Please read the following descriptions in conjunction with IM 01E22A01-01EN.
This document only applies to AXG produced at Yokogawa Corporation of America and sold to North/Central America.

This manual outlines the basic guidelines for installation and wiring procedures. This manual is applicable only for EtherNet/IP communication type. For the items which are not covered in this manual, read the user’s manuals and the general specifications as listed in Table 1.1.
1. Introduction

This manual provides the basic guidelines for installation, wiring procedures and basic operation of ADMAG Ti (Total Insight) Series AXG magnetic flowmeters with EtherNet/IP protocol.

For the items which are not covered in this manual, read the applicable user’s manuals and general specifications as listed in Table 1.1. These documents can be downloaded from the YOKOGAWA website. To ensure correct use of the product, read these manuals thoroughly and fully understand how to operate the product before operating it. For method of checking the model and specifications, read Chapter 2 and general specifications as listed in Table 1.1.

Website address: http://www.yokogawa.com/fld/doc/

These manuals can be downloaded from the website of YOKOGAWA or purchased from the YOKOGAWA representatives.

Table 1.1 Manual and General Specifications List

<table>
<thead>
<tr>
<th>Model</th>
<th>Document Title</th>
<th>Document No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXG###</td>
<td>ADMAG Ti Series AXG### Magnetic Flowmeter</td>
<td>IM 01E21A21-04EN-A</td>
</tr>
<tr>
<td>AXG4A</td>
<td>EtherNet/IP communication type Read Me First</td>
<td></td>
</tr>
<tr>
<td>AXG###</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter Installation Manual</td>
<td>IM 01E22A01-01EN</td>
</tr>
<tr>
<td>AXG4A</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter</td>
<td>IM 01E21A01-03EN-A</td>
</tr>
<tr>
<td>AXG###</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter Installation Manual Difference to IM 01E22A01-01EN</td>
<td></td>
</tr>
<tr>
<td>AXG4A</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter</td>
<td>IM 01E22A01-02EN</td>
</tr>
<tr>
<td>AXG###</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter General Specification</td>
<td>GS 01E22A01-01EN</td>
</tr>
<tr>
<td>AXG4A</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter</td>
<td>IM 01E21A02-06EN</td>
</tr>
<tr>
<td>AXG###</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter</td>
<td>GS 01E21F02-02EN-A</td>
</tr>
<tr>
<td>AXG4A</td>
<td>ADMAG Ti Series AXG Magnetic Flowmeter</td>
<td></td>
</tr>
</tbody>
</table>

![NOTE]

When describing the model name like AXG### in this manual, “###” means any of the following: 002, 005, 010, 015, 025, 040, 050, 080, 100, 150, 200

■ Trademarks:

(Please read the descriptions on IM 01E22A01-01EN, and add the following description.)

- “EtherNet/IP”, “CIP” and “ODVA” are registered trademark of ODVA Inc.

1.1 For Safe Use of Product

System in which this product is incorporated, be sure to follow the instructions and precautions on safety that is stated in this manual whenever you handle the product. Take special note that if you handle the product in a manner that violated these instructions, the protection functionality of the product may be damaged or impaired. In such cases, YOKOGAWA shall not be liable for any indirect or consequential loss incurred by either using or not being able to use the Product.

(1) General

- This product conforms to IEC safety class I (with Protective grounding terminal), Installation Category (Overvoltage Category) II, No Measurement Category (“O”(Other)), Micro Pollution degree 2, Macro Pollution degree 4, Altitude at installation Site Max. 2000 m above sea level.
- This product is an EN61326-1 (EMC standard), Class A (for use in commercial, industrial, or business environments).
- This product conforms to the standard specifications of CIP for EtherNet/IP communication.
- This product is complied with IP66 and IP67 in the EN60529. YOKOGAWA assumes no liability for the customer’s failure to comply with these requirements.
- This product is designed for indoor and outdoor use.

CAUTION

This product is a Class A product in the EN61326-1(EMC standard). Operation of this product in a residential area may cause radio interference, in which case the user is required to take appropriate measures to correct the interference.

IMPORTANT

The minimum ambient temperature is limited by the minimum fluid temperature of the sensor (the lining). For more information, read the applicable general specifications as listed in Table 1.1. The flowmeter may be used in an ambient humidity where the relative humidity ranges from 0 to 100%. However, avoid long-term continuous operation at relative humidity above 95%.
1. Introduction

**WARNING**

- **Purpose of use**
  This product is the Magnetic Flowmeter for use of measuring the liquid flow. Do not use this product for other purposes.

**WARNING**

- **Installation, wiring and maintenance of the magnetic flowmeter**
  - Installation, wiring and maintenance of the magnetic flowmeter must be performed by expert engineer or skilled personnel. No operator shall be permitted to perform procedures relating to installation, wiring and maintenance.
  - Wiring work should be done adequate wire, sleeve crimp and torque force. Use terminal with insulating cover for the power supply wiring and protective grounding wiring. Do not pull the wires too much strongly in order to prevent electric shocks caused by their damage.
  - Do not open the cover in wet weather or humid environment. When the cover is open, stated enclosure protection is not applicable.
  - Ensure that the power supply is off in order to prevent electric shocks.
  - When opening the cover, wait for more than 20 minutes after turning off the power. Only expert engineer or skilled personnel are permitted to open the cover.
  - When opening and closing the transmitter cover, be sure to handle the transmitter cover carefully so that there are no damage and foreign matter adhesion at its threads and O-ring.
  - This product employs the parts which are affected by a function damage caused by static electricity. Thus, you should do the antistatic work using an anti-static wrist band for it and be careful to avoid touching each electrical parts and circuitry directly.
  - When connecting the wiring, check that the supply voltage is within the range of the voltage specified for this product before connecting the power cable. In addition, check that no voltage is applied to the power cable before connecting the wiring.
  - To prevent electric shocks, ensure the electrical wiring cover is completely attached after the wiring work.
  - To prevent electric shocks, do not impress over rated voltage to each input/output terminals.
  - If there is any unused cable entry, use the blanking plug to cover which comes with this product or which is supplied by YOKOGAWA. The blanking plug should be fastened into the unused cable entry without any mistake. If not, stated enclosure protection is not applicable.
  - To prevent electric shocks, do not remove safety cover (Read section 3.6).

**IMPORTANT**

- **When closing the cover**
  - Close it with both hands until the cover does not turn in order to bring the housing and cover into tight contact.
  - Tighten while confirming that the cover rotates smoothly.

(2) Installation

(Please read the descriptions on IM 01E22A01-01EN.)

(3) Wiring

(Please read the descriptions on IM 01E22A01-01EN.)

(4) Operation

(Please read the descriptions on IM 01E22A01-01EN.)

(5) Maintenance

(Please read the descriptions on IM 01E22A01-01EN.)

(6) Modification

(Please read the descriptions on IM 01E22A01-01EN.)

(7) Product Disposal

(Please read the descriptions on IM 01E22A01-01EN.)

(8) Power Supply

- **Power Supply Code 1**:
  - AC Type: Rated Power Supply: 100 to 240 V AC, 50/60 Hz
  - DC Type: Rated Power Supply: 100 to 120 V DC

- **Power Supply Code 2**:
  - AC Type: Rated Power Supply: 24 V AC, 50/60 Hz
  - DC Type: Rated Power Supply: 24 V DC

- **Power Consumption**:
  - Integral Type: 13W
  - Remote Type (with AXG4A): 13W

(9) microSD Card

(Please read the descriptions on IM 01E22A01-01EN.)
1.2 Warranty
(Please read the descriptions on IM 01E22A01-01EN.)

1.3 Combination for Remote Sensor and Remote Transmitter
(Please read the descriptions on IM 01E22A01-01EN.)
2. Receiving and Storage

When the product is delivered, check visually that no damage has occurred during transportation. Also check that all flowmeters mounting hardware shown below is included.

### Integral Flowmeter

<table>
<thead>
<tr>
<th>Model</th>
<th>Part name</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXG###</td>
<td>Centering Device (*1)</td>
<td>1 set</td>
</tr>
<tr>
<td></td>
<td>Blanking Plug</td>
<td>1 pcs.</td>
</tr>
<tr>
<td></td>
<td>Gasket (sensor side) (*2)</td>
<td>2 sheets</td>
</tr>
</tbody>
</table>

### Remote Transmitter

<table>
<thead>
<tr>
<th>Model</th>
<th>Part name</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXG4A</td>
<td>Mounting Bracket</td>
<td>1 set</td>
</tr>
<tr>
<td></td>
<td>Blanking Plug</td>
<td>1 pcs.</td>
</tr>
</tbody>
</table>

*1: When the following process connection codes (wafer type) have been selected, the centering device is attached. AA1, AA2
*2: When the following code is specified for “Lining”, gaskets (sensor side) are attached. The gaskets (customer pipe side) should be prepared by customers. - Lining code: C

2.1 Model and Specifications Check

As shown in Figure 2.1 to Figure 2.3, the model, suffix code, serial number, meter factor, fluid specification, and device information are found on the name plate located on the outside of the housing. And, this product can check their information from parameters. Read the user’s manual of applicable communication type as listed in Table 1.1 for checking device information from parameters.

When checking the matching of model and specification you ordered, see the applicable general specifications as listed in Table 1.1.

Be sure you have the model code and serial number available when contacting YOKOGAWA.

The model and specification described on the nameplate are those of the state at the time of shipment.

Note: Description on the nameplate
- Made in _______: Country of origin
- COMB No.: Serial number of the combined remote sensor or remote transmitter

---

2.2 Storage Precautions

(Please read the descriptions on IM 01E22A01-01EN.)
3. Installation

(Please read the descriptions on IM 01E22A01-01EN.)
4. Wiring

4.1 Wiring Precautions
(Please read the descriptions on IM 01E22A01-01EN.)

4.2 Cables
(Please read the descriptions on IM 01E22A01-01EN, and add the following description.)

4.2.5 Recommended Cable for EtherNet/IP communication
STP (Shielded Twist Pair) with CAT5e, CAT6 or more.

Note: Ethernet cable with Protective boot is not fit. Ensure that protective boot is not equipped.

4.3 Cable Entries
(Please read the descriptions on IM 01E22A01-01EN.)

4.4 Connecting to External Products of Integral Flowmeter and Remote Transmitter

4.4.1 Wiring Precautions for Power Supply Cables
When connecting to the power supply, observe the points below. Failure to comply with these warnings may result in an electric shock or damage to the product.

WARNING
• Ensure that the power supply is off in order to prevent electric shocks.
• When opening the cover, wait for more than 20 minutes after turning off the power.
• Ensure the protective grounding terminal is grounded before turning on the power.
• Terminate all the cable finish with round or rod shaped crimp terminal (depending on the shape of the terminal block) with insulation cover, and connect them reliably.
• Install an external switch or circuit breaker as a means to turn the power off (capacitance: 15A, conforming to IEC60947-1 and IEC60947-3). Locate this switch either near the product or in other places facilitating easy operation. Affix a “Power Off Equipment” label to this external switch or circuit breaker.

WARNING
For explosion protection type products, please be sure to read the user’s manual of the applicable explosion protection type as listed in Table 1.1.
Wiring Procedure
1. Check the product’s power is off, then remove the terminal cover (transparent).
2. Wire the power supply cable and the functional grounding cable to the power supply terminals.
3. Install the terminal cover.

4.4.2 DC Power Connection
(Please read the descriptions on IM 01E22A01-01EN.)

4.4.3 Grounding
(Please read the descriptions on IM 01E22A01-01EN.)

4.4.4 Connecting to External Products
(Please read the descriptions on IM 01E22A01-01EN.)

4.4.5 Wiring Procedures

(1) For Integral Flowmeter and AXG4A Remote Transmitter
(Please read the descriptions on IM 01E22A01-01EN.)

(2) Terminal Configuration
(Integral Flowmeter and AXG4A Transmitter)

When the cover is removed, the connection terminals will be visible. The description of the terminal symbols is shown in the following Figure.

<To be wired to Power Supply and PORTs>

M4 Screw Type for EtherNet/IP communication
Communication and I/O code: P0

<table>
<thead>
<tr>
<th>Terminal Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorting Screw</td>
<td>(Need to be fixed for normal operation)</td>
</tr>
<tr>
<td>Functional Grounding</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
</tr>
<tr>
<td>Ethernet port (RJ-45, 2 ports)</td>
<td></td>
</tr>
<tr>
<td>Protective Grounding</td>
<td></td>
</tr>
<tr>
<td>(Inside and outside of the terminal box)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.4.2 Terminal Configuration (Integral Flowmeter and AXG4A Remote Transmitter)
Wiring Procedure for Ethernet communication cable

1) Push the cable through the cable entry.

2) Connect to the RJ-45 connector.

3) Plug in the RJ-45 connector.

The same procedure for PORT2.

AXG4A Remote Transmitter:

<To be wired to Remote Sensor>

![AXG4A Remote Transmitter Diagram]

<table>
<thead>
<tr>
<th>Terminal Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>Flow Signal Input</td>
</tr>
<tr>
<td>SB</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>EX1</td>
<td>Excitation Current Output</td>
</tr>
<tr>
<td>EX2</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.4.3 Terminal Configuration (AXG4A Remote Transmitter)
5. Basic Operating Procedures

5.1 Operation by Display unit
(Please read the descriptions on IM 01E22A01-01EN.)

5.2 Display and Basic Configuration
(Please read the descriptions on IM 01E22A01-01EN.)

5.3 Display Mode and Setting Mode
The device runs in the Display Mode when the power is turned on. For check or change of parameters, the Setting Mode must be activated. The following procedure explains how to change to the Setting Mode. For the function of IR switches, read Subsection 5.2.1.

[Procedure]
1) Keep touching [SET] switch for few seconds.

2) Touch [SFT] + [INC] switches.

3) "No" is selected.
   Touch [INC] switch and select "Yes".

4) Touch [SET] switch.

5) "Yes" is blinking.
   Touch [SET] switch again.

6) The screen moves to the menu of Operation Level.

7) Select an appropriate operation level by moving the cursor with [INC] or [DEC] switch.
   Passcode is not necessary for "Operator". For "Maintenance" and "Specialist", passcode is necessary for each. For passcode setting, [SFT] is for position change, and [INC] is for number, then twice [SET] is for entry completion.
   The default passcode at the factory shipment is set to "0000".

8) When the Operation Level is determined, the screen moves to "Device setup" as the Setting Mode where parameters can be configured.

9) After completing parameter setting, push [ESC] switch. The screen returns to the Display Mode.
5. Basic Operating Procedures

[Passcode Confirmation and Change]
The confirmation and change of the passcode are allowed only by parameter setting from the display unit.

Display Menu Path:
Device setup ► Detailed setup ► Access cfg ► Chg mainte
Device setup ► Detailed setup ► Access cfg ► Chg special

(1) Passcode for “Maintenance” operation level
To change the passcode (Maintenance code), “Maintenance” or “Specialist” as the operational level is required.

(2) Passcode for “Specialist” operation level
To change the passcode (Specialist code), “Maintenance” or “Specialist” as the operational level is required.

IMPORTANT

When parameters are changed in the Wizard of Easy setup, “Setting download” in the menu of each parameter must be executed after parameter is changed. Without the execution, any parameter changed is not stored into the device.

NOTE

If 10 minutes past without operation in the Setting Mode, the screen goes back to the Display Mode.

5.4 Parameter Setting from Display Panel
(Please read the descriptions on IM 01E22A01-01EN.)

5.5 microSD Card Setting
(Please read the descriptions on IM 01E22A01-01EN.)

5.6 BRAIN Configuration Tool
(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)

5.7 HART Configuration Tool
(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)

5.8 Modbus Configuration Tool
(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)
5.9 FOUNDATION fieldbus Configuration Tool

(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)

5.10 EtherNet/IP Configuration Tool

The Ethernet configuration can connect with this product from any connection point of RJ-45. Port 1 and/or Port 2 can be used for plant operation and maintenance of Ethernet communication.

Product code/name and EDS file for EtherNet/IP

EDS file is required to connect host application tool for EtherNet/IP (e.g. PLC). If EDS is not installed in the host tool, download the correct EDS file from ODVA official web site and install it, or contact respective vendor of the host tool.

EDS file is separated by the Product code/name. Confirm the following table to install the correct EDS file.

**AXG4A**

<table>
<thead>
<tr>
<th>Vendor ID</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor Name</td>
<td>Yokogawa Electric Corporation</td>
</tr>
<tr>
<td>Product Code</td>
<td>201</td>
</tr>
<tr>
<td>Product Name</td>
<td>AXG4A Magnetic Flowmeter</td>
</tr>
</tbody>
</table>

**NOTE**

For maintenance (temporary connection) purpose, connect RJ-45 Ethernet cable without passing though the cable hole of device.

Web page can be used for configuration of EtherNet/IP device. See IM 01E21A02-06EN for details.

**Supported software**

<table>
<thead>
<tr>
<th>Operation systems</th>
<th>Microsoft Windows 7 or higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web browser</td>
<td>Internet explorer 8 or higher</td>
</tr>
<tr>
<td></td>
<td>Google chrome</td>
</tr>
<tr>
<td></td>
<td>Microsoft Edge</td>
</tr>
</tbody>
</table>
6. Operation

6.1 Pre-operation Zero Adjustment
(Please read the descriptions on IM 01E22A01-01EN.)

6.2 Zero Adjustment from Display Unit
(Please read the descriptions on IM 01E22A01-01EN.)

6.3 Hardware Switch Setting

**NOTE**
The integral type is explained as an example. Pay same attention to the AXG4A remote transmitter.

6.3.1 Integral Type and AXG4A Remote Transmitter

**IMPORTANT**
- Removing and installing the cover are necessary for hardware switches. Perform removing and installing the cover as described in Section 3.6 of IM 01E22A01-01EN. When opening the cover, wait for more than 20 minutes after turning off the power. This work must be carried out by the trained personnel having knowledge of safety standard.
- To preserve the safety, do not touch the electrical circuit and the cables except the setting switches.
- When installing the cover, in order to contact the housing and the cover, be sure to screw it firmly into the housing without any space between them.

(1) Remove the cover.
(2) While holding the display by hand, loosen the two mounting screws.
(3) While holding the display by hand (careful for connecting cable), set the switches. Never remove connector in this case.

(4) Taking care not to entangle the cables, tighten the two screws on the display.
(5) Install the cover.

**WARNING**
To prevent electric shock and maintain performance, do not remove the safety cover.

**NOTE**
The hardware switches are adjacent. Special care should be taken when making switch settings. Accordingly, special care should be taken when making switch settings.
Setting of Write Protect Switch

The write protect function is to prevent the overwriting of parameters. Write protection can be carried out using either the write protection switch (SW1-2) (See Figure 6.3.1) or software function with parameter setting. If either of these items is activated, the overwriting of parameters will be prohibited.

Table 6.3.1 Write protect switch (SW1-2)

<table>
<thead>
<tr>
<th>Position of Switch</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 L2 ON OFF</td>
<td>Write protect: ON</td>
</tr>
<tr>
<td></td>
<td>Parameters cannot be overwritten</td>
</tr>
<tr>
<td>H1 L2 ON OFF</td>
<td>Write protect: OFF</td>
</tr>
<tr>
<td></td>
<td>Parameter can be overwritten.</td>
</tr>
</tbody>
</table>

NOTE

- If the hardware switch is set to “ON”, the condition of preventing parameter overwriting kept until the switch is set to “OFF”.
- For the software write protect, read the user’s manual of applicable communication type as listed in Table 1.1.

Setting of Address Switch (ADDRESS)

The device IP address can be set using either the address switch (ADDRESS) (See Figure 6.3.2) or software parameters.

The Address Switch (ADDRESS) is used to set the 4th octet (8 bits) of the IP address. The 1st, 2nd and 3rd octets of the IP address are set by software parameters. The 4th octet of the address which is set by this switch (ADDRESS) is enabled when the Enable hardware switch (SW3-1) is set to ON. When the Enable hardware switch (SW3-1) is set to OFF, the 4th octet of the IP address set by this switch (ADDRESS) is disabled, and the 4th octet of the address set by software parameter is enabled.

Table 6.3.2 Address switch

<table>
<thead>
<tr>
<th>Position of Switch</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 6 5 4 3 2 1 0</td>
<td>Setting range: 1 to 254</td>
</tr>
<tr>
<td></td>
<td>If all switches are set to “OFF” or “ON”, the device IP address (4th octet) is automatically converted to 210.</td>
</tr>
</tbody>
</table>

Setting example:
If only the address switch “position 7” is set to 1, the device IP address (4th octet) is 128.

6.3.2 AXG1A Remote Transmitter

(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)

6.3.3 AXFA11 Remote Transmitter

(Not applicable for EtherNet/IP communication type. Please read the descriptions on IM 01E22A01-01EN if necessary.)
7. Errors and Countermeasures (Display unit)

- System Alarm
(Please read the descriptions on IM 01E22A01-01EN, and add the following description.)

<table>
<thead>
<tr>
<th>NE107 Status</th>
<th>Error Message</th>
<th>Error Description</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>200 Opt bd comm ERR1</td>
<td>Communication error of EtherNet/IP board was detected.</td>
<td>Contact Yokogawa service center.</td>
</tr>
<tr>
<td>F</td>
<td>201 Opt bd comm ERR2</td>
<td>Communication error of EtherNet/IP board was detected.</td>
<td>Contact Yokogawa service center.</td>
</tr>
</tbody>
</table>

- Process Alarm
(Please read the descriptions on IM 01E22A01-01EN.)

- Setting Alarm
(Please read the descriptions on IM 01E22A01-01EN.)

- Warning
(Please read the descriptions on IM 01E22A01-01EN.)

- Information
(Please read the descriptions on IM 01E22A01-01EN.)
Revision Information

- Title: ADMAG TI Series AXG Magnetic Flowmeter EtherNet/IP Communication Type Installation Manual Difference to IM 01E22A01-01EN
- Manual No.: IM 01E21A01-03EN-A

<table>
<thead>
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<th>Edition</th>
<th>Date</th>
<th>Page</th>
<th>Revised Item</th>
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</thead>
<tbody>
<tr>
<td>1st</td>
<td>Mar. 2020</td>
<td>—</td>
<td>New publication</td>
</tr>
</tbody>
</table>