F backup name	Factory backup name	Displays the backup name defined at shipment from the manufacturing factory.
MTB1	35	F backup date	Factory backup date	Displays the backup date at shipment from the manufacturing factory.
MTB1	36	SD backup name	SD backup name	Specifies the name of the file to be backed up to the microSD card.
MTB1	37	Backup name 1	Backup name 1	Specifies backup name 1. Up to 16 characters
MTB1	38	Backup date 1	Backup date 1	Specifies date 1.
MTB1	39	Backup name 2	Backup name 2	Specifies backup name 2. Up to 16 characters
MTB1	40	Backup date 2	Backup date 2	Specifies date 2.
MTB1	41	Backup name 3	Backup name 3	Specifies backup name 3. Up to 16 characters
MTB1	42	Backup date 3	Backup date 3	Specifies date 3.
MTB1	43	Backup execute	Backup Exe	Specifies the execution of the backup function.*1

■ Backup result

Menu path

Display	Device setup ► Diag/Service ► Param bkup/restore ► (see below)
PROFIBUS PA	Device ► Query Device ► Maintenance Transducer Block ► index 24-99 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	44	Backup result	Backup result	Displays the result of the backup function.*2

*1: From the table below, select the execution of the backup function. In the communication access of PROFIBUS PA, the communication access is set with the procedures of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Not execute	Not Execute	Does not back up data.
Store main to 1	Store Main to 1	Backs up parameter settings from the main board to memory 1 in the display's built-in memory.
Store main to 2	Store Main to 2	Backs up parameter settings from the main board to memory 2 in the display's built-in memory.
Store main to 3	Store Main to 3	Backs up parameter settings from the main board to memory 3 in the display's built-in memory.
Store main to SD	Store Main to SD	Backs up parameter settings from the main board to the microSD card.
Store EEP1 to SD	Store EEP1 to SD	Backs up parameter settings from memory 1 in the display's built-in memory to the microSD card.
Store EEP2 to SD	Store EEP2 to SD	Backs up parameter settings from memory 2 in the display's built-in memory to the microSD card.
Store EEP3 to SD	Store EEP3 to SD	Backs up parameter settings from memory 3 in the display's built-in memory to the microSD card.

*2: The result of the backup function is displayed as shown below.

Selection		Description
Display	PROFIBUS PA	
Unexecuted	Unexecuted	Backup not executed.
Success	Success	Backup successful.
Failure	Failure	Backup failed.
Running	Running	Parameter backup running.

The table below shows alarms whose parameters can be backed up when an alarm occurs.

✓: Executable when an alarm occurs.
-: Not executable when an alarm occurs.

Alarm name		Backup
Display	PROFIBUS PA	
010:Main CPU FAIL	10:Main board CPU failure	-
011:Rev calc FAIL	11:Reverse calculation failure	-
012:Main EEP FAIL	12:Main board EEPROM failure	-
013:Main EEP dflt	13:Main board EEPROM default	-
014:Snsr bd FAIL	14:Sensor board failure	✓
015:Snsr comm ERR	15:Sensor communication error	✓
016:AD 1 FAIL[Sig]	16:A/D1 failure[Signal]	✓
017:AD 2 FAIL[Excit]	17:A/D2 failure[Exciter]	✓
018:Coil open	18:Coil open	✓
019:Coil short	19:Coil short	✓
020:Exciter FAIL	20:Exciter failure	✓
027:Restore FAIL	27:Parameter restore incomplete	✓
028:Ind bd FAIL	28:Indicator board failure	-
029:Ind bd EEP FAIL	29:Indicator board EEP failure	-
030:LCD drv FAIL	30:LCD driver failure	-
031:Ind bd mismatch	31:Indicator board mismatch	-
032:Ind comm ERR	32:Indicator communication error	-
033:microSD FAIL	33:microSD failure	-
050:Signal overflow	50:Signal overflow	✓
051:Empty detect	51:Empty pipe detection	✓
052:H/L HH/LL alm	52:H/L or HH/LL alarm	✓
053:Adh over lv 4	53:Adhesion over level 4	✓
060:Span cfg ERR	60:Span configuration error	-
065:H/L cfg ERR	65:H/L HH/LL configuration error	✓
066:Density cfg ERR	66:Density configuration error	-
067:Pls 1 cfg ERR	67:Pulse output 1 configuration error	-
069:Nomi size cfg	69:Nominal size configuration error	-
070:Adh cfg ERR	70:Adhesion configuration error	-
071:FLN cfg ERR	71:Flow noise configuration error	-
072:Log not start	72:Data logging not started	-
082:Pls 1 saturate	82:Pulse output 1 saturated	✓
085:Cable miscon	85:Cable misconnect	✓
086:Coil insulation	86:Coil insulation warning	✓
087:Adhesion lv 3	87:Adhesion over level 3	✓
088:LC warn	88:Low conductivity Warning	✓
089:Insu detect	89:Insulation detection	✓
090:FLN over lv 3	90:Flow noise over level 3	✓
091:FLN over lv 4	91:Flow noise over level 4	✓
092:AZ warn	92:Autozero warning	✓
093:Verif warn	93:Verification warning	✓
094:Fact noise warn	94:Factory noise warning	✓
095:Simulate active	95:Simulation active	✓
098:Pls 1 fix	98:Pulse output 1 fixed	✓
101:Param restore run	101:Parameter restore running	-
102:Disp over	102:Display over warning	-
103:SD size warn	103:microSD card size warning	-
104:Bkup incmplt	104:Parameter backup incomplete	✓
105:SD mismatch	105:microSD card mismatch	-
106:SD removal ERR	106:microSD card removal procedure error	-
120:Watchdog	120:Watchdog	✓
121:Power off	121:Power off	✓

Alarm name		Backup
Display	PROFIBUS PA	
122:Inst power FAIL	122:Instant power failure	✓
123:Param bkup run	123:Parameter backup running	-
124:Data log run	124:Data logging running	✓
131:Trans mismatch	131:Transmitter type mismatch	-
133:G/A mismatch	133:G/A mismatch error	-
500:AI1 LL Alarm	500:AI1 Lo Lo alarm	✓
501:AI1 HH Alarm	501:AI1 Hi Hi alarm	✓
502:AI2 LL Alarm	502:AI2 Lo Lo alarm	✓
503:AI2 HH Alarm	503:AI2 Hi Hi alarm	✓
504:TOT1 Unit ERR	504:TOT1 unit error	✓
505:TOT2 Unit ERR	505:TOT2 unit error	✓
506:TOT3 Unit ERR	506:TOT3 unit error	✓
507:PB O/S Mode	507:PB in O/S mode	✓
508:AI1 O/S Mode	508:AI1 in O/S mode	✓
509:AI2 O/S Mode	509:AI2 in O/S mode	✓
510:TOT1 O/S Mode	510:TOT1 in O/S mode	✓
511:TOT2 O/S Mode	511:TOT2 in O/S mode	✓
512:TOT3 O/S Mode	512:TOT3 in O/S mode	✓
513:DI1 O/S Mode	513:DI1 in O/S mode	✓
514:DI2 O/S Mode	514:DI2 in O/S mode	✓
515:AO O/S Mode	515:AO1 in O/S mode	✓
516:FTB O/S Mode	516:FTB in O/S mode	✓
517:LTB O/S Mode	517:LTB in O/S mode	✓
518:DTB O/S Mode	518:DTB in O/S mode	✓
519:M1TB O/S Mode	519:MTB1 in O/S mode	✓
520:M2TB O/S Mode	520:MTB2 in O/S mode	✓
521:PB Simulate Act	521:PB simulation active	✓
522:AI1 Simulate Act	522:AI1 simulation active	✓
523:AI2 Simulate Act	523:AI2 simulation active	✓
527:DI1 Simulate Act	527:DI1 simulation active	✓
528:DI2 Simulate Act	528:DI2 simulation active	✓
529:AO Simulate Act	529:AO1 simulation active	✓
530:AI1 Man Mode	530:AI1 in Man mode	✓
531:AI2 Man Mode	531:AI2 in Man mode	✓
532:TOT1 Man Mode	532:TOT1 in Man mode	✓
533:TOT2 Man Mode	533:TOT2 in Man mode	✓
534:TOT3 Man Mode	534:TOT3 in Man mode	✓
535:DI1 Man Mode	535:DI1 in Man mode	✓
536:DI2 Man Mode	536:DI2 in Man mode	✓
537:AO Man Mode	537:AO1 in Man mode	✓
560:Id Num Violation	560:Ident Number Violation	✓

IMPORTANT

- When backing up the data in the microSD card, make sure that the preparation of the microSD card is completed. It takes approximately one minute until the product is ready to store data in the microSD card after it has been turned on.
- Note that parameters cannot be changed while the backup function is running. It takes approximately 20 seconds to complete backup processing.
- Take care not to duplicate the file name when backing up data to the microSD card.
- Note that if the microSD card runs out of free space, the subsequent data will not be stored.

NOTE

The backup name and date do not affect the backup function. Use this as the memo column when performing the backup function.

5.11.2 Restore/Duplicate Parameter

If the restore function is used, it becomes possible to restore parameter settings, which are backed up in the display's built-in memory or microSD card (with the optional code MC selected), to the product. Also, it is possible to return parameters to default values defined when shipped from the factory and to duplicate the backed-up parameters to other device based on the same specifications.

NOTE

When using the restore function, set FTB, DTB, MTB1,MTB2, and LTB to the O/S mode.

IMPORTANT

For the remote type, it is necessary to set the device information of the remote sensor to the parameters of the remote transmitter.

The methods to restore or duplicate settings can be selected from the following four types.

Duplicate Data	Restores the target parameter (excluding the service parameters related to the transmitter adjustment) from the product in which the parameter is backed up. Restore is also executable for other products.
Restore Data	Restores the target parameter (including the service parameters related to the transmitter adjustment) from the product in which the parameter is backed up. Restore is not executable for other products.
Compulsion Data	Restores the target parameter (specified at shipment from the manufacturing factory) from the product for which the parameter is backed up. Forced restore is also executable for other products.
Restore Factory	Restores all the target parameters (parameters related to items specified at shipment from the manufacturing factory).

When using the restore function, always make sure that the backed-up device information matches the device information to be restored.
The table below shows the consistency of the device information.

✓: Match between devices is required

Device Information	Duplicate Data	Restore Data	Compulsion Data
Option Board ID	✓	✓	-
Transmitter Serial No	-	✓	-
Sensor Serial No	-	✓	-
Main Board Software Rev.	✓	✓	-
Sensor Board Software Rev.	✓	✓	-
Display Board Software Rev.	✓	✓	-
Model (Note)	✓	✓	-
Communication and I/O Code	✓	✓	-

NOTE

Data can only be duplicated or restored between products of the same model code.

The setting can be configured with the following parameters.
For details about the restorable parameters, refer to Subsection 5.11.3.

Restore execute

Menu path

Display	Device setup ► Diag/Service ► Param bkup/restore ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Param backup/restore ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	45	Restore execute	Restore Exe	Specifies the execution of the restore function.*1

Restore result

Menu path

Display	Device setup ► Diag/Service ► Param bkup/restore ► (see below)
PROFIBUS PA	Device ► Query Device ► Maintenance Transducer Block ► index 24-99 ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	46	Restore result	Restore result	Displays the result of the restore function.*2

*1: From the table below, select the execution of the restore function. In the communication access of PROFIBUS PA, the communication access is set with the procedures of the interactive operation guide called DD Method.

Selection		Description
Display	PROFIBUS PA	
Not execute	Not execute	Does not restore data.
Duplicate data 1	Duplicate Data1	Restores the parameter (Duplicate Data) setting from memory 1 on the display board to the main board of the product.
Duplicate data 2	Duplicate Data2	Restores the parameter (Duplicate Data) setting from memory 2 on the display board to the main board of the product.
Duplicate data 3	Duplicate Data3	Restores the parameter (Duplicate Data) setting from memory 3 on the display board to the main board of the product.
Duplicate SD	Duplicate SD	Restores the parameter (Duplicate Data) setting from the microSD card to the main board of the product.
Restore data 1	Restore Data1	Restores the parameter (Restore Data) setting from memory 1 on the display board to the main board of the product.
Restore data 2	Restore Data2	Restores the parameter (Restore Data) setting from memory 2 on the display board to the main board of the product.
Restore data 3	Restore Data3	Restores the parameter (Restore Data) setting from memory 3 on the display board to the main board of the product.
Restore SD	Restore SD	Restores the parameter (Restore Data) setting from the microSD card to the main board of the product.
Compulsion data 1	Compulsion Data1	Restores the parameter (Compulsion Data) setting from memory 1 on the display board to the main board of the product.
Compulsion data 2	Compulsion Data2	Restores the parameter (Compulsion Data) setting from memory 2 on the display board to the main board of the product.
Compulsion data 3	Compulsion Data3	Restores the parameter (Compulsion Data) setting from memory 3 on the display board to the main board of the product.
Compulsion SD	Compulsion SD	Restores the parameter (Compulsion Data) setting from the microSD card to the main board of the product.
Restore factory	Restore Factory	Restores to the status that is set at shipment from the manufacturing factory.

*2: The result of the restore function is displayed as shown below.

Selection		Description
Display	PROFIBUS PA	
Unexecuted	Unexecuted	Does not restore data.
Success	Success	Succeeded in restoration.
Failure	Failure	Failed in restoration.
Running	Running	Restore running

The table below shows alarms whose parameters can be restored or duplicated when an alarm occurs.

✓: Executable when an alarm occurs.
-: Not executable when alarm occurs.

Alarm Name		Restore or Duplicate
Display	PROFIBUS PA	
010:Main CPU FAIL	10:Main board CPU failure	-
011:Rev calc FAIL	11:Reverse calculation failure	-
012:Main EEP FAIL	12:Main board EEPROM failure	-
013:Main EEP dflt	13:Main board EEPROM default	-
014:Snsr bd FAIL	14:Sensor board failure	✓
015:Snsr comm ERR	15:Sensor communication error	✓
016:AD 1 FAIL[Sig]	16:A/D1 failure[Signal]	✓
017:AD 2 FAIL[Excit]	17:A/D2 failure[Exciter]	✓
018:Coil open	18:Coil open	✓
019:Coil short	19:Coil short	✓
020:Exciter FAIL	20:Exciter failure	✓
027:Restore FAIL	27:Parameter restore incomplete	✓
028:Ind bd FAIL	28:Indicator board failure	-
029:Ind bd EEP FAIL	29:Indicator board EEP failure	-
030:LCD drv FAIL	30:LCD driver failure	-
031:Ind bd mismatch	31:Indicator board mismatch	-
032:Ind comm ERR	32:Indicator communication error	-
033:microSD FAIL	33:microSD failure	-
050:Signal overflow	50:Signal overflow	✓
051:Empty detect	51:Empty pipe detection	✓
052:H/L HH/LL alm	52:H/L or HH/LL alarm	✓
053:Adh over lv 4	53:Adhesion over level 4	✓
060:Span cfg ERR	60:Span configuration error	-
065:H/L cfg ERR	65:H/L HH/LL configuration error	✓
066:Density cfg ERR	66:Density configuration error	-
067:Pls 1 cfg ERR	67:Pulse output 1 configuration error	-
069:Nomi size cfg	69:Nominal size configuration error	-
070:Adh cfg ERR	70:Adhesion configuration error	-
071:FLN cfg ERR	71:Flow noise configuration error	-
072:Log not start	72:Data logging not started	-
082:Pls 1 saturate	82:Pulse output 1 saturated	✓
085:Cable miscon	85:Cable misconnect	✓
086:Coil insulation	86:Coil insulation warning	✓
087:Adhesion lv 3	87:Adhesion over level 3	✓
088:LC warn	88:Low conductivity Warning	✓
089:Insu detect	89:Insulation detection	✓
090:FLN over lv 3	90:Flow noise over level 3	✓
091:FLN over lv 4	91:Flow noise over level 4	✓
092:AZ warn	92:Autozero warning	✓
093:Verif warn	93:Verification warning	✓
094:Fact noise warn	94:Factory noise warning	✓
095:Simulate active	95:Simulation active	✓

Alarm Name		Restore or Duplicate
Display	PROFIBUS PA	
098:Pls 1 fix	98:Pulse output 1 fixed	✓
101:Param restore run	101:Parameter restore running	-
102:Disp over	102:Display over warning	-
103:SD size warn	103:microSD card size warning	-
104:Bkup incmplt	104:Parameter backup incomplete	✓
105:SD mismatch	105:microSD card mismatch	-
106:SD removal ERR	106:microSD card removal procedure error	-
120:Watchdog	120:Watchdog	✓
121:Power off	121:Power off	✓
122:Inst power FAIL	122:Instant power failure	✓
123:Param bkup run	123:Parameter backup running	-
124:Data log run	124:Data logging running	-
131:Trans mismatch	131:Transmitter type mismatch	-
133:G/A mismatch	133:G/A mismatch error	-
500:AI1 LL Alarm	500:AI1 Lo Lo alarm	✓
501:AI1 HH Alarm	501:AI1 Hi Hi alarm	✓
502:AI2 LL Alarm	502:AI2 Lo Lo alarm	✓
503:AI2 HH Alarm	503:AI2 Hi Hi alarm	✓
504:TOT1 Unit ERR	504:TOT1 unit error	✓
505:TOT2 Unit ERR	505:TOT2 unit error	✓
506:TOT3 Unit ERR	506:TOT3 unit error	✓
507:PB O/S Mode	507:PB in O/S mode	✓
508:AI1 O/S Mode	508:AI1 in O/S mode	✓
509:AI2 O/S Mode	509:AI2 in O/S mode	✓
510:TOT1 O/S Mode	510:TOT1 in O/S mode	✓
511:TOT2 O/S Mode	511:TOT2 in O/S mode	✓
512:TOT3 O/S Mode	512:TOT3 in O/S mode	✓
513:DI1 O/S Mode	513:DI1 in O/S mode	✓
514:DI2 O/S Mode	514:DI2 in O/S mode	✓
515:AO O/S Mode	515:AO1 in O/S mode	✓
516:FTB O/S Mode	516:FTB in O/S mode	✓
517:LTB O/S Mode	517:LTB in O/S mode	✓
518:DTB O/S Mode	518:DTB in O/S mode	✓
519:M1TB O/S Mode	519:MTB1 in O/S mode	✓
520:M2TB O/S Mode	520:MTB2 in O/S mode	✓
521:PB Simulate Act	521:PB simulation active	✓
522:AI1 Simulate Act	522:AI1 simulation active	✓
523:AI2 Simulate Act	523:AI2 simulation active	✓
527:DI1 Simulate Act	527:DI1 simulation active	✓
528:DI2 Simulate Act	528:DI2 simulation active	✓
529:AO Simulate Act	529:AO1 simulation active	✓
530:AI1 Man Mode	530:AI1 in Man mode	✓
531:AI2 Man Mode	531:AI2 in Man mode	✓
532:TOT1 Man Mode	532:TOT1 in Man mode	✓
533:TOT2 Man Mode	533:TOT2 in Man mode	✓
534:TOT3 Man Mode	534:TOT3 in Man mode	✓
535:DI1 Man Mode	535:DI1 in Man mode	✓
536:DI2 Man Mode	536:DI2 in Man mode	✓
537:AO Man Mode	537:AO1 in Man mode	✓
560:Id Num Violation	560:Ident Number Violation	✓

IMPORTANT

When using the restore function, be sure to prepare a backup file in the built-in memory or the microSD card. Note that the restore function is not executable if a backup file is not provided. When executing the restore function from the microSD card, make sure that the preparation of the microSD card is completed. Approximately one minute is required until the microSD card can be used after it has been turned on.

5.11.3 Backup and Restore Parameters

The list below shows the parameters that can be backed up or restored.

NOTE

Those parameters not listed in the following table are out of scope for both back up and restore. (Velocity Unit, Volume Flow Unit, Mass Flow Unit, Total1 Unit, etc.)
Those parameters which can be backed up have check marks in the check box in the column of “Duplicate data” in the following table.

Block Name	Parameter		Restore			
	Display	PROFIBUS PA	Duplicate data	Restore data	Compulsion data	Restore Factory
FTB	Damp AO/F	Velocity damping AO/ frequency	✓	✓	-	✓
FTB	Damp pls/ttl	Velocity damping pulse/total	✓	✓	-	✓
FTB	Damp AO/F	Volume flow damping AO/ frequency	✓	✓	-	✓
FTB	Damp pls/ttl	Volume flow damping pulse/ total	✓	✓	-	✓
FTB	Damp AO/F	Mass flow damping AO/ frequency	✓	✓	-	✓
FTB	Damp pls/ttl	Mass flow damping pulse/total	✓	✓	-	✓
FTB	Damp AO/F	Calorific value damping AO/ frequency	✓	✓	-	✓
FTB	Damp pls/ttl	Calorific value damping pulse/ total	✓	✓	-	✓
FTB	Low MF	Low MF(CALIBR_FACTOR)	✓	✓	✓	✓
FTB	High MF	High MF	✓	✓	✓	✓
FTB	Low MF EDF	Low MF EDF	✓	✓	-	✓
FTB	High MF EDF	High MF EDF	✓	✓	-	✓
FTB	Flow sensor sel	Select Flow Tube	✓	✓	-	✓
FTB	Measure mode	Display measure mode	✓	✓	-	✓
FTB	Nominal size unit	Nominal size unit	✓	✓	✓	✓
FTB	Nominal size	Nominal size	✓	✓	✓	✓
FTB	PV flow select	Selected Flow	✓	✓	✓	✓
FTB	Span	Velocity Span	✓	✓	✓	✓
FTB	Span	Volume Flow Span	✓	✓	✓	✓
FTB	Span	Mass Flow Span	✓	✓	✓	✓
FTB	Span	Calorie Span	✓	✓	-	✓
FTB	Zero value	Zero point offset	✓	✓	-	✓
FTB	Failure opts	Fail Safe Mode	✓	✓	-	✓
FTB	Options	Totalizer Mode	✓	✓	-	✓
FTB	Reset/Preset	Totalizer Set	✓	✓	-	✓
FTB	Preset value	Preset Value	✓	✓	-	✓
FTB	Set point	Total 1 set point	✓	✓	-	✓

Block Name	Parameter		Restore			
	Display	PROFIBUS PA	Duplicate data	Restore data	Compulsion data	Restore Factory
FTB	Failure opts	Fail Safe Mode	✓	✓	-	✓
FTB	Options	Totalizer Mode	✓	✓	-	✓
FTB	Reset/Preset	Totalizer Set	✓	✓	-	✓
FTB	Preset value	Preset Value	✓	✓	-	✓
FTB	Set point	Total 2 set point	✓	✓	-	✓
FTB	Failure opts	Fail Safe Mode	✓	✓	-	✓
FTB	Options	Totalizer Mode	✓	✓	-	✓
FTB	Reset/Preset	Totalizer Set	✓	✓	-	✓
FTB	Preset value	Preset Value	✓	✓	-	✓
FTB	Set point	Total 3 set point	✓	✓	-	✓
MTB1	Output mode	Pulse 1 output mode	✓	✓	✓	✓
MTB1	Active mode	Pulse 1 active mode	✓	✓	-	✓
MTB1	Fix width	Pulse 1 fix width	✓	✓	-	✓
MTB1	Rate unit	Pulse 1 rate unit	-	-	✓	✓
MTB1	Rate value	Pulse 1 rate value	✓	✓	✓	✓
MTB1	Low cut	Pulse1 low cut	✓	✓	-	✓
MTB1	Alarm out	Pulse 1 alarm out	✓	✓	-	✓
MTB1	Frequency at 0%	Frequency1 at 0%	✓	✓	✓	✓
MTB1	Frequency at 100%	Frequency1 at 100%	✓	✓	✓	✓
MTB1	SO1 function	Status output1 function	✓	✓	-	✓
FTB	Function	Temperature function	✓	✓	-	✓
FTB	URV	Temperature URV	✓	✓	-	✓
FTB	LRV	Temperature LRV	✓	✓	-	✓
FTB	Flow direct	Flow direction	✓	✓	-	✓
FTB	Rate limit	Rate limit	✓	✓	-	✓
FTB	Dead time	Dead time	✓	✓	-	✓
FTB	Noise filter	Noise filter	✓	✓	-	✓
FTB	Pulsing flow	Pulsing flow	✓	✓	-	✓
FTB	Power sync on/off	Power synchronize	✓	✓	✓	✓
FTB	Set power freq	Set power frequency	✓	✓	✓	✓
FTB	Value select	Density value select	✓	✓	-	✓
FTB	Fixed density	Density fixed value	✓	✓	✓	✓
FTB	Std density	Standard density	✓	✓	-	✓
FTB	Std temperature	Standard temperature	✓	✓	-	✓
FTB	Coef A1	Temp coef A1	✓	✓	-	✓
FTB	Coef A2	Temp coef A2	✓	✓	-	✓
FTB	Specific heat	Specific heat	✓	✓	-	✓
FTB	Fixed temperature	Calorific fix temp	✓	✓	-	✓
FTB	Mask 1-1	Alarm out mask 1	✓	✓	-	✓
FTB	Mask 1-2					
FTB	Mask 2-1	Alarm out mask 2	✓	✓	-	✓
FTB	Mask 2-2					
FTB	Mask 3-1	Alarm out mask 3	✓	✓	-	✓
FTB	Mask 3-2					
FTB	Mask 4-1	Alarm out mask 4	✓	✓	-	✓
FTB	-	Alarm out mask 5	✓	✓	-	✓
FTB	-	Alarm out mask 6	✓	✓	-	✓
FTB	Mask 1-1	Alarm record mask 1	✓	✓	-	✓
FTB	Mask 1-2					
FTB	Mask 2-1	Alarm record mask 2	✓	✓	-	✓
FTB	Mask 2-2		-	-	-	-
FTB	Mask 3-1	Alarm Record Mask3	✓	✓	-	✓

Block Name	Parameter		Restore			
	Display	PROFIBUS PA	Duplicate data	Restore data	Compulsion data	Restore Factory
LTB	Line 1	Display select1	-	-	✓	✓
LTB	Line 2	Display select2	-	-	✓	✓
LTB	Line 3	Display select3	-	-	✓	✓
LTB	Line 4	Display select4	-	-	✓	✓
LTB	Line 5	Display select5	-	-	✓	✓
LTB	Line 6	Display select6	-	-	✓	✓
LTB	Line 7	Display select7	-	-	✓	✓
LTB	Line 8	Display select8	-	-	✓	✓
LTB	Format PV	Display format PV	-	-	✓	✓
LTB	Line mode	Display line	-	-	✓	✓
LTB	Language	Language	-	-	✓	✓
LTB	Disp install	Display installation	-	-	✓	✓
PB	-	Local Operation Enable	-	-	✓	✓
LTB	Low cut	Display low cut	✓	✓	-	✓
MTB1	Electrode size	Electrode size	✓	✓	-	✓
MTB1	Model code	Basic model code	✓	✓	-	✓
MTB1	Suffix config 1	Suffix config 1	✓	✓	-	✓
MTB1	Suffix config 2	Suffix config 2	✓	✓	-	✓
MTB1	Option 1	Option 1	✓	✓	-	✓
MTB1	Option 2	Option 2	✓	✓	-	✓
MTB1	Option 3	Option 3	✓	✓	-	✓
MTB1	Option 4	Option 4	✓	✓	-	✓
MTB1	Model code	Remote sensor basic model code	✓	✓	-	✓
MTB1	Suffix config 1	Remote sensor suffix config 1	✓	✓	-	✓
MTB1	Suffix config 2	Remote sensor suffix config 2	✓	✓	-	✓
MTB1	Option 1	Remote sensor option 1	✓	✓	-	✓
MTB1	Option 2	Remote sensor option 2	✓	✓	-	✓
MTB1	Option 3	Remote sensor option 3	✓	✓	-	✓
MTB1	Option 4	Remote sensor option 4	✓	✓	-	✓
MTB1	Trans serial No	Transmitter serial No	✓	✓	-	✓
MTB1	Sensor serial No	Sensor serial No	✓	✓	-	✓
FTB	Function	Adhesion function	✓	✓	✓	✓
FTB	Threshold level 1	Adhesion level 1	✓	✓	-	✓
FTB	Threshold level 2	Adhesion level 2	✓	✓	-	✓
FTB	Threshold level 3	Adhesion level 3	✓	✓	-	✓
FTB	Threshold level 4	Adhesion level 4	✓	✓	-	✓
FTB	Check cycle	Adhesion check cycle	✓	✓	-	✓
FTB	Function	Flow noise function	✓	✓	-	✓
FTB	Threshold level 1	Flow noise level 1	✓	✓	-	✓
FTB	Threshold level 2	Flow noise level 2	✓	✓	-	✓
FTB	Threshold level 3	Flow noise level 3	✓	✓	-	✓
FTB	Threshold level 4	Flow noise level 4	✓	✓	-	✓
FTB	Damp	Flow noise damping	✓	✓	-	✓
FTB	Function	Low conductivity function	✓	✓	-	✓
FTB	Low limit	Conductivity low limit	✓	✓	-	✓
DTB	Coil insul threshold	Coil insulation threshold	✓	✓	-	✓
DTB	VF target select	VF target select	✓	✓	-	✓
DTB	Diagnostic output	Diagnostic output	✓	✓	-	✓
DTB	Mode	VF mode	✓	✓	-	✓
DTB	VF No	VF No	✓	✓	-	✓
MTB1	Release time	Release time	✓	✓	-	✓

5.11.4 Data Logging Function

When the optional code MC (microSD card) is selected, the data logging function can store up to four process values to the microSD card. To use this function, it is necessary to specify a file name, data storage interval,and ending time.
Stored data is saved in the “YOKOGAWA” folder as a “.TRD” file.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Diag/Service ► Data log ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Data logging ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	47	File name	File name	Specifies the name of the file to be stored.
MTB1	48	Interval time	Interval time	Specifies the data storage interval.*1
MTB1	49	Start date	Start date	Displays the date to start the data logging function.
MTB1	50	Start time	Start time	Displays the time to start the data logging function.
MTB1	51	End time	End time	Specifies the time to end the data logging function.*2
MTB1	52	Log 1	Log 1 select	Specifies process value 1 to be stored.*3
MTB1	53	Log 2	Log 2 select	Specifies process value 2 to be stored.*3
MTB1	54	Log 3	Log 3 select	Specifies process value 3 to be stored.*3
MTB1	55	Log 4	Log 4 select	Specifies process value 4 to be stored.*3
MTB1	56	Execute	Logging Exe	Specifies the execution of the data logging function.*4

*1: From the table below, select the data storage interval.

Selection		Description
Display	PROFIBUS PA	
1 s	1 s	Sets the storage interval to 1 sec.
10 s	10 s	Sets the storage interval to 10 sec.
30 s	30 s	Sets the storage interval to 30 sec.
1 min	1 min	Sets the storage interval to 1 min.
5 min	5 min	Sets the storage interval to 5 min.
30 min	30 min	Sets the storage interval to 30 min.
1 h	1 h	Sets the storage interval to 1 hour.

*2: From the table below, select the ending time of the data logging function.

Selection		Description
Display	PROFIBUS PA	
10 min	10 min	Sets the ending time to 10 minutes later.
30 min	30 min	Sets the ending time to 30 minutes later.
1 h	1 h	Sets the ending time to 1 hour later.
3 h	3 h	Sets the ending time to 3 hours later.
12 h	12 h	Sets the ending time to 12 hours later.
24 h	24 h	Sets the ending time to 24 hours (1 day) later.
72 h	72 h	Sets the ending time to 72 hours (3 days) later.
240 h	240 h	Sets the ending time to 240 hours (10 days) later.
720 h	720 h	Sets the ending time to 720 hours (30 days) later.
1440 h	1440 h	Sets the ending time to 1440 hours (60 days) later.

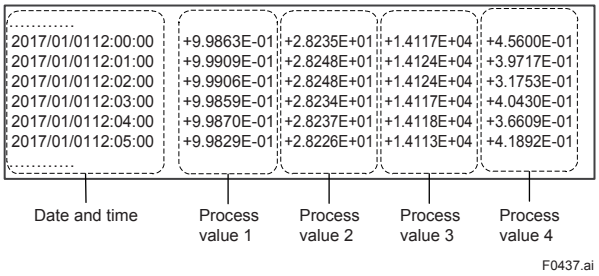
*3: From the table below, select the process value to be stored.

Selection		Description
Display	PROFIBUS PA	
Velocity	Velocity	Stores the flow velocity.
Volume flow	Volume flow	Stores the volumetric flow rate.
Mass flow	Mass flow	Stores the mass flow rate.
Calorie	Calorie	Stores the calorie (only available for AXG, not for AXW).
PV	PV	Stores the process value PV-mapped in Subsection 5.1.6.
Flow noise	Flow noise	Stores the flow noise value (only available for AXG, not for AXW).
Adhesion	Adhesion	Stores the resistance value of the electrode adhesion detection.
Electrode A	Electrode A	Stores the voltage of electrode A.
Electrode B	Electrode B	Stores the voltage of electrode B.
V peak	V peak	Stores the peak value of the flow rate signal (only available for AXG, not for AXW).

*4: From the table below, select the use of the data logging function.

Selection		Description
Display	PROFIBUS PA	
Not execute	Not Execute	Does not execute the data logging function.
Execute	Execute	Executes the data logging function.

Setting data is stored on the microSD card at a specified data storage interval during a period from the start of the data logging function to the end. The file stored with the data logging function can be opened as a text file.
Example: If the storage interval is set to “1 min”, data is stored as shown below.



The access ongoing to the microSD card can be confirmed with the icon on the display. For example, the icons of the “microSD card ready” and “Access to microSD card” are displayed alternately and repeatedly because the product accesses to the microSD card periodically during its data logging.
When the microSD card cannot be accessed to remove, the icon of “Disable to access the microSD card” is displayed.
Insert the microSD card again when it is necessary to use this function again. The alarm of “microSD failure” occurs when the microSD card has any problems.

	Ready for the microSD card		Accessing the microSD card
	Disable to access the microSD card		

IMPORTANT

- Before using the data logging function, make sure that the microSD card is prepared. It takes approximately one minute until the product is ready to store data in the microSD card after it has been turned on.
- Note that if the microSD card runs out of free space, the subsequent data will not be stored.

NOTE

Do not remove the microSD card while the data logging function is running.

5.12 Write Lock Function

A write protection is a function to forbid changing of parameters.
It is possible to set the software write protection by parameter setup or the hardware write protection by the hardware switch.

In case of the setting up by parameters, it can set up in “Write Locking”. When “Write Locking” is “All locked”, the status of write protect becomes protected mode. And when “Write Locking” is “Not locked”, the status becomes disable mode.

In case of the setting up by hardware switch, it can set up on the No.2 switch of SW1*.
When the switch is turned on, the status becomes protected mode, and when the switch is turned off , the status becomes disable mode. The state of the hardware write-protection switch can be checked with the parameter “HW Write Protection”.

As the mentioned above, write protection is available by the setting either of software protection or hardware protection, one of them is set to protect mode, the status becomes protected mode.

* See Figure 13.1 Settings of Simulation Switch

Menu path

Display	Device setup ► Detailed setup ► PROFIBUS info ► PB ► (see below)
PROFIBUS PA	Device ► Physical Block ► Configuration ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
PB	25	-	HW Write Protection	Sets the operation of the write lock switch (see below).
PB	18	WRITE_LOCKING	Write Locking	Specifies the use of the software write locking.

From the table belo, select the HW Write Protection

Selection		Description
Display	PROFIBUS PA	
-	Unprotected	0: The Write Protect switch is OFF.
-	Protected, manual operation permitted	1: The Write Protect switch is ON.

From the table below, select the use of write locking.

Selection		Description
Display	PROFIBUS PA	
Not Locked	Not locked	2457: Indicates the state in which parameter writing is allowed.
Locked	All locked	0: Indicates the state in which parameter writing is prohibited.

Feature Selection
The user can choose to enable either the write lock function with the switch, or the software write lock function. (See the table below.)

Table 5.12.1 Write Lock

Setting of Hardware Write lock SW*	Displaying of HW Write Protection	Setting of Write Locking	State of Protect
OFF	Unprotected	All locked	Protected
OFF	Unprotected	Not locked	Unprotected
ON	Protected, manual operation permitted	All locked	Protected
ON	Protected, manual operation permitted	Not locked	Protected

* See Figure 13.1 Settings of Simulation Switch - Write lock switch(SW1-2)

NOTE

The use status of the write lock function can be checked using the parameters or the icons shown on the display.
The following icons are displayed.

Icon	Description
	Write lock is not in use. (Parameters can be changed)
	Write lock is in use. (Parameter cannot be changed)

5.13 Simulation Function

The product has a function to simulate the input of the function block.
This function makes it possible to test the function block and alarm-processing system on the downstream side.
To prevent this function from being mistakenly activated while running, a simulation switch is implemented as a “key” on the amplifier. If this switch (SW1-1) is moved to the ON side, the simulation is enabled. (See Figure 13.1.)
After use, swiftly prohibit simulation. This function can be configured with the following parameters.

■ AIFB

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Analog input (1-2) function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AI(1-2)	34	-	Simulation ► Enable	Controls the simulation function of this block. 0:Disable 1:Enable
		-	Simulation ► Value	Sets the value for AI simulation. If simulation is enabled, the value set in this parameter is reflected in OUT.
		-	Simulation ► Condensed Status (Simulation ► Status,Quality)	Sets the status of the AI simulation. When the simulation is enabled, the status set in this parameter is reflected in OUT.

■ DIFB

Menu path

Display	-
PROFIBUS PA	Device ► Output ► Discrete input (1-2) Function Block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
DI(1-2)	24	-	Simulation ► Enable	Controls the simulation function of this block. 0:Disable 1:Enable
		-	Simulation ► Value	Sets the value for DI simulation. If simulation is enabled, the value set in this parameter is reflected in OUT.
		-	Simulation ► Condensed Status (Simulation ► Status,Quality)	Sets the status of the DI simulation. When the simulation is enabled, the status set in this parameter is reflected in OUT.

AOFB

Menu path

Display	-
PROFIBUS PA	Device ► Input ► Analog output Function block ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
AO1	35	-	Simulation ► Enable	Controls the simulation function of this block. 0:Disable 1:Enable
		-	Simulation ► Value	Sets the value for AO simulation. If simulation is enabled, the value set in this parameter is reflected in OUT.
		-	Simulation ► Condensed Status (Simulation ► Status,Quality)	Sets the status of the AO simulation. When the simulation is enabled, the status set in this parameter is reflected in OUT.

If “Enable” is set to Simulate Enable, the relevant function block starts using the simulation value which is set to this parameter instead of the data from the transducer block.

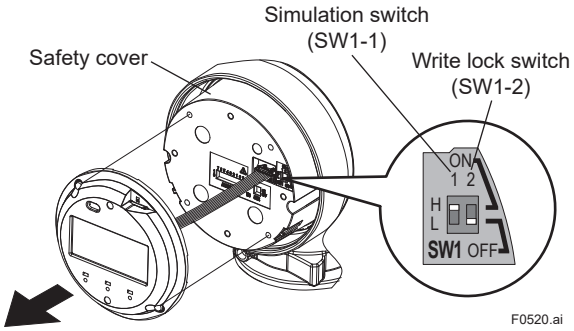


Figure 13.1 Settings of Simulation Switch

IMPORTANT

- To set the simulation switch, it needs to remove and install the cover on the display side. Refer to the procedures described on the ADMAG TI Installation Manual for implementation.
- To secure your safety, do not touch an electric circuit and cable other than the simulation switch.

5.14 Pulse Output, Frequency Output, and Status Output

NOTE

The pulse output, frequency output and status output should be used only at calibrating, and not used when normally running.

5.14.1 Outputs of I/O2 Terminals

Use the I/O2 terminal only when calibrating. The I/ O2 terminal can be used as the pulse output, frequency output, and status output.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	64	Output mode	Pulse1 output mode	Specifies the output of the I/O2 terminal.

From the table below, select the output of I/O2 terminal.

Selection		Description
Display	PROFIBUS PA	
No function	No function	Does not use the terminal.
Fixed pulse output	Fixed pulse	Sets to the fixed pulse output.
Frequency output	Frequency output	Sets to the frequency output (Duty 50%).
Status output	Status output	Sets to the status output. For details about the status output, refer to Subsection 5.14.6.

5.14.2 Alarm Output Function

The alarm output function can be used when using the frequency output or pulse output. This function can be set the output operation to be performed when an alarm has activated.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	71	Alarm out	Pulse1 alarm out	Specifies the alarm output function for the frequency output or pulse output.

From the table below, select the use of the alarm output function.

Selection		Description
Display	PROFIBUS PA	
0 pps	0 pps	Pulse output stop
Measured value	Measured value	Outputs the frequency or fixed pulse with the measured value calculated while an alarm occurs.
Last valid	Last valid	Outputs the frequency or pulse with the last instantaneous value right before an alarm occurs (output is monotonic increase).
Max pps	Max pps	Outputs the frequency or pulse at 12500 pps.

5.14.3 Pulse Width Setting

The pulse width can be selected to use the pulse output.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	66	Fix width	Pulse1 fix width	Specifies the pulse width.

From the table below, select the pulse width.

Selection		Max. output frequency [Hz]
Display	PROFIBUS PA	
0.05 ms	0.05 ms	10000
0.1 ms	0.1 ms	5000
0.5 ms	0.5 ms	1000
1 ms	1 ms	500
20 ms	20 ms	25
33 ms	33 ms	15
50 ms	50 ms	10
100 ms	100 ms	5
200 ms	200 ms	2.5
330 ms	330 ms	1.5
500 ms	500 ms	1.0
1000 ms	1000 ms	0.5
2000 ms	2000 ms	0.25
Duty cycle 50% *	Duty cycle 50% *	-

*: The maximum pulse width is up to 300 seconds (5 minutes) when “Duty cycle 50%” is selected.
When outputting the pulse whose period is over 10 minutes, the pulse width is fixed at 300s.
There is not the above limitation on Main soft rev (MAIN_B_REV) R1.01.30 or later. And the tracking performance for flow rate changes from low flow rates has been improved.

5.14.4 Active Direction Setting

The active direction of the pulse output or status output can be set.
The setting can be configured with the following parameter.

Menu path

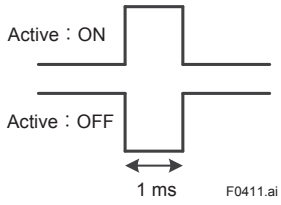
Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	65	Active mode	Pulse1 active mode	Specifies an active direction for the pulse signal.

From the table below, select the active direction of the pulse signal.

Selection		Description
Display	PROFIBUS PA	
On active	On active	Sets to Active when the pulse signal is set on.
Off active	Off active	Sets to Active when the pulse signal is set off.

Example:
If the fixed pulse output is specified and the pulse width is set to “1 ms”, it is set to active as shown below.



5.14.5 Pulse Rate Setting

The weight of the fixed width pulse per pulse and the pulse rate scaling can be set.
The unit of the pulse rate is set to that of the process value which is assigned to PV in Subsection 5.1.6.
The setting can be configured with the following parameters. If the pulse rate scaling is changed, the pulse rate value is also changed conjunction with the changed unit.

■ Scaling pulse rate

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	67	Rate unit	Pulse1 rate unit	Specifies the pulse rate value.

From the table below, select the pulse rate scaling.

Selection		Description
Display	PROFIBUS PA	
n unit/P	n unit/P	10^{-9} x units per pulse
u unit/P	u unit/P	10^{-6} x units per pulse
m unit/P	m unit/P	10^{-3} x units per pulse
Unit/P	Unit/P	1 unit per pulse
k unit/P	k unit/P	10^{3} x units per pulse
M unit/P	M unit/P	10^{6} x units per pulse
n P/unit	n P/unit	10^{-9} x pulses per unit
u P/unit	u P/unit	10^{-6} x pulses per unit
m P/unit	m P/unit	10^{-3} x pulses per unit
P/unit	P/unit	1 pulse per unit
k P/unit	k P/unit	10^{3} x pulses per unit
M P/unit	M P/unit	10^{6} x pulses per unit

Unit: The unit of the process value to be output as a pulse output

NOTE

The maximum pulse rate and pulse width must be specified so that the following conditions are satisfied.

Maximum pulse rate value [pps*]

= Flow rate span [Unit/s] x Pulse rate [P/Unit]

≤ 10 [k pps]

≤ 1 / (Pulse width x 2)

* pps:Pulse per sec

Example:
When the pulse width is set to “0.1 ms”, the maximum pulse rate value is set to “1 / (0.0001 x 2) = 5000 [pps]”. If the specified pulse rate exceeds this value, it causes a setting error, and an alarm is displayed.

■ Pulse rate value

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	68	Rate value	Pulse1 rate value	Specifies the pulse rate value.

5.14.6 Frequency Output Range Setting

When the frequency output is used, the frequency at 0% and 100% can be specified for the span of the process value. The frequency output range can be set by specifying the frequency.
Set the output frequency for the span of the process value which is assigned to PV in Subsection 5.1.6.
The setting can be configured with the following parameters.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	72	Frequency at 0%	Frequency 1 at 0%	Specifies the output frequency when the process value is 0%.
MTB1	73	Frequency at 100%	Frequency 1 at 100%	Specifies the output frequency when the process value is 100%.

5.14.7 Status Output Function Setting

When the status output is used, the device status can be output as a contact point.
The setting can be configured with the following parameter.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► PO1/SO1 ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	74	SO1 function	Status output 1 function	Specifies the status output function.

From the table below, select the status output function.

Selection		Description
Display	PROFIBUS PA	
No function	No function	The status output is not available because the status output function is not enabled.
Alarm output	Alarm output	The status output is activated when the specific alarm occurs.
Warning output	Warning output	The status output is activated when the specific warning occurs.
Total limit 1	Total limit 1	The status output is activated while the totalized value of totalizer 1 is out of the set target value. For details about the totalization switch function, refer to Subsection 5.2.3.
Total limit 2	Total limit 2	The status output is activated while the totalized value of totalizer 2 is out of the set target value. For details about the totalization switch function, refer to Subsection 5.2.3.
Total limit 3	Total limit 3	The status output is activated while the totalized value of totalizer 3 is out of the set target value. For details about the totalization switch function, refer to Subsection 5.2.3.
H/L alarm	H/L alarm	The status output is activated when the H/L alarm occurs.
HH/LL alarm	HH/LL alarm	The status output is activated when the HH/LL alarm occurs.

5.14.8 Pulse Option Setting

An instantaneous flow rate is totalized for the fixed width pulse output or frequency output and is output as a pulse when the totalized value exceeds 1. With the pulse option, the totalization method can be selected.

Menu path

Display	Device setup ► Detailed setup ► Pulse/Status out ► (see below)
PROFIBUS PA	Maintenance ► Maintenance Transducer Block ► Pulse/Status ► (see below)

Block Name	Relative Index	Parameter		Description
		Display	PROFIBUS PA	
MTB1	75	PO1/SO1 ► Options	Pulse 1 option	Specifies pulse 1 option.

Selection		Description
Display	PROFIBUS PA	
Balanced	Balanced	Totalizes a flow rate in the forward direction with a positive value and a flow rate in the reverse direction with a negative value, and outputs a value as a pulse if the forward and negative totalized values exceed 1.
Absolute	Absolute	Totalizes an absolute value of the flow rate and outputs it as a pulse if the totalized value exceeds 1.
Only positive	Only positive	Totalizes only a flow rate in the forward direction and outputs it as a pulse if the totalized value exceeds 1. (The negative flow rate is not totalized as 0)
Only negative	Only negative	Converts a negative flow rate to a positive value and totalizes it. Outputs the value as a pulse if the value exceeds 1. (The negative flow rate is not totalized in the forward direction as 0)

Use “Balanced” and “Absolute” in the following cases.

Balanced	When raising 0% point with frequency output Setting example) Pulse mode = Freq, Freq at 0% = 100Hz, Freq at 100% = 500Hz, Pulse option = Balanced Since 100Hz is output at 0% with the above settings, an instantaneous flow rate can be measured up to -25% in frequency output. (Possible to use in the same way as the analog output)
Absolute	When using in combination with forward/reverse range Setting example) Pulse mode = Fixed, Pulse option = Absolute, SO function = Fwd/Rev range Please set your desired value for pulse width / rate / rate unit, and reverse span1. With the above settings, the same pulse output can be reproduced as when the forward/reverse range setting is made with the old model AXF.

6. Parameter Lists

Note: The Write Mode column contains the modes in which each parameter is write enabled.

O/S : Write enabled in the O/S mode.

MAN : Write enabled in the Man and O/S modes.

AUTO : Write enabled in the Auto, Man, and O/S modes.

- : Unable to write

6.1 Physical Block

List of Physical Block parameter

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC	Space (32characters)	-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc…
5	TARGET_MODE	0x08(Auto)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(Auto) 0x88(O/S,Auto) 0x08(Auto)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual : Indicates the current operating condition. Permit : Indicates the operating condition that the block is allowed to take. Normal : Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : Bit7 is available. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	SOFTWARE_REVISION	-	-	Revision-number of the software of the field device.
9	HARDWARE_REVISION	-	-	Revision-number of the hardware of the field device.
10	DEVICE_MAN_ID	55(0x37)	-	Identification code of the manufacturer of the field device.

Relative Index	Parameter Name	Default Value	Write Mode	Description
11	DEVICE_ID	ADMAG TI AXG4A or ADMAG TI AXW4A	-	Manufacturer specific identification of the field device.
12	DEVICE_SER_NUM	-	-	Serial number of the field device.
13	DIAGNOSIS	0	-	Detailed information of the device, bitwise coded. More than one message possible at once. See 5.6.2 ■DIAGNOSIS and DIAGNOSIS_EXTENSION.
14	DIAGNOSIS_ EXTENSION	0	-	Additional manufacturer-specific information of the device, bitwise coded. See 5.6.2 ■DIAGNOSIS and DIAGNOSIS_EXTENSION.
15	DIAGNOSIS_MASK	Condensed Status: 0x00,0xB8,0x0F,0x80 Classic Status: 0x73,0xBD,0x00,0x80	-	Definition of supported DIAGNOSIS information-bits. See 5.6.2 ■DIAGNOSIS and DIAGNOSIS_EXTENSION.
16	DIAGNOSIS_ MASK_ EXTENSION	0x0F,0xEA,0x0C,0x67, 0x00,0x00	-	Definition of supported DIAGNOSIS_ EXTENSION information-bits. See 5.6.2 ■DIAGNOSIS and DIAGNOSIS_EXTENSION.
17	DEVICE_ CERTIFICATION	Space (32characters)	-	Not used for ADMAG TI
18	WRITE_LOCKING	2457 (0x999)	-	If set, no writes from anywhere are allowed, except to clear WRITE_LOCKING. 0: Indicates the state in which parameter writing is prohibited. 2457: Indicates the state in which parameter writing is allowed.”
19	FACTORY_RESET	0	-	Allows a manual restart to be initiated. 0: No function. 1: Resetting device to the factory default. 2506: Warm start of the device.All parameterization remains unchanged. 2712: Reset the bus address to “126”.
20	DESCRIPTOR		-	User definition text (a string) to describe the device within the application.
21	DEVICE_MESSAGE		-	User definable MESSAGE (a string) to describe the device within the application or in the plant.
22	DEVICE_INSTAL_ DATE		-	Date of installation of the device.
23	LOCAL_OP_ENA	1	-	Specifies whether writing of parameters from the indicator is prohibited or allowed. 0: Indicates that writing of the parameter is prohibited. 1: Indicates that writing of the parameter is allowed.
24	IDENT_NUMBER_ SELECTOR	127(Adaptation Mode)	-	Each PROFIBUS-DP device shall have an Ident_Number provided by the PNO. 0:Profile specific 1:Manufacturer specific 127:Adaptation Mode
25	HW_WRITE_ PROTECTION	0	-	This parameter is used in order to indicate the position of a write blocking mechanism which protests all acyclic write access to all writable parameters of a device. See 5.12.

Relative Index	Parameter Name	Default Value	Write Mode	Description
26	FEATURE	0x03000000(Supported) 0x01000000(Enabled)	-	Indicates the features supported or enabled by the device. Octet1:0bit=Condensed status and diagnosis supported Octet1:1bit=Classic status/diagnosis supported Octet1:2bit=data exchange broadcast supported Octet1:3bit=MS1 application(DTM etc.) relationship supported Octet1:4bit=PROFIsafe communication supported Octet2-8:Reserved Supported :Indicates the features supported by the device. Enabled : Indicates the functions supported and enabled by the device.
27	COND_STATUS_ DIAG	1	-	Select the status and diagnostic format. 0: Status and Diagnosis 1: Condensed Status and Diagnosis information is provided Parameters cannot be changed during the cycle communication.
28-32	reserved by PNO	reserved by PNO	-	
33	SOFT_DESC	-	-	Yokogawa internal use.
34	SET_ADDRESS	0	-	This parameter is used in order to set or change the station address.
35	reserved		-	
36	DEVICE_STATUS_1	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
37	DEVICE_STATUS_2	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
38	DEVICE_STATUS_3	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
39	DEVICE_STATUS_4	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
40	DEVICE_STATUS_5	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
41	DEVICE_STATUS_6	0	-	Indicates an alarm or warning that is occurring on the equipment. See ■DEVICE_STATUS_(1-5)
42	DIAGNOSIS_SIM_ MODE	0(Disabled)	-	For testing alarms and warnings can be modified. Switch to enable or disable alarm simulation. When this parameter is set to enable and the hardware simulation jumper is on, all of alarms and warnings in DIAGNOSIS_ EXTENSION can be modified with DIAGNOSIS_SIM_EXTENSION. 0:Disable 1:Enable

Relative Index	Parameter Name	Default Value	Write Mode	Description
43	DIAGNOSIS_SIM_ EXTENSION	0x00...0 (12 digits)	-	Definision of supported DIAGNOSIS_ EXTENSION information-bits. For testing alarms and warnings can be modified. When the hardware simulation jumper is on, DIAGNOSIS_SIM_MODE is set to enable, and the bits are set to “1”, the arlarms (or warnings) can be modified. See ■DIAGNOSIS_SIM_EXTENSION.
44-47	NULL_PARAM		-	
48	IDENT_NUMBER	4591(AXG) or 4592(AXW)	-	Indicates an Ident Number.
248	VIEW_PHYSICAL_ BLOCK		-	View objects allow the following groups of physical block parameter values to be read with one read request. ST_REV, MODE_BLK, ALARM_SUM, DIAGNOSIS

■ DEVICE_STATUS_(1-5)

Label			Value	Selection	
Parameter Name	Display	PROFIBUS PA		Display	PROFIBUS PA
DEVICE_STATUS_1	-	Device status 1	0x00000001	-	10:Main board CPU failure
			0x00000002	-	11:Reverse calculation failure
			0x00000004	-	12:Main board EEPROM failure
			0x00000008	-	13:Main board EEPROM default
			0x00000010-0x00000080	-	Reserved
			0x00000100	-	14:Sensor board failure
			0x00000200	-	15:Sensor communication error
			0x00000400	-	16:A/D1 failure[Signal]
			0x00000800	-	17:A/D2 failure[Exciter]
			0x00001000	-	18:Coil open
			0x00002000	-	19:Coil short
			0x00004000	-	20:Exciter failure
			0x00008000-0x00800000	-	Reserved
			0x01000000	-	27:Parameter restore incomplete
			0x02000000	-	28:Indicator board failure
			0x04000000	-	29:Indicator board EEPROM failure
			0x08000000	-	30:LCD driver failure
			0x10000000	-	31:Indicator board mismatch
			0x20000000	-	32:Indicator communication error
			0x40000000	-	33:microSD card failure
			0x80000000	-	Reserved

Label			Value	Selection	
Parameter Name	Display	PROFIBUS PA		Display	PROFIBUS PA
DEVICE_STATUS_2	-	Device status 2	0x00000001	-	50:Signal overflow
			0x00000002	-	51:Empty pipe detection
			0x00000004	-	52:H/L or HH/LL alarm
			0x00000008	-	53:Adhesion over level 4
			0x00000010-0x00000080	-	Reserved
			0x00000100	-	60:Span configuration error
			0x00000200-0x00001000	-	Reserved
			0x00002000	-	65:H/L HH/LL configuration error
			0x00004000	-	66:Density configuration error
			0x00008000	-	Reserved
			0x00010000	-	67:Pulse output 1 configuration error
			0x00020000	-	Reserved
			0x00040000	-	69:Nominal size configuration error
			0x00080000	-	70:Adhesion configuration error
			0x00100000	-	71:Flow noise configuration error
			0x00200000	-	72:Data logging not started
			0x00400000-0x02000000	-	Reserved
			0x04000000	-	82:Pulse output 1 saturated
			0x08000000	-	Reserved
			0x10000000	-	Reserved
			0x20000000	-	85:Cable misconnect
			0x40000000	-	86:Coil insulation warning
			0x80000000	-	131:Transmitter type mismatch

Label			Value	Selection	
Parameter Name	Display	PROFIBUS PA		Display	PROFIBUS PA
DEVICE_STATUS_3	-	Device status 3	0x00000001	-	87:Adhesion over level 3
			0x00000002	-	88:Low conductivity Warning
			0x00000004	-	89:Insulation detection
			0x00000008	-	90:Flow noise over level 3
			0x00000010	-	91:Flow noise over level 4
			0x00000020	-	92:Autozero warning
			0x00000040	-	93:Verification warning
			0x00000080	-	94:Factory noise warning
			0x00000100	-	95:Simulation active
			0x00000200	-	Reserved
			0x00000400	-	Reserved
			0x00000800	-	98:Pulse output 1 fixed
			0x00001000- 0x00008000	-	Reserved
			0x00010000	-	101:Parameter restore running
			0x00020000	-	102:Display over warning
			0x00040000	-	103:microSD card size warning
			0x00080000	-	104:Parameter backup incomplete
			0x00100000	-	105:microSD card mismatch
			0x00200000	-	106:microSD card removal procedure error
			0x00400000	-	Reserved
			0x00800000	-	Reserved
			0x01000000	-	120:Watchdog
			0x02000000	-	121:Power off
			0x04000000	-	122:Instant power failure
			0x08000000	-	123:Parameter backup running
			0x10000000	-	124:Data logging running
			0x20000000	-	Reserved
			0x40000000	-	126:microSD card insert
			0x80000000	-	127:microSD card removed
DEVICE_STATUS_4	-	Device status 4	0x00000001 0x00000200	-	Reserved
			0x00000400	-	133:G/A mismatch error
			0x00000800 0x80000000	-	Reserved

Label			Value	Selection	
Parameter Name	Display	PROFIBUS PA		Display	PROFIBUS PA
DEVICE_STATUS_5	-	Fuction Block Status 1	0x00000001	-	500:AI1 Lo Lo alarm
			0x00000002	-	501:AI1 Hi Hi alarm
			0x00000004	-	502:AI2 Lo Lo alarm
			0x00000008	-	503:AI2 Hi Hi alarm
			0x00000010	-	504:TOT1 unit error
			0x00000020	-	505:TOT2 unit error
			0x00000040	-	506:TOT3 unit error
			0x00000080	-	Reserved
			0x00000100	-	507:PB in O/S mode
			0x00000200	-	508:AI1 in O/S mode
			0x00000400	-	509:AI2 in O/S mode
			0x00000800	-	510:TOT1 in O/S mode
			0x00001000	-	511:TOT2 in O/S mode
			0x00002000	-	512:TOT3 in O/S mode
			0x00004000	-	513:DI1 in O/S mode
			0x00008000	-	514:DI2 in O/S mode
			0x00010000	-	515:AO1 in O/S mode
			0x00020000	-	516:FTB in O/S mode
			0x00040000	-	517:LTB in O/S mode
			0x00080000	-	518:DTB in O/S mode
			0x00100000	-	519:MTB1 in O/S mode
			0x00200000	-	520:MTB2 in O/S mode
			0x00400000	-	521:PB simulation active
			0x00800000	-	522:AI1 simulation active
			0x01000000	-	523:AI2 simulation active
			0x02000000 0x08000000	-	Reserved
			0x10000000	-	527:DI1 simulation active
			0x20000000	-	528:DI2 simulation active
			0x40000000	-	529:AO1 simulation active
			0x80000000	-	Reserved
DEVICE_STATUS_6	-	Fuction Block Status 2	0x00000001	-	530:AI1 in Man mode
			0x00000002	-	531:AI2 in Man mode
			0x00000004	-	532:TOT1 in Man mode
			0x00000008	-	533:TOT2 in Man mode
			0x00000010	-	534:TOT3 in Man mode
			0x00000020	-	535:DI1 in Man mode
			0x00000040	-	536:DI2 in Man mode
			0x00000080	-	537:AO1 in Man mode
			0x00000100- 0x20000000	-	Reserved
			0x40000000	-	560:Ident Number Violation
			0x80000000	-	Reserved

DIAGNOSIS_SIM_EXTENSION

Label			Value	Selection	
Parameter Name	Display	PROFIBUS PA		Display	PROFIBUS PA
DIAGNOSIS_SIM_EXTENSION	-	Diagnosis Extension Simulation Value	0x010000000000	-	Electronics failure
			0x020000000000	-	Sensor/Actuator failure
			0x040000000000	-	Failure which requires investigation
			0x080000000000	-	Compatibility failure
			0x000200000000	-	Non operating state
			0x000400000000	-	Calibration warning
			0x000800000000	-	Instrument configuration error
			0x001000000000	-	Function restricted
			0x002000000000	-	Simulation mode
			0x004000000000	-	Manual mode
			0x008000000000	-	Function Block notification
			0x000001000000	-	Process variable adjusted
			0x000004000000	-	Sensor value/Actuator value out of specification
			0x000008000000	-	Environment out of specification
			0x000040000000	-	Temporal decrease of value quality
			0x000080000000	-	Deteriorate estimation by counter
			0x000000010000	-	Deteriorate estimation by anomaly detection
			0x000000020000	-	Decrease of value quality by process environment
			0x000000040000	-	Adjustment failure by process environment
			0x000000100000	-	Optional function configuration error
			0x000000200000	-	Alarm related information
			0x000000400000	-	Process alarm

6.2 Flow Transducer Block

List of flow transducer block parameter

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT		-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08 :AUTO	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08:Auto 0x88:O/S,Auto 0x08:Auto	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : only available for Bit7. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	CALIBR_FACTOR	1.0	-	Set the meter factor for the low frequency side of standard dual frequency excitation.
9	LOW_FLOW_ CUTOFF	0.0	O/S	Specifies the output low cut value of Volume flow.
10	MEASUREMENT_ MODE	1(Bidirectional)	O/S	Set the mode of the flow measurement,either unidirectional or bidirectional. 0: Unidirectional 1: Bidirectional
11	FLOW_DIRECTION	0(+Direction)	O/S	Assign an arbitrary positive or negative sign to the measured value. See 5.5.1. 0: +Direction: Positive direction 1: -Direction: Nebative direction
12	ZERO_POINT	0.0	O/S	This function shows the current zero point compensation value for the sensor. This parameter is used to display the results obtained from ZERO_POINT_ADJUST . Specifically, the correction values displayed, and it is also possible to directly enter correction values.
13	ZERO_POINT_ ADJUST	0	-	This parameter executes the automatic zero adjustment function: If “Execute” is selected, this function will be started. See 5.1.15

Relative Index	Parameter Name	Default Value	Write Mode	Description
14	ZERO_POINT_UNIT	1062(mm/s)	O/S	This parameter is used in order to select the unit for zero point. 1062: mm/s
15	NOMINAL_SIZE	100	O/S	This parameter is used in order to set the size (diameter) of the sensor (flow tube).
16	NOMINAL_SIZE_ UNITS	1013(mm)	O/S	This parameter is used in order to select the unit of size (diameter) of the sensor (flow tube). 1013: mm 1019: inch
17	VOLUME_FLOW. Value	0.0 0	-	Indicates the current measured value and status as the volumetric flow. Value : input to the AI Function Block and the Totalizer Function Block. Status : Status of Value
18	VOLUME_FLOW_ UNITS	1349(m3/h)	O/S	This parameter is used in order to select the unit for VOLUME_FLOW, VOLUME_FLOW_ LO_LIMIT and VOLUME_FLOW_HI_LIMIT parameters. See ■Unit and Code for Flow Transducer Block.
19	VOLUME_FLOW_ LO_LIMIT	-452.3893	O/S	This parameter is used in order to enter the lower range value for volumetric flow.
20	VOLUME_FLOW_ HI_LIMIT	452.3893	O/S	This parameter is used in order to enter the upper range value for volumetric flow.
21	MASS_FLOW	0.0(Value) 0(Status)	-	Indicates the current measured value and status as the mass flow. Value : input to the AI Function Block and the Totalizer Function Block. Status : Status of Value
22	MASS_FLOW_ UNITS	1324(kg/h)	O/S	Units of mass flow rate. See ■Unit and Code for Flow Transducer Block.
23-28	reserved		-	
29	TEMPERATURE	0.0(Value) 0(Status)	-	Indicates the temperature input from the AO. Value : temperature input from the AO. Status : Status of Value
30	TEMPERATURE_ UNITS	1001(degC)	O/S	Indicates units of temperature. ■Unit and Code for Flow Transducer Block.
31	TEMPERATURE_ LO_LIMIT	0.0	O/S	Indicates the lower limit of temperature.
32	TEMPERATURE_ HI_LIMIT	120.0	O/S	Indicates the upper limit of temperature.
33-40	reserved		-	
41	SAMPLING_FREQ	0.0(Value) 0(Status)	-	This parameter is used in order to indicates the field frequency of the sensor.
42	SAMPLING_ FREQ_UNITS	1077(Hz)	O/S	This parameter is used in order to selected unit code for SAMPLING_FREQ parameter. 1077: Hz
43-52	reserved		-	
53	VOLUME_FLOW_ DAMPING	3.0	-	Sets the damping time for volume flow (other than totalization).
54	VOLUME_FLOW_ DAMPING_TOTAL	3.0	-	Sets the damping time for volume flow (totalized).
55	MASS_FLOW_ DAMPING	3.0	-	Sets the damping time for mass flow rate (other than totalization).
56	MASS_FLOW_ DAMPING_TOTAL	3.0	-	Sets the dumping time for mass flow rate (totalized).
57	MASS_FLOW_ CUTOFF	0.0	O/S	Specifies the output low cut value of Mass flow.
58	VELOCITY_FLOW_ VALUE	0.0(Value) 0(Status)	-	Indicates the current measured value and status as the velocity. Value : input to the AI Function Block and the Totalizer Function Block. Status : Status of Value

Relative Index	Parameter Name	Default Value	Write Mode	Description
59	VELOCITY_FLOW_UNIT	1061(m/s)	O/S	This parameter is used in order to selected unit code for VELOCITY_FLOW_VALUE parameter. See ■Unit and Code for Flow Transducer Block.
60	VELOCITY_FLOW_CUTOFF	0.0	O/S	Specifies the output low cut value of velocity.
61	VELOCITY_CHECK	0.0(m/s)	-	AI1.CHANNEL Indicates the flow velocity for the SPAN of the flow rate selected in CHANNEL.
62	VELOCITY_DAMPING	3.0(s)	-	Set the damping time for flow velocity (other than total).
63	VELOCITY_DAMPING_TOTAL	3.0(s)	-	Set the damping time for flow velocity (totalized).
64	CALORIFIC_VALUE	0.0(Value) 0(Status)	-	Indicates the current measured value and status as the calorific value. Value : input to the AI Function Block and the Totalizer Function Block. Status : Status of Value
65	CALORIFIC_UNIT	32801(J/h)	O/S	This parameter is used in order to selected unit code for CALORIFIC_VALUE parameter. See Unit and Code.
66,67	reserved		-	
68	CALORIFIC_DAMPING	3.0(s)	-	Sets the damping time for calorific flow rate (other than totalization).
69	CALORIFIC_DAMPING_TOTAL	3.0(s)	-	Sets the damping time for calorific flow (totalization).
70	CALORIFIC_CUTOFF	0.0	O/S	Set the Calorific flow low cut range value. This value must be set to the lower switching point because this function has a hysteresis.
71	VELOCITY_CHECK_1	-	-	Yokogawa internal use.
72	VELOCITY_CHECK_2	-	-	Yokogawa internal use.
73	HIGH_MF	1.0	O/S	Set the meter factor for the high frequency side of standard dual frequency excitation.
74	LOW_MF_EDF	1.0	O/S	Sets the meter factor for the low frequency side of extended dual frequency excitation.
75	HIGH_MF_EDF	1.0	O/S	Sets the meter factor on the high frequency side of extended dual frequency excitation.
76	SELECT_FLOW_SENSOR	0(ADMAG AXG)	O/S	Set the type of detector. See 5.1.14
77	MEASURE_MODE	0(Standard DF)	O/S	Yokogawa internal use.
78	SIGNAL_LOCK	0(Unlock)	-	Enables/disables Signal Lock. See 5.5.7. 0: Unlock 1: Lock
79	VELOCITY_FLOW_SPAN	1.0	O/S	Specifies the span of the flow velocity. See 5.1.9.
80	VOLUME_FLOW_SPAN	28.2743	O/S	Specifies the span of volumetric flow rate. See 5.1.9.
81	MASS_FLOW_SPAN	1.0	O/S	Specifies the span of the mass flow rate. See 5.1.9.
82	CALORIFIC_SPAN	1.0	O/S	Specifies the span of the calorie. See 5.1.9.
83	TEMPERATURE_FUNC	0(No function)	O/S	Specifies as what value the device should handle the external temperature input internally. See 5.4.
84-86	reserved		-	
87	RATE_LIMIT	5.0(%)	O/S	This parameter is used in order to set the rate limit value. See 5.5.2.
88	DEAD_TIM	0.0(s)	O/S	This parameter is used in order to set the time for application of the rate limit, and if a value of 0 is set, the rate limit function will be terminated. See 5.5.2.

Relative Index	Parameter Name	Default Value	Write Mode	Description
89	NOISE_FILTER	0(Manual)	O/S	Specifies the noise filter (rate limit value and dead time). See 5.5.2.
90	PULSING_FLOW	0(No)	O/S	This parameter is used in order to set the pulsing flow support. See 5.5.3.
91	POWER_SYNCH	1(Yes)	O/S	This parameter is used in order to indicate whether or not the internal frequency is to be synchronized with that of the power supply.
92	SET_PWR_FREQ	50(Hz)	O/S	Specifies the power frequency when the excitation frequency and power frequency are asynchronous. See 5.5.4.
93	IEX_PWR_FREQ	0.0(Hz)	-	Displays the power frequency (synchronous with the excitation frequency). See 5.5.4.
94	MES_PWR_FREQ	0.0(Hz)	-	Displays the measured power frequency. See 5.5.4.
95	DENSITY_SEL	0	O/S	Selects one of the following temperature-based density corrections. See 5.1.13.
96	DENSITY_UNIT	1097(kg/m3)	O/S	Specifies the unit of the density. See 5.1.13. 0: kg/m3 1: lb/gal 2: lb/cf
97	FIXED_DENS	0.0	O/S	Specifies the value of the fixed density. See 5.1.13.
98	STD_DENSITY	0.0	O/S	Specifies the reference standard density value to use the temperature-based density correction function (only available for AXG, not for AXW). See 5.1.13.
99	STD_TEMP	20.0	O/S	Specifies the reference standard temperature for using the temperature-based density correction function. See 5.1.14.
100	TEMP_COEF_A1	0.0	O/S	Specifies the primary compensating rate. See 5.5.5.
101	TEMP_COEF_A2	0.0	O/S	Specifies the secondary compensating rate. See 5.5.5.
102	reserved		-	
103	CORRCT_DENS	0.0	-	Displays the corrected density (only available for AXG, not for AXW). See 5.1.13.
104	SPEC_HEAT	4184.0(J/(kg-K))	O/S	Specifies the specific heat. See 5.5.6.
105	CALORIFIC_FIX_TEMP	20.0	O/S	Specifies the reference temperature to use for the calorie calculation with temperature difference from the temperature which is input from the outside. See 5.1.14.
106	ALM_OUT_MASK1	0x02000000	O/S	Specifies the mask function for alarm notification 1. See 5.6.6.
107	ALM_OUT_MASK2	0x4400000C	O/S	Specifies the mask function for alarm notification 2. See 5.6.6.
108	ALM_OUT_MASK3	0x1F3700DF	O/S	Specifies the mask function for alarm notification 3. See 5.6.6.
109	ALM_OUT_MASK4	0x00000000	O/S	Specifies the mask function for alarm notification 4. See 5.6.6.
110	ALM_OUT_MASK5	0x00020008	O/S	Specifies the mask function for alarm notification 5. See 5.6.6.
111	ALM_OUT_MASK6	0x00000000	O/S	Specifies the mask function for alarm notification 6. See 5.6.6.
112	ALM_REC_MASK1	0x00000000	O/S	Specifies the mask function for alarm record 1. See 5.6.6.
113	ALM_REC_MASK2	0x00000000	O/S	Specifies the mask function for alarm record 2. See 5.6.6.
114	ALM_REC_MASK3	0x00000400	O/S	Specifies the mask function for alarm record 3. See 5.6.6.
115	ALM_RECORD1	0	-	Displays the name of new alarm 1. See 5.6.5.

Relative Index	Parameter Name	Default Value	Write Mode	Description
116	ALM_TIME1	" 00000D 00:00"	-	Displays the operation time when the first new alarm occurs. See 5.6.5.
117	ALM_RECORD2	0	-	Displays the name of new alarm 2. See 5.6.5.
118	ALM_TIME2	" 00000D 00:00"	-	Displays the operation time when the second new alarm occurs. See 5.6.5.
119	ALM_RECORD3	0	-	Displays the name of new alarm 3. See 5.6.5.
120	ALM_TIME3	" 00000D 00:00"	-	Displays the operation time when the third new alarm occurs. See 5.6.5.
121	ALM_RECORD4	0	-	Displays the name of new alarm 4. See 5.6.5.
122	ALM_TIME4	" 00000D 00:00"	-	Displays the operation time when the fourth new alarm occurs. See 5.6.5.
123	PV1_UNIT_IDX	-	-	Yokogawa internal use.
124	PV2_UNIT_IDX	-	-	Yokogawa internal use.
125	SELECTED_FLOW	1	-	Displays the target process for PV. See 5.1.6.
126	STB_INFO1	0	-	Yokogawa internal use.
127	TOT1_SETPOINT	0.0	O/S	Specifies the target value of totalizer 1. See 5.2.3.
128	TOT2_SETPOINT	0.0	O/S	Specifies the target value of totalizer 2. See 5.2.3.
129	TOT3_SETPOINT	0.0	O/S	Specifies the target value of totalizer 3. See 5.2.3.
130	ADHESION_VALUE	0.0(M ohm) 0(Status)	-	Displays the resistance and status of the sensor to detect electrode adhesion. See 5.1.7.
131	ELECTRODE_A_VALUE	0.0(V) 0(Status)	-	Displays the voltage value and status between electrode A and electrode C. See 5.1.7.
132	ELECTRODE_B_VALUE	0.0(V) 0(Status)	-	Displays the voltage value and status between electrode B and electrode C. See 5.1.7.
133	FLOW_NOISE_VALUE	0.0(cm/s) 0(Status)	-	Displays the flow noise. See 5.1.7.
134	CONDUCTIVITY_VALUE	0.0(mS/cm) 0(Status)	-	Displays conductivity and status. See 5.1.7.
135	ADHESION_CHECK	1(Enable)	-	Enable/Disable the electrode adhesion detection function. See 5.9.3. 0: Disable: Disables electrode adhesion diagnosis. 1: Enable: Enable the electrode adhesion diagnosis.
136	ADHESION_LEVEL1	0.1(M ohm)	-	Set the threshold for electrode adhesion detection level 1. See 5.9.3.
137	ADHESION_LEVEL2	0.5(M ohm)	-	Set the threshold for electrode adhesion detection level 2. See 5.9.3.
138	ADHESION_LEVEL3	4.0(M ohm)	-	Set the threshold for electrode adhesion detection level 3. See 5.9.3.
139	ADHESION_LEVEL4	12.0(M ohm)	-	Set the threshold for electrode adhesion detection level 4. See 5.9.3.
140	ADHESION_STATUS	0(Level0)	-	Displays the current value of the sensor's adhesion level. See 5.9.3.
141	ADHESION_CHECK_CYCLE	2(2 min)	-	Set the update cycle for electrode adhesion detection. See 5.9.3.
142	FLOW_NOISE_CHECK	0(Disable)	-	Enable/Disable the flow noise function. See 5.9.8. 0: Disable: Disables the flow noise function. 1: Enable: Enables the flow noise function.
143	FLOW_NOISE_LEVEL1	5.0(cm/s)	-	Set the threshold for flow noise level 1. See 5.9.8.
144	FLOW_NOISE_LEVEL2	10.0(cm/s)	-	Set the threshold for flow noise level 2. See 5.9.8.
145	FLOW_NOISE_LEVEL3	30.0(cm/s)	-	Set the threshold for flow noise level 3. See 5.9.8.

Relative Index	Parameter Name	Default Value	Write Mode	Description
146	FLOW_NOISE_ LEVEL4	400.0(cm/s)	-	Set the threshold for flow noise level 4. See 5.9.8.
147	FLOW_NOISE_ STATUS	0	-	Displays the current value of the flow noise level. See 5.9.8.
148	FLOW_NOISE_ DAMPING	3.0	-	Set the damping time constant for flow noise. See 5.1.10.
149	LOW_CONDUCT_ CHECK	0(Disable)	-	Enable/Disable: Sets the enable/disable of low conductivity diagnosis. See 5.9.9. 0: Disable: Disables low conductivity diagnostics. 1: Enable: Enable low conductivity diagnostics.
150	CONDUCTIVITY_ LIMIT	0.001(mS/cm)	-	Set the threshold for low-conductivity diagnosis. See 5.9.9.
151	EMPTY_STS	0(Full)	-	Display the status of the detector's empty detection. See 5.9.4. 0: Full:Indicates that the detector is full of water. 1: Empty: Indicates that the detector is not full of water.
248	VIEW_FTB	-	-	View objects allow the following groups of physical block parameter values to be read with one read request. ST_REV, MODE_BLK, ALARM_SUM, VOLUME_FLOW, SAMPLING_FREQ

Unit and Code for Flow Transducer Block

VOLUME_FLOW_UNITS			
code	Unit	code	Unit
1347	m3/s	1488	mbbl/h
1348	m3/min	1489	kbbl/h
1349	m3/h	1491	ubbl/d
1350	m3/d	1492	mbbl/d
1351	L/s	1493	kbbl/d
1352	L/min	1511	cm3/s
1353	L/h	1512	cm3/min
1354	L/d	1513	cm3/h
1355	ML/d	1514	cm3/d
1356	ft3/s	1518	kL/min
1357	ft3/min	1519	kL/h
1358	ft3/h	1520	kL/d
1359	ft3/d	1521	ML/min
1362	gal/s	1522	ML/h
1363	gal/min	1523	kL/s
1364	gal/h	1524	kcf/s
1365	gal/d	1525	kcf/min
1366	Mgal/d	1526	kcf/h
1371	bbl/s	1527	kcf/d
1372	bbl/min	1528	mft3/s
1373	bbl/h	1529	mft3/min
1374	bbl/d	1530	mft3/h
1449	mgal/s	1531	mft3/d
1450	kgal/s	1532	kbbl(liq)/min
1451	Mgal/s	1533	kbbl(liq)/h
1453	mgal/min	1534	kbbl(liq)/d
1454	kgal/min	1539	mbbl(liq)/s
1455	Mgal/min	1540	mbbl(liq)/min
1457	mgal/h	1541	mbbl(liq)/h
1458	kgal/h	1542	mbbl(liq)/d
1459	Mgal/h	1543	ubbl(liq)/s
1461	mgal/d	1544	ubbl(liq)/min
1462	kgal/d	1637	bbl(liq)/s
1479	ubbl/s	1638	bbl(liq)/min
1480	mbbl/s	1639	bbl(liq)/h
1481	kbbl/s	1640	bbl(liq)/d
1483	ubbl/min	32768	ML/s
1484	mbbl/min	32769	kbbl(liq)/min
1485	kbbl/min	32770	ubbl(liq)/d
1487	ubbl/h	32771	ubbl(liq)/h

MASS_FLOW_UNITS	
code	Unit
1329	t/d
1328	t/h
1327	t/mim
1326	t/s
1325	kg/d
1324	kg/h
1323	kg/mim
1322	kg/s
1321	g/d
1320	g/h
1319	g/mim
1318	g/s
1548	klb/d
1547	klb/h
1546	klb/mim
1545	klb/s
1333	lb/d
1332	lb/h
1331	lb/mim
1330	lb/s

TEMPERATURE_UNITS	
code	Unit
1000	K
1001	degC
1002	degF

VELOCITY_FLOW_UNIT	
code	Unit
1061	m/s
1067	ft/s

CALORIFIC_UNIT	
code	Unit
1196	MJ/h
1197	BTU/h
1431	kcal/s
1432	kcal/min
1433	kcal/h
1434	kcal/d
1438	kJ/s
1439	kJ/min
1440	kJ/h
1441	kJ/d
1442	MJ/s
1443	MJ/min
1444	MJ/d
1445	BTU/s
1446	BTU/min
1447	BTU/d
32800	J/d
32801	J/h
32802	J/min
32803	J/s
32804	cal/d
32805	cal/h
32806	cal/min
32807	cal/s

6.3 Diagnostic Transducer Block

List of diagnosis transducer block parameter

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	AUTO	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM (DS-42)	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : only available for Bit7. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8-28	reserved		-	
29	DIAG_EXECUTION	0(Not execute)	O/S	Diagnosis of wiring and electrode insulation degradation is executed.See 5.9.5, 5.9.7. Not execute: Indicates that the diagnosis has not been performed. Elec ins exe:Execute electrode insulation degradation diagnostics. Conn chk exe: Execute wiring diagnosis.
30	COIL_ INSULATION_TH	25.0	-	Specifies the value to judge coil insulation.
31	IEX_COMPARE	260.0	-	Displays the standard exciting current value to judge coil insulation.
32	PEAK_HOLD_ VALUE	0.0	-	Displays the maximum amplitude of the electrode signal (voltage value).
33	IEX_COIL_ RESISTANCE	0.0	-	Displays the resistance of the excitation coil.
34	reserved	-	-	
35	DIAG_OUTPUT	0(Zero)	-	Specifies the output to execute the verification function. See 5.9.5, 5.9.6, or 5.9.7.
36	VERIFICATION_ TARGET	0x001F	-	Specifies the target for diagnosis. See 5.9.6.
37	VERIFICATION_ MODE	0(No flow)	-	Specifies the fluid status to execute the verification function. See 5.9.6.

Relative Index	Parameter Name	Default Value	Write Mode	Description
38	VERIFICATION_ EXE	0(Not execute)	O/S	Specifies the execution of the verification function. See 5.9.6.
39	VERIFICATION_NO	0(Factory)	-	Specifies the diagnosis result display time. See 5.9.6.
40	VERIFICATION_ CHECK_RESULT	3(No Data)	-	Execution result. See 5.9.6.
41	VERIFICATION_ OPERATION_TIME	" 00000D 00:00"	-	Operation time of verification when started. See 5.9.6.
42	MAGNETIC_ CIRCUIT_RESULT	3(No Data)	-	Magnetic circuit diagnosis result. See 5.9.6.
43	EXCITING_ CIRCUIT_RESULT	3(No Data)	-	Excitation circuit diagnosis result. See 5.9.6.
44	CALCULATION_ CIRCUIT_RESULT	3(No Data)	-	Calculation circuit diagnosis result. See 5.9.6.
45	DEVICE_STATUS_ RESULT	3(No Data)	-	Device alarm diagnosis result. See 5.9.6.
46	CONNECTION_ STATUS_RESULT	3(No Data)	-	Wiring connection diagnosis result. See 5.9.6.
47	ALARM_ACTIVE	0(Value) 0(Status)	-	The value is 1 when an alarm is present.
48	WARNING_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a warning occurs.
49	TOTAL_LIMIT_1_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the totalizer 1 exceeds TOT1_SET_POINT.
50	TOTAL_LIMIT_2_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the totalizer 2 exceeds TOT2_SET_POINT.
51	TOTAL_LIMIT_3_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the totalizer 3 exceeds TOT3_SET_POINT.
52	HI_LO_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a high or low alarm occurs.
53	HIHI_LOLO_ ALARM_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a HiHi or LoLo alarm is occurring.
54	SYSTEM_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a system alarm is present.
55	PROCESS_ ALARM_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a process alarm has occurred.
56	SETTING_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a setting alarm has occurred.
57	SIGNAL_ OVERFLOW_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a signal overflow has occurred.
58	EMPTY_DETECT_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when an empty detection is occurring.
59	ADHESION_ OVER_LV4_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the electrode adhesion level is greater than 4.
60	CABLE_ MISSCONNECT_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a false connection is occurring.
61	COIL_INSULATE_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when coil insulation degradation is occurring.
62	ADHESION_ OVER_LV3_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the electrode adhesion level is greater than 3.
63	LOW_ CONDUCTIVITY_ WARNING_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a low conductivity warning occurs.
64	INSULATION_ DETECT_ACTIVE	0(Value) 0(Status)	-	The value is 1 when insulation degradation is occurring.

Relative Index	Parameter Name	Default Value	Write Mode	Description
65	FLOW_NOISE_ OVER_LV3_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the flow noise level is greater than 3.
66	FLOW_NOISE_ OVER_LV4_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the flow noise level is greater than 4.
67	VERIFICATION_ WARNING_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a Verification warning is generated.
68	FACTORY_NOISE_ WARNING_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a factory noise warning occurs.
69	LOLO_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when a Lo alarm has occurred.
70	LO_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 when the LoLo alarm occurs.
71	HI_ALARM_ACTIVE	0(Value) 0(Status)	-	The value is 1 when a high alarm has occurred.
72	HIHI_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is 1 for a HiHi alarm.
73	NON_ALARM_ ACTIVE	0(Value) 0(Status)	-	The value is always zero.
74	HIGH_ALARM_ SETPOINT	300.0	-	Set the threshold for high alarm.
75	LOW_ALARM_ SETPOINT	-300.0	-	Set the threshold for low alarm.
76	HIGH_HIGH_ ALARM_SETPOINT	300.0	-	Set the threshold for high high alarm.
77	LOW_LOW_ ALARM_SETPOINT	-300.0	-	Set the threshold for low low alarm.
78	HIGH_LOW_ ALARM_HYS	5.0	-	Set the high low alarm hysteresis.
79	DIAG_ INFORMATION_1	1		Yokogawa internal use.
80	DIAG_ INFORMATION_2	1		Yokogawa internal use.
81	DIAG_ INFORMATION_3	0		Yokogawa internal use.
82	DIAG_ INFORMATION_4	0		Yokogawa internal use.
83	DIAG_ INFORMATION_5	0		Yokogawa internal use.
84	DIAG_ INFORMATION_6	0		Yokogawa internal use.
248	VIEW_DTB	-	-	View objects allow the following groups of physical block parameter values to be read with one read request.ST_REV, MODE_BLK, ALARM_SUM

6.4 LCD Indicator Transducer Block

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	AUTO	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM (DS-42)	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : only available for Bit7. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	DISP_LINE1_SEL	1(PV)	-	Set the item to be displayed in the first line of the display unit. See 5.7.2.
9	DISP_LINE2_SEL	1:Flow rate(%)	-	Set the item to be displayed in the second line of the display unit. See 5.7.2.
10	DISP_LINE3_SEL	12(Long tag)	-	Sets the item to be displayed on the third line of the display unit. See 5.7.2.
11	DISP_LINE4_SEL	0(None)	-	Sets the item to be displayed in the 4th line of the display unit. See 5.7.2.
12	DISP_LINE5_SEL	0(None)	-	Sets the item to be displayed in the 5th line of the display unit. See 5.7.2.
13	DISP_LINE6_SEL	0(None)	-	Sets the item to be displayed in the 6th line of the display unit. See 5.7.2.
14	DISP_LINE7_SEL	0(None)	-	Sets the item to be displayed in line 7th line of the display unit. See 5.7.2.
15	DISP_LINE8_SEL	0(None)	-	Sets the item to be displayed on the 8th line of the display unit. See 5.7.2.

Relative Index	Parameter Name	Default Value	Write Mode	Description
16	DISP_FORMAT_FR	7(Auto 2)	-	Sets the display unit's decimal point position. See 5.7.3.
17	DISP_FORMAT_TTL1	0(Auto)	-	Sets the decimal point position of the display unit's totalizer 1.
18	DISP_FORMAT_TTL2	0(Auto)	-	Sets the decimal point position of the display unit's totalizer 2.
19	DISP_FORMAT_TTL3	0(Auto)	-	Sets the decimal point position of the display unit's totalizer 3.
20	DISP_CONTRAST	5(0)	-	Set the contrast of the display unit -:Light +:Dark See 5.7.6.
21	DISP_LINE	3(3 Line)	-	Sets the number of lines displayed on the display unit. 1 Line(Big): 1 line, large number, no units 1 Line: 1 line, with units 2 Line: 2 lines, with units 3 Line: 3 lines, with units 4 Line: 4 lines, with units See 5.7.4.
22	DISP_PERIOD	1(0.4s)	-	Set the display unit's process value update cycle. 0:0.2s 1:0.4s 2:1.0s 3:2.0s 4:4.0s 5:8.0s See 5.7.5.
23	DISP_NE107	0(Nomal)	-	Set the display or non-display of the alarm according to NAMUR NE107. Normal: Normal alarm display NE107: Alarm indication in accordance with NAMUR NE107 See 5.6.4.
24	DISP_ALARM	0(Nomal)	-	Set the display format of the alarm. Normal: Normal alarm display (process value and alarm name) Detail: Detailed Alarm Display (Alarm Name and Action) See 5.6.4.
25	DISP_SCROLL	0(Off)	-	The scrolling method of the display unit is set. Off: No scrolling. Manual: scrolling by infrared switch Auto(2 s): Automatic scrolling in 2-second cycles Auto(4 s): Automatic scrolling in 4-second cycles Auto(8 s): Automatic scrolling in 8-second cycles See 5.7.4.
26	DISP_DAMPING	0.0	-	Sets the display unit damping time constant. See 5.7.6.
27	DISP_FORMAT_DATE	0(MM/DD/YYYY)	-	Sets the display format for the date. YYYY: year, MM: month, DD: day See 5.7.6.
28	LANGUAGE	0(English)	-	Sets the language of the display unit. See 5.7.1.
29	DISPLAY_MODE	0(Normal)	-	Set the trend graph display function. Normal: Normal display (no trend graph) Trend: Show trend graphs See 5.7.5.
30	TREND_OFFLINE_LRV	0.0	-	Specifies the low limit when displaying in a trend graph.

Relative Index	Parameter Name	Default Value	Write Mode	Description
31	TREND_OFFLINE_URV	10.0	-	Specifies the high limit value when displaying in a trend graph.
32	DISP_TREND_SEL1	1(PV)	-	Set the item 1 of the trend graph. See 5.7.5.
33	DISP_TREND_SEL2	0(None)	-	Set the item 2 of the trend graph. See 5.7.5.
34	DISP_TREND_SEL3	0(None)	-	Set the item 3 of the trend graph. See 5.7.5.
35	DISP_TREND_SEL4	0(None)	-	Set the item 4 of the trend graph. See 5.7.5.
36	DISP_INVERSE	0(Normal)	-	Set the display unit's black and white inversion. Normal: Normal display (text color: black, background color: white) Invert: Black and white inversion (text color: white, background color: black) See 5.7.6.
37	LCD_TEST	0(Not Execute)	-	Set the test display function of the display unit. Not execute: do not display the test. Execute: Test display (All lights on ► All lights off ► Staggered lattice ► Staggered lattice (inverted)) Show Pattern 1: Test display (all lights on) Show Pattern 2: Test display (all lights off) Show Pattern 3: Test Display (Staggered Grid) Show Pattern 4: Test Display (staggered (inverted))
38	SQUAWK	0(Off)	-	Set the display unit's squawk function (display unit backlight blinking). Off: no squawk display. On: Show squawk (continuous) Squawk Once: Show squawk once (one time only) See 5.7.6.
39	LANGUAGE_PACKAGE	0(Pack 1)	-	Displays the language package. See 5.7.1.
40	DISP_INSTALL	1(With disp)	-	Specifies the presence or absence of the display.
41	DISP_LOWCUT	0.0	-	Sets the display unit's lowcut value. See 5.7.6.
42	DISP_LOWCUT_UNIT	1349(m3/h)	-	The unit of the display unit's lowcut value is shown. See 5.7.6.
248	VIEW_LTB	-	-	View objects allow the following groups of physical block parameter values to be read with one read request.ST_REV, MODE_BLK, ALARM_SUM

Unit and Code for LCD Indicator Transducer Block

code	Unit	code	Unit	code	Unit
1355	ML/d	1455	Mgal/min	1640	bbl(liq)/d
1522	ML/h	1451	Mgal/s	1639	bbl(liq)/h
1521	ML/min	1462	kgal/d	1638	bbl(liq)/min
1350	m3/d	1458	kgal/h	1637	bbl(liq)/s
1349	m3/h	1454	kgal/min	1542	mbbl(liq)/d
1348	m3/min	1450	kgal/s	1541	mbbl(liq)/h
1347	m3/s	1365	gal/d	1540	mbbl(liq)/min
1520	kL/d	1364	gal/h	1539	mbbl(liq)/s
1519	kL/h	1363	gal/min	1544	ubbl(liq)/min
1518	kL/min	1362	gal/s	1543	ubbl(liq)/s
1523	kL/s	1461	mgal/d	1329	t/d
1354	L/d	1457	mgal/h	1328	t/h
1353	L/h	1453	mgal/min	1327	t/mim
1352	L/min	1449	mgal/s	1326	t/s
1351	L/s	1493	kbbl/d	1325	kg/d
1514	cm3/d	1489	kbbl/h	1324	kg/h
1513	cm3/h	1372	bbl/min	1323	kg/mim
1512	cm3/min	1371	bbl/s	1322	kg/s
1511	cm3/s	1492	mbbl/d	1321	g/d
1527	kcf/d	1488	mbbl/h	1320	g/h
1526	kcf/h	1485	kbbl/min	1319	g/mim
1525	kcf/min	1481	kbbl/s	1318	g/s
1524	kcf/s	1374	bbl/d	1548	klb/d
1359	ft3/d	1373	bbl/h	1547	klb/h
1358	ft3/h	1484	mbbl/min	1546	klb/mim
1357	ft3/min	1480	mbbl/s	1545	klb/d
1356	ft3/s	1491	ubbl/d	1333	lb/d
1531	mft3/d	1487	ubbl/h	1332	lb/h
1530	mft3/h	1483	ubbl/min	1331	lb/mim
1529	mft3/min	1479	ubbl/s	1330	lb/d
1528	mft3/s	1534	kbbl(liq)/d	1061	m/s
1366	Mgal/d	1533	kbbl(liq)/h	1067	ft/s
1459	Mgal/h	1532	kbbl(liq)/min		

6.5 Maintenance Transducer Block 1

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : only available for Bit7. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	OPERATE_TIME	" 00000D 00:00"	-	Operation time of the device.
9	TRNS_TYPE	2(4A Type)	-	Displays the serial number (device No.) of the transmitter. See 5.8.2.
10	EL_SIZE	1(3 mm)	-	Displays the electrode size. See 5.9.9.
11	EX_PROTECTION	0(No)	-	Selects an explosionprotective product or standard product. See 5.8.4.
12	MODEL_CODE	Space (16 characters)	-	Specifies the model code of the integral flowmeter or remote transmitter. See 5.8.1.
13	SUFFIX_CONF1	Space (16 characters)	-	Specifies the suffix code of the integral flowmeter or remote transmitter. See 5.8.1.
14	SUFFIX_CONF2	Space (16 characters)	-	
15	OPTION1	Space (16 characters)	-	Specifies the optional code of the integral flowmeter or remote transmitter. See 5.8.1.
16	OPTION2	Space (16 characters)	-	
17	OPTION3	Space (16 characters)	-	
18	OPTION4	Space (16 characters)	-	
19	RS_MDL_CD	Space (16 characters)	-	Specifies the model code of the remote sensor. See 5.8.1.
20	RS_SUF_CONF1	Space (16 characters)	-	Specifies the suffix code of the remote sensor. See 5.8.1.
21	RS_SUF_CONF2	Space (16 characters)	-	
22	RS_OPT1	Space (16 characters)	-	Specifies the optional code of the remote sensor. See 5.8.1.
23	RS_OPT2	Space (16 characters)	-	
24	RS_OPT3	Space (16 characters)	-	
25	RS_OPT4	Space (16 characters)	-	

Relative Index	Parameter Name	Default Value	Write Mode	Description
26	TRNS_SR_NO	Space (16 characters)	-	Displays the serial number (device No.) of the transmitter. See 5.8.1.
27	FS_SR_NO	Space (16 characters)	-	Displays the serial number (device No.) of the sensor. See 5.8.1.
28	MEMO1	Space (16 characters)	-	Specifies memo 1. See 5.8.3.
29	MEMO2	Space (16 characters)	-	Specifies memo 2. See 5.8.3.
30	MEMO3	Space (16 characters)	-	Specifies memo 3. See 5.8.3.
31	MAIN_B_REV	"R0.52.03"	-	Displays the software revision of the main board. See 5.8.2.
32	SENSOR_B_REV	"R0.20.01"	-	Displays the software revision of the sensor board. See 5.8.2.
33	IND_B_REV	"R0.52.01"	-	Displays the software revision of the display board. See 5.8.2.
34	F_BCKUP_NAME	"Factory Delivery"	-	Displays the backup name defined at shipment from the manufacturing factory. See 5.11.1.
35	F_BCKUP_DATE	" 01/01/2019"	-	Displays the backup date at shipment from the manufacturing factory. See 5.11.1.
36	SD_BCK_NAME	"SD_FILE "	-	Specifies the name of the file to be backed up to the microSD card. See 5.11.1.
37	BCK_NAME1	" Backup 1"	-	Specifies backup name 1. Up to 16 characters. See 5.11.1.
38	BCK_DATE1	" 01/01/2019"	-	Specifies date 1. See 5.11.1.
39	BCK_NAME2	" Backup 2"	-	Specifies backup name 2. Up to 16 characters. See 5.11.1.
40	BCK_DATE2	" 01/01/2019"	-	Specifies date 2. See 5.11.1.
41	BCK_NAME3	" Backup 3"	-	Specifies backup name 3. Up to 16 characters. See 5.11.1.
42	BCK_DATE3	" 01/01/2019"	-	Specifies date 3. See 5.11.1.
43	BACKUP_EXEC	0(Not execute)	-	Specifies the execution of the backup function. See 5.11.1.
44	BACKUP_RSLT	0(Unexecuted)	-	Displays the result of the backup function. See 5.11.1.
45	RESTORE_EXEC	0(Not Execute)	-	Specifies the execution of the restore function. See 5.11.2.
46	RESTORE_RSLT	0(Unexecuted)	-	Displays the result of the restore function. See 5.11.2.
47	LOGGING_FILE	"LOG_FILE"	-	Specifies the name of the file to be stored. See 5.11.4.
48	LOG_INTR_TIM	3(1 min)	-	Specifies the data storage interval. See 5.11.4.
49	L_START_DATE	" 01/01/2019"	-	Displays the date to start the data logging function. See 5.11.4.
50	L_START_TIME	" 00:00:00"	-	Displays the time to start the data logging function. See 5.11.4.
51	LOG_END_TIME	4(12 h)	-	Specifies the time to end the data logging function. See 5.11.4.
52	LOG1_SELECT	4(PV)	-	Specifies process value 1 to be stored. See 5.11.4.
53	LOG2_SELECT	0(Velocity)	-	Specifies process value 2 to be stored. See 5.11.4.
54	LOG3_SELECT	1(Volume flow)	-	Specifies process value 3 to be stored. See 5.11.4.
55	LOG4_SELECT	2(Mass flow)	-	Specifies process value 4 to be stored. See 5.11.4.
56	LOGGING_EXEC	0(Not execute)	-	Specifies the execution of the data loging function. See 5.11.4.
57	TEST_AUTO_ RELEASE_TIM	1(30 min)	-	Specifies the time to automatically reset the test mode. See 5.11.4.
58	TEST_MODE	0x00000000	-	Selects the test item. See 5.10.1.

Relative Index	Parameter Name	Default Value	Write Mode	Description
59	VELOCITY_TEST_VALUE	0.0	-	Sets the display item to the flow velocity. See 5.10.2.
60	P1_TEST_VALUE	0	-	Specifies the frequency of pulse output or frequency output 1 for the I/O2 terminal. See 5.10.2.
61	SO1_TEST_VALUE	0(Open)	-	Specifies the status of status output 1 for the I/O2 terminal. See 5.10.2.
62	TEST_2_MODE	0(Not execute)	-	Setting Test 2 mode. See 5.10.3.
63	TEST_2_OUT	0.0	-	Setting Test 2 mode value. See 5.10.3.
64	P1_OUT_MODE	0(No function)	-	Specifies the output of the I/O2 terminal. See 5.14.1.
65	P1_ACT_MODE	0(On active)	-	Specifies an active direction for the pulse signal. See 5.14.4.
66	P1_WIDTH	13(Duty cycle 50%)	-	Specifies the pulse width. See 5.14.3.
67	P1_RATE_UNIT	3(Unit/P)	-	Specifies the pulse rate value. See 5.14.5.
68	P1_RATE_VAL	0.0	-	Specifies the pulse rate value. See 5.14.5.
69	P1_LOW_CUT	0.84823	-	Specifies the output low-cut value. See 5.1.11.
70	Reserved	-	-	-
71	P1_ALM_OUT	0(0 pps)	-	Specifies the alarm output function for the frequency output or pulse output. See 5.14.2.
72	F1_AT_0	0	-	Specifies the output frequency when the process value is 0%. See 5.14.6.
73	F1_AT_100	0	-	Specifies the output frequency when the process value is 100%. See 5.14.6.
74	SO1_FUNC	0(No function)	-	Specifies the status output function. See 5.14.7.
75	P1_OPTS	2(Only positive)	-	Specifies pulse 1 option. See 5.14.8.
76	Reserved	-	-	-
77	DEVICE_KEY	0	-	Parameter for service personnel.
78-167	Reserved	-	-	-
168	CURRENT_DATE	" 01/01/2019"	-	Displays current date.
169	CURRENT_TIME	" 00:00:00"	-	Displays current time.
170	SET_CURRENT_DAY	1	-	Sets the current day(1-31).
171	SET_CURRENT_MONTH	1	-	Sets the current month(1-12).
172	SET_CURRENT_YEAR	2019	-	Sets the current year(1900-2155).
173	SET_CURRENT_HOUR	0	-	Sets the current hour(0-23).
174	SET_CURRENT_MINUTE	0	-	Sets the current minute(0-59).
175	SET_CURRENT_SEC	0	-	Sets the current sec(0-59).
176-248	Reserved	-	-	-

6.6 Maintenance Transducer Block 2

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x88(O/S,Auto) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : only available for Bit7. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8-248	Reserved			

6.7 Analog Input Function Block

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT		-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08(AUTO)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x98(O/S, MAN,AUTO) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current : Bit1, 2, 3, 4, and 7 are available. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	BATCH	0(BATCH_ID) 0(RUP) 0(OPERATION) 0(PHASE)	-	This parameter is intended to be used in Batch applications in line with IEC 61512.
9	reserved		-	
10	OUT	0(Value) 0(Status)	-	This parameter contains the current measurement value from Transducer Block or configuration adjusted engineering unit and the belonging state in AUTO MODE. OUT contains the value and status set by an operator in MAN MODE.
11	PV_SCALE	100.0(Array1) 0.0(Array2)	-	Converts the process value to a % with Array1 as 100% and Array2 as 0%. The units are linked to the units of the flow rate selected in CHANNEL, and the values of Array1 and Array2 are recalculated accordingly.

Relative Index	Parameter Name	Default Value	Write Mode	Description
12	OUT_SCALE	100.0(EU at 100%) 0.0(EU at 0%) 1349(Units Index) 1(Decimal Point)	-	Scale of the Process Variable. This parameter contains the values of the lower limit and upper limit effective range, the code number of the engineering unit of Process Variable and the number of digits on the right hand side of the decimal point. EU at 100% : Valid range of the upper limit EU at 0% : Valid range of the lower limit Units Index : the code number of the engineering unit of Process Variable Decimal Point :Specifies a decimal point position.
13	LIN_TYPE	0	-	This parameter is used in order to select the type of linearization.
14	CHANNEL	0x0111(Volume)	O/S	Reference to the active Transducer Block which provides the measurement value to the Function Block. See 5.1.6.
15	reserved		-	
16	PV_FTIME	0.0	-	Time constant of a single exponential filter for the PV, in seconds.
17	FSAFE_TYPE	1(Storing last valid Output Value)	-	Defines reaction of device, if a fault is detected. 0:Default value is used as output value. 1:Storing last valid Output Value. 2:The calculated output value is incorrect
18	FSAFE_VALUE	0.0	-	Default value for the OUT parameter, if sensor or sensor electronic fault is detected. The unit of this parameter is the same like the OUT one.
19	ALARM_HYS	0.5	-	Set the hysteresis of HI_HI_LIM, HI_LIM, LO_LIM and LO_LO_LIM.
20	reserved		-	
21	HI_HI_LIM	+1.#INF	-	The setting for high high alarm in engineering units.
22	reserved	-	-	
23	HI_LIM	+1.#INF	-	The setting for high alarm in engineering units.
24	reserved	-	-	
25	LO_LIM	-1.#INF	-	The setting of the low alarm in engineering units.
26	reserved	-	-	
27	LO_LO_LIM	-1.#INF	-	The setting of the low low alarm in engineering units.
28,29	reserved		-	
30	HI_HI_ALM (DS-39)	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of HI_HI_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
31	HI_ALM (DS-39)	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of HI_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
32	LO_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of LO_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.

Relative Index	Parameter Name	Default Value	Write Mode	Description
33	LO_LO_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of LO_LO_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
34	SIMULATE	0(Simulate_Status) 0.0(Simulate_Value) 0(Simulate_Enabled)	-	Set the AI simulation. Simulate_Status:Sets the status of the AI simulation. When the simulation is enabled, the status set in this parameter is reflected in OUT. Simulate_Value:Sets the value of the AI simulation. When the simulation is enabled, the value set in this parameter is reflected in OUT. Simulate_Enable/Disable the AI simulation, which can only be used when the Simulate switch on the AXG unit is ON.
35	OUT_UNIT_TEXT		-	If a specific unit of OUT parameter is not in the code list the user has the possibility to write the specific text in this parameter. The unit code is then equal “textual unit definition”.
36-44	reserved		-	
248	VIEW_AI		-	View objects allow the following groups of physical block parameter values to be read with one read request. ST_REV, MODE_BLK, ALARM_SUM, OUT

OUT_SCALE→Unit Index

code	Unit
1061	m/s
1067	ft/s
1318	g/s
1319	g/mim
1320	g/h
1321	g/d
1322	kg/s
1323	kg/mim
1324	kg/h
1325	kg/d
1326	t/s
1327	t/mim
1328	t/h
1329	t/d
1330	lb/s
1331	lb/mim
1332	lb/h
1333	lb/d
1347	m3/s
1348	m3/min
1349	m3/h
1350	m3/d
1351	L/s
1352	L/min
1353	L/h
1354	L/d
1355	ML/d
1356	ft3/s
1357	ft3/min
1358	ft3/h
1359	ft3/d
1362	gal/s
1363	gal/min
1364	gal/h
1365	gal/d
1366	Mgal/d
1371	bbl/s
1372	bbl/min
1373	bbl/h
1374	bbl/d
1449	mgal/s
1450	kgal/s
1451	Mgal/s
1453	mgal/min
1454	kgal/min
1455	Mgal/min
1457	mgal/h
1458	kgal/h
1459	Mgal/h
1461	mgal/d
1462	kgal/d
1479	ubbl/s
1480	mbbl/s
1481	kbbl/s
1483	ubbl/min
1484	mbbl/min
1485	kbbl/min
1487	ubbl/h
1488	mbbl/h
1489	kbbl/h
1491	ubbl/d
1492	mbbl/d
1493	kbbl/d
1511	cm3/s
1512	cm3/min
1513	cm3/h
1514	cm3/d
1518	kL/min
1519	kL/h
1520	kL/d
1521	ML/min
1522	ML/h
1523	kL/s
1524	kcf/s
1525	kcf/min
1526	kcf/h
1527	kcf/d
1528	mft3/s
1529	mft3/min
1530	mft3/h
1531	mft3/d
1532	kbbl(Fed)/min
1533	kbbl(Fed)/h
1534	kbbl(Fed)/d
1539	mbbl(Fed)/s
1540	mbbl(Fed)/min
1541	mbbl(Fed)/h
1542	mbbl(Fed)/d
1543	ubbl(Fed)/s
1544	ubbl(Fed)/min
1545	klb/s
1546	klb/mim
1547	klb/h
1548	klb/d
1637	bbl(Fed)/s
1638	bbl(Fed)/min
1639	bbl(Fed)/h
1640	bbl(Fed)/d
32768	ML/s
32769	kbbl(Fed)/s
32770	ubbl(Fed)/d
32771	ubbl(Fed)/h

6.8 Totalizer Function Block

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT		-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08(AUTO)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x98(O/S, MAN,AUTO) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current:Bit1, 2, 3, 4, 7 are available. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	BATCH	0(BATCH_ID) 0(RUP) 0(OPERATION) 0(PHASE)	-	This parameter is intended to be used in Batch applications in line with IEC 61512.
9	reserved		-	
10	TOTAL	0.0(Value) 0(Status)	-	This parameter contains the integrated quantity of the rate parameter provided by CHANNEL and the associated status.
11	UNIT_TOT	1034(m3)	O/S	This parameter is used in order to set the unit of the totalized quantity. See ■Unit and Code for Totalizer Function Block parameter.
12	CHANNEL	0x0111(Volume)	O/S	Reference to the active Transducer Block which provides the measurement value to the Function Block. 0x0111: Volume 0x0115: Mass 0x0140:Calorie
13	SET_TOT	0(TOTALIZE)	-	This parameter is used in order to assign the condition to the totalizer. Resets/presets the totalizer. 0:TOTALIZE;Conducts the totalization process. 1:RESET; resets the total value to zero. 2:PRESET;Presets the totalizer to the value of PRESET_TOT.

Relative Index	Parameter Name	Default Value	Write Mode	Description
14	MODE_TOT	TOT1: 0 TOT2: 1 TOT3: 2	-	This parameter is used in order to define how the totalizer counts. 0: Pos. and neg. values; Totalizes the flow rate (difference) of the forward and reverse directions. 1: Positive values only; Totalizes only the flow rate in the forward direction. 2: negative values only; Totalizes only the flow rate in the reverse direction. 3: Hold count; Stops totalization processing (holding the current totalized value).
15	FAIL_TOT	0(RUN)	-	This parameter is used in order to define error response in the event of the device error or bad measured value. Sets the totalizing mode in case of an error. 0:RUN; continues to totalize even if the status is BAD. 1:HOLD; Stops totalizing when status is BAD. 2:MEMORY; When the status is BAD, the last time the status was GOOD is used for totaling.
16	PRESET_TOT	0	-	This parameter is used in order to define the starting value to the totalizer.
17	ALARM_HYS	0	-	Set the hysteresis of HI_HI_LIM, HI_LIM, LO_LIM and LO_LO_LIM.
18	HI_HI_LIM	+INF	-	The setting for high high alarm in engineering units.
19	HI_LIM	+INF	-	The setting for high alarm in engineering units.
20	LO_LIM	-INF	-	The setting of the low alarm in engineering units.
21	LO_LO_LIM	-INF	-	The setting of the low low alarm in engineering units.
22	HI_HI_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of HI_HI_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
23	HI_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of HI_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
24	LO_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of LO_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
25	LO_LO_ALM	0(Unacknowledged) 0(Alarm State) 0(Time Stamp) 0(Subcode) 0.0(Value)	-	Indicates the state of LO_LO_ALM alarms. Unacknowledged:For future use. Alarm State:0:No alarm, <>0:Alarm active Time Stamp:For future use. Subcode:Do not use (always 0). Value:value for alarm on/off.
26-35	reserved		-	
36	TOTAL_CONV_FACTOR	1.0	-	Set the conversion factor for calculating the total count value from the total value.
37	TOTAL_COUNT	0	-	The total count value is displayed.
38,39	reserved		-	
248	VIEW_TOT	-	-	A View object can get the following parameters at a single load: ST_REV, MODE_BLK, ALARM_SUM, TOTAL

Unit and Code for Totalizer Function Block

code	Unit	code	Unit
1034	m3	1180	cal
1035	dm3	1181	kcal
1036	cm3	1183	BTU
1038	l	1517	kl
1040	ml	1549	Ml
1041	hl	1641	bbl(fed)
1043	cf	32900	kcf
1048	gal	32901	mcf
1051	bbl(oil)	32902	Mgal
1088	kg	32903	kgal
1089	g	32904	mgal
1090	mg	32905	kbbl(oil)
1091	Mg	32906	mbbl(oil)
1092	t	32907	ubbl(oil)
1094	lb	32908	Kbbl(fed)
1167	J	32909	mbbl(fed)
1172	MJ	32910	ubbl(fed)
1173	kJ	32911	klb

6.9 Discrete input Function Block

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	0x08(AUTO)	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x98(O/S, MAN,AUTO) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current:Bit7 is available. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	BATCH	0(BATCH_ID) 0(RUP) 0(OPERATION) 0(PHASE)	-	This parameter is intended to be used in Batch applications in line with IEC 61512.
9	reserved	-	-	
10	OUT_D	0.0(Value) 0(Status)	MAN	The output value and status of the DI function block. In MAN mode, the output value can be written to the status.
11-13	reserved	-	-	
14	CHANNEL	0x0349(No function)	O/S	Select the object to be output by DI1. See 5.3.4.
15	INVERT	0(not inverted)	-	Used to reverse the output value of OUT_D. 0:not inverted 1:inverted
16-19	reserved		-	
20	FSAFE_TYPE	1(Storing last valid Output Value)	-	Sets the behavior of OUT when a fault is detected. 0:Default value is used as output value. 1:Storing last valid Output Value 2:The calculated output value is incorrect

Relative Index	Parameter Name	Default Value	Write Mode	Description
21	FSAFE_VAL_D	0	-	Set the value that will be output to OUT when a failure is detected with FSAFE_TYPE set to 0.
22,23	reserved		-	
24	SIMULATE_D	0(Simulate_Status) 0(Simulate_Value) 0(Simulate_Enabled)	-	Sets the status of a DI simulation. Simulate_Status: Sets the status of the DI simulation. When simulation is enabled, the status set in this parameter is reflected in OUT. Simulate_Value: Sets the value of the DI simulation. When simulation is enabled, the value set in this parameter is reflected in OUT. Simulate_Enabled: Enables or disables DI simulation, which can only be used when the Simulate switch on the AXG unit is ON.
25-34	reserved		-	
248	VIEW_DI		-	A View object can get the following parameters at a single read: ST_REV, MODE_BLK, ALARM_SUM, OUT_D

6.10 Analog Output Function Block

Relative Index	Parameter Name	Default Value	Write Mode	Description
0	BLOCK_OBJECT	-	-	Information on this block such as Block Tag, DD Revision, Execution Time etc.
1	ST_REV	0	-	The revision level of the static data associated with the function block. The revision value will be incremented each time a static parameter value in the block is changed.
2	TAG_DESC		-	The user description of the intended application of the block.
3	STRATEGY	0	-	The strategy field can be used to identify grouping of blocks. This data is not checked or processed by the block.
4	ALERT_KEY	0	-	The identification number of the plant unit. This information may be used in the host for sorting alarms, etc.
5	TARGET_MODE	AUTO	-	Set the Target of block mode (MODE_BLK) to Auto or O/S according to the Write Mode of the parameter to be set or changed.
6	MODE_BLK	0x08(AUTO) 0x98(O/S, MAN,AUTO) 0x08(AUTO)	-	The mode parameter is a structured parameter composed of the actual mode, the normal mode and the permitted mode. Actual: Indicates the current operating condition. Permit: Indicates the operating condition that the block is allowed to take. Normal: Indicates the operating condition that the block will usually take.
7	ALARM_SUM	0(Current) 0(Unacknowledged) 0(Unreported) 0(Disabled)	-	The current alert status, unacknowledged status, unreported status and disabled status of the alarms associated with the function block. Current:Bit7 is available. Unacknowledged : for future use Unreported : for future use Disabled : for future use
8	BATCH	0(BATCH_ID) 0(RUP) 0(OPERATION) 0(PHASE)	-	This parameter is intended to be used in Batch applications in line with IEC 61512.
9	SP	0.0(Value) 0(Status)	-	Indicates the set point value and status of the AO function block. In MAN mode, the status can be written to the output value.
10	reserved		-	
11	PV_SCALE	100.0(EU at 100%) 0.0(EU at 0%) 1001(Units Index) 1(Decimal Point)	-	Scale of the Process Variable. This parameter contains the values of the lower limit and upper limit effective range, the code number of the engineering unit of Process Variable and the number of digits on the right hand side of the decimal point. EU at 100% : Valid range of the upper limit EU at 0% : Valid range of the lower limit Units Index : the code number of the engineering unit of Process Variable Decimal Point :Specifies a decimal point position.
12	READBACK	0.0(Value) 0(Status)	-	not used
13-20	reserved		-	

Relative Index	Parameter Name	Default Value	Write Mode	Description
21	IN_CHANNEL	0x011d(Temperature)	O/S	0x011d:Temperature only
22	OUT_CHANNEL	0x011d(Temperature)	O/S	0x011d:Temperature only
23	FSAFE_TIME	0.0	-	Sets the behavior of OUT when a fault is detected.
24	FSAFE_TYPE	2(Actuator goes to fail-safe position)	-	Defines reaction of device, if a fault is detected. 0:Fail Safe Value is used as control regulator input 1:Storing last valid setpoint. 2:Actuator goes to fail-safe position
25	FSAFE_VALUE	0.0	-	Default value for the OUT parameter, if sensor or sensor electronic fault is detected. The unit of this parameter is the same like the OUT one.
26-30	reserved		-	
31	POS_D	0.0(Value) 0(Status)	-	not used
32	SETP_DEVIATION	0.0	-	not used
33	CHECK_BACK	0,0,0	-	not used
34	CHECK_BACK_ MASK	0x0D,0x4C,0x00	-	not used
35	SIMULATE	0(Simulate_Status) 0.0(Simulate_Value) 0(Simulate_Enabled)	-	Sets the AO simulation. Simulate_Status: Sets the status of the AO simulation. When the simulation is enabled, the status set in this parameter is reflected in OUT. Simulate_Value: Sets the value for AO simulation. If simulation is enabled, the value set in this parameter is reflected in OUT. Simulate_Enabled: Enables or disables AO simulation, which can only be used when the Simulate switch on the AXG unit is ON.
36	INCREASE_CLOSE	0	-	not used
37	OUT	0.0(Value) 0(Status)	-	Indicates the output value and status of the AO function block. In MAN mode, the status can be written to the output value.
38	OUT_SCALE	100.0(EU at 100%) 0.0(EU at 0%) 1001(Units Index) 1(Decimal Point)	-	Scale of the Process Variable. This parameter contains the values of the lower limit and upper limit effective range, the code number of the engineering unit of Process Variable and the number of digits on the right hand side of the decimal point. EU at 100% : Valid range of the upper limit EU at 0% : Valid range of the lower limit Units Index : the code number of the engineering unit of Process Variable Decimal Point :Specifies a decimal point position.
39-48	reserved		-	
248	VIEW_AO	-	-	A View object can get the following parameters at a single load: ST_REV, MODE_BLK, ALARM_SUM,READBACK, POS_D,CHECK_BACK

7. Parameter Menu Tree

NOTE

The available menus and parameters vary depending on the connection terminal type and the optional codes selected at the time of ordering.

7.1 Display Menu Tree

The following table provides an overview of the display menu structure.
See the installation manual for general information regarding the operation via display unit.

NOTE

When writing parameters from a display, it is necessary to set all blocks to the O/S mode.

- **Operation level**
  - Exit
  - Operator
  - Maintenance
  - Specialist

R	Read only
R/W1	Read and write possible
R/W2	Read always possible, Writing limited to the following operation levels (Operation level: Maintenance, Specialist)
R/W3	Read always possible, Writing limited to the following operation levels (Operation level: Specialist)

- **Device setup**
  - Block mode
  - Current alarm -> Page 191
  - Language R/W1
  - Process variables -> Page 193
    - Flow rate(%)
    - Flow rate
    - Velocity
    - Volume
    - Mass
    - Calorie
    - Totalizer
  - Diag/Service -> Page 194
    - All block target mode
    - Sts/Self test
    - Time stamp
    - Diagnosis
    - Verification
    - Autozero
    - Test
    - Param bkup/restore
    - Data log
    - Disp indicator
  - Easy setup wizard -> Page 198
    - All block target mode
    - Volume
    - Pulse/Status out
    - Display set
    - Autozero exe
  - Detailed setup -> Page 199
    - All block target mode
    - Pro var
    - Sensor
    - Totalizer
    - Pulse/Status out
    - Temperature
    - AUX calculation
    - Display set
    - Access cfg
    - Device info
    - PROFIBUS info
    - Protection
  - microSD -> Page 204
    - Contents
    - Unmount
    - Format
    - Property

Current alarm

Current alarm		
	Setting upload	
	DevSts1-1	R
	DevSts1-2	R
	DevSts2-1	R
	DevSts2-2	R
	DevSts3-1	R
	DevSts3-2	R
	DevSts4-1	R
	DevSts5-1	R
	DevSts5-2	R
	DevSts6-1	R
	DevSts6-2	R
	Setting download	

DevSts1-1
010:Main CPU FAIL
011:Rev calc FAIL
012:Main EEP FAIL
013:Main EEP dflt
014:Snsr bd FAIL
015:Snsr comm ERR
016:AD 1 FAIL[Sig]
017:AD 2 FAIL[Excit]
018:Coil open
019:Coil short
020:Exciter FAIL

DevSts1-2
027:Restore FAIL
028:Ind bd FAIL
029:Ind bd EEP FAIL
030:LCD drv FAIL
031:Ind bd mismatch
032:Ind comm ERR
033:microSD FAIL

DevSts2-1
050:Signal overflow
051:Empty detect
052:H/L HH/LL alm
053:Adh over lv 4
060:Span cfg ERR
066:Density cfg ERR

DevSts2-2
067:Pls 1 cfg ERR
069:Nomi size cfg
070:Adh cfg ERR
071:FLN cfg ERR
072:Log not start
082:Pls 1 saturate
085:Cable miscon
086:Coil insulation
131:Trans mismatch

DevSts3-1
087:Adhesion lv 3
088:LC warn
089:Insu detect
090:FLN over lv 3
091:FLN over lv 4
092:AZ warn
093:Verif warn
094:Fact noise warn
095:Simulate active
098:Pls 1 fix

DevSts3-2
101:Param restore run
102:Disp over
103:SD size warn
104:Bkup incmplt
105:SD mismatch
106:SD removal ERR
120:Watchdog
121:Power off
122:Inst power FAIL
123:Param bkup run
124:Data log run

DevSts4-1
133:G/A mismatch

DevSts5-1
500:AI1 LL Alarm
501:AI1 HH Alarm
502:AI2 LL Alarm
503:AI2 HH Alarm
504:TOT1 Unit ERR
505:TOT2 Unit ERR
506:TOT3 Unit ERR
507:PB O/S Mode
508:AI1 O/S Mode
509:AI2 O/S Mode
510:TOT1 O/S Mode
511:TOT2 O/S Mode
512:TOT3 O/S Mode
513:DI1 O/S Mode
514:DI2 O/S Mode

DevSts5-2
515:AO O/S Mode
516:FTB O/S Mode
517:LTB O/S Mode
518:DTB O/S Mode
519:M1TB O/S Mode
520:M2TB O/S Mode
521:PB Simulate Act
522:AI1 Simulate Act
523:AI2 Simulate Act
527:DI1 Simulate Act
528:DI2 Simulate Act
529:AO Simulate Act

DevSts6-1
530:AI1 Man Mode
531:AI2 Man Mode
532:TOT1 Man Mode
533:TOT2 Man Mode
534:TOT3 Man Mode
535:DI1 Man Mode
536:DI2 Man Mode
537:AO Man Mode

DevSts6-2
560:Id Num Violation

NOTE

Only the status items that occur in the PROFIBUS PA communication type are described above. Other items than the above status items are also shown on the display.

Process value

Process variables			
	Flow rate(%)		R
	Flow rate		R
	Velocity		R
	Volume		R
	Mass		R
	Calorie		R
	Totalizer		
		Totalizer 1	R
		Totalizer 2	R
		Totalizer 3	R
		Totalizer 1 count	R
		Totalizer 2 count	R
		Totalizer 3 count	R

Diagnosis/service

- **Diag/Service**
  - All block target mode
  - Sts/Self test -> Page 195
  - Time stamp
    - Date R
    - Time R
    - Op time R
  - Diagnosis -> Page 196
  - Verification -> Page 197
  - Autozero
    - Execute R/W2
    - Result
      - Zero value R/W2
  - Test -> Page 197
  - Param bkup/restore
    - F backup name R
    - F backup date R
    - SD backup name R/W3
    - Backup execute R/W3
    - Backup result R/W3
    - Restore execute R/W3
    - Restore result R/W3
    - Backup name 1 R/W3
    - Backup date 1 R/W3
    - Backup name 2 R/W3
    - Backup date 2 R/W3
    - Backup name 3 R/W3
    - Backup date 3 R/W3
  - Data log
    - File name R/W3
    - Interval time R/W3
    - Start date R/W3
    - Start time R/W3
    - End time R/W3
    - Execute R/W3
    - Log 1 R/W3
    - Log 2 R/W3
    - Log 3 R/W3
    - Log 4 R/W3
  - Disp indicator
    - LCD test R/W1
    - Squawk R/W1

State/ Self test

- **Sts/Self test**
  - Current alarm
    - DevSts1-1 R
    - DevSts1-2 R
    - DevSts2-1 R
    - DevSts2-2 R
    - DevSts3-1 R
    - DevSts3-2 R
    - DevSts4-1 R
    - DevSts5-1 R
    - DevSts5-2 R
    - DevSts6-1 R
    - DevSts6-2 R
  - Alarm
    - Alarm record mask
      - Mask 1-1 R/W3
      - Mask 1-2 R/W3
      - Mask 2-1 R/W3
      - Mask 2-2 R/W3
      - Mask 3-1 R/W3
    - Alarm record
      - Record alarm 1 R
      - Record time 1 R
      - Record alarm 2 R
      - Record time 2 R
      - Record alarm 3 R
      - Record time 3 R
      - Record alarm 4 R
      - Record time 4 R
    - Alarm out mask
      - Mask 1-1 R/W3
      - Mask 1-2 R/W3
      - Mask 2-1 R/W3
      - Mask 2-2 R/W3
      - Mask 3-1 R/W3
      - Mask 3-2 R/W3
      - Mask 4-1 R/W3

Diagnosis

- **Diagnosis**
  - Adhesion
    - Function R/W3
    - Threshold level 1 R/W3
    - Threshold level 2 R/W3
    - Threshold level 3 R/W3
    - Threshold level 4 R/W3
    - Result
      - Value R
      - Status R
    - Check cycle R/W3
  - Flow noise
    - Function R/W3
    - Threshold level 1 R/W3
    - Threshold level 2 R/W3
    - Threshold level 3 R/W3
    - Threshold level 4 R/W3
    - Result
      - Value R
      - Status R
    - Damp R/W3
  - Conductivity
    - Function R/W3
    - Low limit R/W3
    - Result
      - Value R
  - Diagnostic execute R/W3
  - Coil insul threshold R/W3
  - IEX compare R
  - Diagnostic output R/W3
  - V peak hold R
  - IEX resistance R
  - Empty check
    - Electrode voltage A R
    - Electrode voltage B R
    - Empty status R

Verification

Verification			
	Mode		R/W3
	Execute		R/W3
	VF No		R/W3
	VF target select		R/W3
	Result		
		Failed/Passed	R
		VF operate time	R
		Magnetic circuit	R
		Excite circuit	R
		Calc circuit	R
		Device status	R
		Connect status	R

Test

Test		
	Release time	
	Test mode	R/W3
	Velocity	R/W3
	PO1	R/W3
	SO1	R/W3
	Test 2 mode	R/W3
	Test 2 value	R/W3

Easy setup wizard

- **Easy setup wizard**
  - All block target mode
  - Volume
    - Setting upload
    - Damp AO/F — R/W3
    - Damp pls/ttl — R/W3
    - Unit — R
    - Time unit — R
    - Span — R/W3
    - Setting download
  - Pulse/Status out
    - Setting upload
    - P1 unit — R/W3
    - P1 val — R/W3
    - F1 at 0% — R/W3
    - F1 at 100% — R/W3
    - Setting download
  - Display set
    - Setting upload
    - Line 1 — R/W1
    - Line 2 — R/W1
    - Line 3 — R/W1
    - Setting download
  - Autozero exe — R/W2

Detailed setup

- **Detailed setup**
  - All block target mode
  - Pro var -> Page 200
  - Sensor
    - Low MF R/W3
    - High MF R/W3
    - Low MF EDF R/W3
    - High MF EDF R/W3
    - Flow sensor sel R/W3
    - Measure mode R/W3
    - Nominal size unit R/W3
    - Nominal size R/W3
  - Totalizer -> Page 201
  - Pulse/Status out
    - PO1/SO1
      - Output mode R/W3
      - Active mode R/W3
      - Fix width R/W3
      - Rate unit R/W3
      - Rate value R/W3
      - Low cut R/W3
      - Alarm out R/W3
      - Frequency at 0% R/W3
      - Frequency at 100% R/W3
      - SO1 function R/W3
      - Options R/W3
  - Temperature
    - Function R/W3
    - Unit R/W3
    - URV R/W3
    - LRV R/W3
  - AUX calculation
    - Flow direct R/W3
    - Rate limit R/W3
    - Dead time R/W3
    - Noise filter R/W3
    - Pulsing flow R/W3
    - 0% signal lock R/W3
    - Power sync R/W3
    - Set power freq R/W3
    - Iex power frequency R
    - Meas power freq R

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Display set	-> Page 201	
Access cfg		
	User role	R
	Chg mainte	R/W2
	Chg special	R/W3
Device info	-> Page 202	
PROFIBUS info	-> Page 203	
	All block target mode	R/W3
	PB TARGET_MODE	R/W3
	FTB TARGET_MODE	R/W3
	DTB TARGET_MODE	R/W3
	LTB TARGET_MODE	R/W3
	M1TB TARGET_MODE	R/W3
	M2TB TARGET_MODE	R/W3
	RB	
	FTB	
	AI1FB	
	AI2FB	
	DI1FB	
	DI2FB	
	TOT1FB	
	TOT2FB	
	TOT3FB	
	AOFB	
Protection		
	Key code	R/W3
	Write protect sts	R

Process variables

Pro var			
	PV flow select	R	
	Velocity		
		Damp AO/F	R/W3
		Damp pls/ttl	R/W3
		Unit	R
		Span	R/W3
	Volume		
		Damp AO/F	R/W3
		Damp pls/ttl	R/W3
		Unit	R
		Time unit	R
		Span	R/W3
	Mass		
		Damp AO/F	R/W3
		Damp pls/ttl	R/W3
		Unit	R
		Time unit	R
		Span	R/W3
	Calorie		
		Damp AO/F	R/W3
		Damp pls/ttl	R/W3
		Unit	R
		Time unit	R
		Span	R/W3
		Specific heat	R/W3
	Density		
		Value select	R/W3
		Unit	R/W3
		Fixed density	R/W3
		Std density	R/W3
		Correct density	R
	Temperature		
		Std temperature	R/W3
		Meas temperature	R
		Fixed temperature	R/W3
		Coef A1	R/W3
		Coef A2	R/W3
	Velocity check	R	

Totalizer

Totalizer

Totalizer 1		
	Unit	R
	Conv factor	R/W3
	Failure opts	R/W3
	Options	R/W3
	Reset/Preset	R/W3
	Preset value	R/W3
	Set point	R/W3

Totalizer 2		
	Unit	R
	Conv factor	R/W3
	Failure opts	R/W3
	Options	R/W3
	Reset/Preset	R/W3
	Preset value	R/W3
	Set point	R/W3

Totalizer 3		
	Unit	R
	Conv factor	R/W3
	Failure opts	R/W3
	Options	R/W3
	Reset/Preset	R/W3
	Preset value	R/W3
	Set point	R/W3

Display

Display set

Line select		
	Line 1	R/W1
	Line 2	R/W1
	Line 3	R/W1
	Line 4	R/W1
	Line 5	R/W1
	Line 6	R/W1
	Line 7	R/W1
	Line 8	R/W1

Trend select		
	Trend 1	R/W1
	Trend 2	R/W1
	Trend 3	R/W1
	Trend 4	R/W1

Disp format		
	Format PV	R/W1
	Format total 1	R/W1
	Format total 2	R/W1
	Format total 3	R/W1

Optional config		
	Contrast	R/W1
	Line mode	R/W1
	Period	R/W1
	NE107 display	R/W1
	Alarm display	R/W1
	Scroll mode	R/W1
	Damp	R/W1
	Low cut	R/W1
	Format date	R/W1
	Inversion	R/W1
	Language package	R
	Display mode	R/W1
	Trend offln LRV	R/W1
	Trend offln URV	R/W1

Device information

- **Device info**
  - Date/Time
    - Current date — R
    - Current time — R
    - Operation time — R
  - Order info
    - Tag No — R
    - Electrode size — R/W3
    - Explosion protection — R/W3
    - MS code
      - Model code — R/W3
      - Suffix config 1 — R/W3
      - Suffix config 2 — R/W3
      - Option 1 — R/W3
      - Option 2 — R/W3
      - Option 3 — R/W3
      - Option 4 — R/W3
    - RS MS code
      - Model code — R/W3
      - Suffix config 1 — R/W3
      - Suffix config 2 — R/W3
      - Option 1 — R/W3
      - Option 2 — R/W3
      - Option 3 — R/W3
      - Option 4 — R/W3
    - Disp install — R/W3
  - Ver/Num info
    - Transmitter type — R
    - Trans serial No — R/W3
    - Sensor serial No — R/W3
    - Main soft rev — R
    - Snsr soft rev — R
    - Ind soft rev — R
  - Memo
    - Memo 1 — R/W3
    - Memo 2 — R/W3
    - Memo 3 — R/W3

PROFIBUS info

PROFIBUS info			
	All block target mode		R/W3
	PB TARGET_MODE		R/W3
	FTB TARGET_MODE		R/W3
	DTB TARGET_MODE		R/W3
	LTB TARGET_MODE		R/W3
	M1TB TARGET_MODE		R/W3
	M2TB TARGET_MODE		R/W3
	PB		
		TARGET_MODE	R/W3
		WRITE_LOCKING	R/W3
		SET_ADDRESS	R/W3
	FTB		
		TARGET_MODE	R/W3
		LOW_FLOW_CUTOFF	R/W3
		SIGNAL_LOCK	R/W3
	AI1FB		
		TARGET_MODE	R/W3
		CHANNEL	R/W3
		OUT_SCALE EU at 100%	R/W3
		OUT_SCALE EU at 0%	R/W3
		OUT_SCALE Units index	R/W3
		PV_FTIME	R/W3
		OUT_UNIT_TEXT	R/W3
	AI2FB		
		TARGET_MODE	R/W3
		CHANNEL	R/W3
		OUT_SCALE EU at 100%	R/W3
		OUT_SCALE EU at 0%	R/W3
		OUT_SCALE Units index	R/W3
		PV_FTIME	R/W3
		OUT_UNIT_TEXT	R/W3
	DI1FB		
		TARGET_MODE	R/W3
		CHANNEL	R/W3

(Continued on next page)

DI2FB		
	TARGET_MODE	R/W3
	CHANNEL	R/W3
TOT1FB		
	TARGET_MODE	R/W3
	CHANNEL	R/W3
	TOT_UNIT	R/W3
TOT2FB		
	TARGET_MODE	R/W3
	CHANNEL	R/W3
	TOT_UNIT	R/W3
TOT3FB		
	TARGET_MODE	R/W3
	CHANNEL	R/W3
	TOT_UNIT	R/W3
AOFB		
	TARGET_MODE	R/W3
	CHANNEL	R/W3
	PV_SCALE EU at 100%	R/W3
	PV_SCALE EU at 0%	R/W3
	PV_SCALE Units index	R/W3

microSD

microSD			
	Contents		R
	Unmount		R/W1
	Format		R/W1
	Property		
		Total space	R
		Available space	R
		File system	R

Revision Information

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