User's Manual

Magnetic Flowmeter Verification Tool

R01.03

IM 01E21A04-01EN

YOKOGAWA
Yokogawa Electric Corporation

IM 01E21A04-01EN
2nd Edition

Magnetic Flowmeter Verification Tool

IM 01E21A04-01EN 2nd Edition

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1. Introduction

This user's manual provides instructions on the usage of "FSA130 Magnetic Flowmeter / Vortex Flowmeter Verification Tool" and the operation of "Magnetic Flowmeter Verification Tool".

The Magnetic Flowmeter Verification Tool is a software tool for health check of the ADMAG TI Series AXG/AXW magnetic flowmeter and magnetic flowmeter CA series of HART communication type. The functions of the tool are incorporated in the DTM file of the AXG/AXW/CA magnetic flowmeter, which operates on FieldMate "Versatile Device Management Wizard". Depending on the check items, AM012 "Magnetic Flowmeter Calibrator", CA500 "Multi-Function Process Calibrator", and/or MY600 "Insulation Resistance Tester" are used.

Read the documents in Table 1.1.1 to understand the related products when operating the Verification Tool. The document can be downloaded from the website of YOKOGAWA.

Website address:
https://www.yokogawa.com/fld/doc/
https://tmi.yokogawa.com/library/

Table 1.1.1 List of Document

Product	Document Title	Document Number
AXG/AXW/CA Magnetic Flowmeter	Magnetic Flowmeter Read Me First	IM 01E21A21-01Z1
AXG/AXW Magnetic Flowmeter	Magnetic Flowmeter Read Me First (Optional Code EC)	IM 01E21A11-01EN
	ADMAG TI Series AXG, AXW Electromagnetic Flowmeter HART Communication Type	IM 01E21A02-02EN
AXG Magnetic Flowmeter	ADMAG TI Series AXG Magnetic Flowmeter Installation Manual	IM 01E22A01-01EN
	ADMAG TI Series AXG Magnetic Flowmeter Maintenance Manual	IM 01E22A01-02EN
	ADMAG TI Series AXG Magnetic Flowmeter General Specifications	GS 01E22A01-01EN
AXW Magnetic Flowmeter	ADMAG TI Series AXW Magnetic Flowmeter Installation Manual	IM 01E24A01-01EN
	ADMAG TI Series AXW Magnetic Flowmeter Maintenance Manual	IM 01E24A01-02EN
	ADMAG TI Series AXW Magnetic Flowmeter [Size: 25 to 400 mm (1 to 16 in.)] General Specifications	GS 01E24A01-01EN
	ADMAG TI Series AXW Magnetic Flowmeter [Size: 500 to 1800 mm (20 to 72 in.)] General Specifications	GS 01E25D11-01EN
AXG1A Magnetic Flowmeter Remote Transmitter	ADMAG TI Series AXG1A Electromagnetic Flowmeter Remote Transmitter HART Communication Type	IM 01E22C02-02EN
	ADMAG TI Series AXG1A Magnetic Flowmeter Remote Transmitter	GS 01E22C01-01EN
Magnetic Flowmeter CA Series	Magnetic Flowmeter CA Series Installation Manual	IM 01E40A01-01EN
	Magnetic Flowmeter CA Series Maintenance Manual	IM 01E40A01-02EN
	Magnetic Flowmeter CA Series HART Communication Type	IM 01E40A02-01EN
	Magnetic Flowmeter CA Series General Specifications	GS 01E40A01-01EN
Magnetic Flowmeter Calibrator	Model AM012 Magnetic Flowmeter Calibrator	IM 1E6K2-E
	Model AM012 Magnetic Flowmeter Calibrator General Specifications	GS 1E6K2-E
FieldMate	FieldMate Versatile Device Management Wizard	IM 01R01A01-01E
	FieldMate Operational Precaution	IM 01R01A01-91E
	FieldMate Wizard Getting Started	IM 01R01A04-01E
	FieldMate Versatile Device Management Wizard General Specifications	GS 01R01A01-01E

Verification Tool	Magnetic Flowmeter Verification Tool (this manual)	IM 01E21A04-01EN
	FSA130 Magnetic Flowmeter / Vortex Flowmeter Verification Tool General Specifications	GS 01E21A04-01EN
Measuring Instrument	CA500, CA550 Multi-function Process Calibrator User's Manual	IM CA500-01EN
	MY600 Insulation Resistance Tester	IM MY600-01EN
	Insulation and Earth Testers Brochure (including specifications)	Bulletin MY-E

1.1 About This Manual

- This manual should be provided to the end user.
- Before using the Magnetic Flowmeter Verification Tool, read this manual thoroughly to comprehend its contents.
- The contents of this manual may be changed without prior notice.
- All rights are reserved. 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 material, including, but not limited to, implied warranties of merchantability and suitability for a particular purpose.
- If any question arises or errors are found, or if any information is missing from this manual, inform the nearest YOKOGAWA sales office.
- All reasonable effort has been made to ensure the accuracy of the contents of this manual. However, if any errors or omissions are found, please inform Yokogawa.
- Yokogawa assumes no responsibilities for this product except as stated in the warranty.
- Please note that this user's manual may not be revised for any changes in specifications, construction changes or operating part changes that are not considered to affect function or performance.
- If the customer or any third party is harmed by the use of this product, Yokogawa assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.
- This manual describes the operation of the Magnetic Flowmeter Verification Tool which operates on FieldMate. For the installation, operation, and function of FieldMate, please read the FieldMate user's manual.
- The content of this manual corresponds to FieldMate R3.04.20 and Device Files R3.09.22. Read the manual of FieldMate on how to confirm the revision. Also, read the latest version manual of FieldMate for possible changes in its operation and function.

1.2 Safety and Modification Precautions

- The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific WARNINGS given elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Yokogawa assumes no liability for the customer's failure to comply with these requirements. If this product is used in a manner not specified in this manual, the protection provided by this product may be impaired.
- Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this product by the customer.
- The following safety symbols are used in this user's manual and on 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 essential information for understanding operations and features.

1.3 Trademarks

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- In case of use on FieldMate or PRM: the same operating environment condition of FieldMate or PRM.
- In other cases: the operating environment conditions defined on the readme file of “Yokogawa Device DTM Library” which is contained in the Licensed Software when Licensee download it from Website.

b) use the Licensed Software on a single computer by single user at same time;

c) use the Licensed Software solely for Licensee’s internal operation use.
For the avoidance of doubt, unless otherwise agreed or provided by Licensor, Licensee is prohibited to use the Licensed Software on any unauthorized hardware via the network.

2 Warranty

(1) Licensor warrants that the media on which the Licensed Software is provided is free of defects in materials and workmanship for a period of 90 days from the installation and shall replace the defective media free of charge.

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The license fee paid by the Licensee in relation to the Licensed Software hereunder shall be non-refundable unless otherwise expressly provided herein.

4 Reference

Unless otherwise provided in this Agreement, the DTM Library Software License Agreement provided by Licensor or accompanying the DTM Library Software (“DTM Library Agreement”) shall apply to the license of the Licensed Software mutatis mutandis, as if the Licensed Software were the DTM Library Software. If there are any inconsistencies between this Agreement and DTM Library Agreement, this Agreement shall prevail.

1.5 Package

Checking the Contents of the Package:

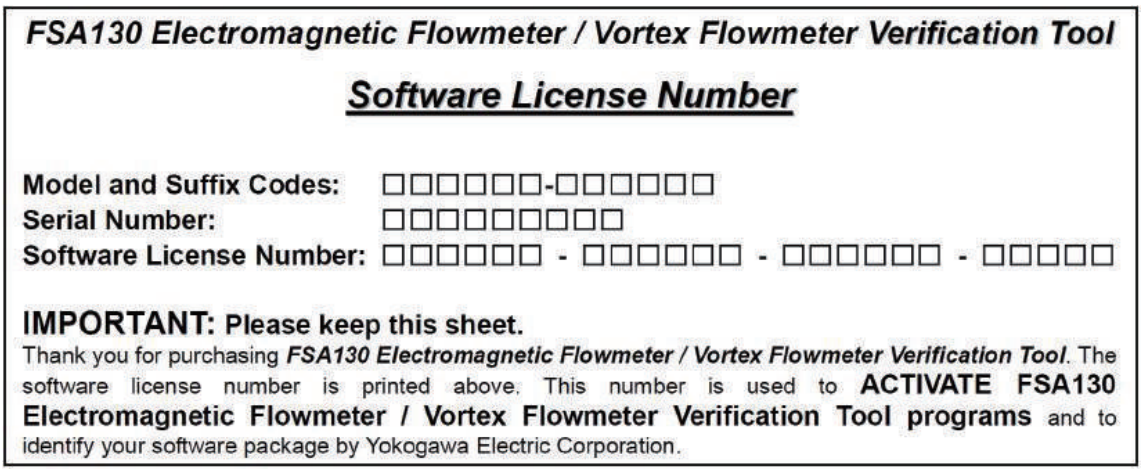
Open the package of “FSA130 Magnetic Flowmeter/Vortex Flowmeter Verification Tool License Number” and check the following prior to use. If some items are missing, or there is a problem with the appearance, contact the place of purchase.

Contents of the package:

- License Sheet
- USB FieldMate Modem (when optional code B is selected)

Note: Read user’s manual for FieldMate on the USB FieldMate Modem.

The form of the License Sheet is as below. The “Software License Number” is used to activate the Verification Tool. Read Section 4.1 on how to enter the license number.



FSA130 Electromagnetic Flowmeter / Vortex Flowmeter Verification Tool

Software License Number

Model and Suffix Codes: □□□□□□-□□□□□□
Serial Number: □□□□□□□□□
Software License Number: □□□□□□ - □□□□□□ - □□□□□□ - □□□□□

IMPORTANT: Please keep this sheet.
Thank you for purchasing ***FSA130 Electromagnetic Flowmeter / Vortex Flowmeter Verification Tool***. The software license number is printed above. This number is used to **ACTIVATE FSA130 Electromagnetic Flowmeter / Vortex Flowmeter Verification Tool programs** and to identify your software package by Yokogawa Electric Corporation.

Figure 1.5.1 Software License Number

2. General Description

The Magnetic Flowmeter Verification Tool operates on the FieldMate R3.04.20 or later, and Device Files R3.09.22 or later.

The performance of the AXG/AXW/CA magnetic flowmeter can be verified by checking several items and this tool provides a certificate that the device (the AXG/AXW/CA magnetic flowmeter) is operating properly.

Table 2.1.1 Applicable AXG/AXW/CA Magnetic Flowmeter

	Model		Specification	
Remote Type	Sensor	Transmitter	Communication	Size
	AXG□□□(*1)	AXG4A, AXG1A	HART	2.5 to 400 mm (0.1 to 16 in.)(AXG4A) 2.5 to 500 mm (0.1 to 20 in.)(AXG1A)
	AXW□□□(*2)	AXW4A, AXG1A	HART	25 to 1000 mm (1 to 40 in.)
	AXW□□□G or AXW□□□W(*3)	AXW4A, AXG1A	HART	500 to 1000 mm (20 to 40 in.)
Integral Type	AXG□□□(*4)		HART	2.5 to 400 mm (0.1 to 16 in.)
	AXW□□□(*2)		HART	25 to 400 mm (1 to 16 in.)
	AXW□□□G(*3)		HART	500 to 1000 mm (20 to 40 in.)
	CA□□□□(*5)		HART	15 to 200 mm (0.5 to 8 in.)

*1: "□□□" means any of the following.
002, 005, 010, 015, 025, 032, 040, 050, 065, 080, 100, 125, 150, 200, 250, 300, 350, 400, 500
*2: "□□□" means any of the following.
025, 032, 040, 050, 065, 080, 100, 125, 150, 200, 250, 300, 350, 400
*3: "□□□" means any of the following.
500, 600, 700, 800, 900, 10L
*4: "□□□" means any of the following.
002, 005, 010, 015, 025, 032, 040, 050, 065, 080, 100, 125, 150, 200, 250, 300, 350, 400
*5: "□□□□" means any of the following.
0015, 0025, 0040, 0050, 0080, 0100, 0150, 0200

When the communication specification is HART, the model and suffix code is as follows.

- Integral Type Flowmeter
  AXG □□□-□□□□□□□□□□□□□□□-□■□□□□ ■: J
  AXW□□□-□□□□□□□□□□□□□□□-□■□□□□ ■: J
  AXW□□□G- ■□□□□□-□□□□-□□□ ■: E, J, or L
  CA□□□□-□□□□□□□□□□□□□□□-□■□□□□ ■: J

- Remote Transmitter
  AXG4A- □□□□□□□■□□ ■: J
  AXW4A-□□□□□□□■□□ ■: J

Two Verification Modes (Standard and Enhanced):

The Verification Tool has two modes, Standard Verification (referred to as Standard VF) and Enhanced Verification (referred to as Enhanced VF). The former is performed in the device itself, and the latter utilizes other equipment to be connected with the device.

*: VF stands for "Verification".

Data Storage and Report Printing:

This tool stores data of verification result (verification data) in a database in an organized manner, and can be used to print a Verification Report that has not only the individual check item result but also the overall status of "Passed" or "Failed".

2.1 System Configuration

The following products, instruments and software are necessary to use the Verification Tool.

- ADMAG TI series AXG/AXW magnetic flowmeter or magnetic flowmeter CA series of HART communication type
- PC (with software below)

  - FieldMate (Versatile Device Management Wizard) R3.04.20 or later, and Device Fiels R3.09.22 or later.
- Printer (for printing verification report)
- USB FieldMate Modem
- AM012 calibrator for magnetic flowmeter (for Enhanced VF)
- CA500 Series Multi-Function Process Calibrator or equivalent(*) (for Enhanced VF)

  * : CA500 can be replaced by a general purpose instrument which has equivalent function to measure current value / pulse count and also to output current signal.
- MY600 Insulation Resistance Tester or equivalent (*) (for Enhanced VF)

  * : MY600 can replaced by other instrument which has equivalent function.

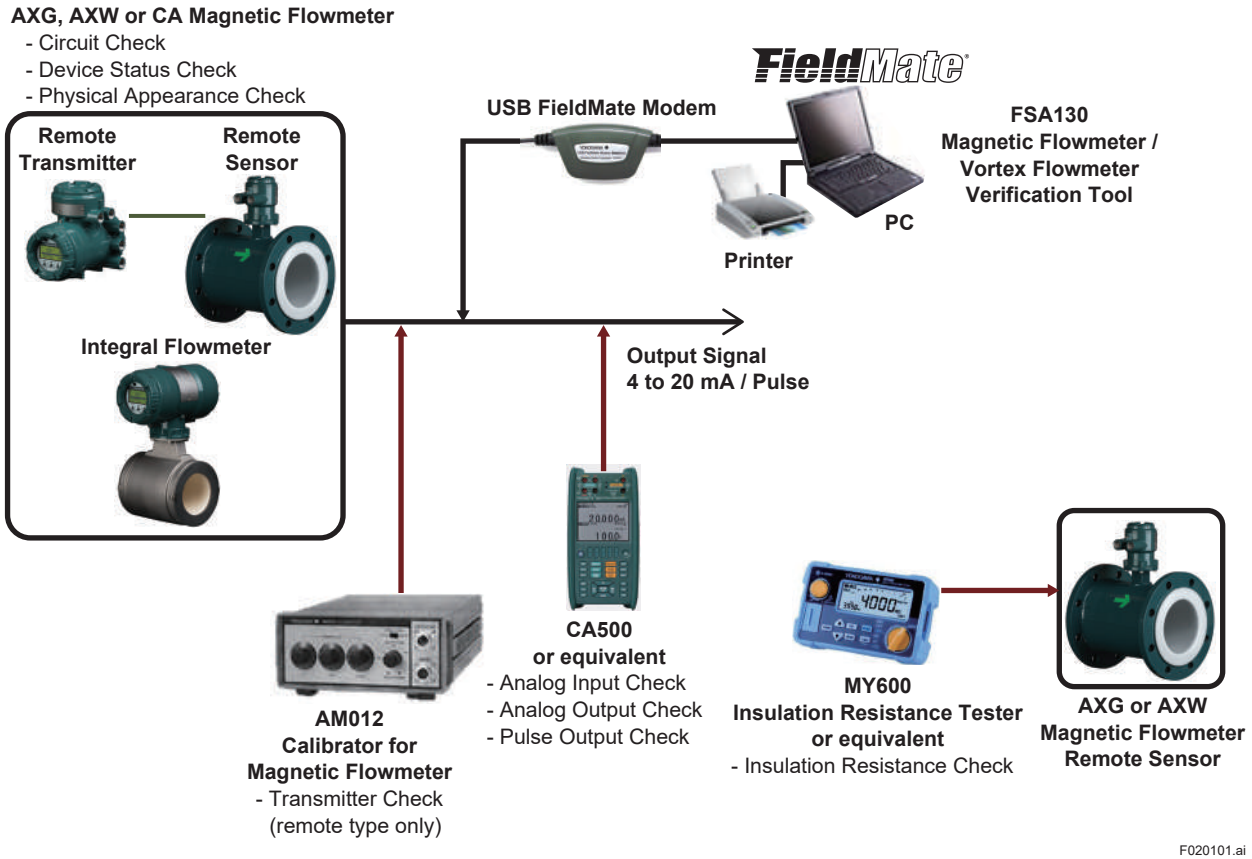


Figure 2.1.1 System Configuration

2.2 Check Item

The Verification Tool has two modes, the Standard Verification (Standard VF) and Enhanced Verification (Enhanced VF). It is always necessary to perform the Standard VF to obtain the overall verification result. See Table 2.2.1 for the whole check items.

1) **Standard VF**
This mode checks the status of magnetic, excitation, and calculation circuit of the device. It also checks the status of alarm occurrence, alarm history, cable connection status for flow signal and excitation current, display board and LCD, and physical appearance of the device. This mode is performed with the AXG/AXW/CA magnetic flowmeter being mounted onto process line filled with fluid.

2) **Enhanced VF**
This mode checks analog input/output, pulse output, transmitter accuracy, and insulation resistance of the coil and signal electrodes for further device diagnosis.

This mode is performed with the AXG/AXW/CA magnetic flowmeter being demounted from process line.

The necessary equipment is an AM012 calibrator to simulate the flow velocity signal for magnetic flowmeter, a CA500 Series Multi-Function Process Calibrator to measure current value and pulse count, and also to output current signal, and an MY600 insulation resistance tester to measure the coil and electrode resistance. The CA500 and MY600 can be replaced by other instrument which has equivalent function.

Table 2.2.1 Check Item

Mode	Check Item		Note
Standard Verification	Circuit	Magnetic Circuit	
		Excitation Circuit	
		Calculation Circuit	
	Device Status	Alarm Occurrence	
		Alarm History	
	Connection Status (*4)	Cable Connection Status	
	Indicator /B Check (Display Board Check) (*1)	Indicator Status (Display Status)	
		LCD display	Visual check by customer on LCD test mode
	Physical Appearance	Flow Sensor	Visual check by customer
		Transmitter	
Enhanced Verification	Analog Output (*2)		Check by using CA500 or equivalent
	Pulse Output (*2)		
	Analog Input (*2) (*4)		
	Transmitter (*3) (*4)		Check by using AM012
	Insulation Resistance (*3) (*4)	Coil	Check by using MY600 or equivalent
		Signal (Electrode)	

*1: For AXG/AXW/CA magnetic flowmeter with no display, this item does not appear on the Tool.
*2: Input/Output items which are not equipped with AXG/AXW/CA magnetic flowmeter are not displayed on the Tool.
*3: For integral type AXG/AXW magnetic flowmeter, these items do not appear on the Tool.
*4: For CA magnetic flowmeter, these items do not appear on the Tool.

2.3 Operation Procedure

The verification procedure starts by activating the Verification Tool function in DTM file operating on the FieldMate. Note that “Default” mode (read section 5.1) cannot be selected when activating the Verification Tool by Device Navigator.

There are two verification mode, Standard VF (read section 7.1) and Enhanced VF (read section 7.2). Always perform at least Standard Verification to get the overall verification result.

See the figure below for the operation procedure.

The number in the figure shows the chapter or section to be referred to.

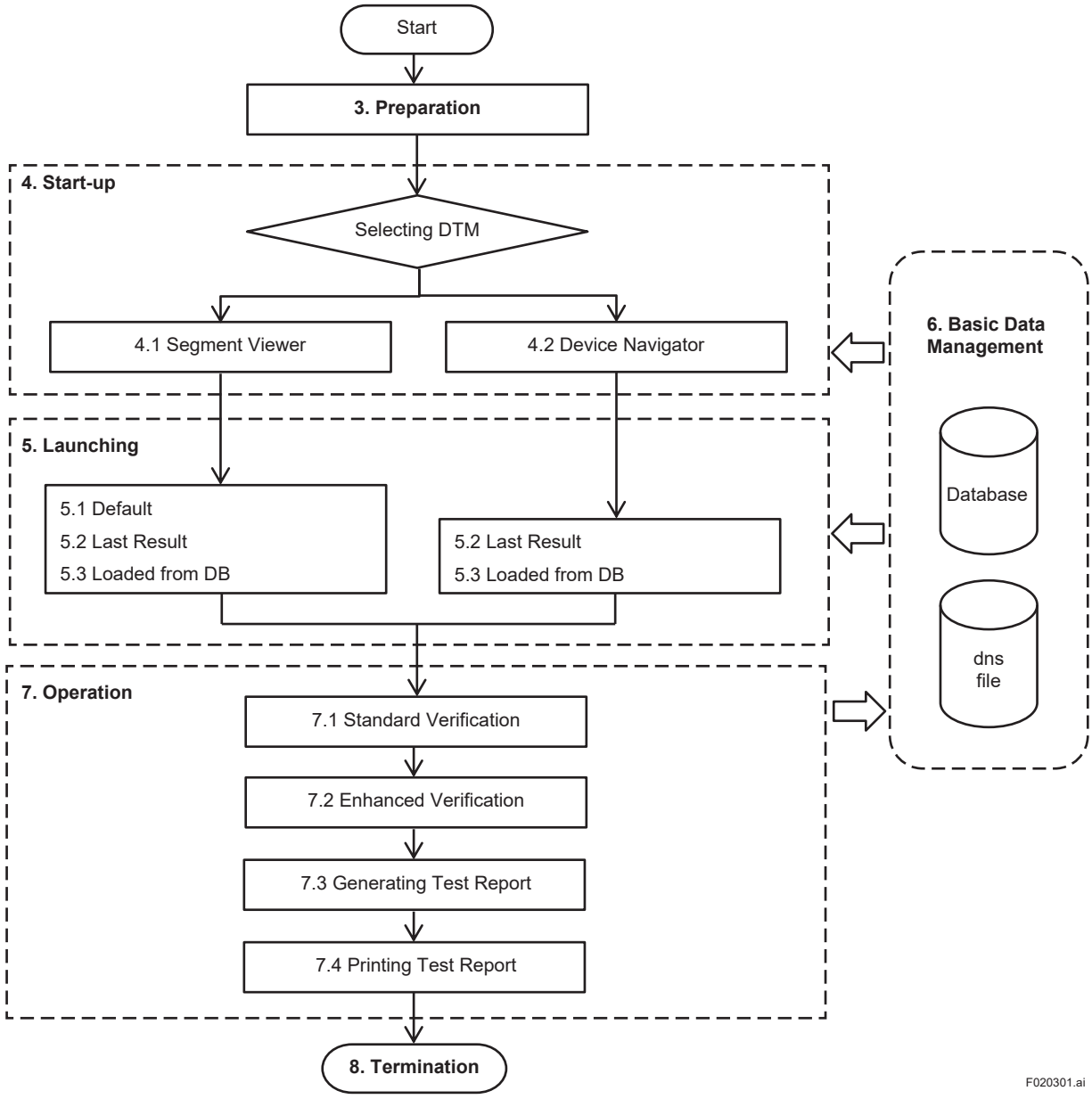


Figure 2.3.1 Operation Procedure

NOTE

If you interrupt the verification tool execution and once finished, please refer to chapter 6.1 and save the data to save the results until the interruption.

3. Preparation

WARNING

- Before operating the Verification Tool, the control loop must be set to manual mode in the host system.
- The following applications may cause inaccurate verification results:
  - Significantly low flow rate
  - Slurry fluid
  - Stray current
- When “unexpected issue (*1)” occurs while operating Verification Tool, follow Section 8.2 and Chapter 9.
- Set the automatic sleep mode of the computer off.

*1: “Unexpected issue” means disconnection between the AXG/AXW/CA magnetic flowmeter and PC:
- Physical disconnection between the AXG/AXW/CA magnetic flowmeter and PC
- Forced shutdown of PC
- Unforeseen power-off of the AXG/AXW/CA magnetic flowmeter

3.1 Installation of FieldMate

Read the manual for FieldMate including connection with the device. Bu sure to install DTM files of the AXG/AXW/CA magnetic flowmeter for HART communication in the installation procedure. If your FieldMate package does not include these DTM files, download them from the following website.

https://www.yokogawa.com/library/documents-downloads/software/yokogawa-dtm-hart/

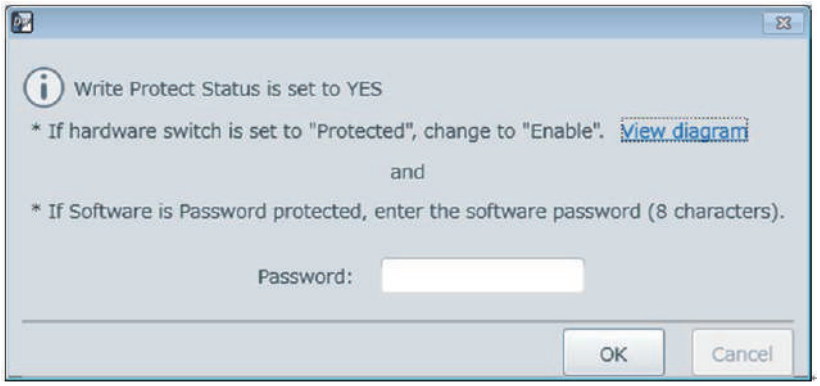
3.2 Disabling Write Protect Setting

Before performing verification, set the hardware write protection function switch of the device OFF if it is set to ON. Follow the installation manual of the AXG/AXW/CA magnetic flowmeter shown in 1.Introduction Table1.1.1 for the procedure.

If this was not done, the following window will appear during verification. Then set the hardware write protection switch OFF and click “OK” in Figure 3.2.1.

Also, if the software write protection function is enabled, the following window will appear during verification. In this case, enter the password for disabling the protection in the Password field of Figure 3.2.1, which has been set by customer, and click “OK”.

It is not necessary to disable the software write protection function in advance. By entering the password at the time the following window appears, the protection is automatically enabled again within 10 minutes after the verification is finished.



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Figure 3.2.1 Disabling Write Protect Setting

4. Start-up

The Verification Tool is one of the functions incorporated in the DTM operatable on the FieldMate.

There are two ways as below in the FieldMate to start up the verification Tool in the DTM.

- From “Segment Viewer”
- From “Device Navigator”

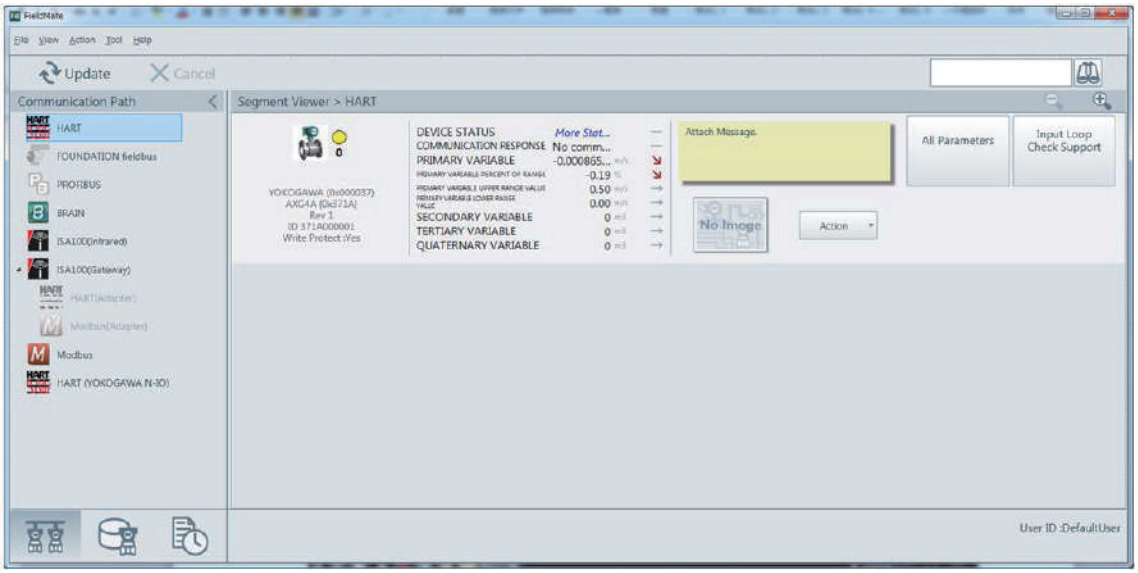
If the device is not connected with a PC where FieldMate is operating, the verification function cannot be performed. However, it is available to view verification data performed in the past when starting up the Verification Tool from “Device Navigator”.

NOTE

- To operate the Verification Tool in “online” mode of FieldMate, start up DTM from Segment Viewer.
- To perform the Standard VF, start up DTM from Segment Viewer
- Starting from Segment Viewer is available only when the device is connected. Device Navigator can be used to read past data even if the device is not connected.

4.1 Start-up from “Segment Viewer”

Step 1: Start up the FieldMate and select “Segment Viewer” window.

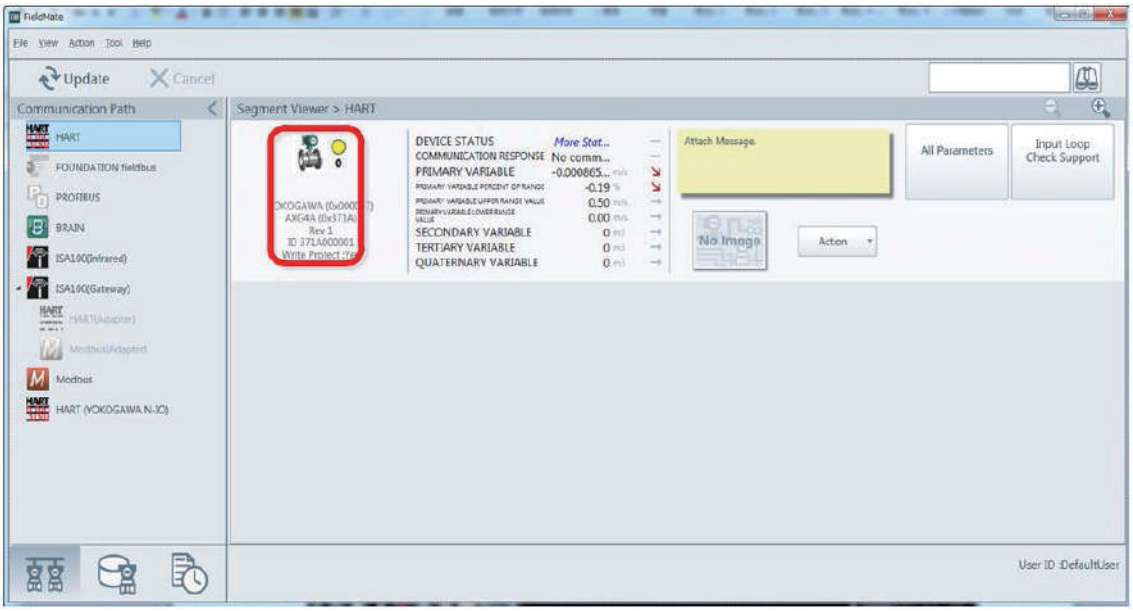


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Figure 4.1.1 Segment Viewer Window of the FieldMate

Step 2: Start up the DTM by any of the following four methods.

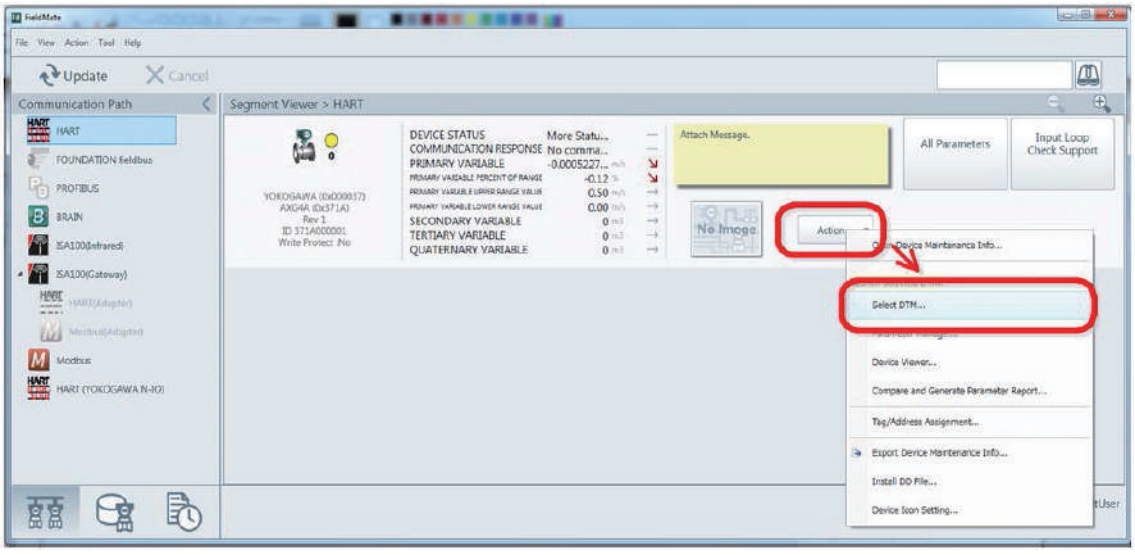
(Method 1) Double-click the device icon. Then go to Step 4.



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Figure 4.1.2 Starting Up DTM by Device Icon

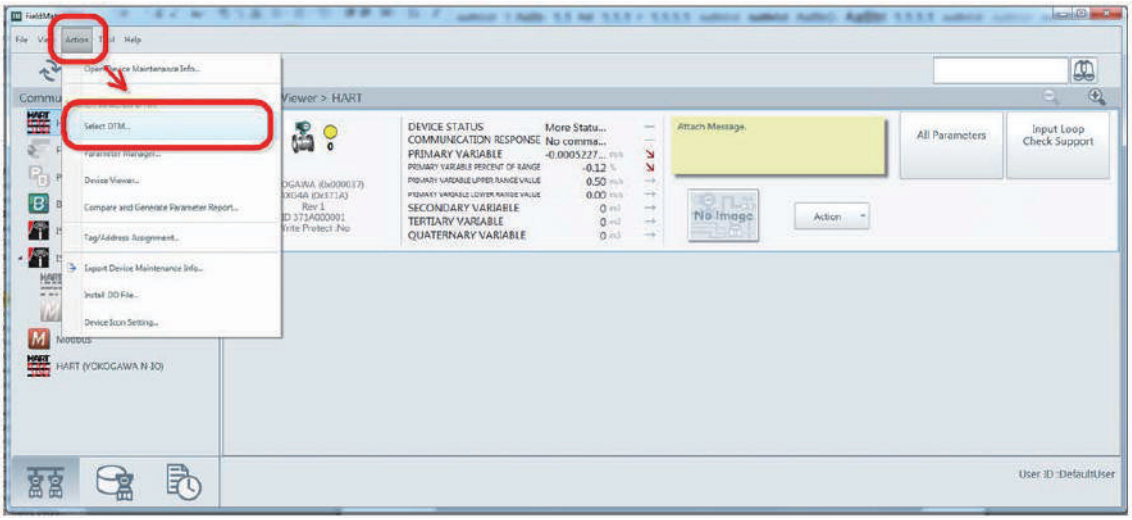
(Method 2) Click “Action” button and select “Select DTM…”.



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Figure 4.1.3 Starting Up DTM by Action Button

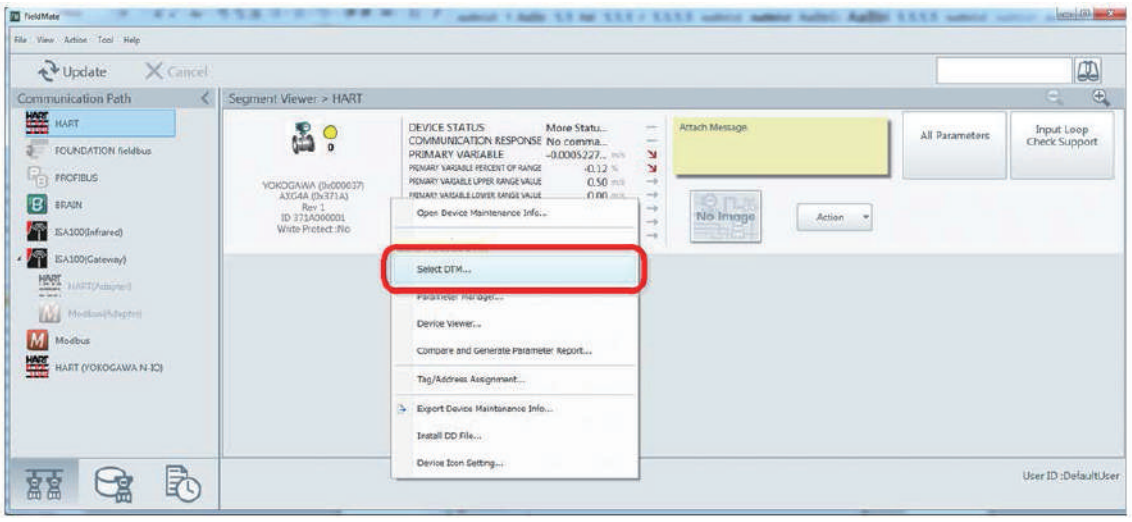
(Method 3) Click “Action” menu and select “Select DTM…”.



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Figure 4.1.4 Starting Up DTM by Action Menu

(Method 4) Right-click on the Segment Viewer window and select “Select DTM…”.



F040105.ai

Figure 4.1.5 Starting Up DTM by Right-clicking

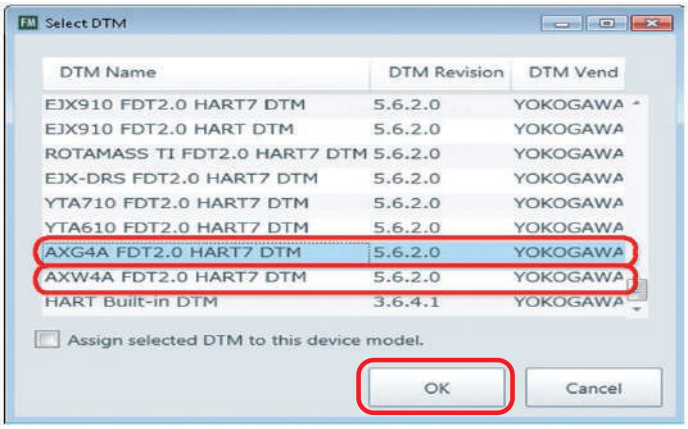
Step 3: Select one DTM for the model from the window and click “OK”.

For the AXG models, select AXG4A FDT2.0 HART7 DTM.

For the AXW models, select AXW4A FDT2.0 HART7 DTM.

For the AXG1A models, select AXG1A FDT2.0 HART7 DTM.

For the CA models, select CA FDT2.0 HART7 DTM.

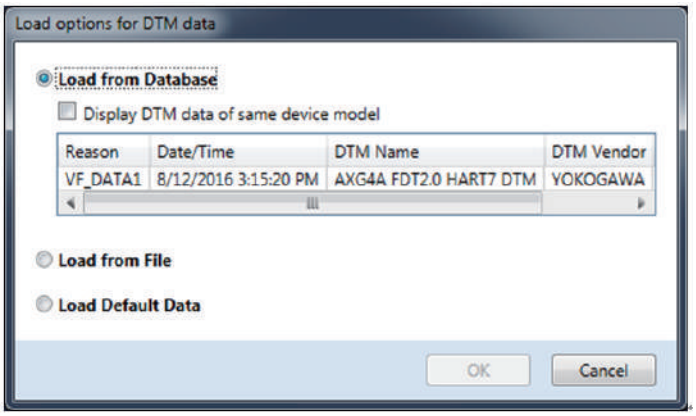


F040106.ai

Figure 4.1.6 Selecting Target DTM

Step 4: Select data to be loaded and click “OK”.

- Load from Database: Data saved in the database
- Load from File: Data saved as “dns” format file
- Load Default Data: Data of the currently connected device



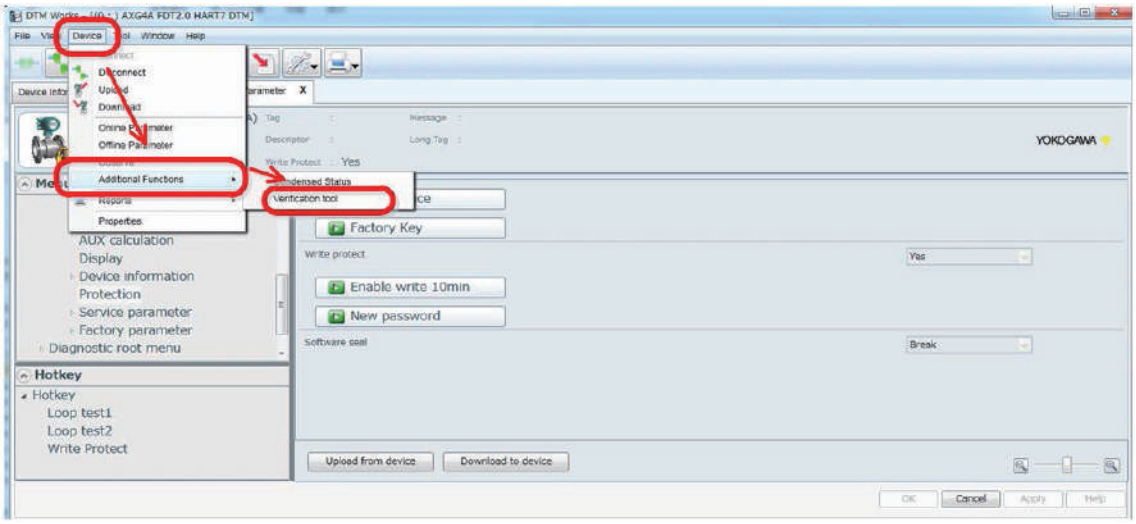
F040107.ai

Figure 4.1.7 Selecting Data to Load

Refer to the manuals for FieldMate on the database and “dns” format file.

When performing a new verification, select “Load Default Data”.

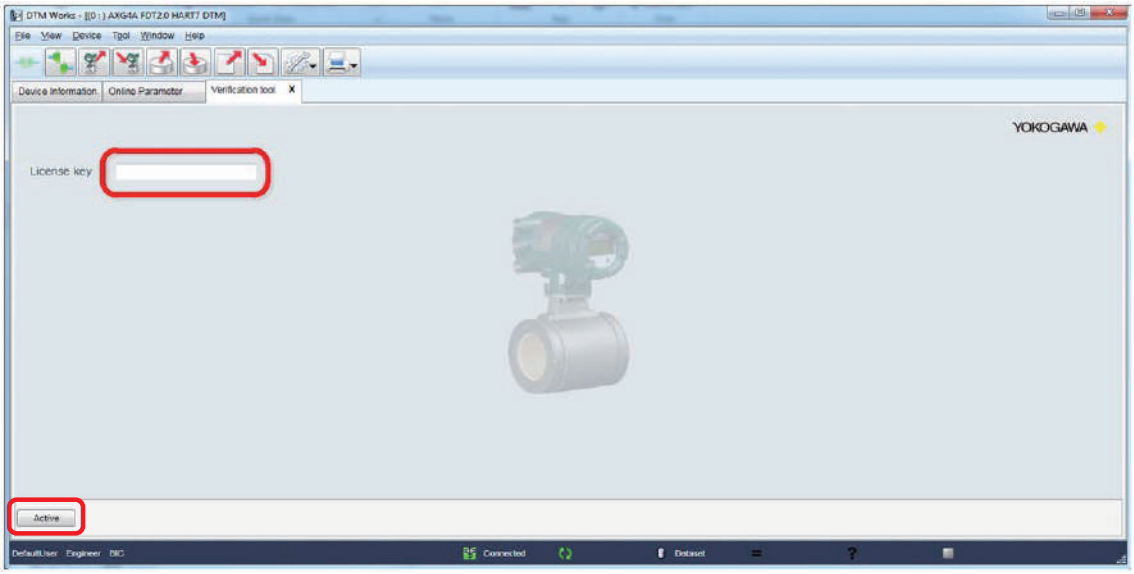
Step 5: Click “Device” menu, select “Additional Functions” and, select “Verification Tool”.



F040108.ai

Figure 4.1.8 Selecting Verification Tool

Step 6: Enter the license number with 23 letters excluding hyphen “-” and click “Active” button. This is only for the first start-up after installation. Refer to Section 1.5 for the license key.



F040109.ai

Figure 4.1.9 Entering License Key

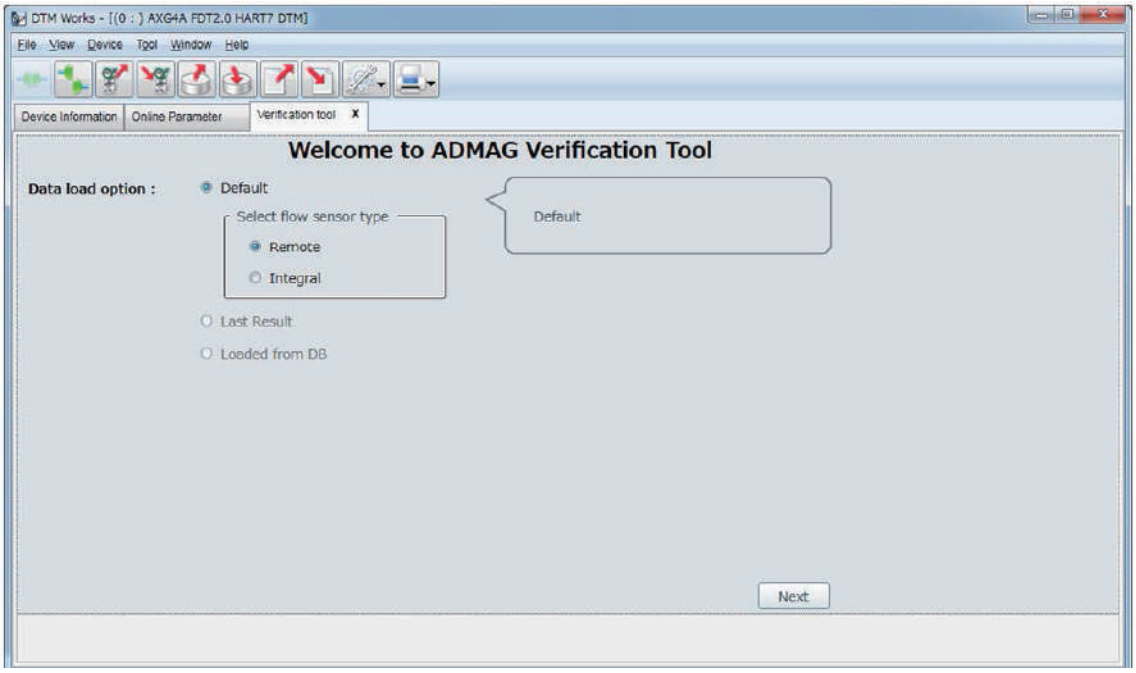
Step 7: The license agreement shown in Section 1.4 is displayed. Confirm it and click “OK”.



F040110.ai

Figure 4.1.10 Confirming License Agreement

Then the Verification Tool will start up as below.



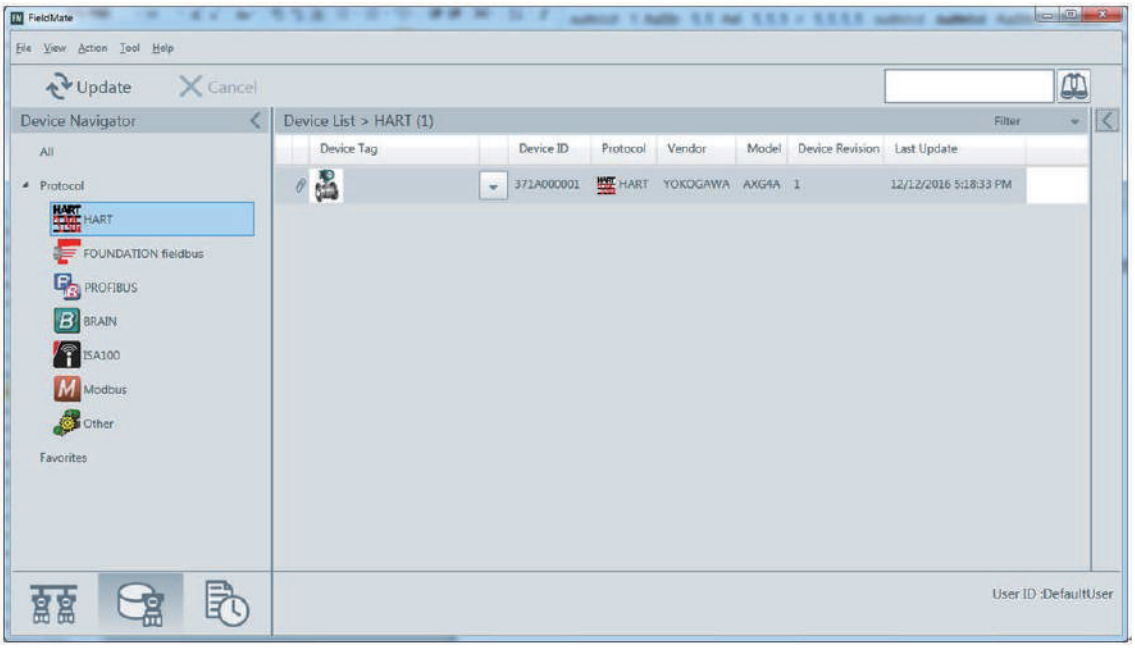
F040111.ai

For the CA models, “Select flow sensor type” is not displayed.

Figure 4.1.11 Verification Tool Start-up Window

4.2 Start-up from “Device Navigator”

Step 1: Start up the FieldMate and Select the Device Navigator window (bottom left of the screen). If it is not displayed, select the Λ mark.

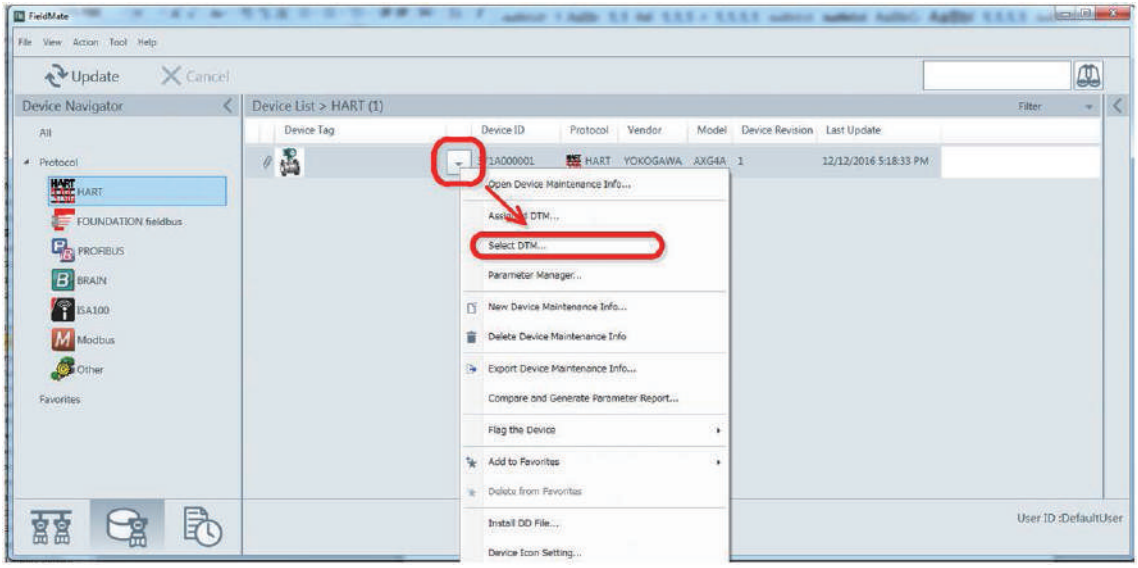


F040201.ai

Figure 4.2.1 Device Navigator Window of the FieldMate

Step 2: Start up the DTM by any of the three methods.

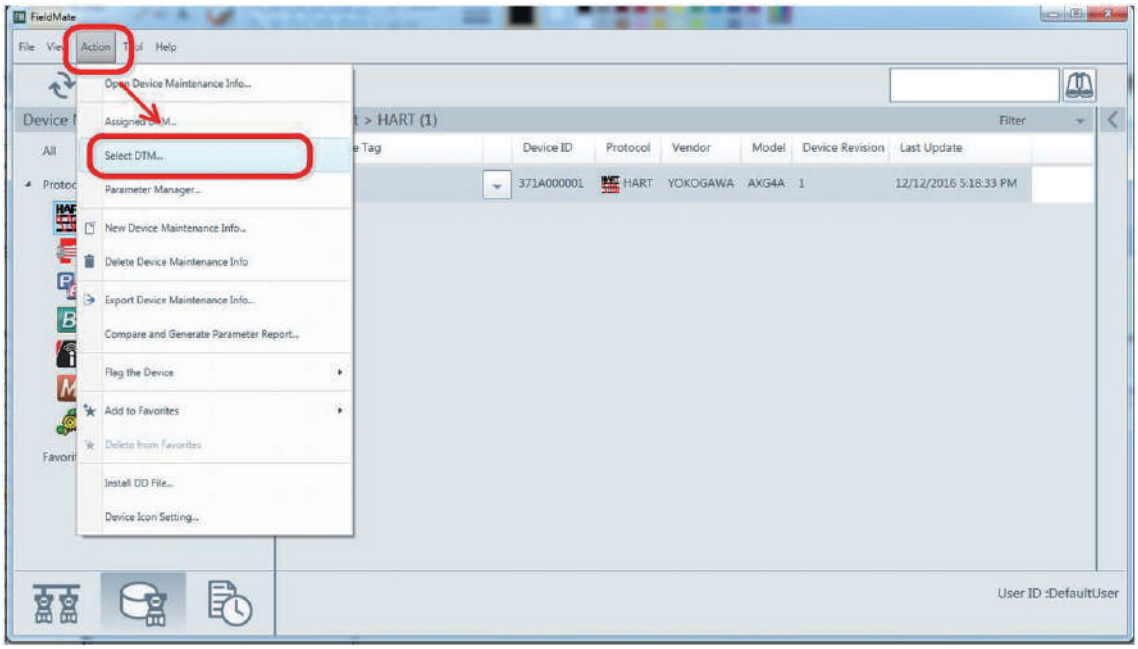
(Method 1) Click pull-down icon on the device list and select “Select DTM…”.



F040202.ai

Figure 4.2.2 Starting Up DTM by Device List

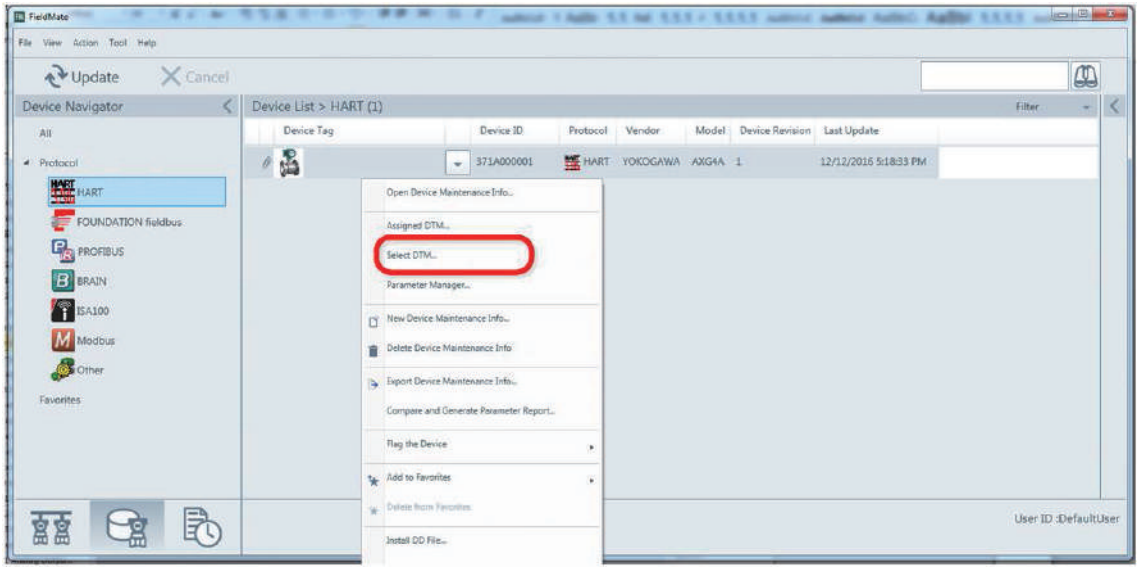
(Method 2) Click “Action” menu and select “Select DTM…”.



F040203.ai

Figure 4.2.3 Starting Up DTM by Action Menu

(Method 3) Right-click on the device list and select “Select DTM…”.



F040204.ai

Figure 4.2.4 Starting Up DTM by Right-clicking

Step 3: Select one DTM for the model from the window and click “OK”.

For the AXG models, select AXG4A FDT2.0 HART7 DTM.

For the AXW models, select AXW4A FDT2.0 HART7 DTM.

For the AXG1A models, select AXG1A FDT2.0 HART7 DTM.

For the CA models, select CA FDT2.0 HART7 DTM.



F040205.ai

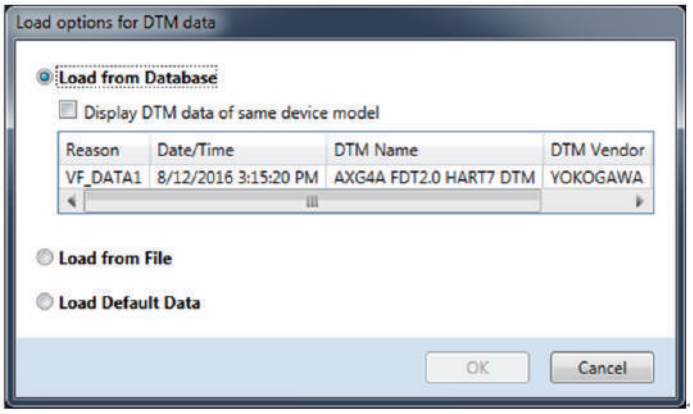
Figure 4.2.5 Selecting Target DTM

Step 4: Select from which to load data for the Verification Tool and click “OK”.

Load from Database: Data saved in the database

Load from File: Data saved as “dns” format file

Load Default Date: Data of the currently connected device



F040206.ai

Figure 4.2.6 Selecting Data to Load

Refer to manuals for FieldMate on the database and “dns” format file.

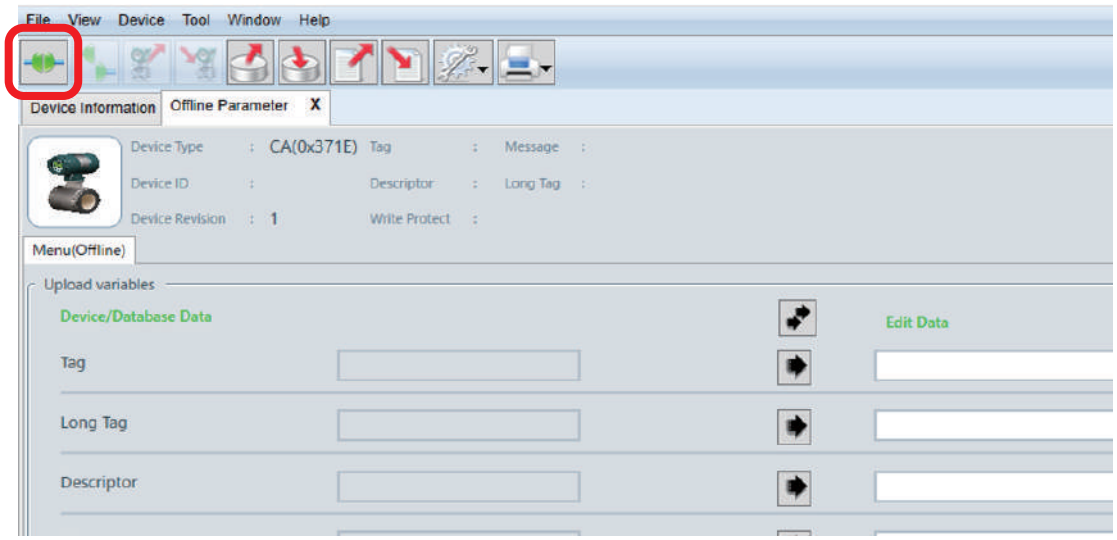
When performing a new verification, select “Load Default Data”.

Step 5: Click OK



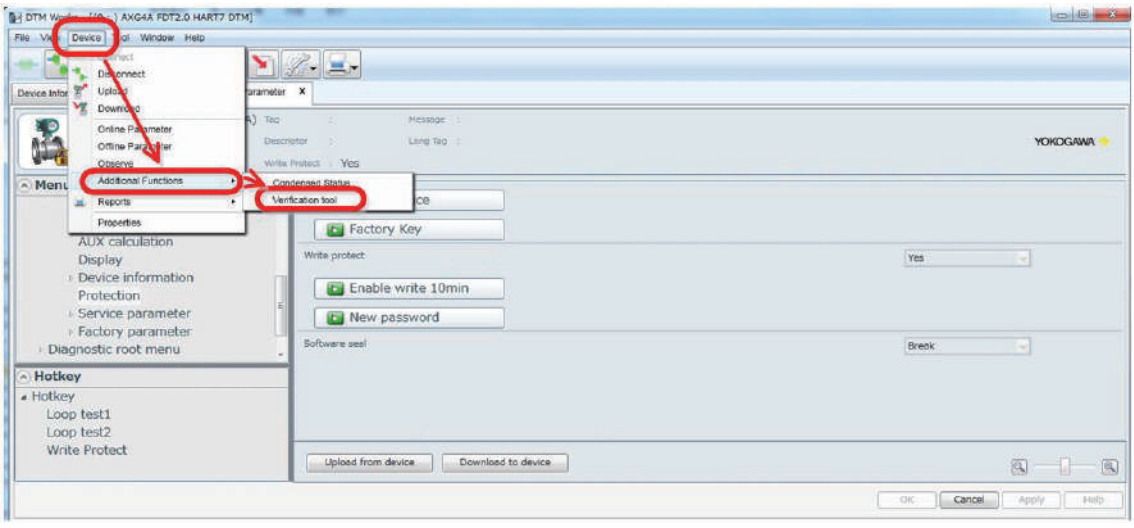
F040211.ai

Step 6: Click Connection Icon



F040212.ai

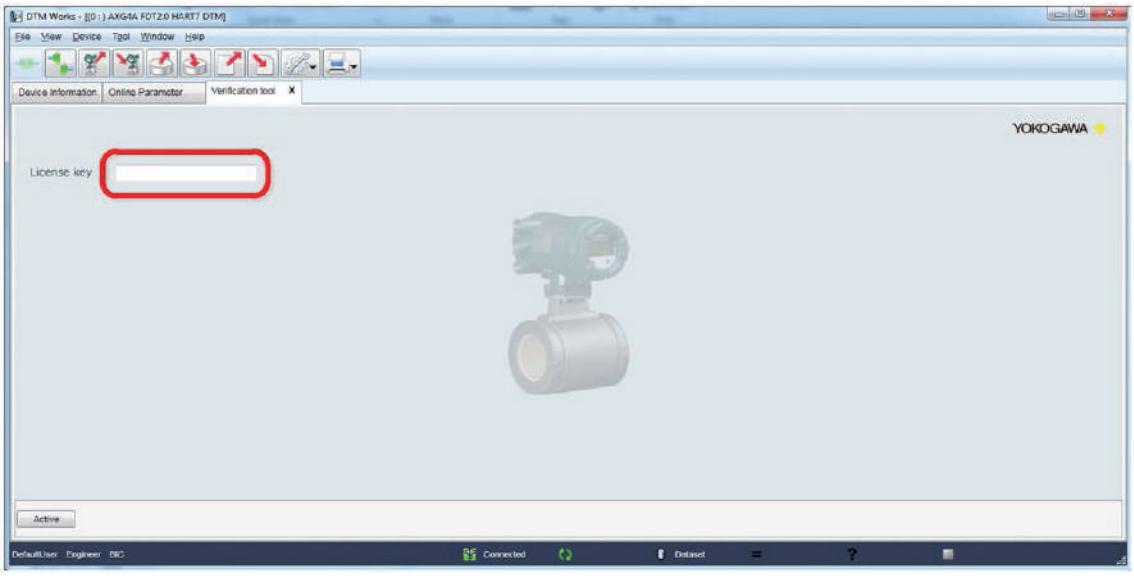
Step 7: Click “Device” menu, select “Additional Functions” and, select “Verification Tool”.



F040207.ai

Figure 4.2.7 Selecting Verification Tool

Step 8: Enter the license key and click “Active” button. This is only for the first start-up after installation. Read Section 1.5 for the license key.



F040208.ai

Figure 4.2.8 Entering License Key

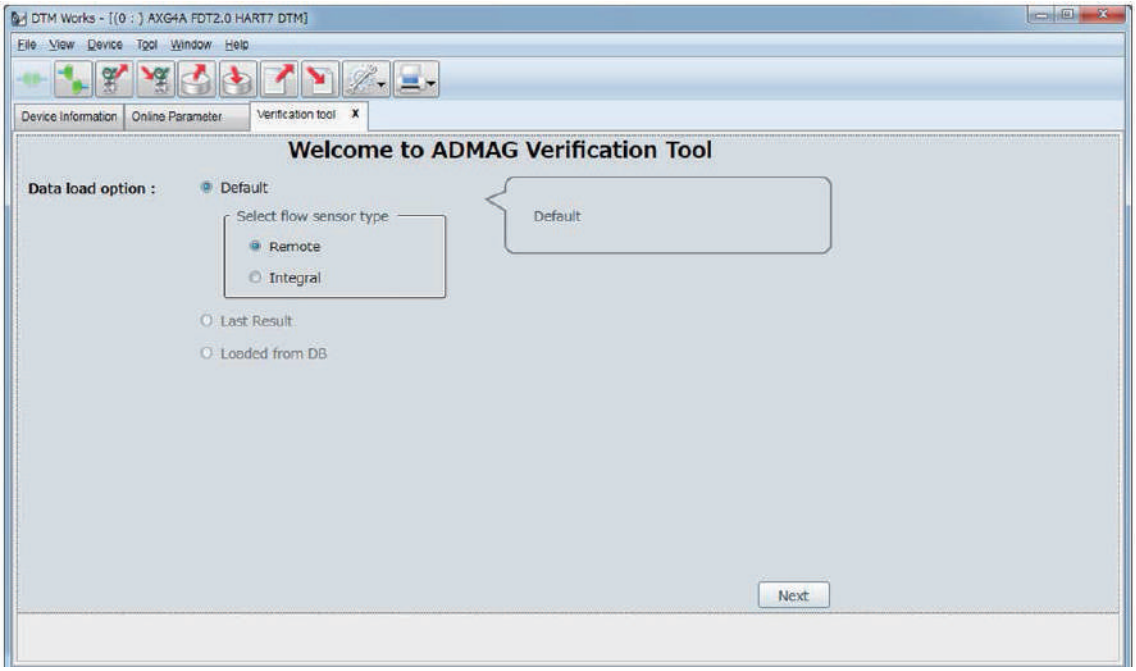
Step 9: The license agreement shown in Section 1.4 is displayed. Confirm it and click “OK”.



F040209.ai

Figure 4.2.9 Confirming License Agreement

Then the Verification Tool will start up as below.



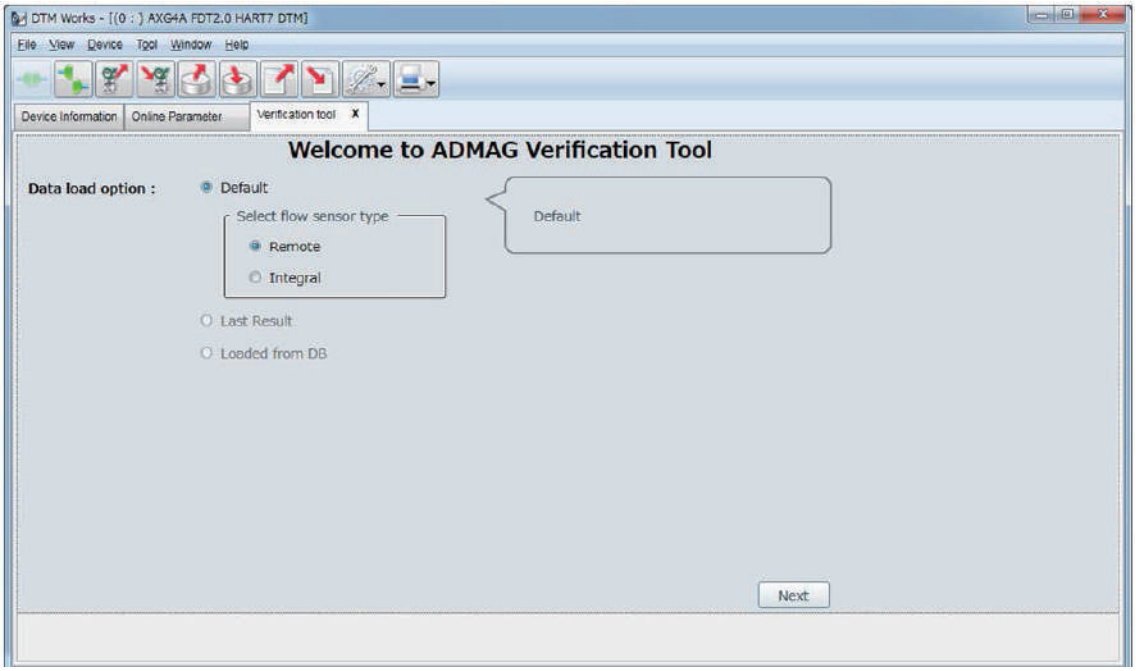
F040210.ai

Figure 4.2.10 Verification Tool Start-up Window

5. Selecting Launching Mode

To begin with, select one of the three launching modes as shown below.

- **Default**
  Select this mode when launching a new verification. Section 5.1 shows the operation.
- **Last Result**
  Select this mode when launching from the last verification result accidentally aborted by some error after the last start-up of the FieldMate on PC. Note that the data of the last result will be lost if the FieldMate is once exited from PC. Section 5.2 shows the operation.
- **Loaded from DB**
  Select this mode when launching from verification data stored in the database. Section 5.3 shows the operation.



F050101.ai

For the CA models, “Select flow sensor type” is not displayed.

Figure 5.1.1 Verification Tool Launching Window

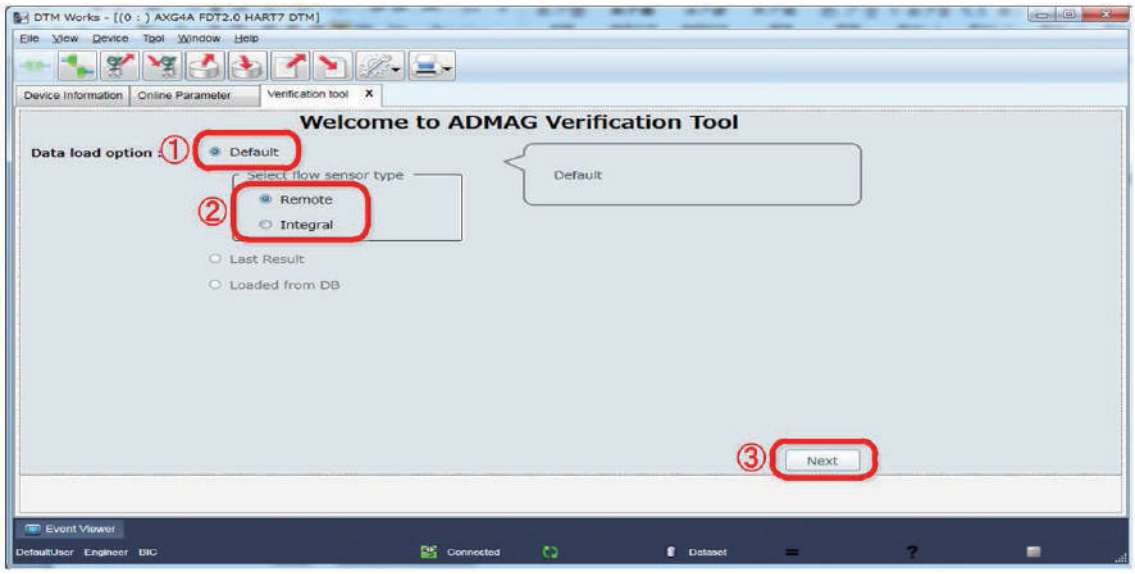
5.1 Default (Launching New Verification)

Follow the procedure below to launch a new verification.

Step 1: Select “Default”

Step 2: Select “Remote” or “Integral” depending on which type of device is to be verified. For the CA models, “Select flow sensor type” cannot be selected, so proceed to step 3.

Step 3: Click “Next”.



F050102.ai

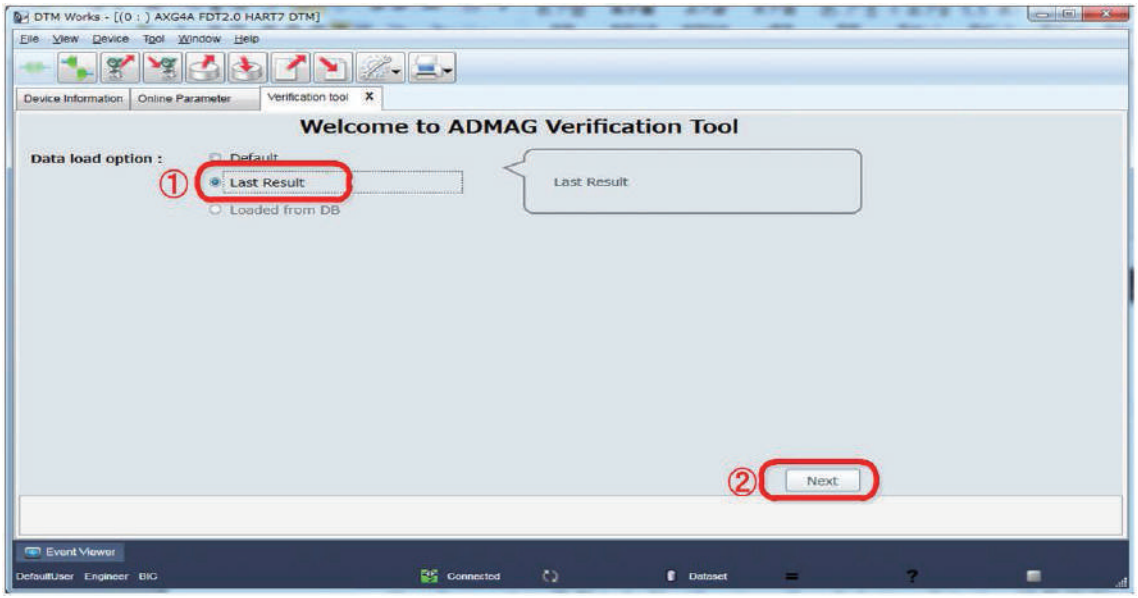
Figure 5.1.2 Selecting “Default”

5.2 Last Result (Launching from Last Verification Result)

Follow the procedure below to launch from the last verification result if there is one saved and available.

Step 1: Select “Last Result”

Step 2: Click “Next”.



F050201.ai

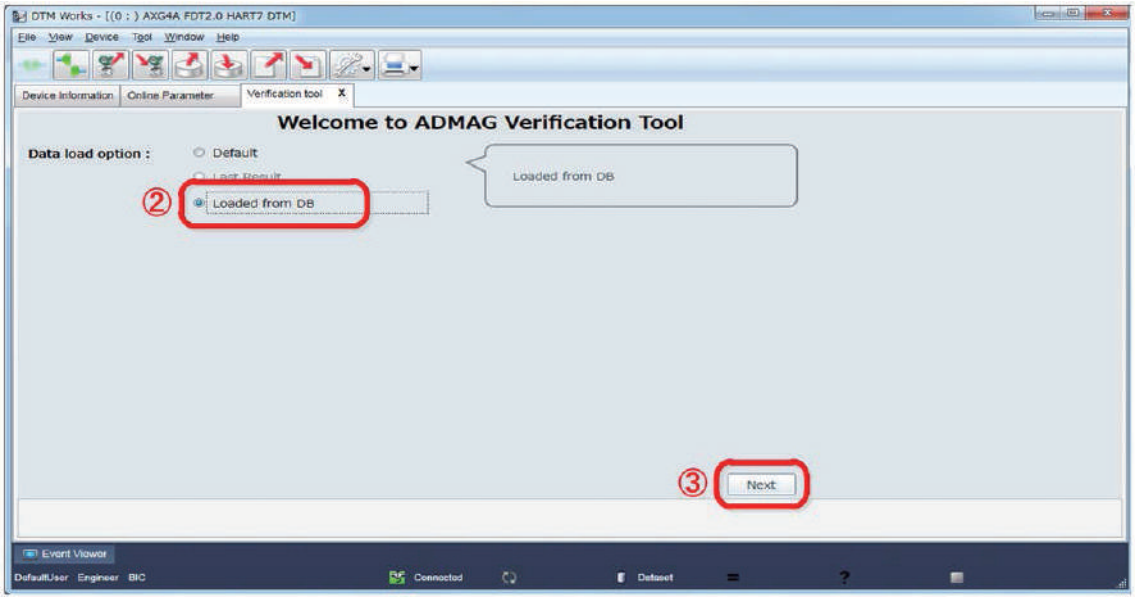
Figure 5.1.3 Selecting “Last Result”

5.3 Loaded from DB (Launching from Data in Database)

Follow the procedure below to launch from verification data stored in the database.

The loaded data from database by the procedure shown in Section 4.1 and 4.2 is used.

See the Step 4 in 4.1 (Start-up from “Segment Viewer”) or 4.2 (Start-up from “Device Navigator”).



F050301.ai

Figure 5.1.4 Selecting “Loaded from DB”

6. Basic Data Management

This chapter describes basic management on saving, loading, and locking verification data, prior to the description on the operation of Verification Tool in the following chapter.

6.1 Saving Verification Data

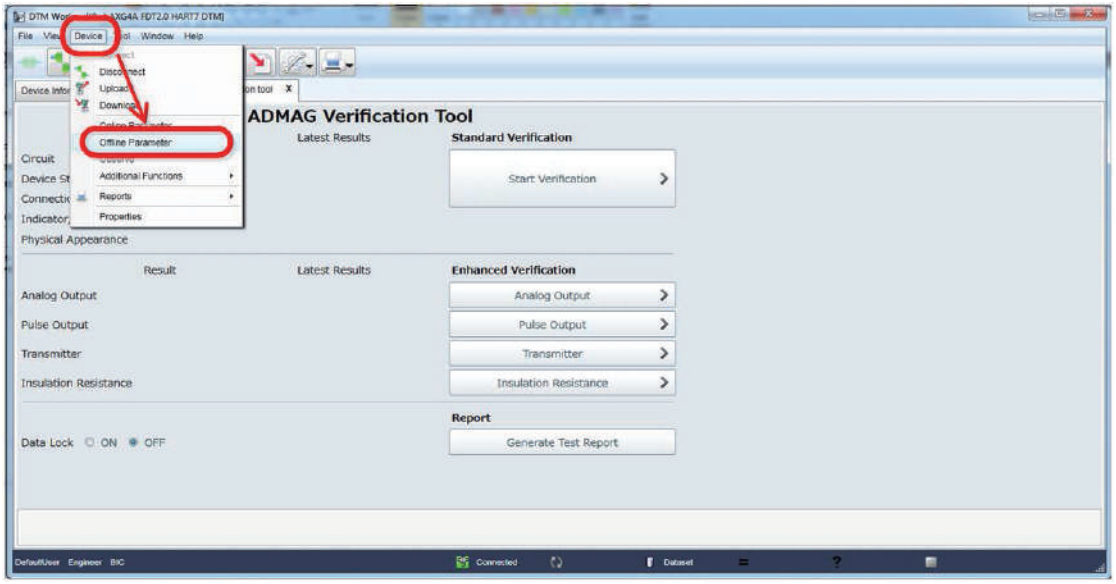
There are two ways to save verification data.

One is saving to database. The other is saving as “dns” format file.

Refer to manuals on FieldMate for the database and “dns” format file.

6.1.1 Saving to Database

Step 1: Click “Device” menu and select “Offline Parameter” from the menu window of the Verification Tool.

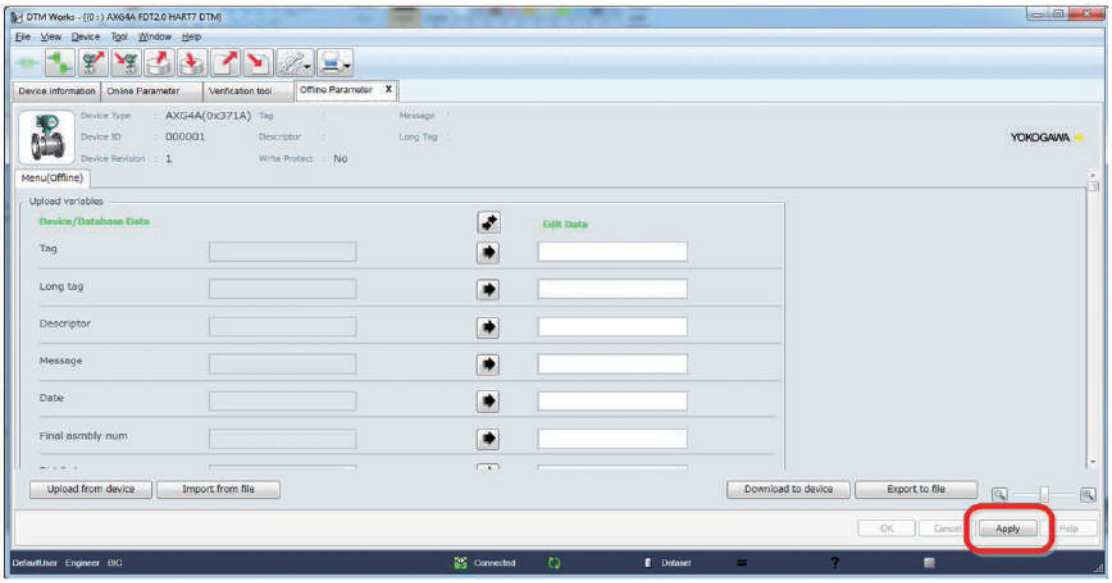


F060101ai

Figure 6.1.1 Selecting “Offline Parameter”

Step 2: Click “Apply”.

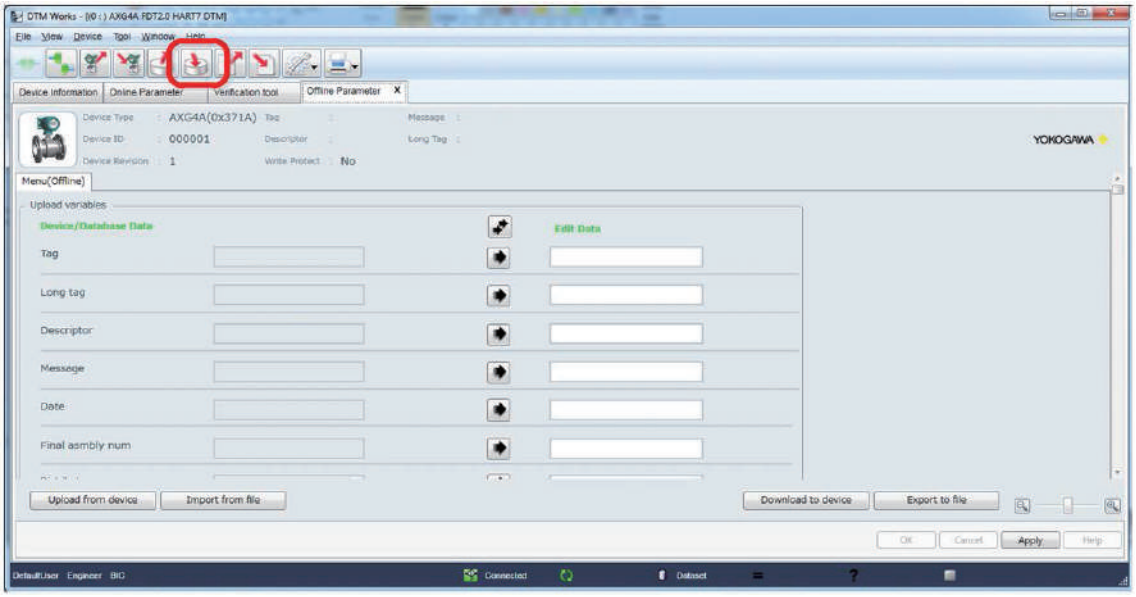
If “Apply” is not enabled, do not click it and proceed to step 3.



F060102.ai

Figure 6.1.2 Applying “Offline Parameter”

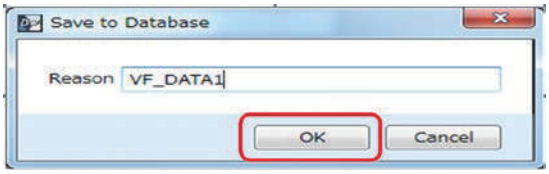
Step 3: Click the icon “Save to Database”



F060103.ai

Figure 6.1.3 Clicking “Save to Database”

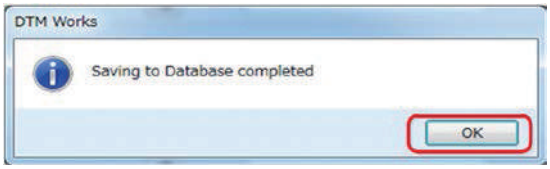
Step 4: Enter registration name and click “OK”.



F060104.ai

Figure 6.1.4 Entering Registration Name

Step 5: Click “OK” to finish.

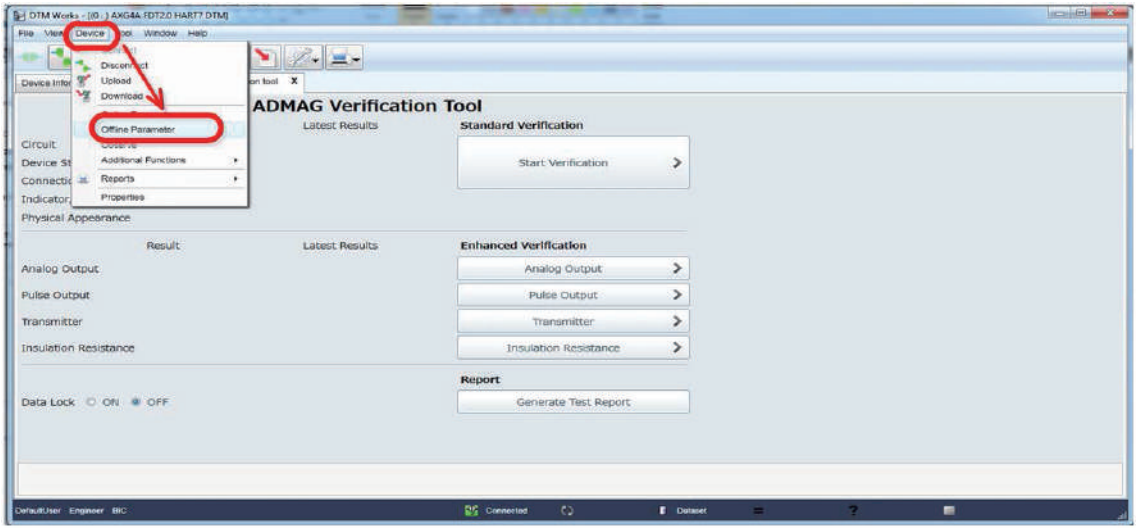


F060105.ai

Figure 6.1.5 Saving to Database Completed

6.1.2 Saving as “dns” Format File

Step 1: Click “Device” menu and select “Offline Parameter” from the menu window of the Verification Tool.

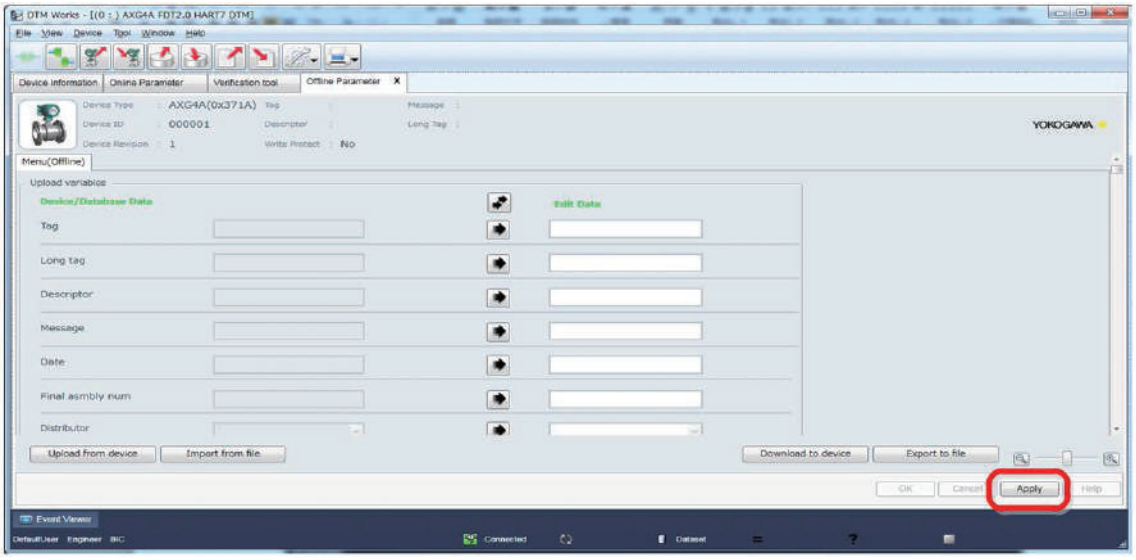


F060106.ai

Figure 6.1.6 Selecting “Offline Parameter”

Step 2: Click the icon “Apply”.

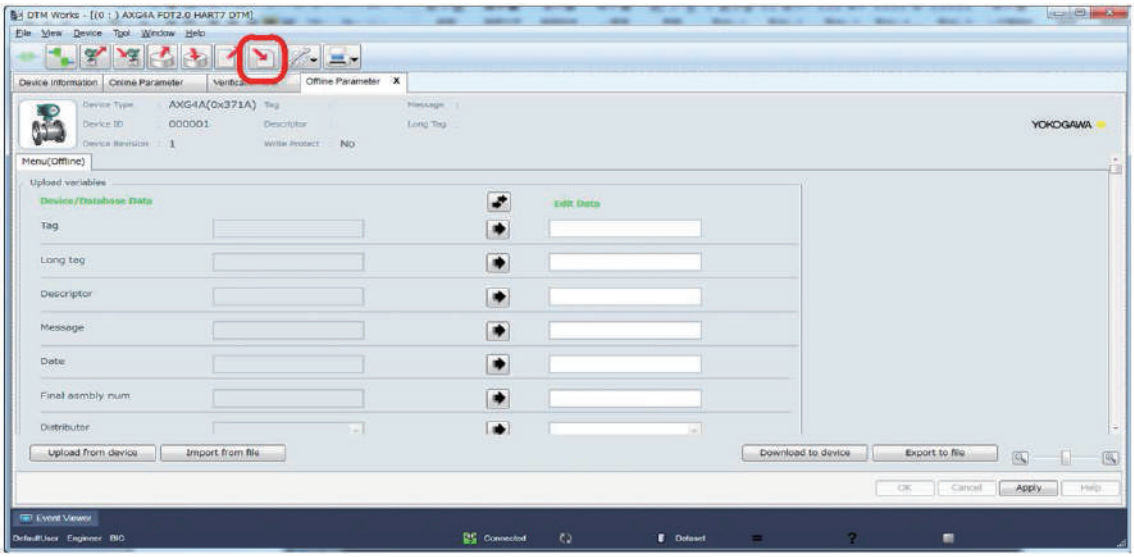
If “Apply” is not enabled, do not click it and proceed to step 3.



F060107.ai

Figure 6.1.7 Applying “Offline Parameter”

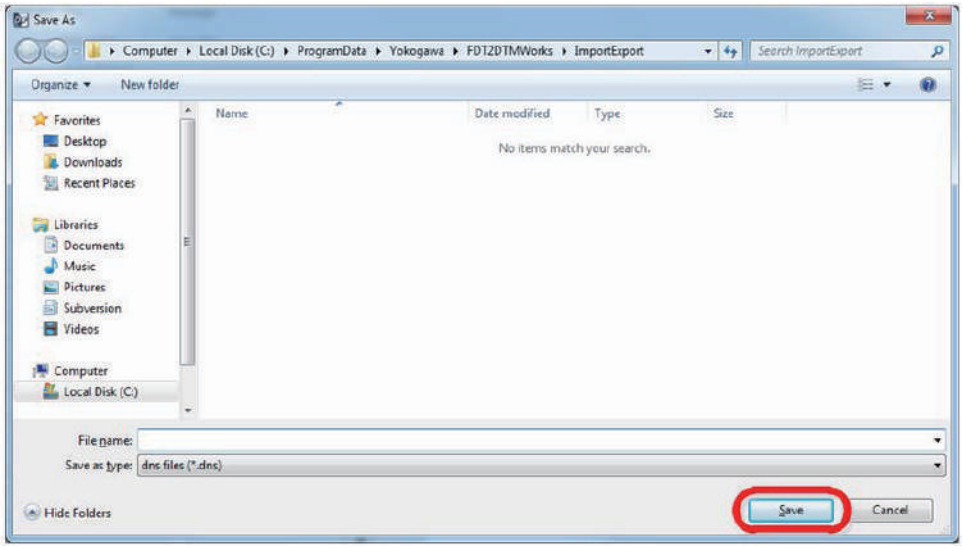
Step 3: Click “Save to File”



F060108.ai

Figure 6.1.8 Clicking “Save to File”

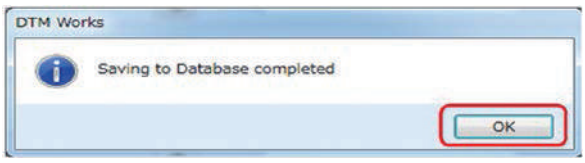
Step 4: Enter file name and click “Save”.



F060109.ai

Figure 6.1.9 Entering File Name

Step 5: Click “OK” to finish.



F060110.ai

Figure 6.1.10 Saving to Database Completed

6.2 Loading Verification Data

There are two ways to load verification data.

One is loading data during starting up the DTM. The other is loading data after starting up the DTM.

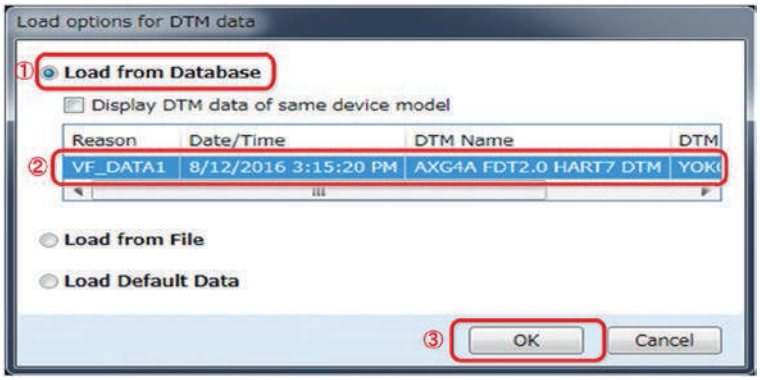
Refer to manuals on FieldMate for the database.

6.2.1 Loading during Starting Up DTM

Step 1: Select “Load from Database” in the window below which appears during starting up DTM.

Step 2: Select data from the list.

Step 3: Click “OK”.

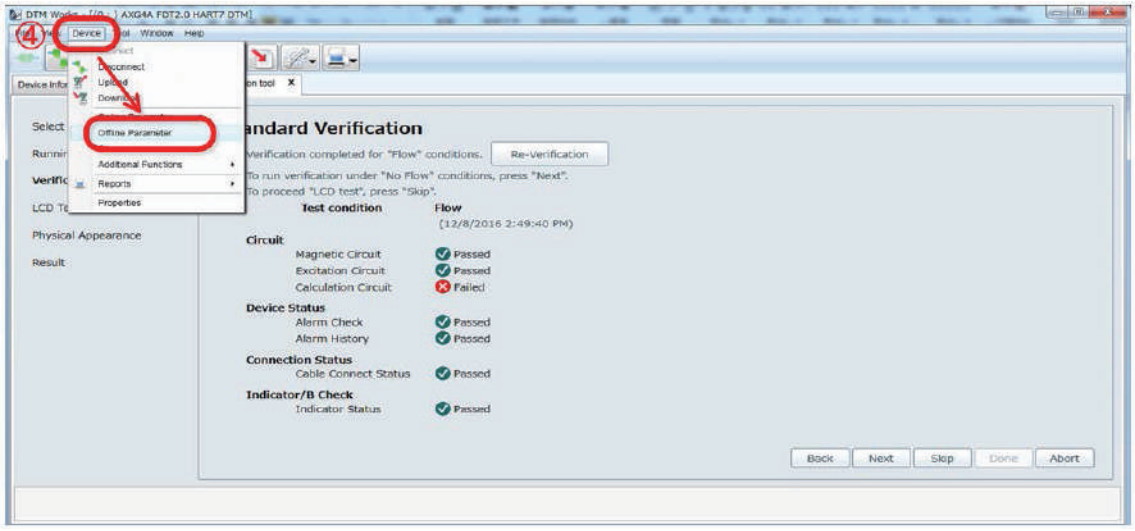


F060201.ai

Figure 6.2.1 Loading during Starting Up DTM

6.2.2 Loading after Starting Up DTM

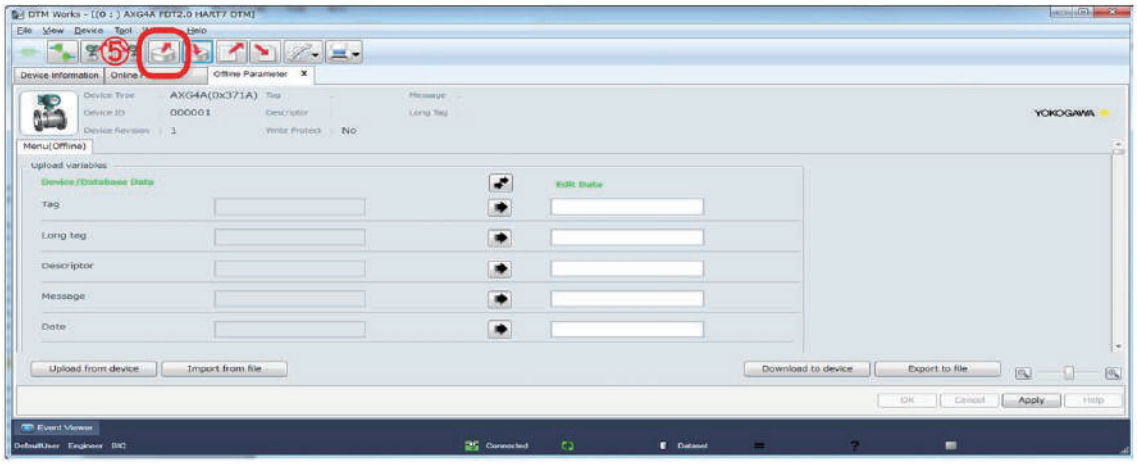
Step 4: Click “Device” menu and select “Offline Parameter”.



F060202.ai

Figure 6.2.2 Selecting “Offline Parameter”

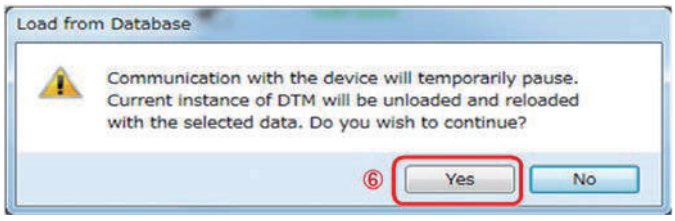
Step 5: Click the icon “Load from Database”.



F060203.ai

Figure 6.2.3 Clicking “Load from Database”

Step 6: Click “Yes”.

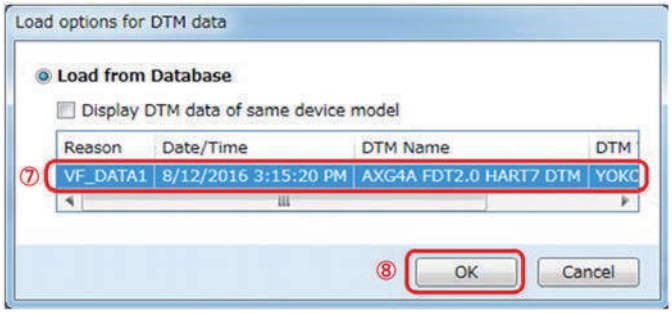


F060204.ai

Figure 6.2.4 Loading from database

Step 7: Select data to load.

Step 8: Click “OK”.



F060205.ai

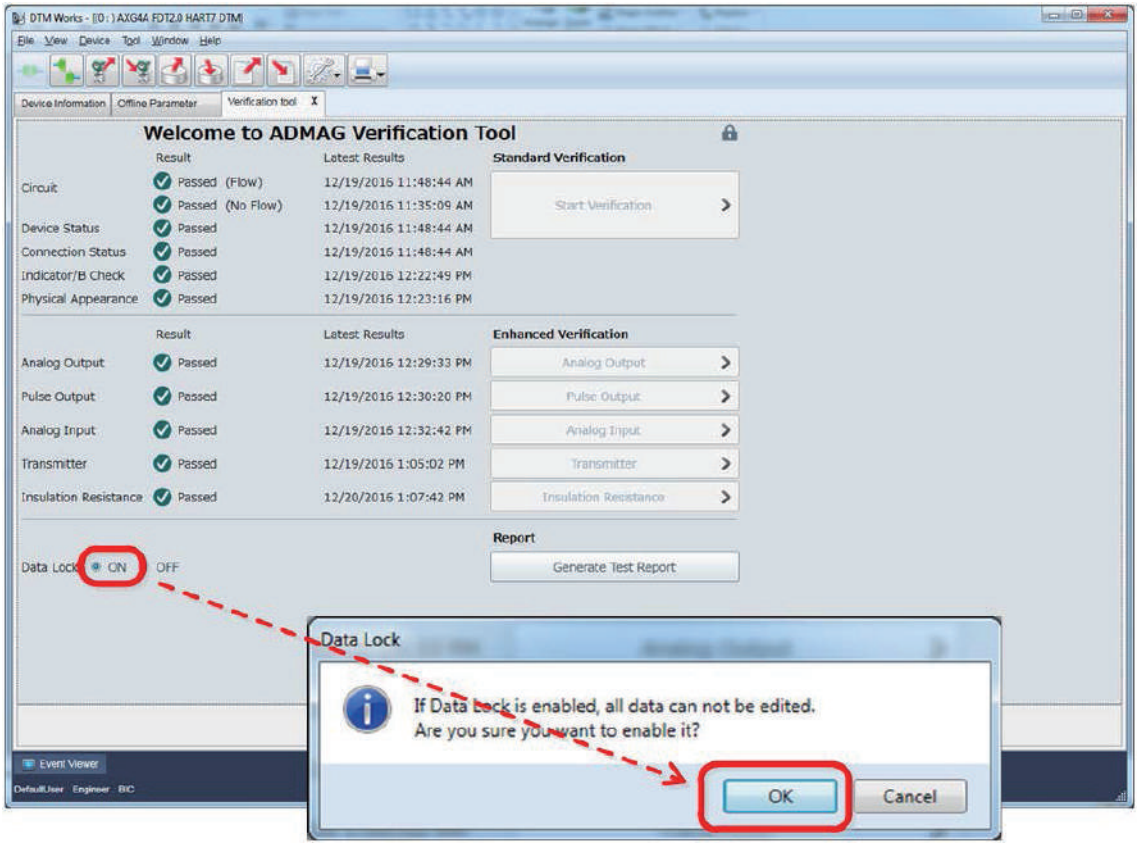
Figure 6.2.5 Selecting data

NOTE

When the data was loaded while the Verification Tool was already operating, it is necessary to restart the Verification Tool again to make the loaded data effective.
Click “X” on the “Verification tool” tab to finish. Refer to Step 5 of Section 4.1 (Start-up from “Segment Viewer”) or Section 4.2 (Start-up from “Device Navigator”) for restart procedure.

6.3 Locking Verification Data

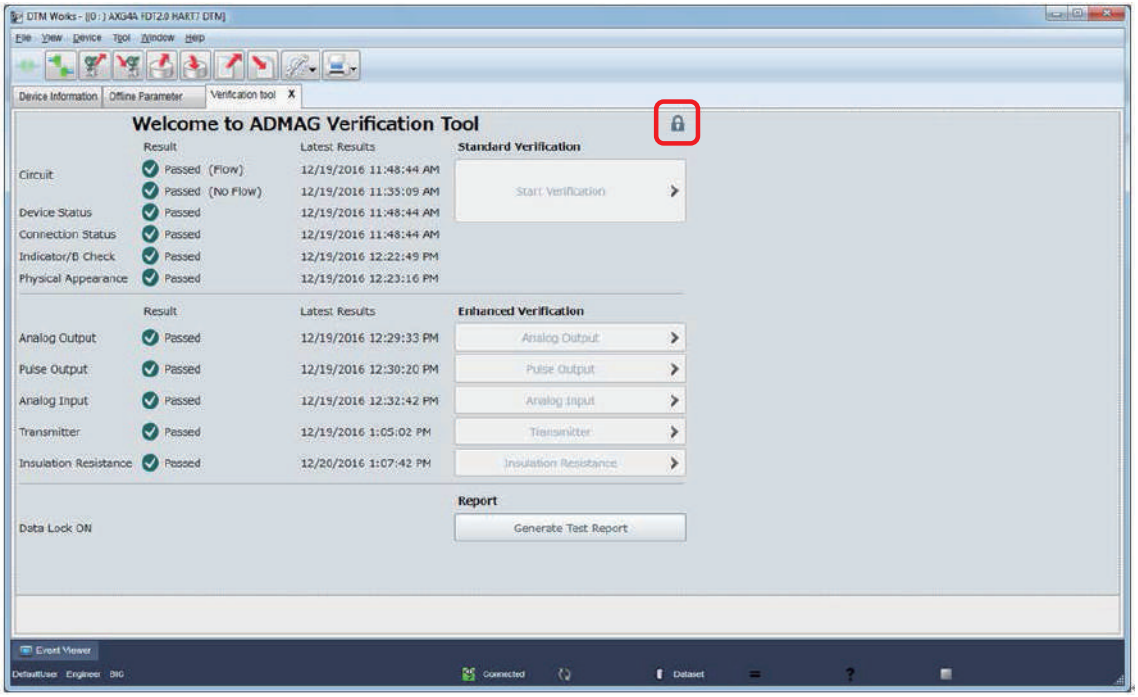
Verification data can be locked so that it cannot be edited. To lock the data, select “ON” button at “Data Lock” as shown in the window below. Click “OK” and the buttons except for “Generate Test Report” are disabled, making it impossible to edit the data.



F060301.ai

Figure 6.3.1 Locking Verification Data

Below is an example of loading verification data that has been locked and saved. After clicking “OK”, the window shows a key-shaped icon below indicating that the data is locked.



F060302.ai

Figure 6.3.2 Locked Verification Data

7. Operation

This chapter describes how to use this Verification Tool.

The figure below shows general procedure of the verification. The number in the figure shows the section to be referred to. Perform the Standard VF at first. Then perform the Enhanced VF if necessary. After that, the test report can be generated and printed out. The test report shows ”Overall Status”.

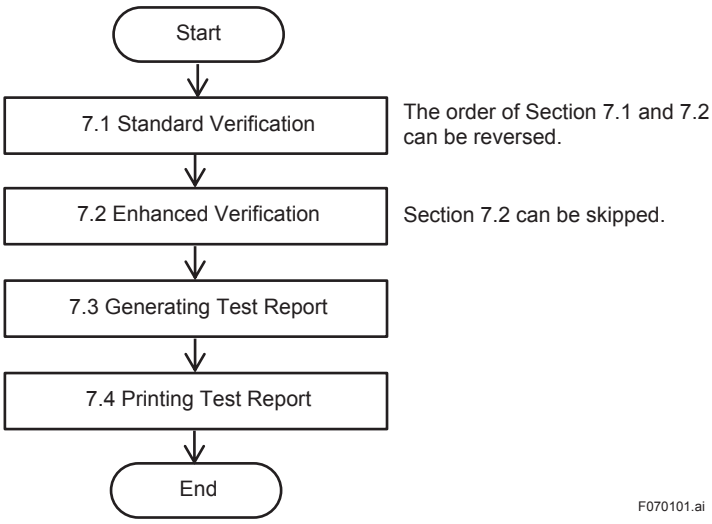


Figure 7.1.1 General Procedure of Verification

NOTE

- Be sure to always perform Standard VF because “Overall Status” in the verification report is generated only when “Standard VF” is being completed. If not being completed, “Overall Status” is not indicated.
- The verification report can be generated and printed even when “Standard VF” is not being completed.

7.1 Standard Verification

IMPORTANT

Do not turn off the power for the AXG/AXW/CA maginetic flowmeter at least for 10 minutes after finishing the verification. If you turn the power off immediately, some of the parameters may be changed to different values from ones before performing the verification.

NOTE

- If Verification Tool turns to “offline” mode due to wiring disconnections, reconnect FieldMate and the AXG/AXW/CA magnetic flowmeter. Verification Tool will be restored to “online” mode again.
- Fill the inside of the AXG/AXW/CA pipe with fluid. If it is not in the full state, the result may not be accurate.

The figure below shows the procedure of the Standard VF. The number in the figure shows the chapter or section to be referred to.

The order in which the tests are performed can be freely determined.

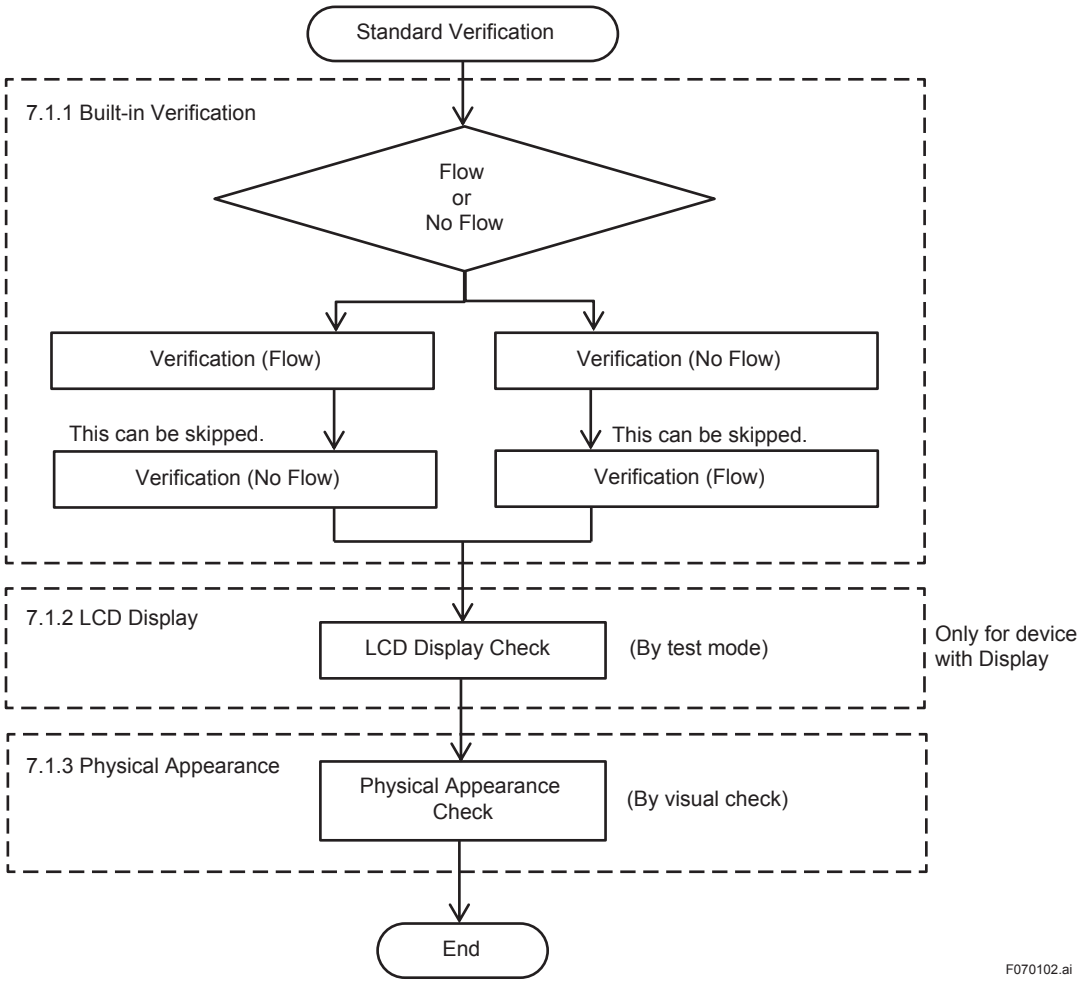
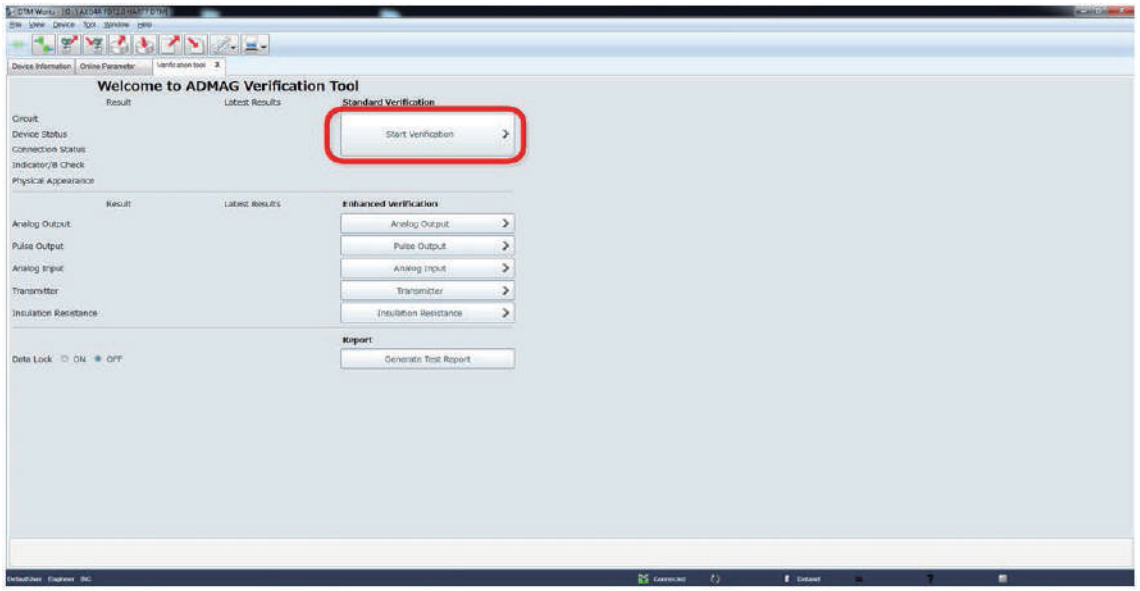


Figure 7.1.2 Procedure of Standard Verification

Click “Start Verification” in the window below to start the Standard VF.



F070103.ai

Figure 7.1.3 Starting Standard Verification

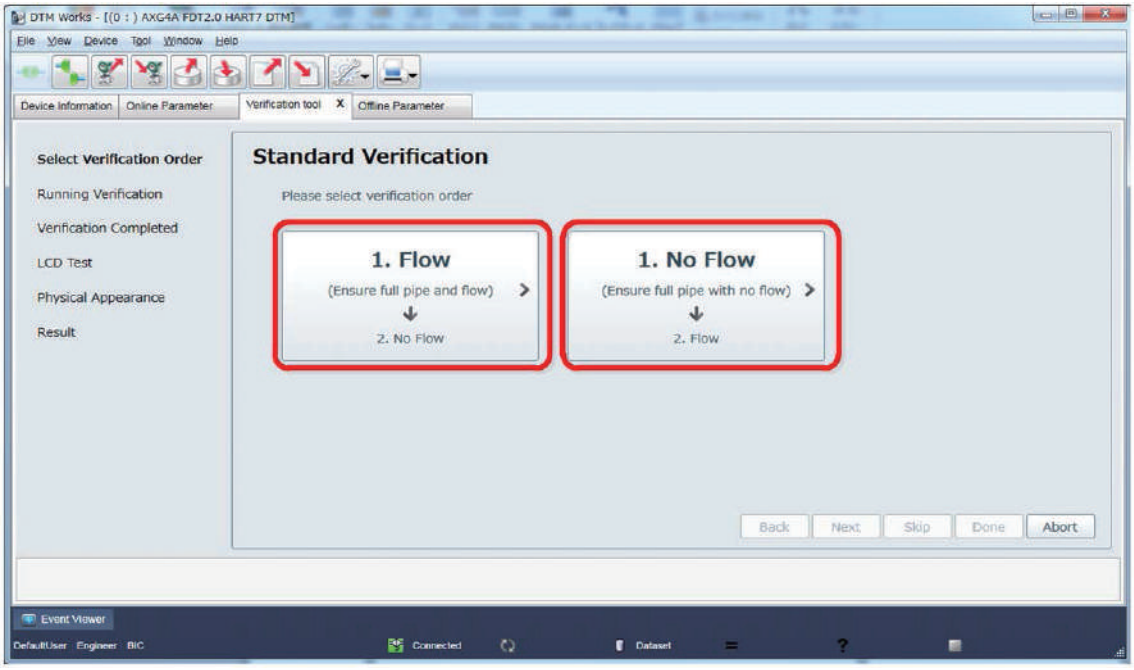
7.1.1 Built-in Verification Check

The Verification Tool utilizes the “Built-in Verification” function of the AXG/AXW/CA magnetic flowmeter as a part of the Standard VF.

It checks the circuits (of magnetic field, excitation, and calculation), device status (alarm occurrence), wiring connection status (of signal and excitation cables), and the status of indicator / display board. Note that it takes approximately 15 minutes (approximately 6 minutes for a CA model) to complete this part.

The verification here is performed in two statuses. One is the status in which the fluid is flowing in the AXG/AXW/CA magnetic flowmeter. The other is the status in which the fluid is not flowing, which means the flow velocity is zero. Either of them can be performed first.

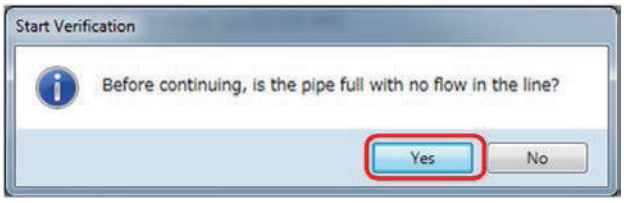
Step 1: If the fluid is flowing, click “1. Flow”. If not flowing, click “1. No Flow”.



F070104.ai

Figure 7.1.4 Selecting Order of Verification

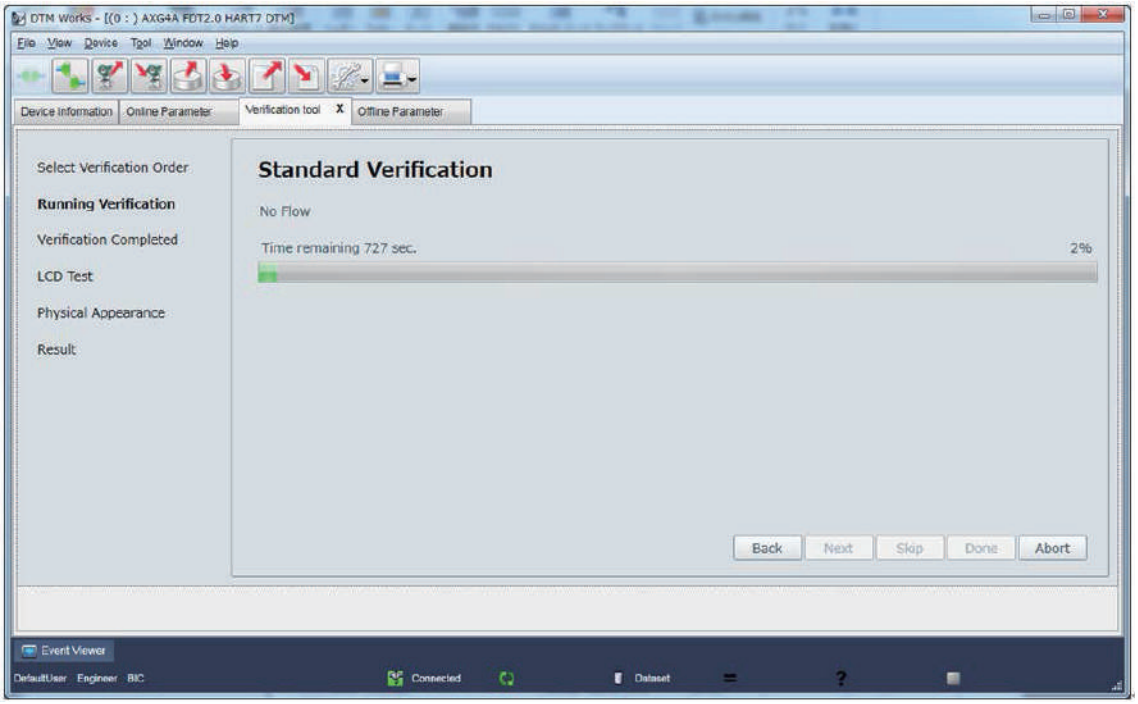
Step 2: Below is the case when selecting “No Flow” status. Make sure that the pipe of the AXG/AXW/CA magnetic flowmeter is full with fluid and it is not flowing. Then click “OK”.



F070105.ai

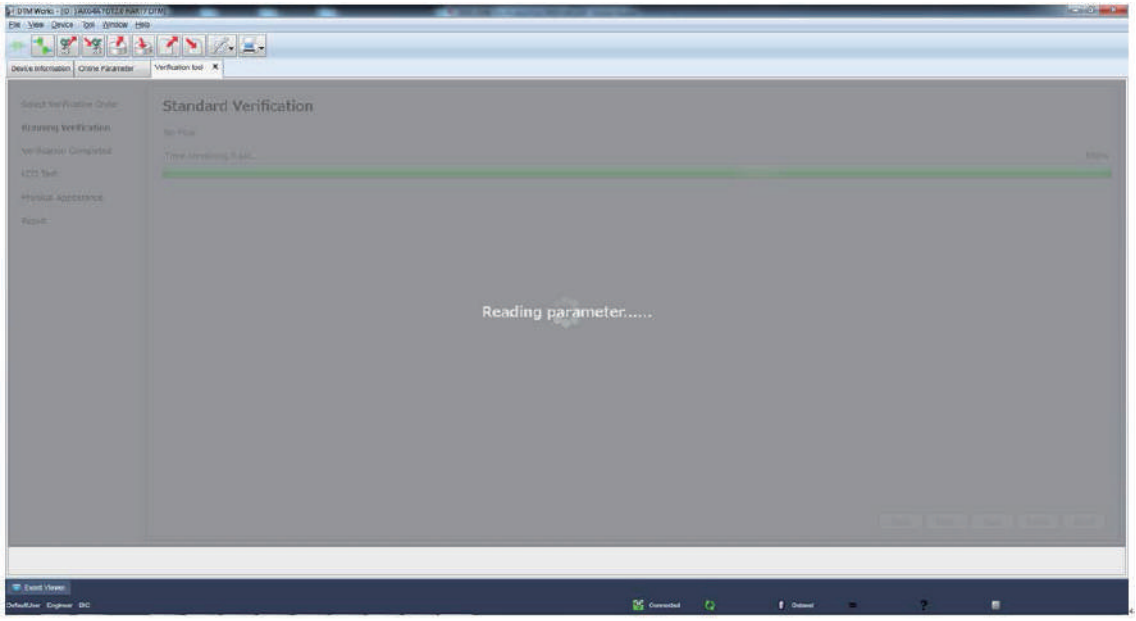
Figure 7.1.5 Start of Verification

Step 3: The progress of the verification work and remaining time is displayed. When the progress reaches to 100%, the window of parameter reading for the verification result is displayed.



F070106.ai

Figure 7.1.6 Progress Bar of Verification



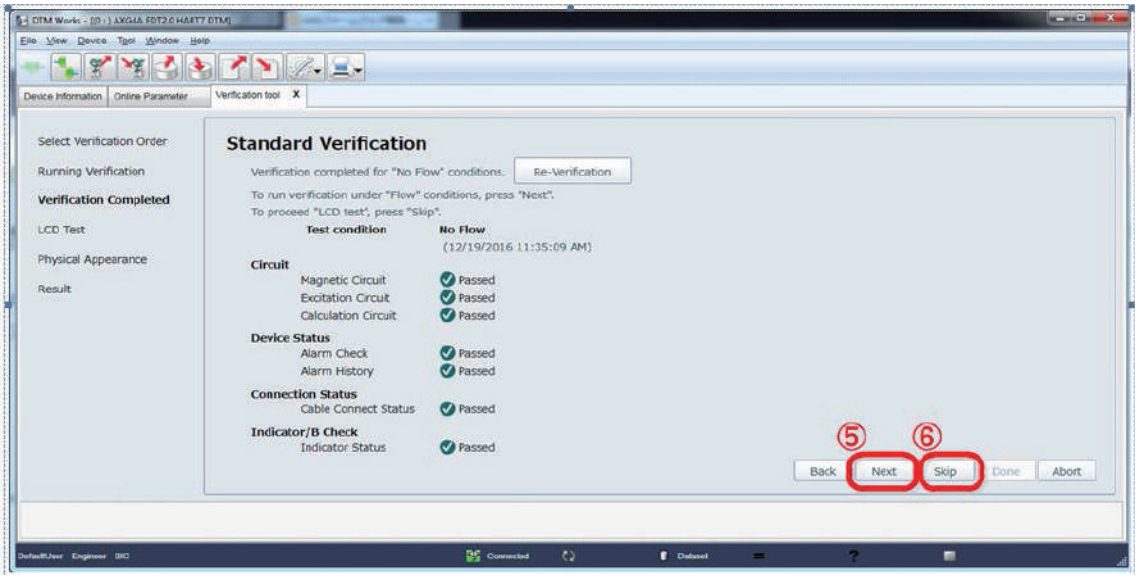
F070107.ai

Figure 7.1.7 Parameter Reading for Verification Result

Step 4: Below is an example showing the result, “Passed” (operating properly) or “Failed” (not operating properly) for each item.

Step 5: Click “Next” and the verification continues with the other status (“Flow” or “No Flow”) which was not selected at first. Continue from Step 2 for the other status.

Step 6: Click “Skip” to finish the procedure in this subsection.



F070108.ai

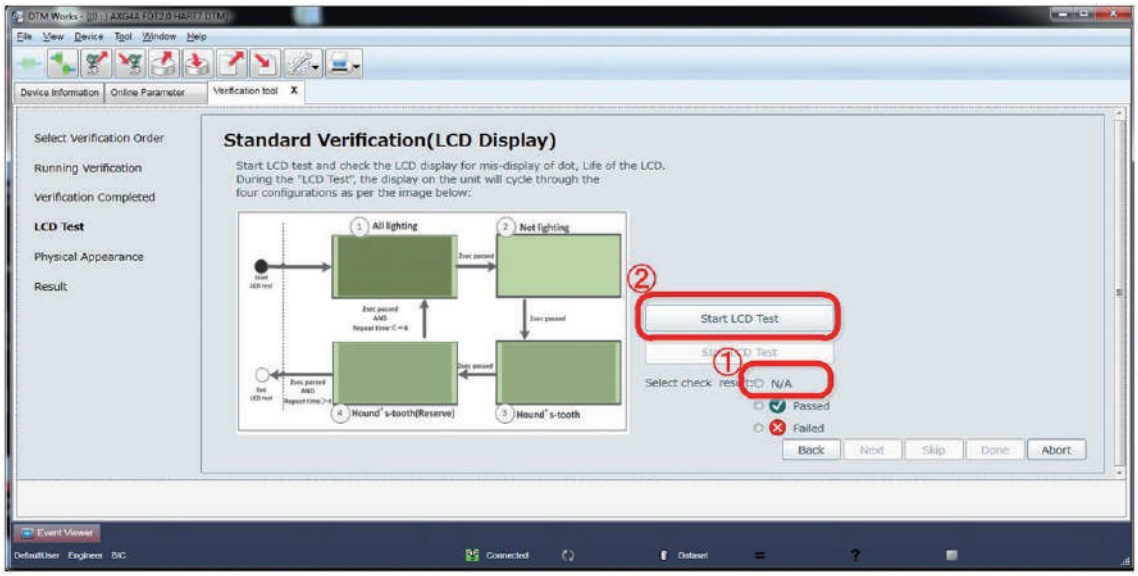
Figure 7.1.8 Example of Verification Result

7.1.2 LCD Display Check

7.1.1 Built-in verification checks the display status, but here the LCD display is checked.

Step 1: When skipping this check, check “N/A” and go to Step 4.

Step 2: Click “Start LCD Test” to check the LCD display.

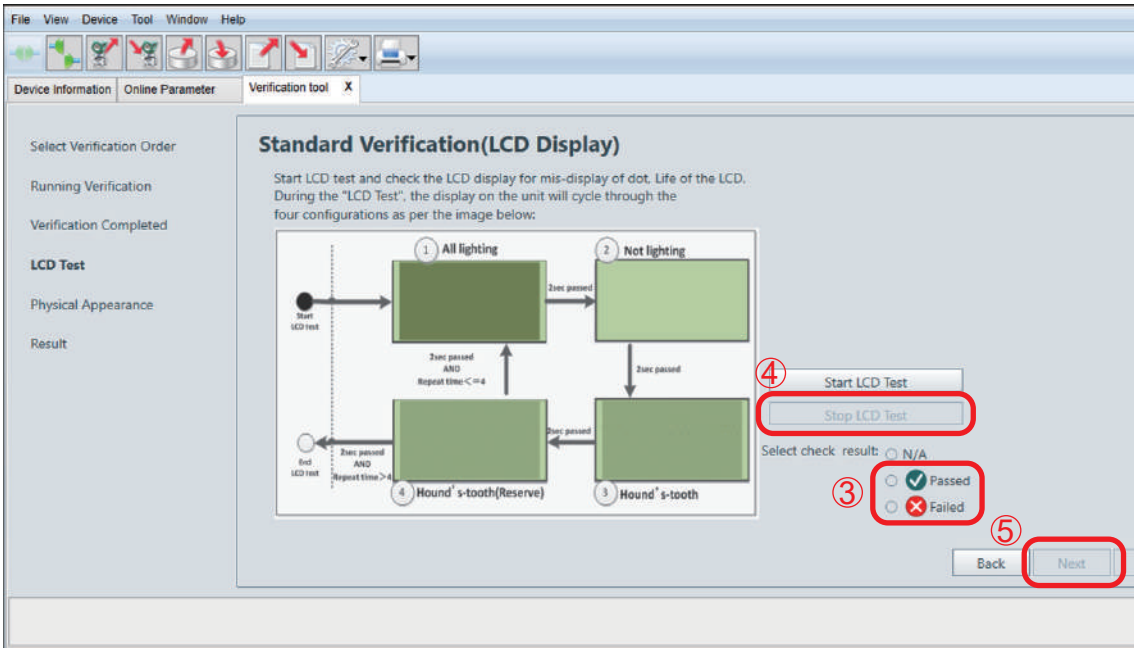


F070109.ai

Figure 7.1.9 Starting LCD Display Check

Step 3: If the LCD display is cycling through the four configurations (all lighting, not lighting, hound’s tooth, and reversed hound’s tooth) as per the image below, select “Passed”. If not, select “Failed”. The image changes at a cycle of 2 seconds, making 8 seconds for one round, and continuing 4 rounds for totally 32 seconds.

Step 4: Click “Stop LCD Test” , and Click “Next” to go to the next procedure.



F070110.ai

Figure 7.1.10 Judging LCD Display Check

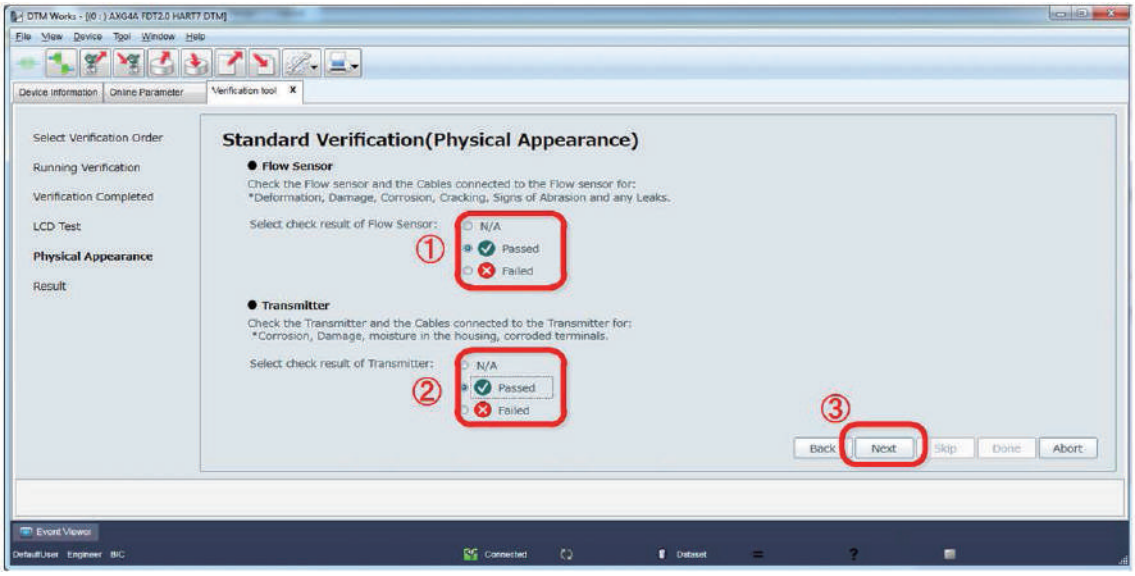
7.1.3 Physical Appearance Check

Check visually the physical appearance of flow sensor, transmitter, and connected cables of the AXG/AXW/CA magnetic flowmeter.

Step 1: Check visually the physical appearance of flow sensor if it has deformation, damage, corrosion, cracks, wear, or leakage. Select “Passed” if it has no such matters. Select “Failed” if it has any of such matters. Or select “N/A” to skip this check.

Step 2: Check visually the physical appearance of transmitter if it has damage, corrosion, dews inside the housing, or corrosion on printed-circuit board. Select “Passed” if it has no such matters. Select “Failed” if it has any of such matters. Or select “N/A” to pass this check.

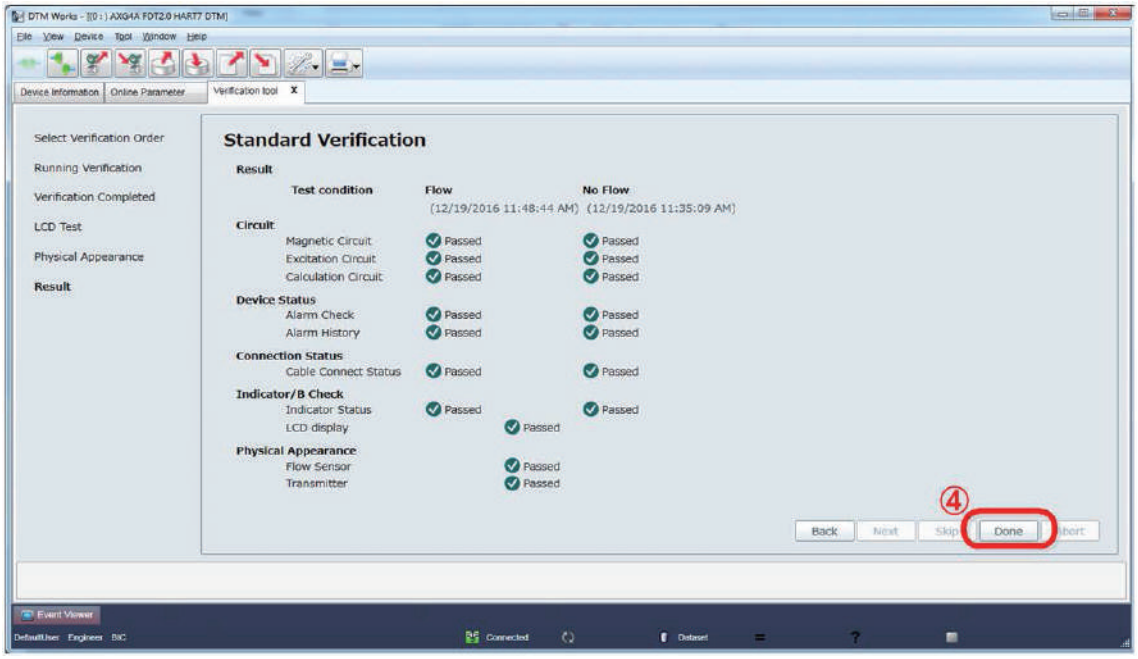
Step 3: Click “Next” to show the result of the Standard VF.



F070111.ai

Figure 7.1.11 Physical Appearance Check

Step 4: Click “Done” to finish the Standard VF.



F070112.ai

Figure 7.1.12 Result of Standard VF

7.2 Enhanced Verification

NOTE

- Before performing the Enhanced VF turn off the power for AXG/AXW/CA magnetic flowmeter and demount it from piping as it is necessary to change its input/output wiring.
- The connection diagram for wiring is displayed when the verification for input/output is performed. However, the diagrams are different depending on the specification of each AXG/AXW/CA magnetic flowmeter model. Note that the diagrams appear in this manual are just examples and follow the actually displayed diagram when wiring.
- If Verification Tool turns to “offline” mode due to wiring disconnections, reconnect FieldMate and the AXG/AXW/CA magnetic flowmeter. Verification Tool will be restored to “online” mode again.

The figure below shows the procedure of the Enhanced VF. The details are in the following subsections. The number in the figure shows the subsection to be referred to.

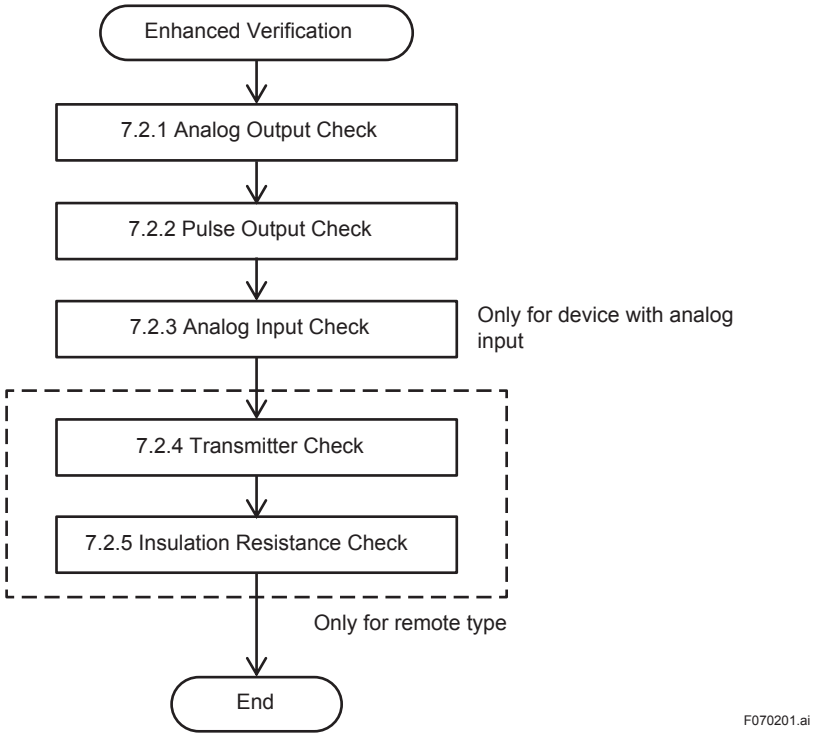


Figure 7.2.1 Procedure of Enhanced VF

NOTE

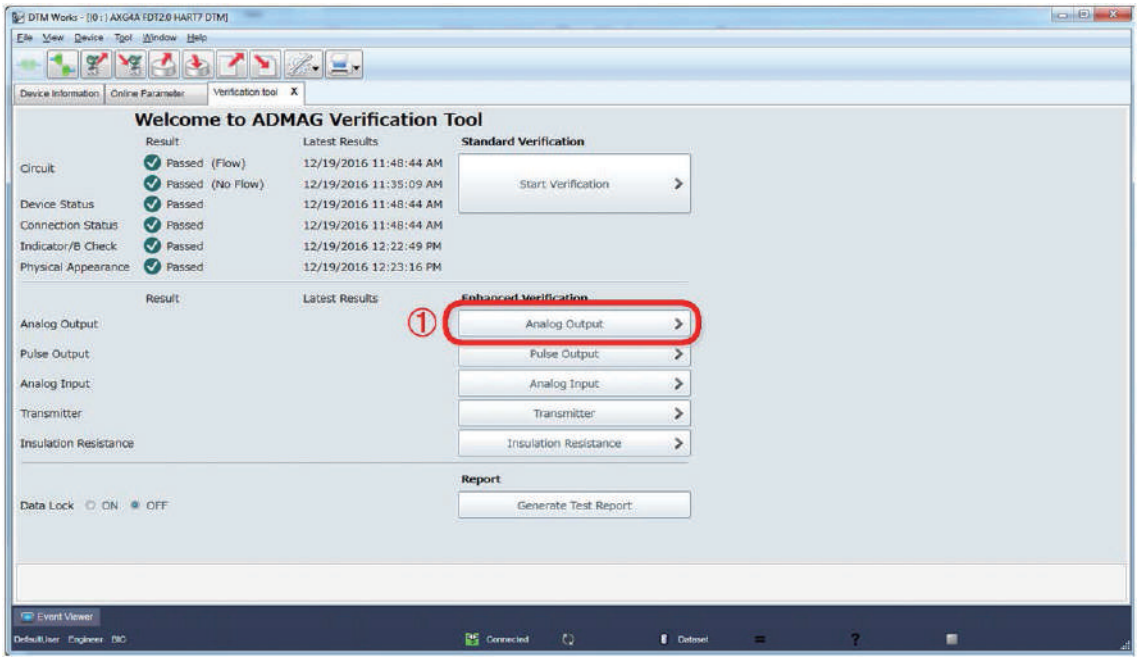
Note for Entering Result Value:
In the Enhanced VF, you may need to enter the value manually in the result field for “Passed” or “Failed” judgment. In this case, please input the numerical value in the result field and then press the Enter key or click on the Verification Tool window. By doing so, the judgment is carried out and the button for transition to the next window becomes effective.

7.2.1 Analog Output Check

The check for analog outputs “AO1” and “AO2” is available. “AO2” is an optional output and only displayed when it is equipped with the AXG/AXW/CA magnetic flowmeter.

Follow the procedure below to check the current output by a measuring instrument (CA500 or equivalent) for each at 4, 12, and 20 mA.

Step 1: Click “Analog Output”.

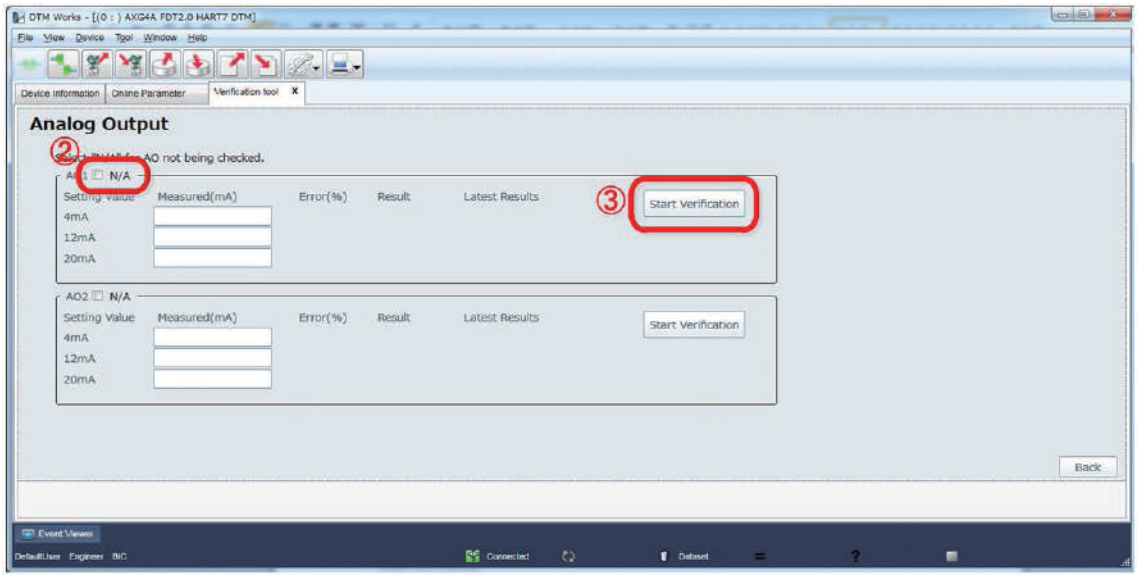


F070204.ai

Figure 7.2.4 Selecting Analog Output Check

Step 2: “N/A” can be checked for “AO1” and “AO2” individually to skip the check for one of them or both.

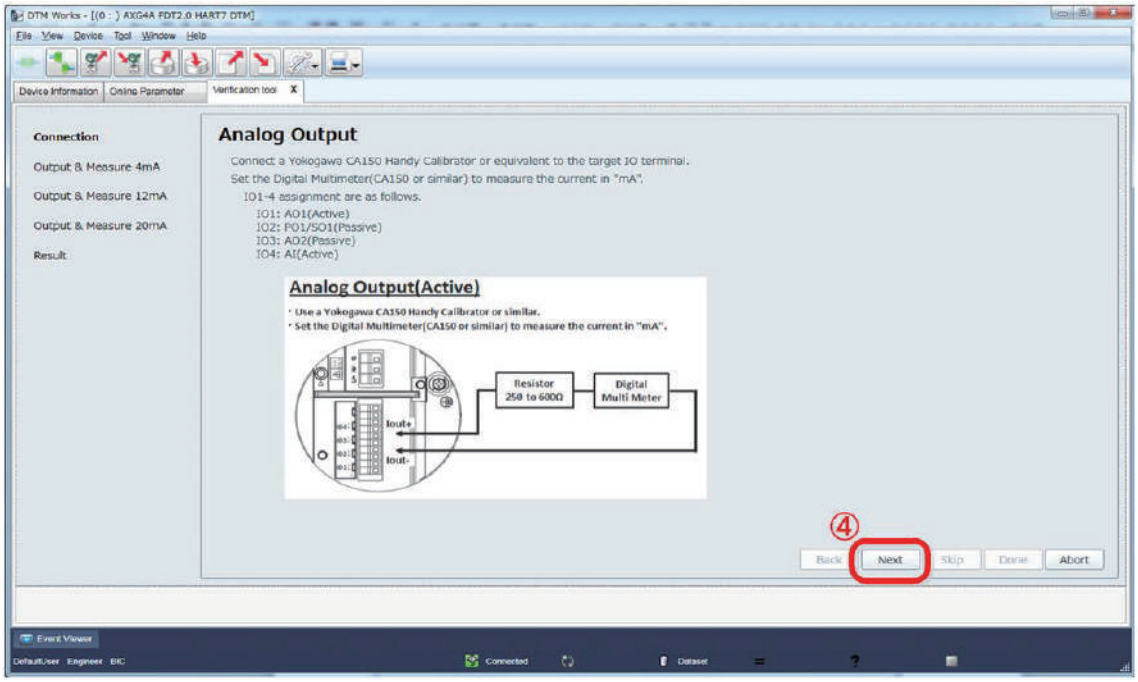
Step 3: Click “Start Verification” to perform the check.



F070205.ai

Figure 7.2.5 Starting Analog Output Check

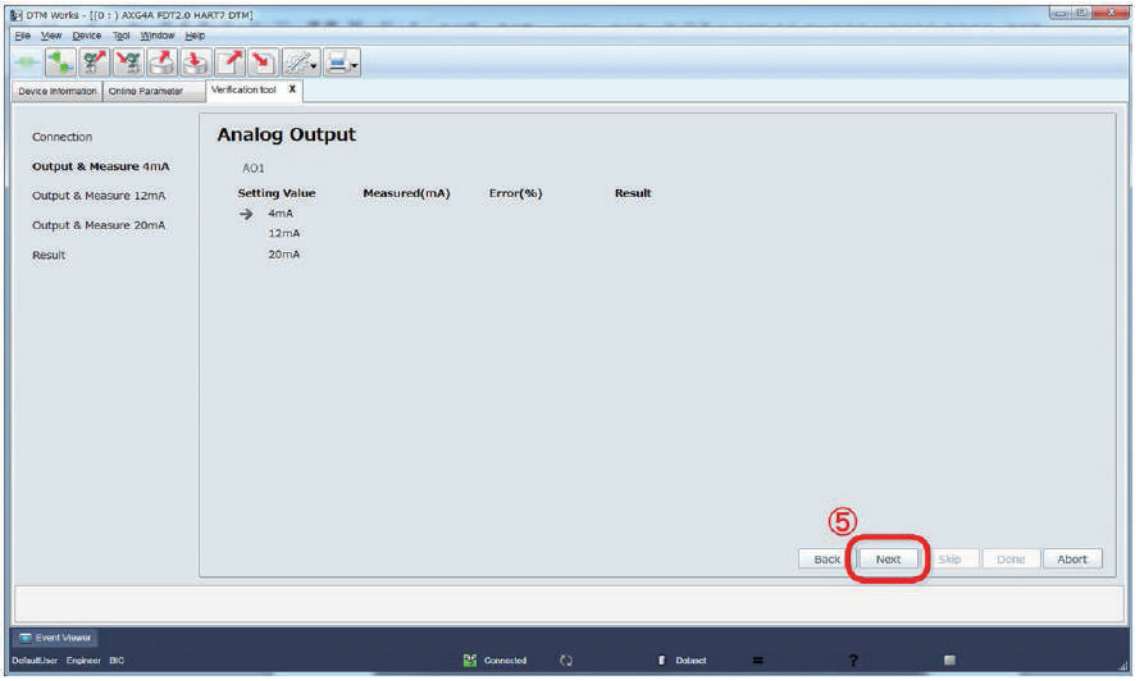
Step 4: Perform wiring connection to the analog output terminals referring the displayed diagram. Note that the diagram shown below is an example and becomes different depending on the specification of the AXG/AXW/CA magnetic flowmeter. Click “Next” to continue.



F070206.ai

Figure 7.2.6 Wiring for Analog Output Check

Step 5: Current value to be checked is indicated. Click “Next” to continue.

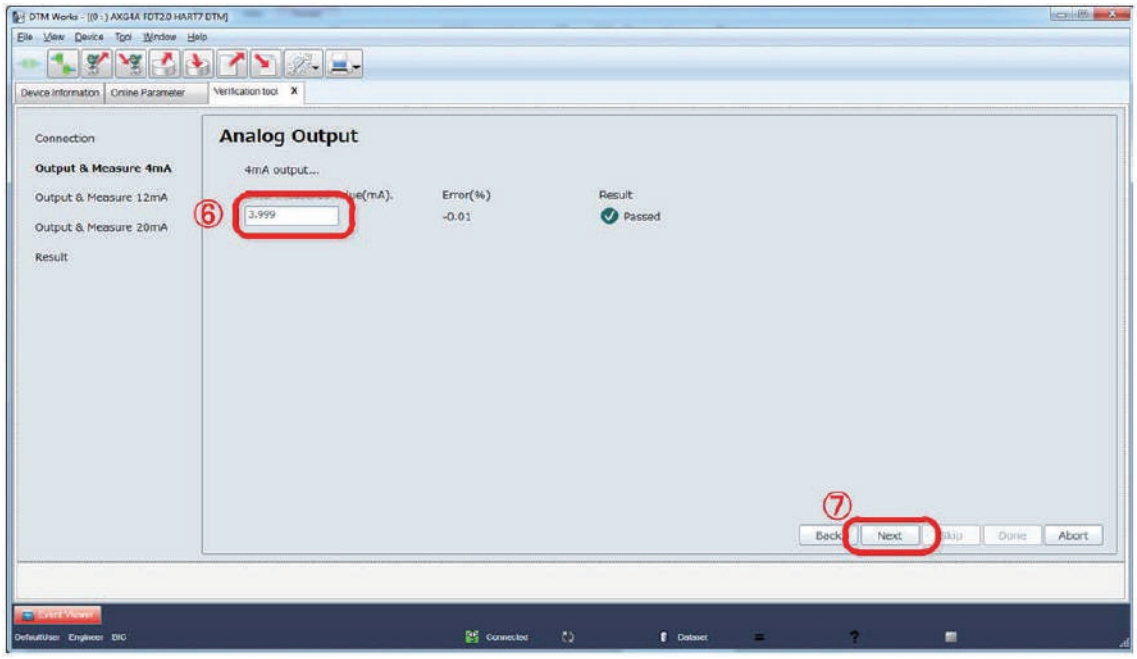


F070207.ai

Figure 7.2.7 Continuing Analog Output Check

Step 6: Read the current value measured by the measuring instrument against 4 mA and enter it in the “Enter measured value (mA)” field.

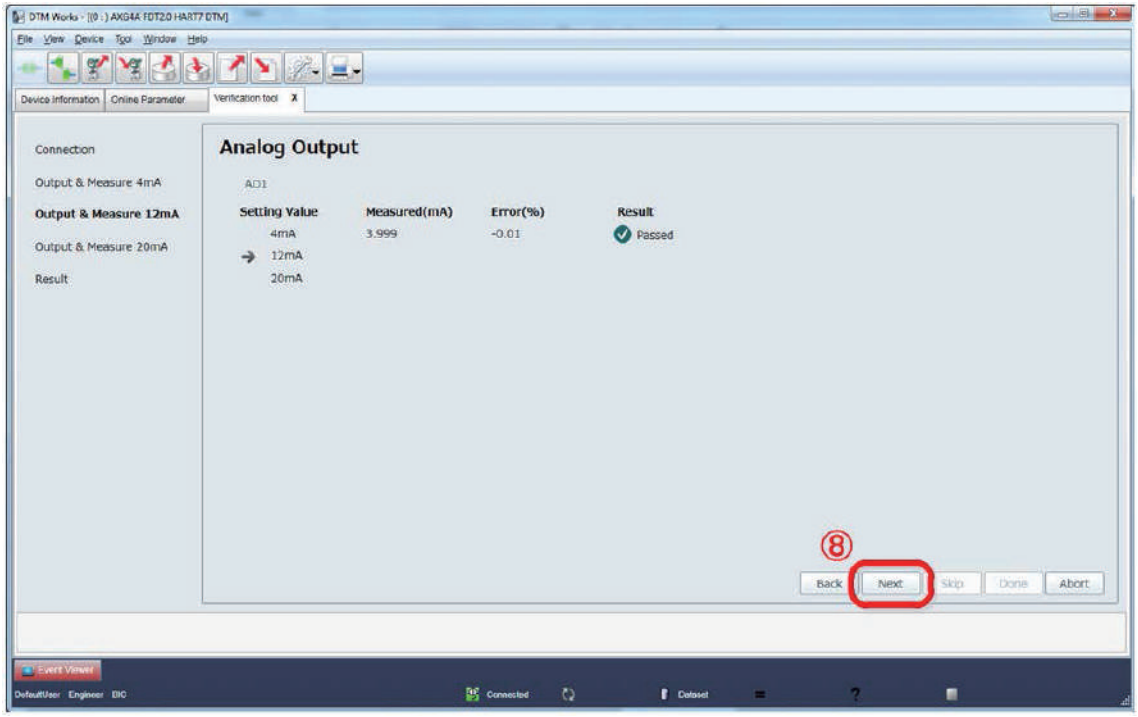
Step 7: Click “Next” to continue.



F070208.ai

Figure 7.2.8 Entering Measured Analog Output Value

Step 8: Current value to be checked is indicated. Click “Next” to continue.

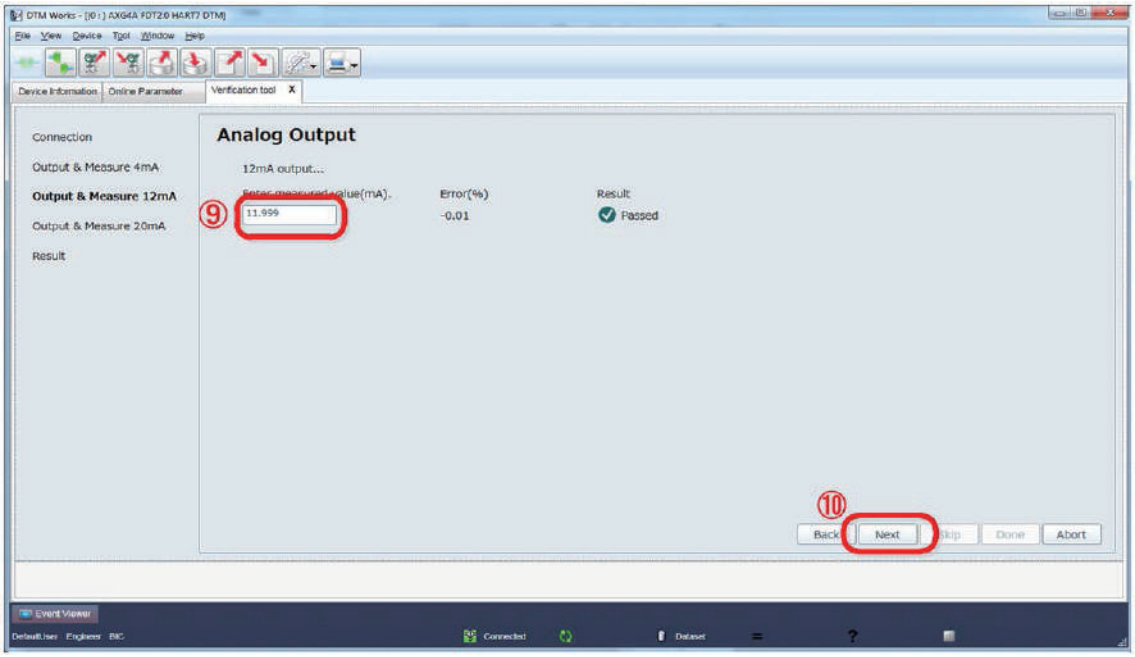


F070209.ai

Figure 7.2.9 Continuing Analog Output Check

Step 9: Read the current value measured by the measuring instrument against 12 mA and enter it in the “Enter measured value (mA)” field.

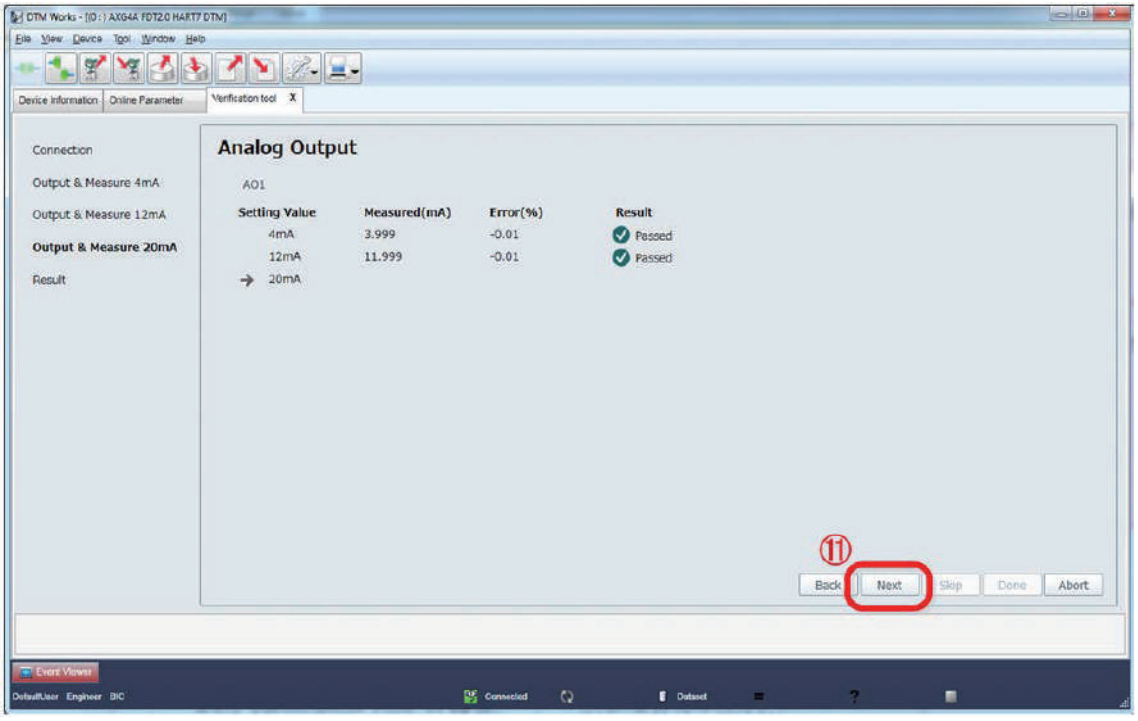
Step 10: Click “Next” to continue.



F070210.ai

Figure 7.2.10 Entering Analog Output Value

Step 11: Click “Next” to continue.

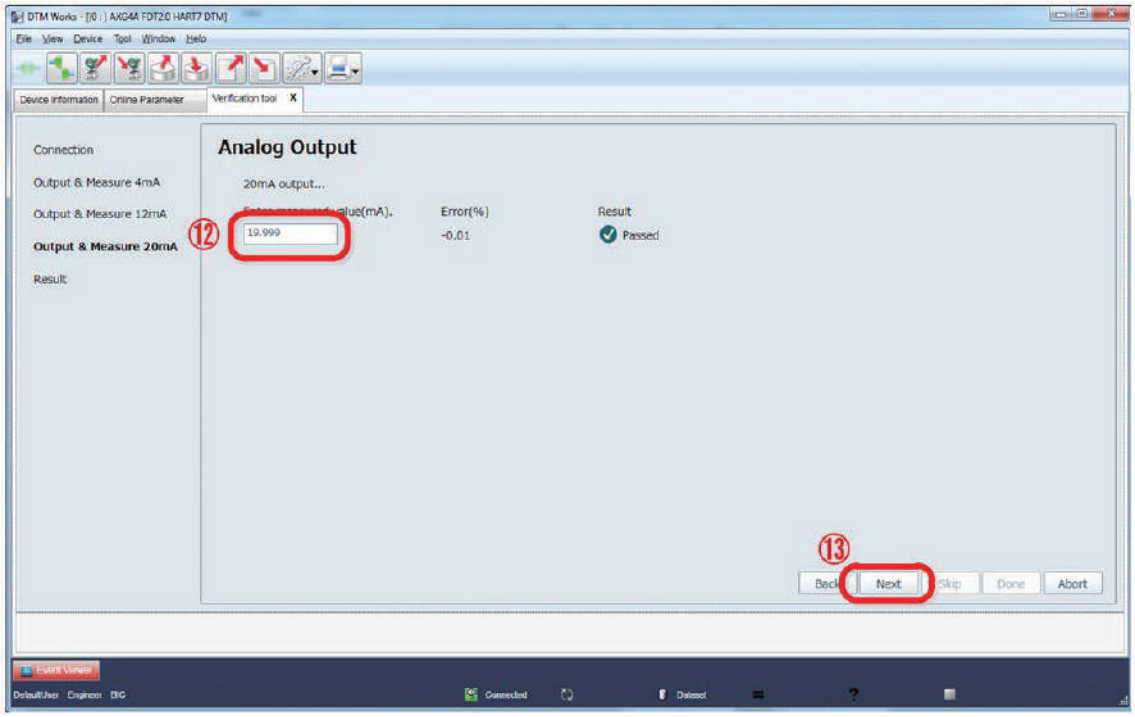


F070211.ai

Figure 7.2.11 Continuing Analog Output Check

Step 12: Read the current value measured by the measuring instrument against 20 mA and enter it in the “Enter measured value (mA)” field.

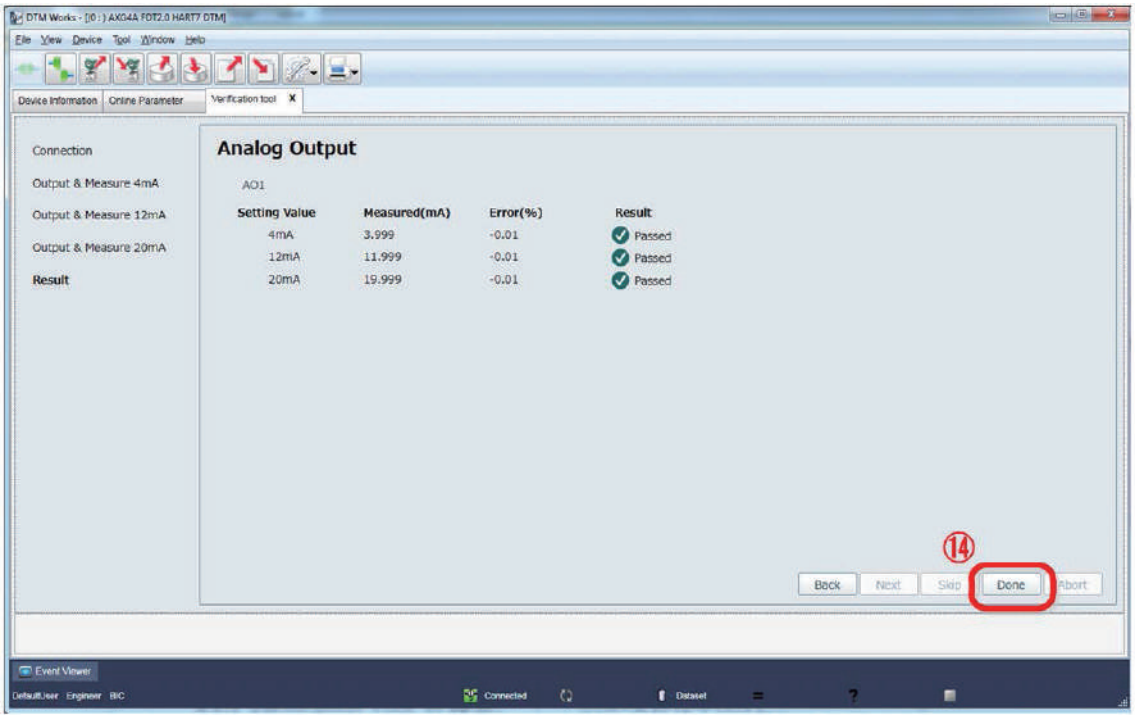
Step 13: Click “Next” to continue.



F070212.ai

Figure 7.2.12 Entering Analog Output Value

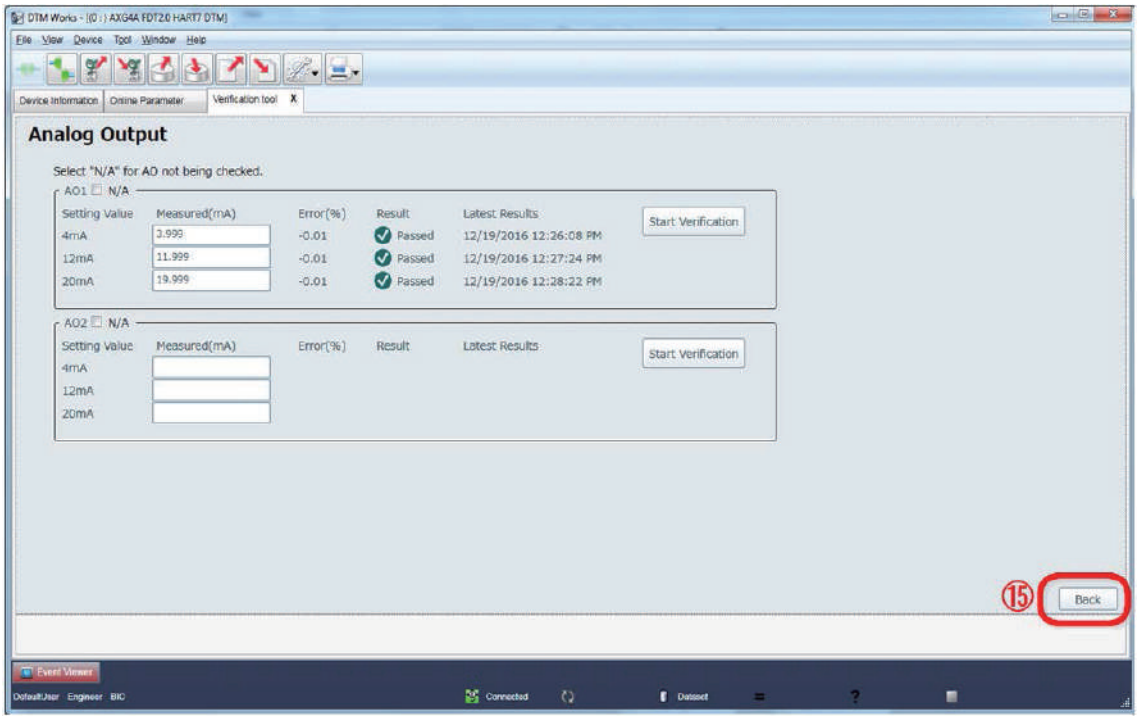
Step 14: Click “Done” to go back to the starting window of analog output check.



F070213.ai

Figure 7.2.13 Continuing Analog Output Check

Step 15: When performing the check for “AO2”, follow the same procedure as for “AO1”. To finish the analog output check, click “Back”.



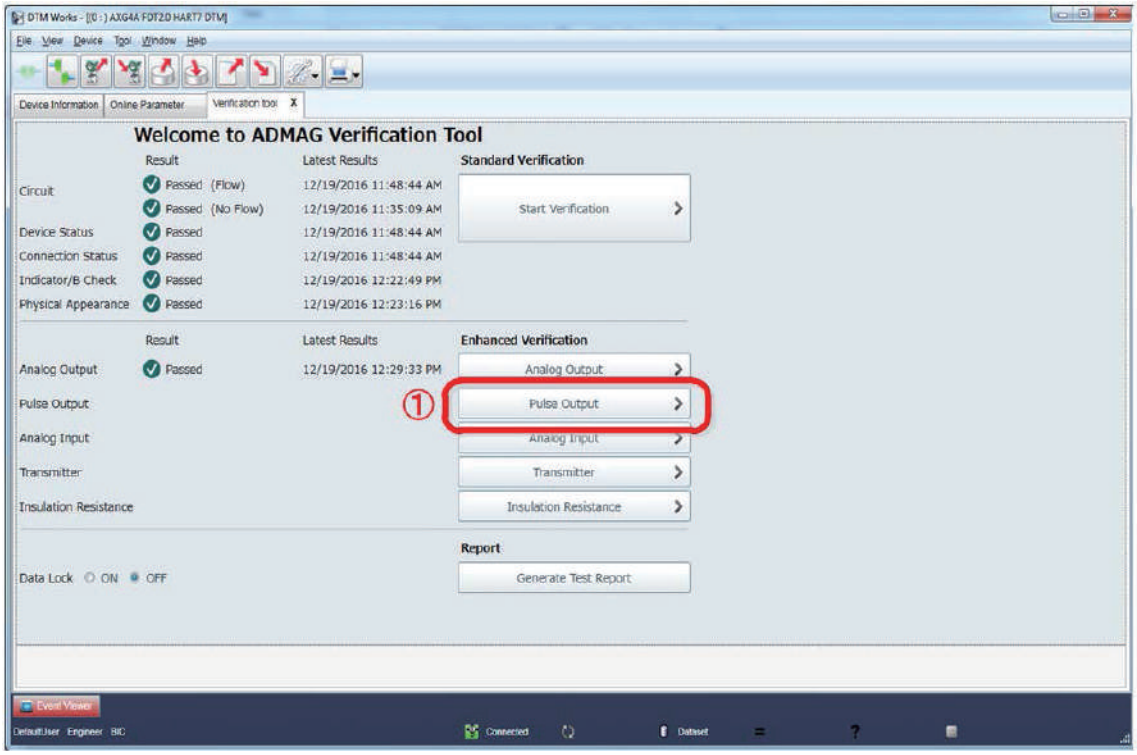
F070214.ai

Figure 7.2.14 Finishing Analog Output Check

7.2.2 Pulse Output Check

The check for pulse outputs “PO1” and “PO2” is available. “PO2” is an optional output and only displayed when it is equipped with the AXG/AXW/CA magnetic flowmeter.

Step 1: Click “Pulse Output”.

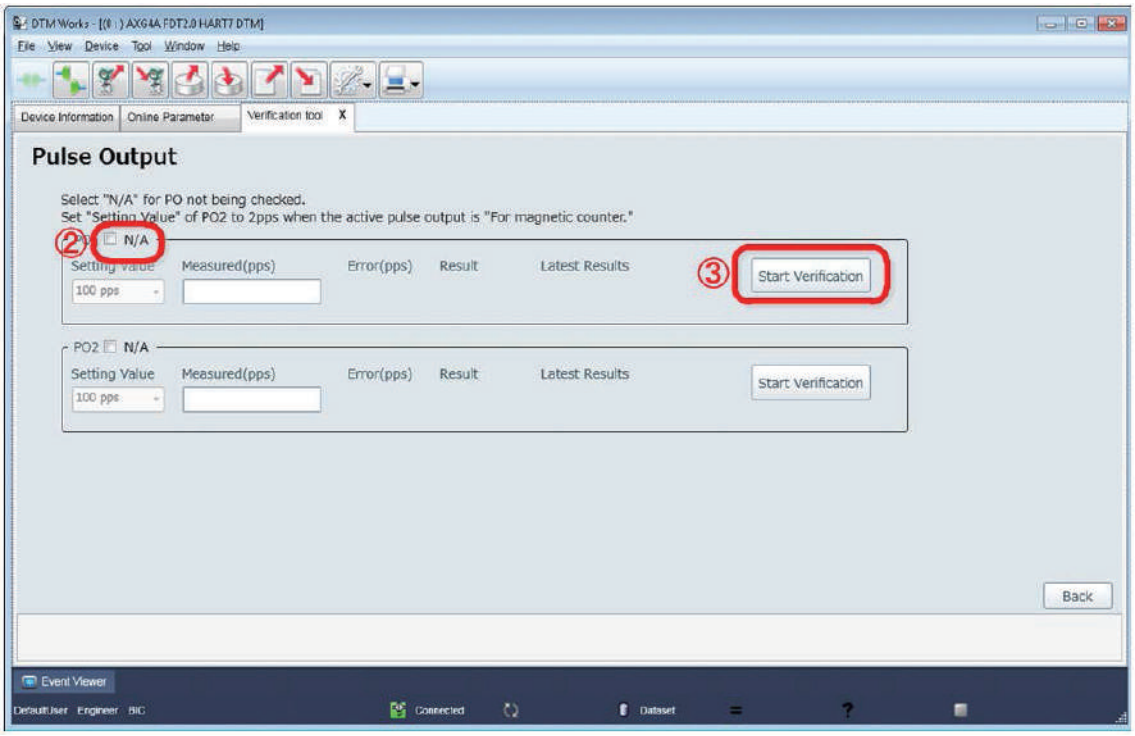


F070215.ai

Figure 7.2.15 Selecting Pulse Output Check

Step 2: “N/A” can be checked selected for “PO1” and “PO2” individually to skip the check for one of them or both.

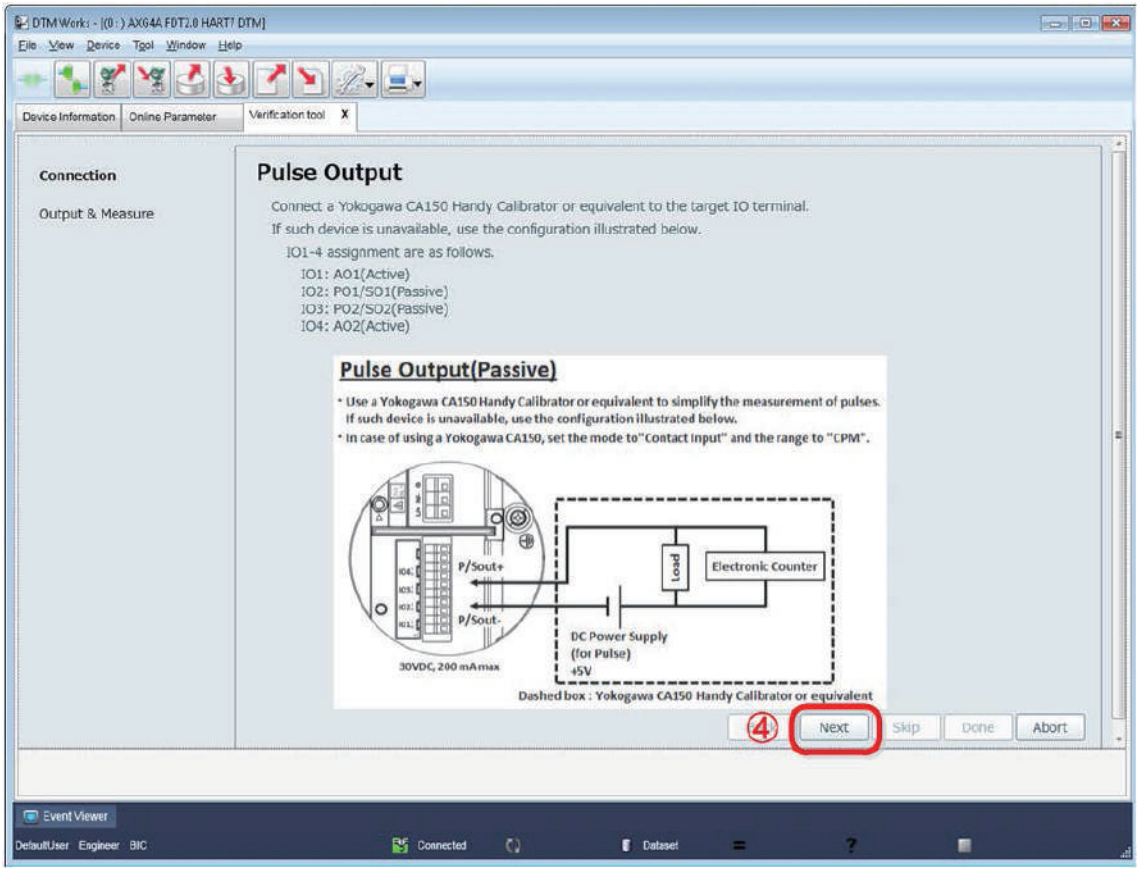
Step 3: Click “Start Verification” to perform the check.



F070216.ai

Figure 7.2.16 Starting Pulse Output Check

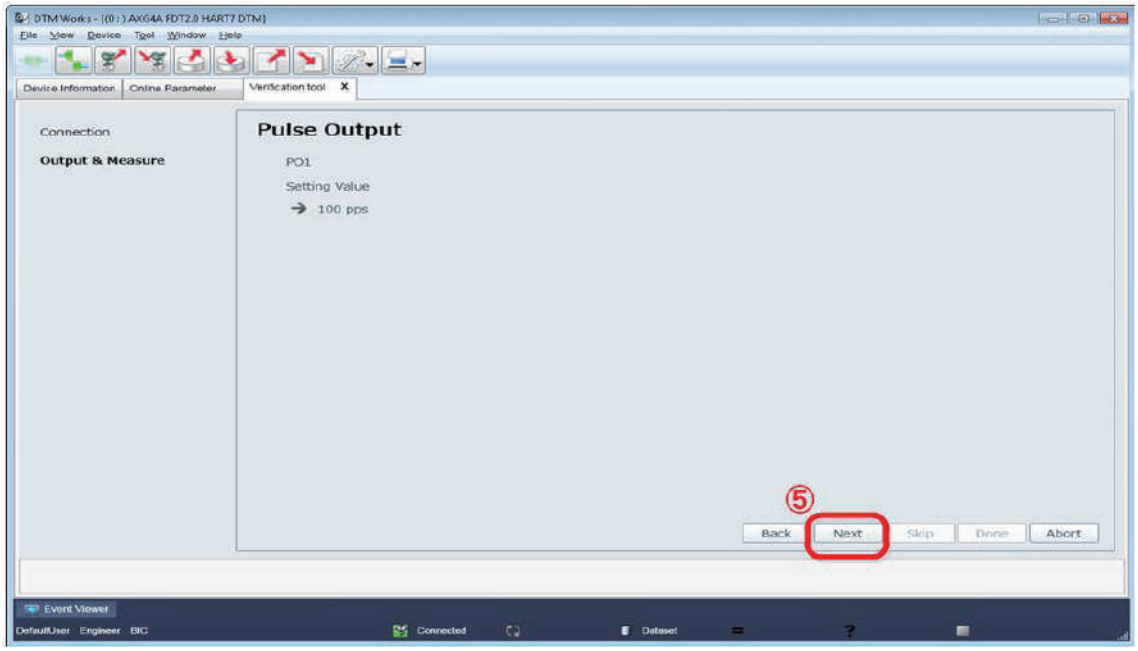
Step 4: Perform wiring connection to the pulse output terminals referring the displayed diagram. Note that the diagram shown below is an example and becomes different depending on the specification of the AXG/AXW/CA magnetic flowmeter. When using the calibrator CA500, set its setting mode “Contact Input” to ON, and select its measurement range (unit) to “CPM”. Click “Next” to continue.



F070217.ai

Figure 7.2.17 Wiring for Pulse Output Check

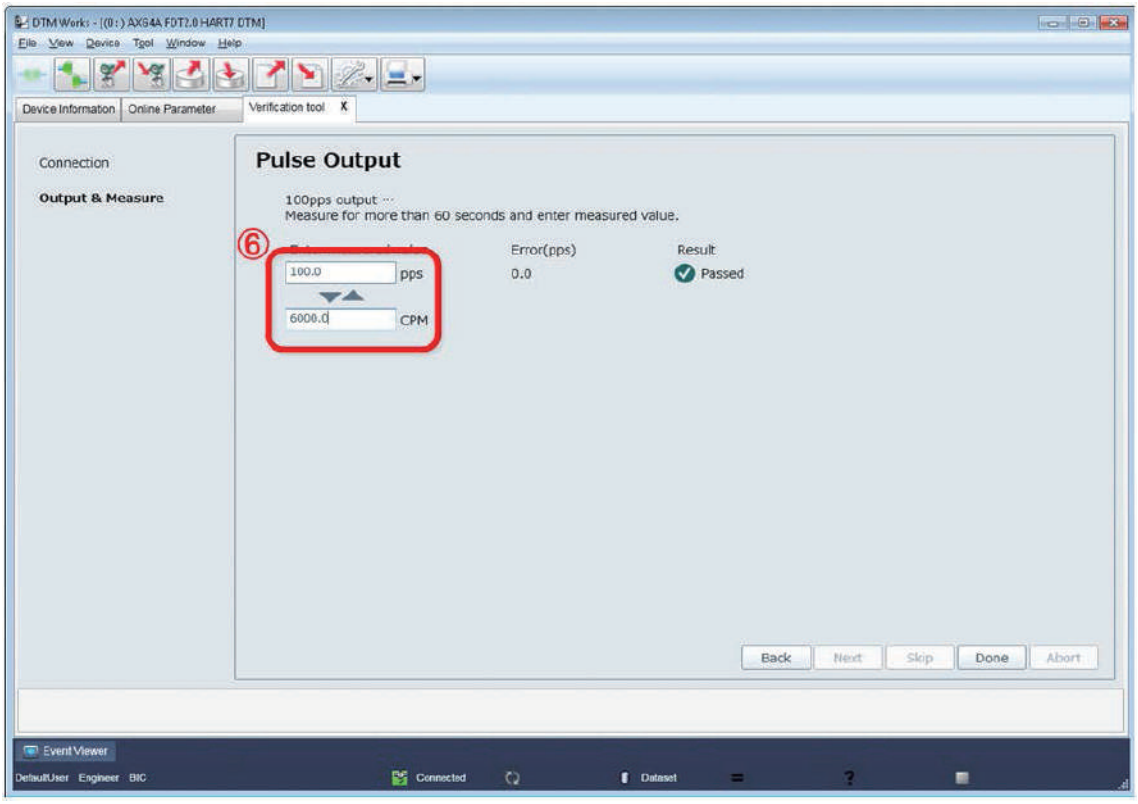
Step 5: The pulse output rate from AXG/AXW/CA magnetic flowmeter on this check is 100 pps or 2 pps depending on its specification. The pulse rate “2 pps” is applied when driving electromechanical counter.
Click “Next” to continue.



F070218.ai

Figure 7.2.18 Continuing Pulse Output Check

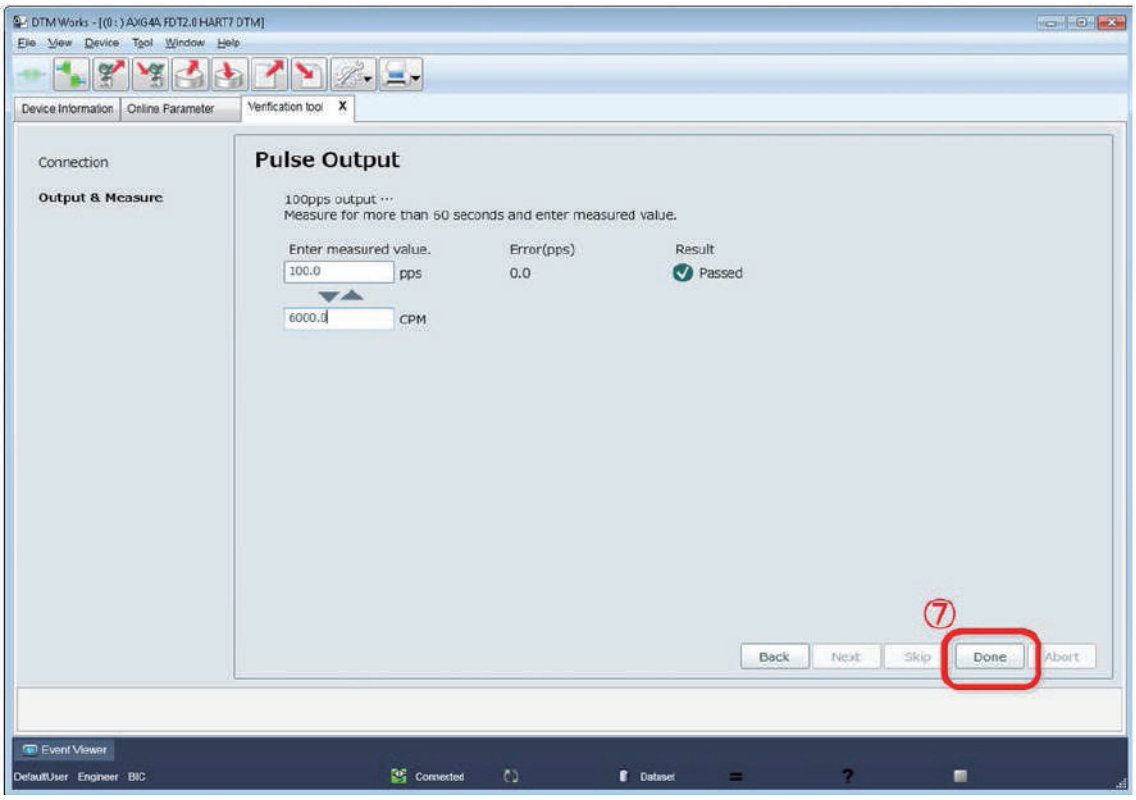
Step 6: Read the pulse count measured by the measuring instrument and enter it in the “pps” or “CPM” field.



F070219.ai

Figure 7.2.19 Entering Pulse Output Value

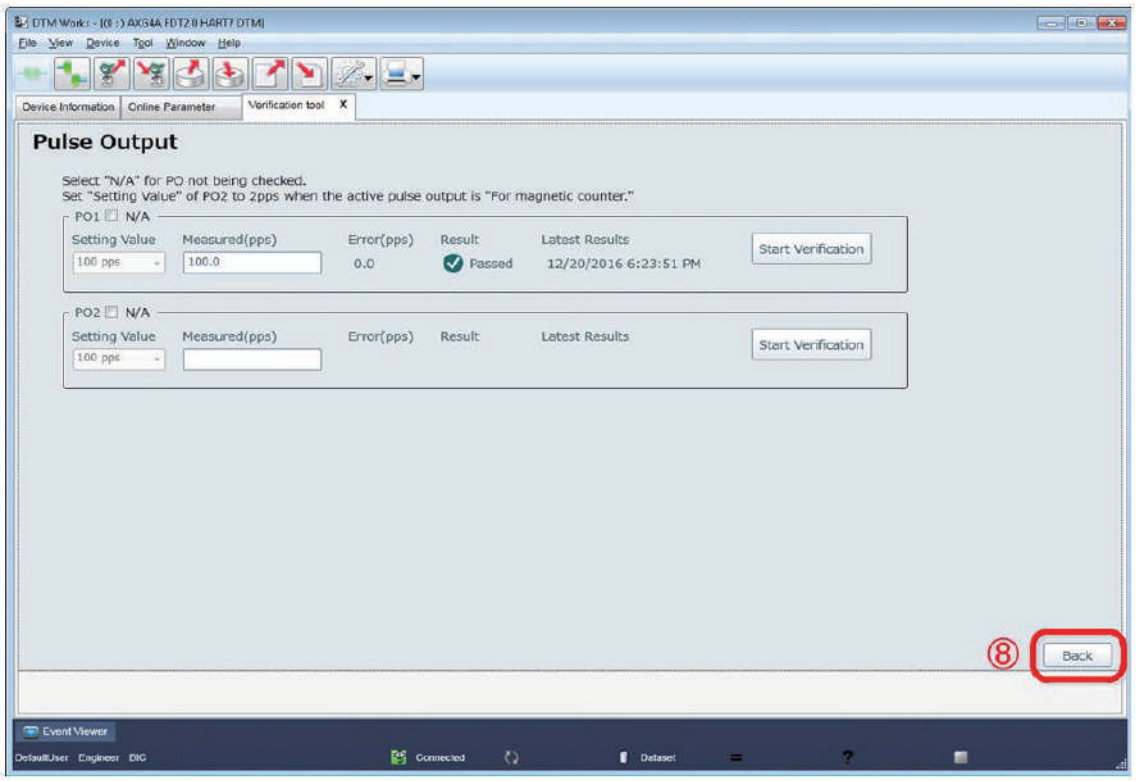
Step 7: Click “Done” to go back to the starting window of pulse output check.



F070220.ai

Figure 7.2.20 Continuing Pulse Output Check

Step 8: When performing the check for “PO2”, follow the same procedure as for “PO1”. To finish the pulse output check, click “Back”.



F070221.ai

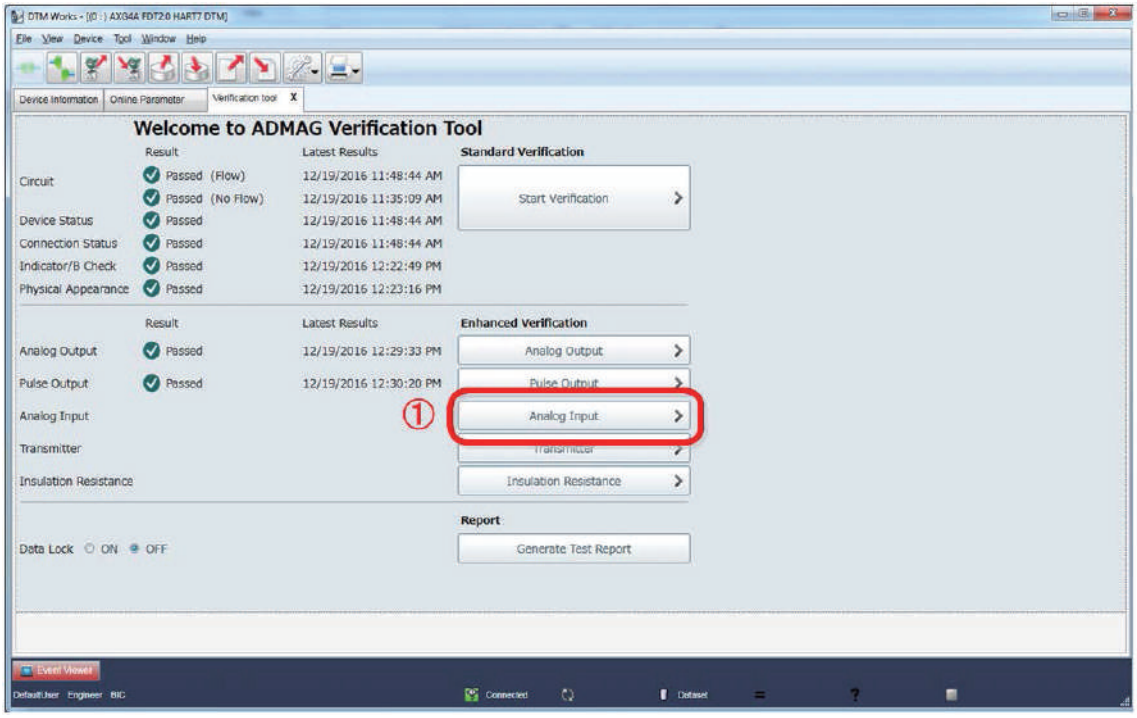
Figure 7.2.21 Finishing Pulse Output Check

7.2.3 Analog Input Check

The analog input is an optional input and only displayed when it is equipped with the AXG/AXW magnetic flowmeter.

For the CA model, this inspection item is not subject to implementation and is not displayed.

Step 1: Click “Analog Input”.

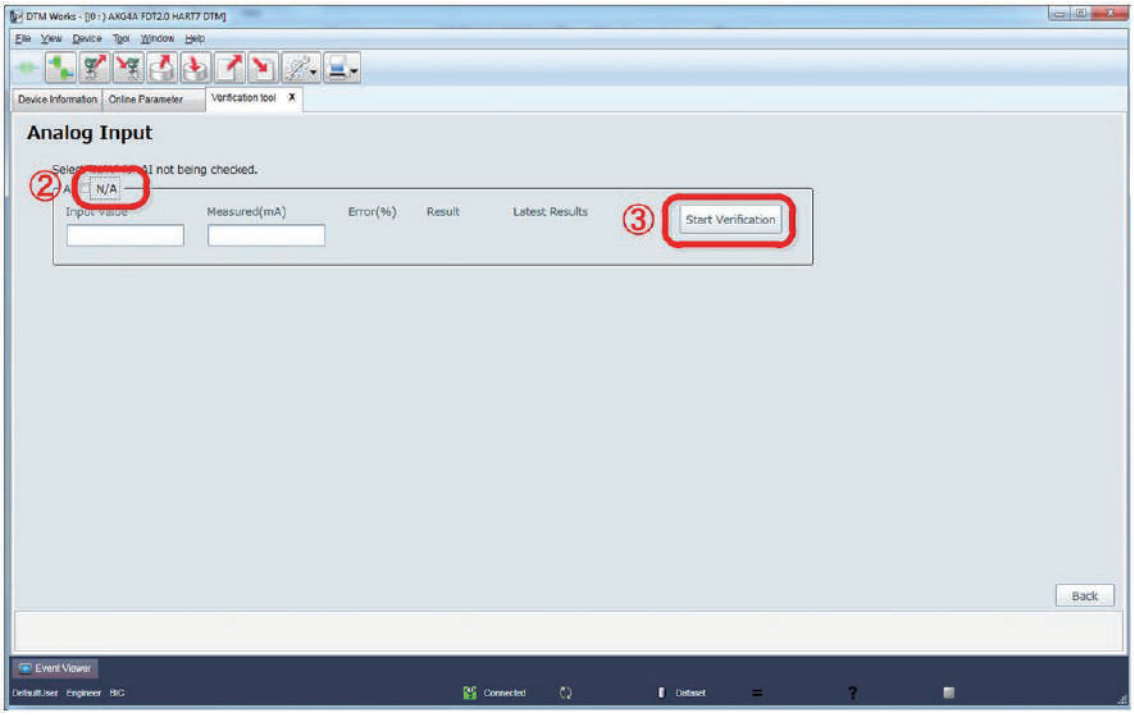


F070222.ai

Figure 7.2.22 Selecting Analog Input Check

Step 2: “N/A” can be checked to skip the check.

Step 3: Click “Start Verification” to perform the check.



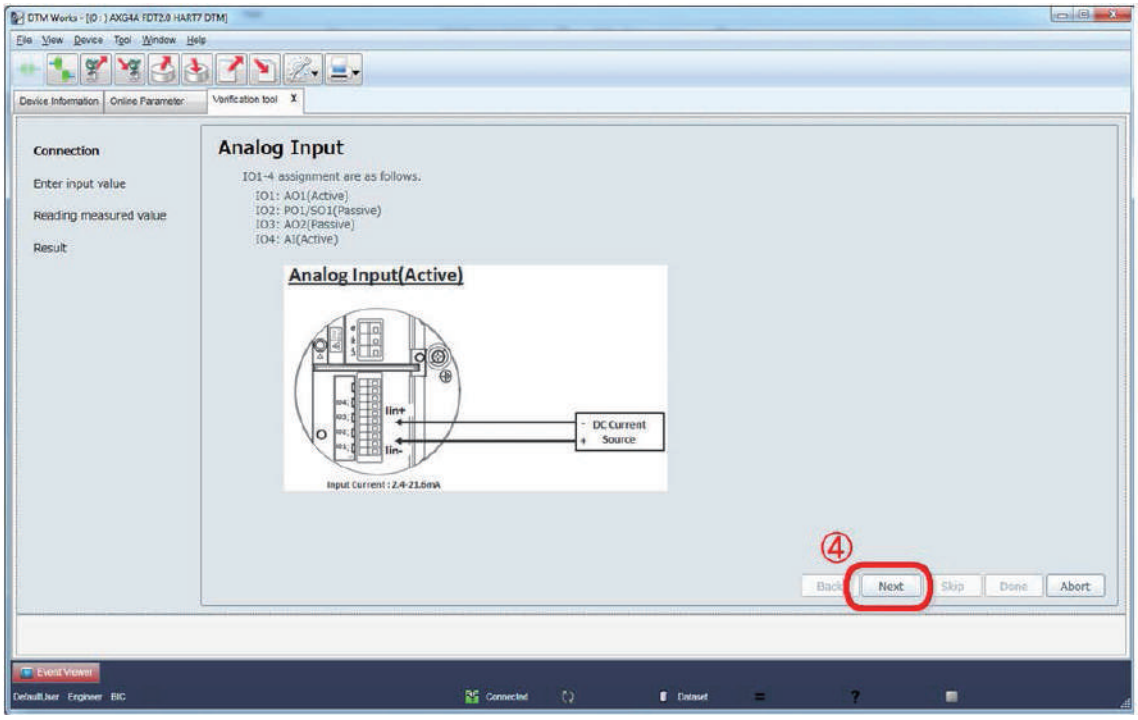
F070223.ai

Figure 7.2.23 Starting Analog Input Check

Step 4: Perform wiring connection to the analog input terminals referring to the displayed diagram. Note that the diagram shown below is an example and becomes different depending on the specification of the AXG/AXW magnetic flowmeter. Click “Next” to continue.

NOTE

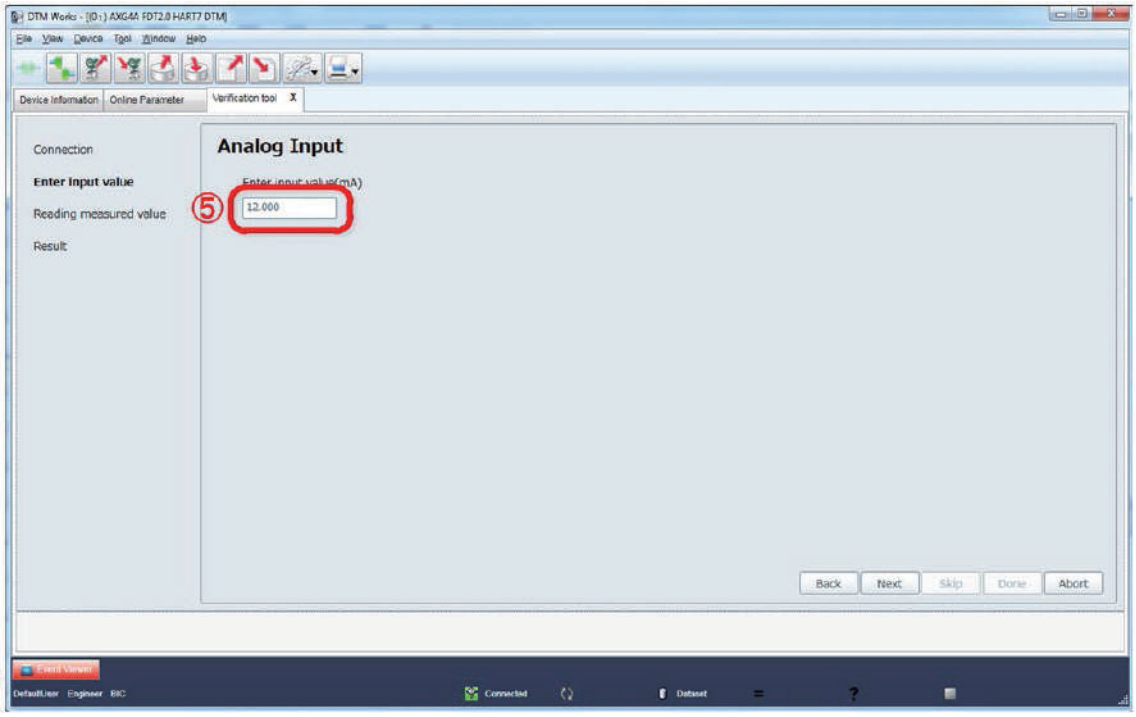
Tips on Using CA500 for Analog Input:
When using CA500 Series Multi-Function Process Calibrator as a DC current source, connect its “+” terminal to “Iin+” and “-“ terminal to “Iin-”. Also, set a minus value like “-12 mA” to the CA500. Then enter its plus value like “12 mA” in the “Enter input value (mA)” field of the Verification Tool.



F070224.ai

Figure 7.2.24 Wiring for Analog Input Check

Step 5: Enter the current input value, which is flowing from measuring instrument (CA500 or equivalent) into the AXG/AXW magnetic flowmeter, in the “Enter input value (mA)” field.

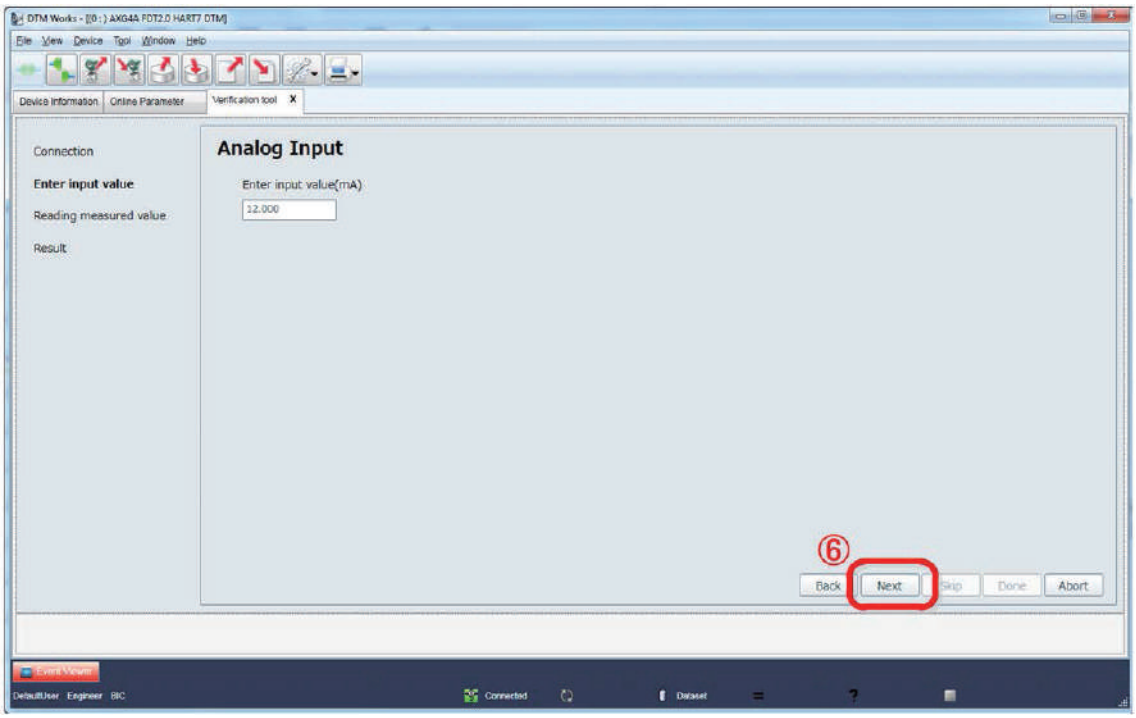


F070225.ai

Figure 7.2.25 Entering Analog Input Value

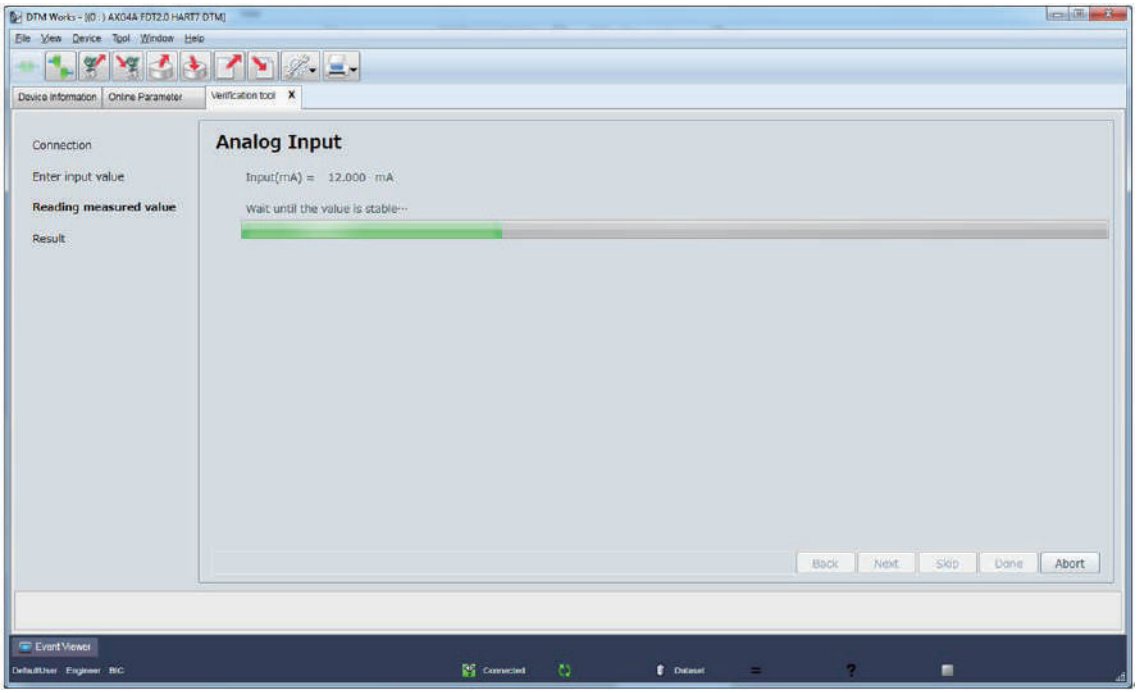
Refer to the “NOTE” in the next page relating to Step 4 and Step 5 in the above.

Step 6: Click “Next” and the window with a message “Wait until the value is stable…” appears.



F070226.ai

Figure 7.2.26 Continuing Analog Input Check

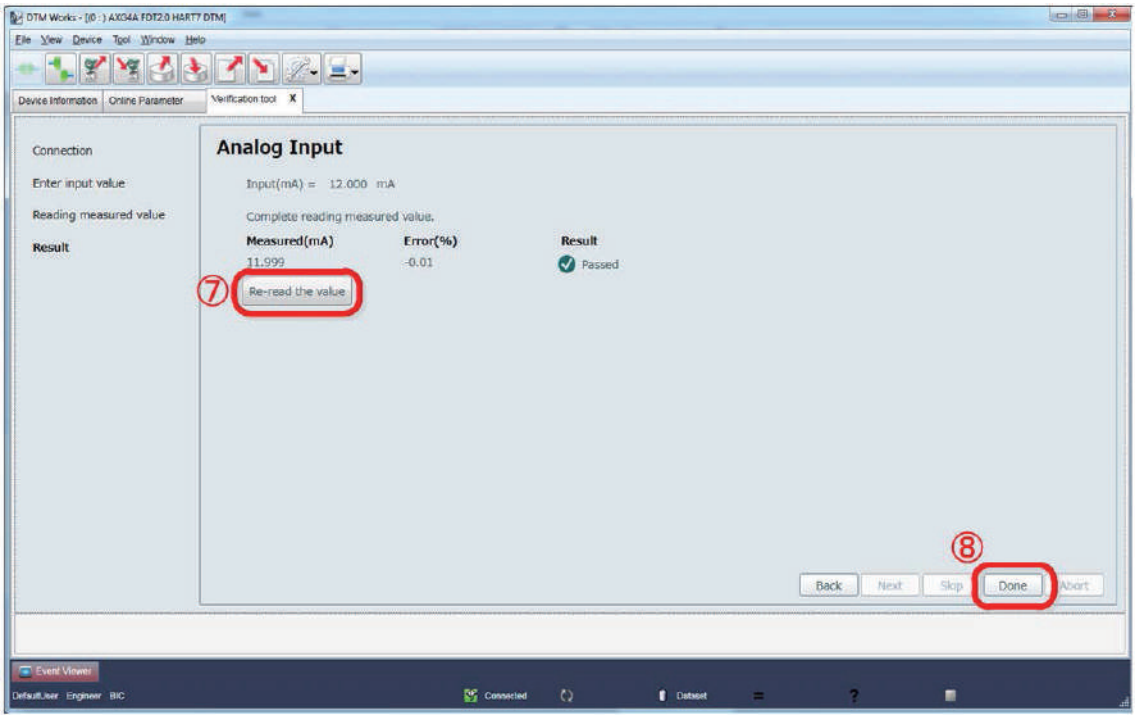


F070227.ai

Figure 7.2.27 Continuing Analog Input Check

Step 7: Click “Re-read the value” to perform this check again.

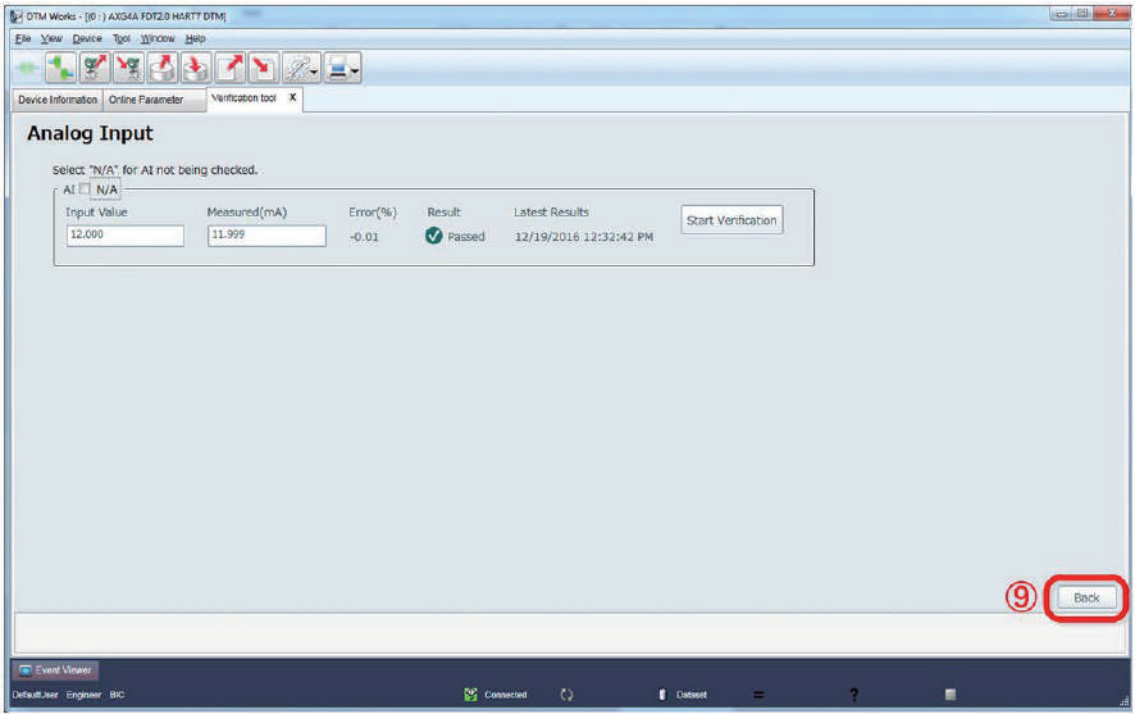
Step 8: Click “Done” to continue.



F070228.ai

Figure 7.2.28 Continuing Analog Input Check

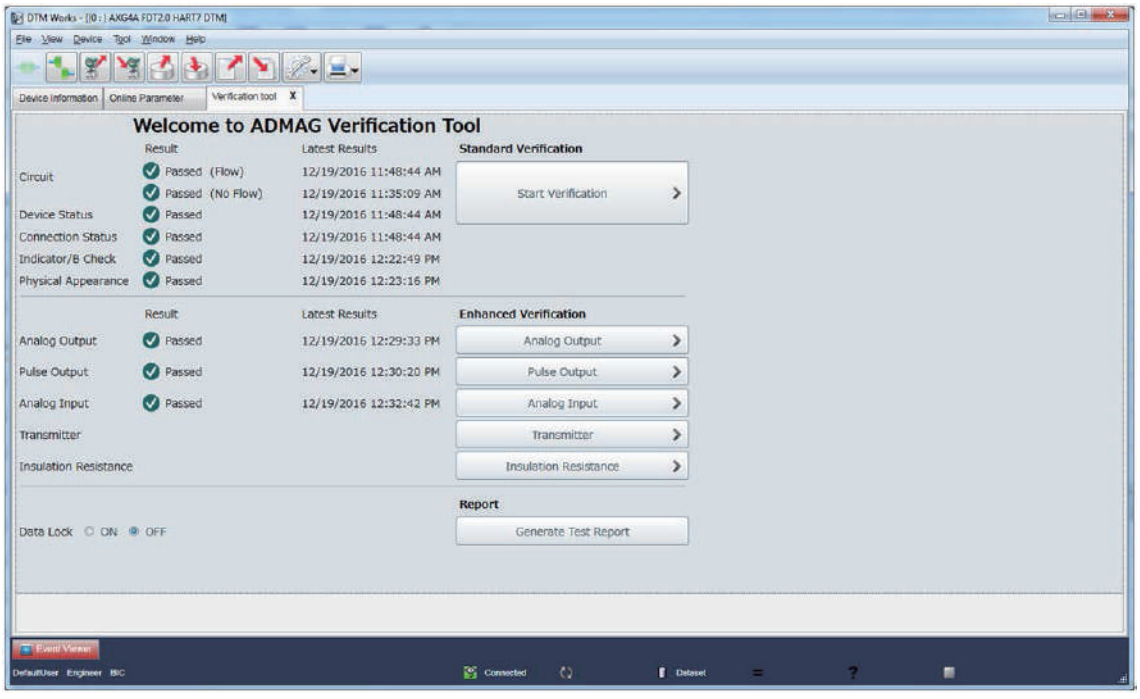
Step 9: Click “Back” to go back to the menu window of the Verification Tool.



F070229.ai

Figure 7.2.29 Finishing Analog Input Check

The menu window of the Verification Tool appears again.



F070230.ai

Figure 7.2.30 Finishing Analog Input Check

7.2.4 Transmitter Check

WARNING

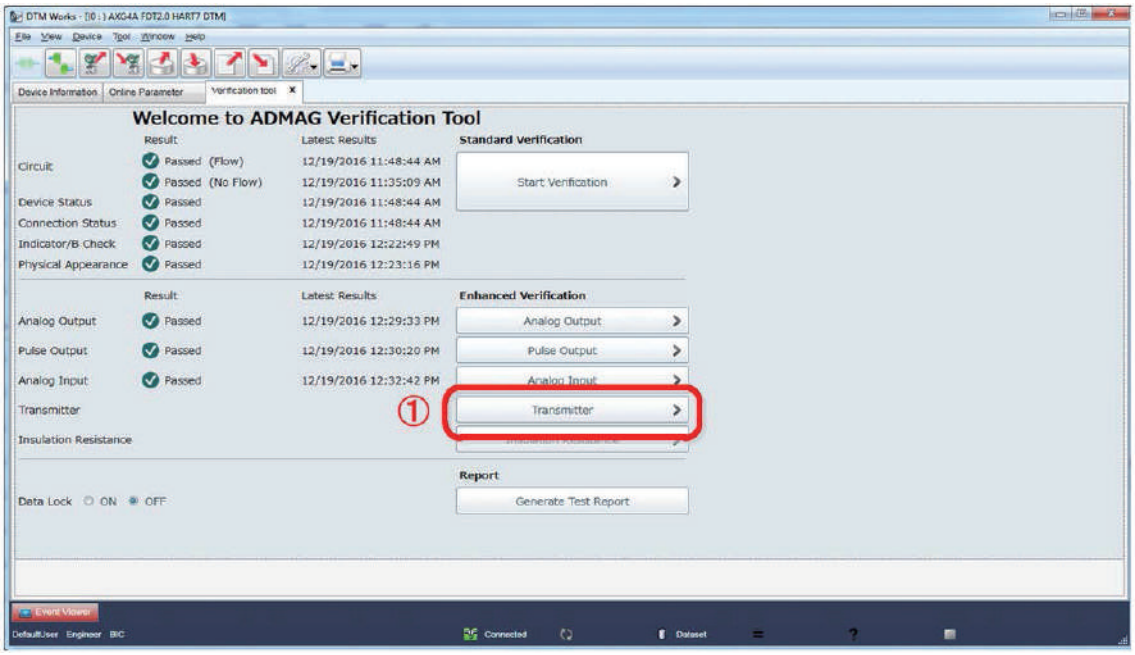
Follow the user's manual for the AM012 Magnetic Flowmeter Calibrator for correct operation and safe handling.

The accuracy of transmitter is checked using the AM012 calibrator.

The cable connections need to be changed during this check, which must be changed back to the original connection after the check.

For the CA model, this inspection item is not subject to implementation and is not displayed.

Step 1: Click "Transmitter".

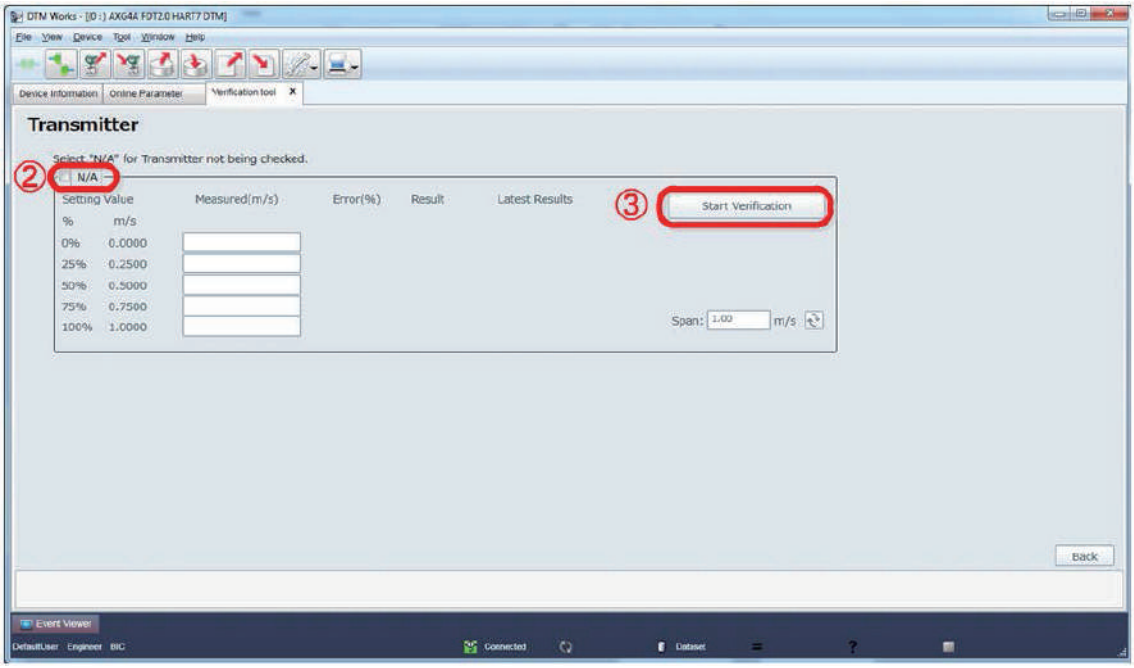


F070231.ai

Figure 7.2.31 Selecting Transmitter Check

Step 2: Click “N/A” to skip this check.

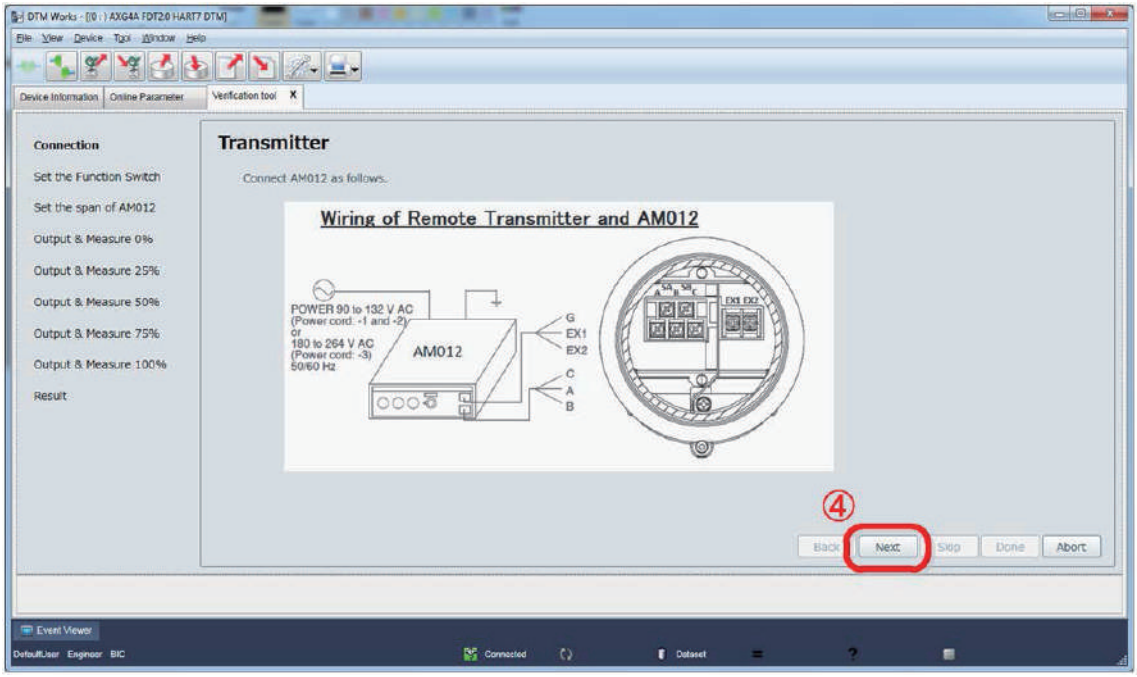
Step 3: Click “Start Verification” to continue this check.



F070232.ai

Figure 7.2.32 Starting Transmitter Check

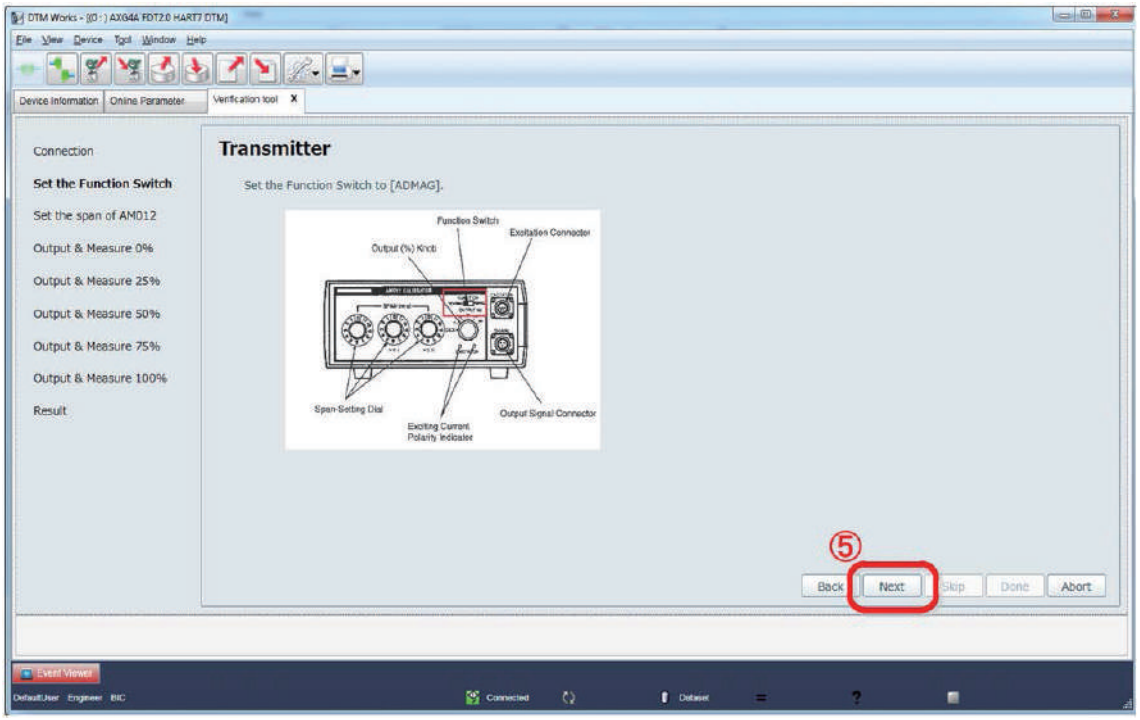
Step 4: Connect the AM012 calibrator and the AXG/AXW magnetic flowmeter’s signal and excitation cable referring to the diagram shown in the window. Then click “Next”.



F070233.ai

Figure 7.2.33 Wiring for Transmitter Check

Step 5: Set the function switch of the AM012 calibrator to “ADMAG” referring to the figure shown in the window. Then click “Next”.



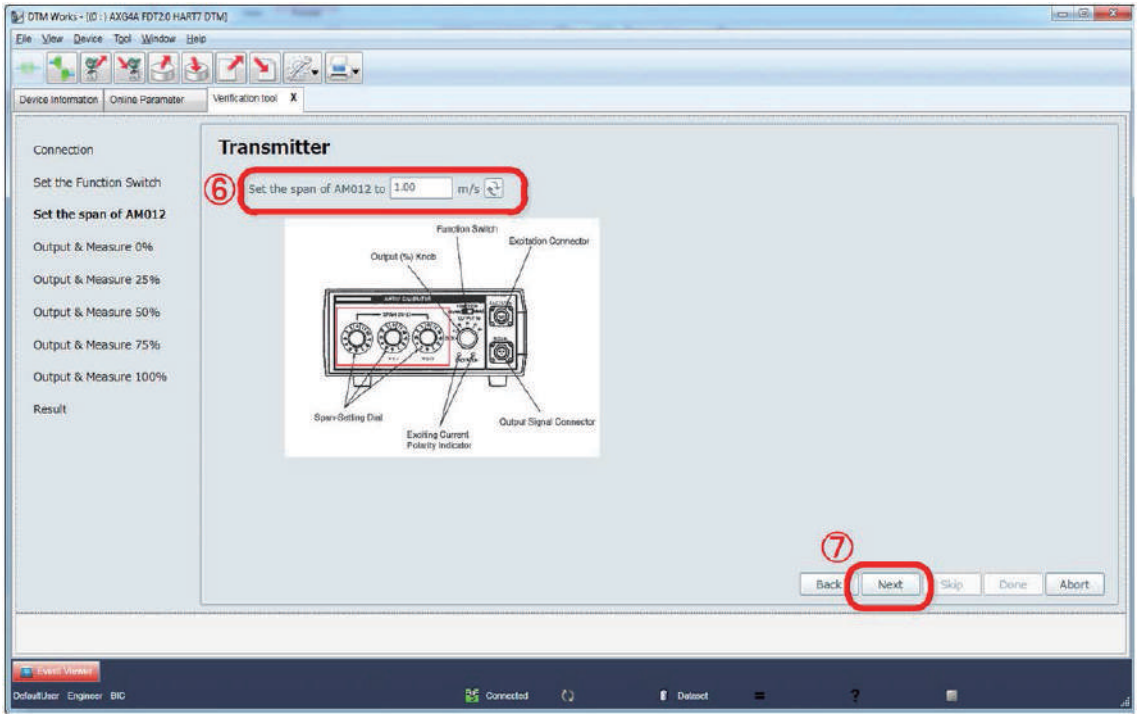
F070234.ai

Figure 7.2.34 Setting Function Switch of AM012 Calibrator

Step 6: The span flow rate of the AXG/AXW magnetic flowmeter (in flow velocity unit [m/s]) appears in the field shown in the window below. If necessary, it can be changed by entering another value. The check will be done using that value. The value set in the AXG/AXW magnetic flowmeter can be read again by clicking icon.

After fixing the value in the field, set the span setting dial of the AM012 calibrator to the same value displayed in the field.

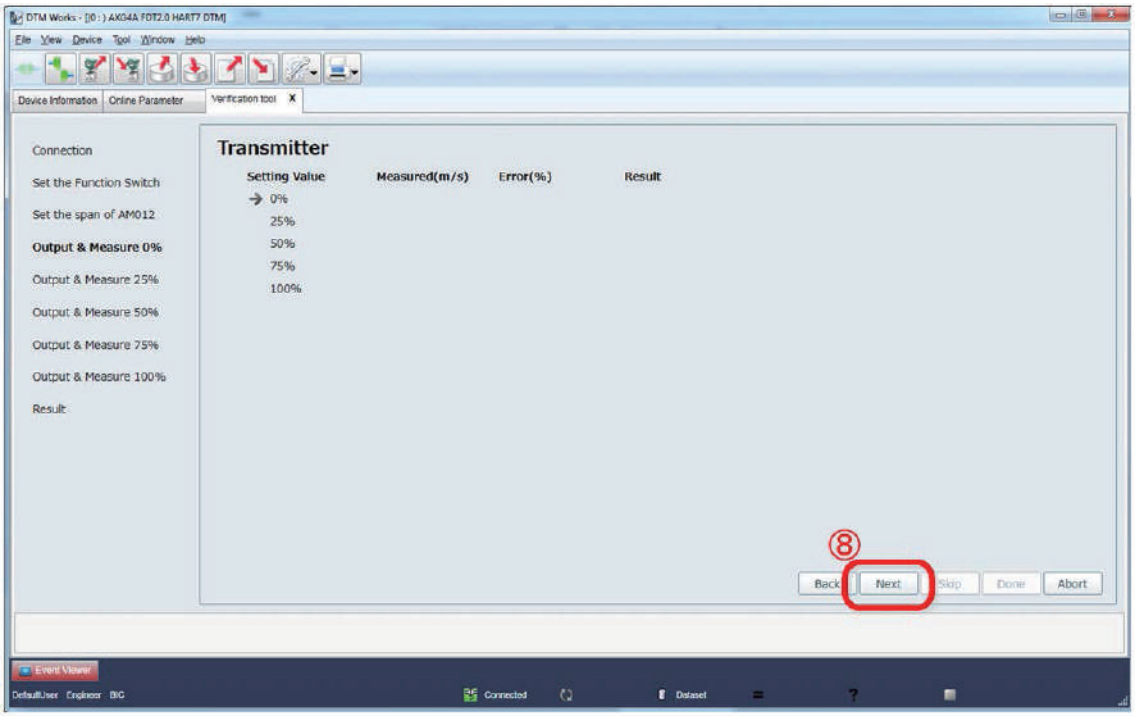
Step 7: Click “Next” to continue.



F070235.ai

Figure 7.2.35 Setting Span Setting Dial of AM012 Calibrator

Step 8: The window below to check “0%” setting value appears. Click “Next” to continue.

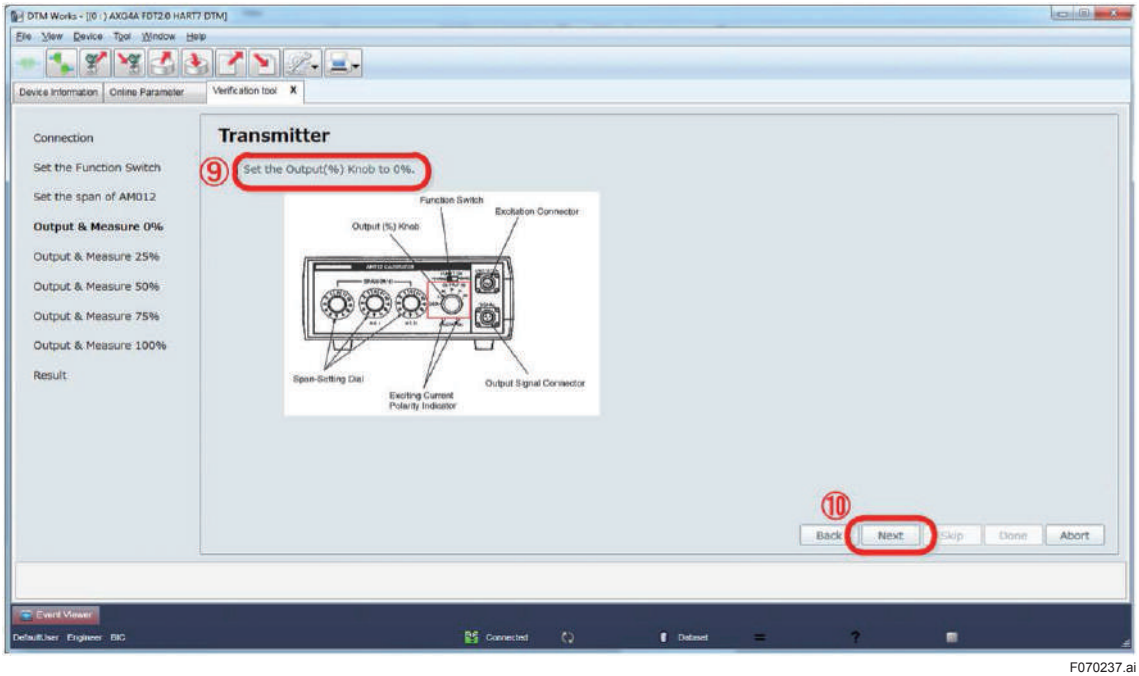


F070236.ai

Figure 7.2.36 Continuing Transmitter Check

Step 9: Set the output (%) dial of the AM012 calibrator to 0% as instructed in the window.

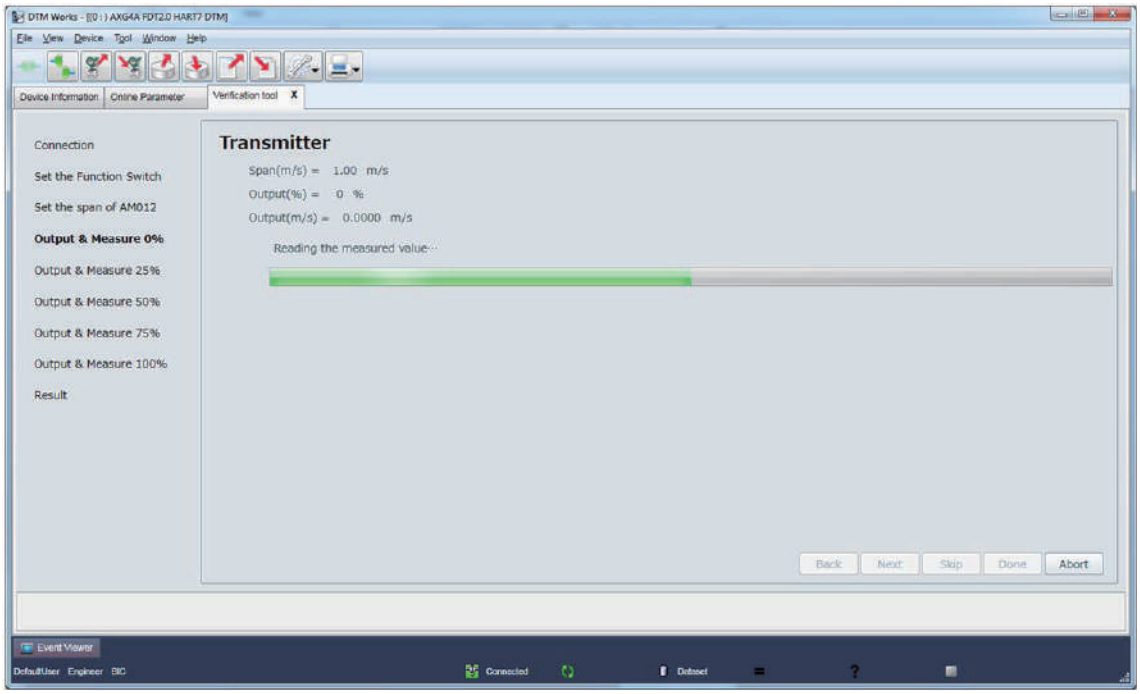
Step 10: Click “Next” to continue.



F070237.ai

Figure 7.2.37 Setting Output Dial of AM012 Calibrator

Step 11: The progress bar of the verification work appears.

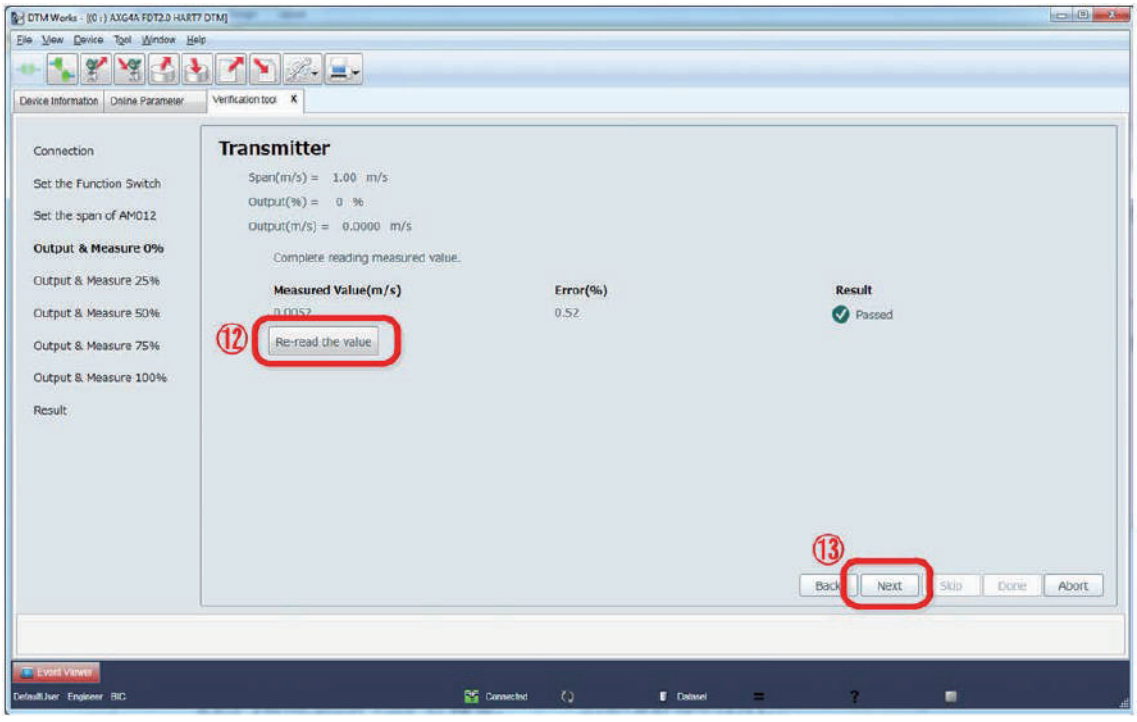


F070238.ai

Figure 7.2.38 Progress Bar for Transmitter Check

Step 12: The window showing the result is displayed. If necessary, click “Re-read the value” to perform this check again.

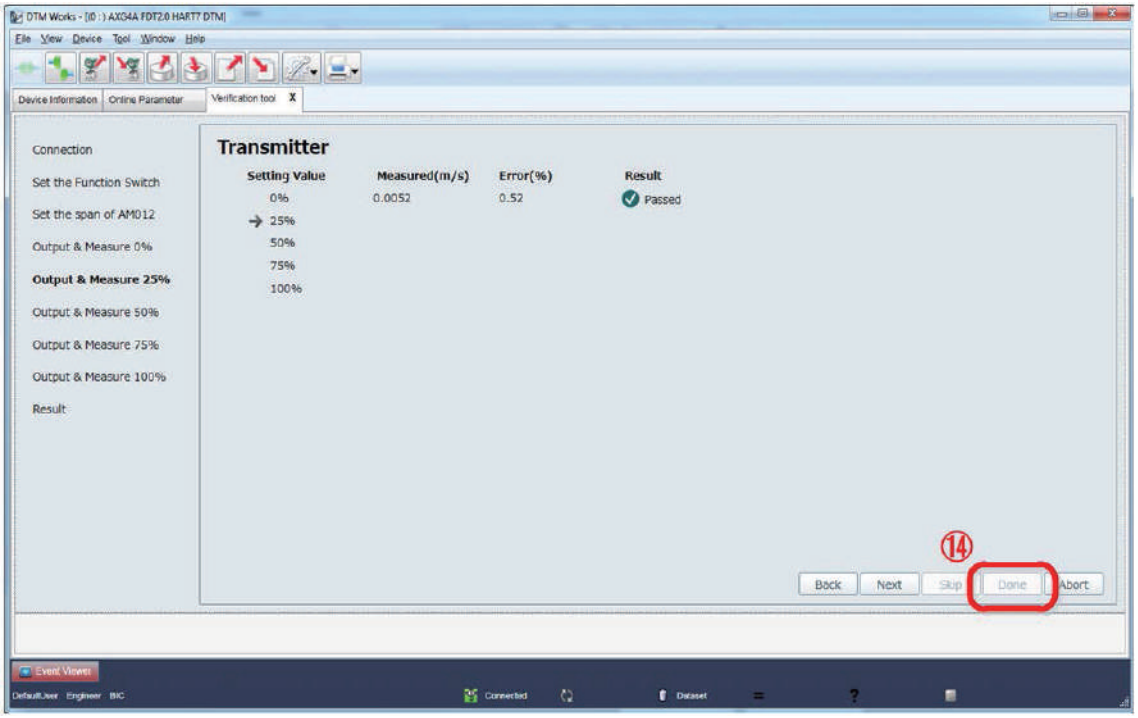
Step 13: Click “Next” to continue.



F070239.ai

Figure 7.2.39 Continuing Transmitter Check

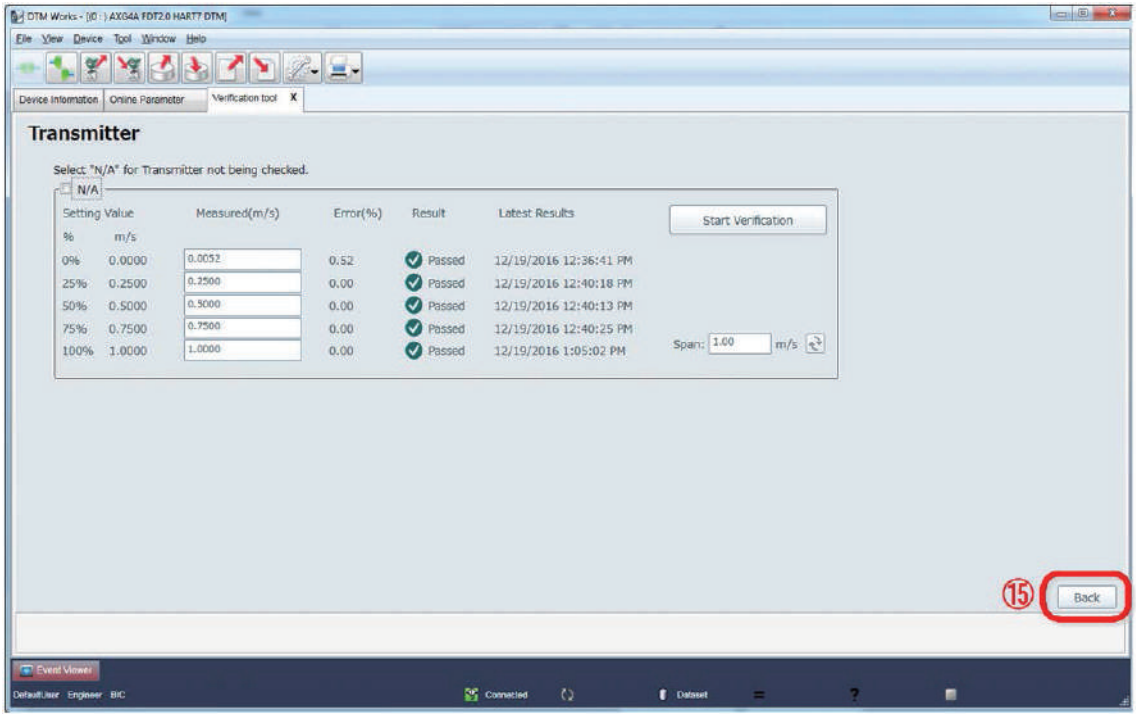
Step 14: Perform this check also for 25%, 50%, 75%, and 100% setting value just like done for 0%. After performing it for all the setting values, click “Done” to continue.



F070240.ai

Figure 7.2.40 Continuing Transmitter Check

Step 15: The window with the result is displayed as an example below. Click “Back” to go back to the starting window of the verification operation.



F070241.ai

Figure 7.2.41 Finishing Transmitter Check

7.2.5 Insulation Resistance Check

The insulation resistance for the excitation coil and signal electrodes is checked, using MY600 insulation resistance tester or equivalent.

For the CA model, this inspection item is not subject to implementation and is not displayed.

WARNING

Follow the user's manual for the AXG/AXW magnetic flowmeter for correct operation and safe handling.

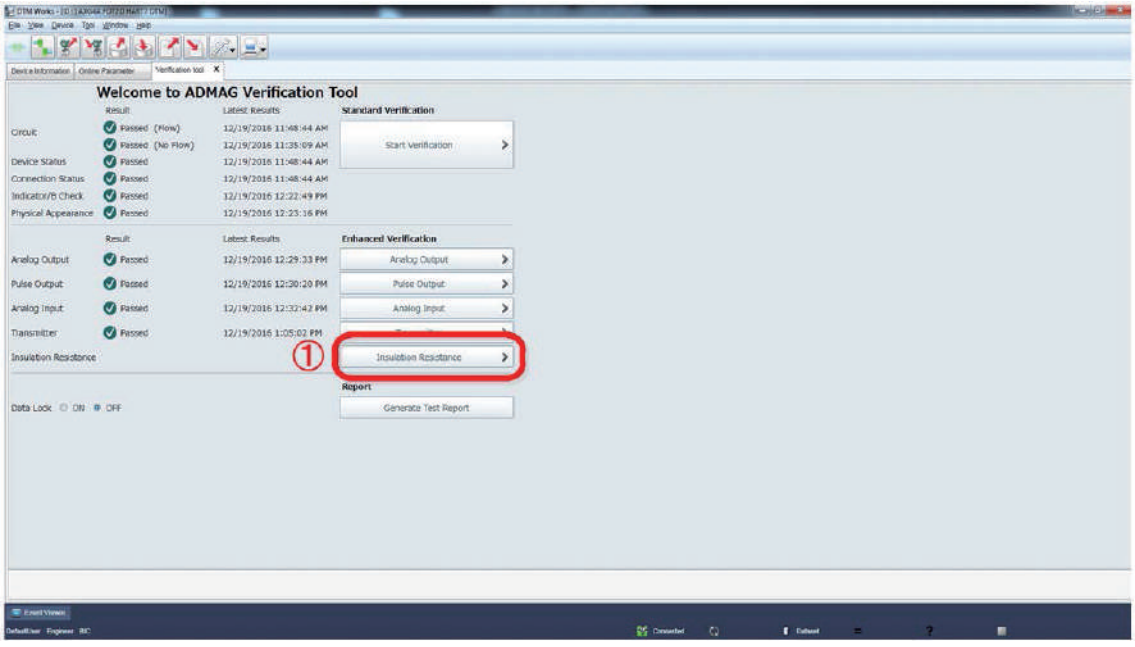
IMPORTANT

Before performing this check, make sure that the AM012 calibrator is not connected to the AXG/AXW magnetic flowmeter.

NOTE

- When checking the insulation resistance for the signal electrodes, make sure that the inside of measuring pipe of the AXG/AXW magnetic flowmeter is empty, the surface of signal electrodes are dry, and they have no material adhered to. When checking the insulation resistance for the excitation coil, it is not necessary to make the measuring pipe empty.
- In case of the submersible use AXG/AXW flowmeter, disconnect wiring at the transmitter side so that the insulation resistance can be measured at the cable terminals.

Step 1: Click ""Insulation Resistance.

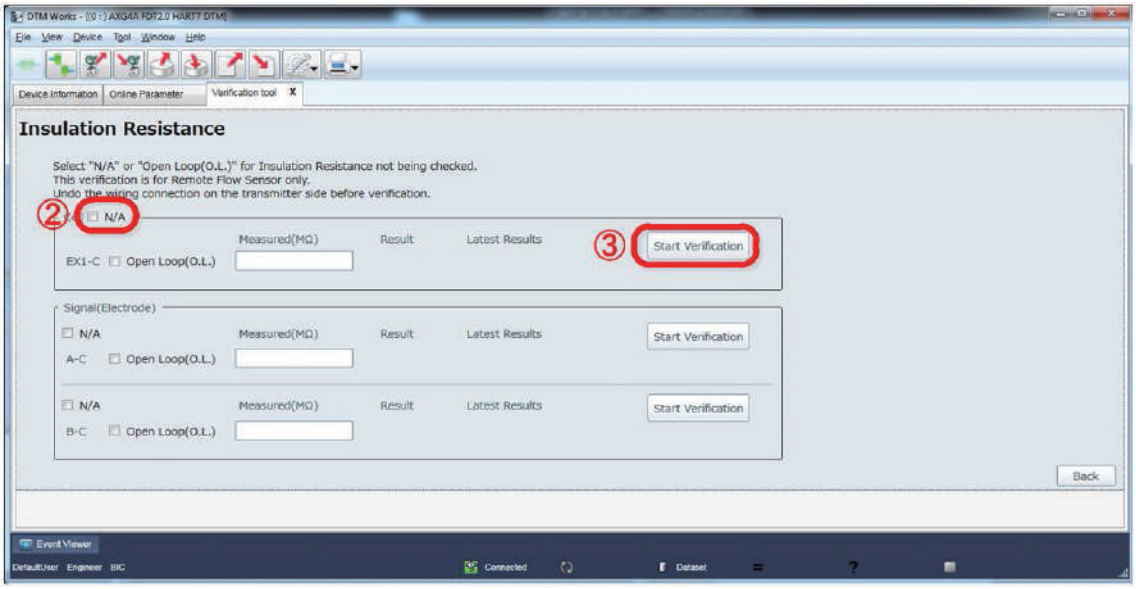


F070242.ai

Figure 7.2.42 Selecting Insulation Resistance Check

Step 2: To skip the check of insurance resistance for excitation coil, select “N/A” in the “Coil” column. If it is sure that the insurance resistance is over the measurable range, select “Open Loop (O.L.)” in the “Coil” column and then this check can be passed.

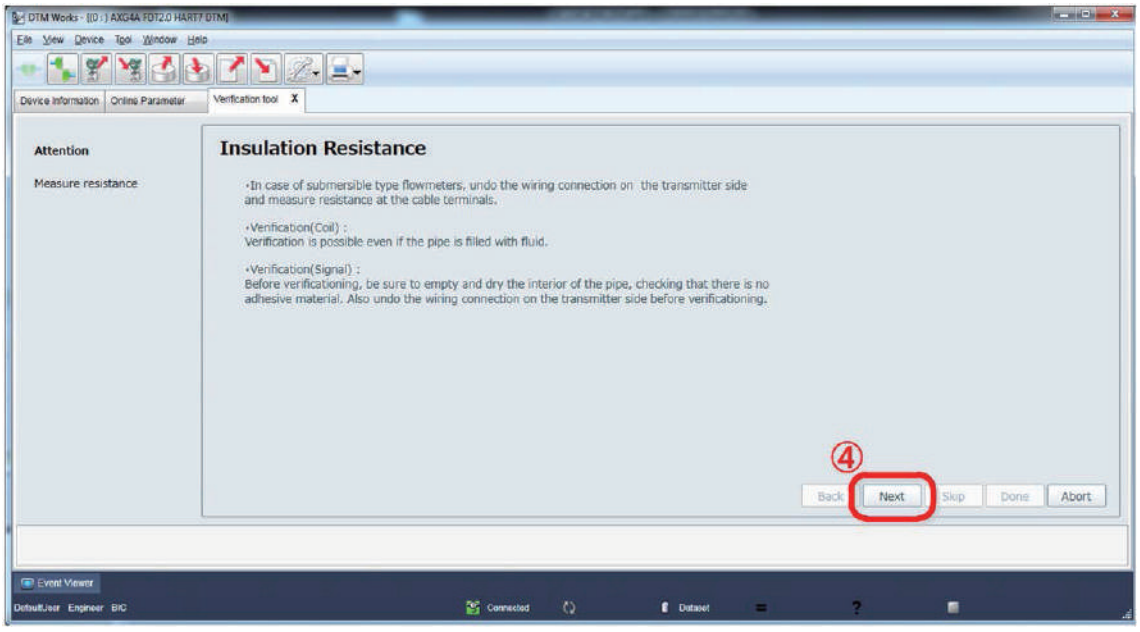
Step 3: Click “Start Verification” to perform the check.



F070243.ai

Figure 7.2.43 Starting Insulation Resistance Check

Step 4: A message window is displayed. Read the message and click “Next” to continue.

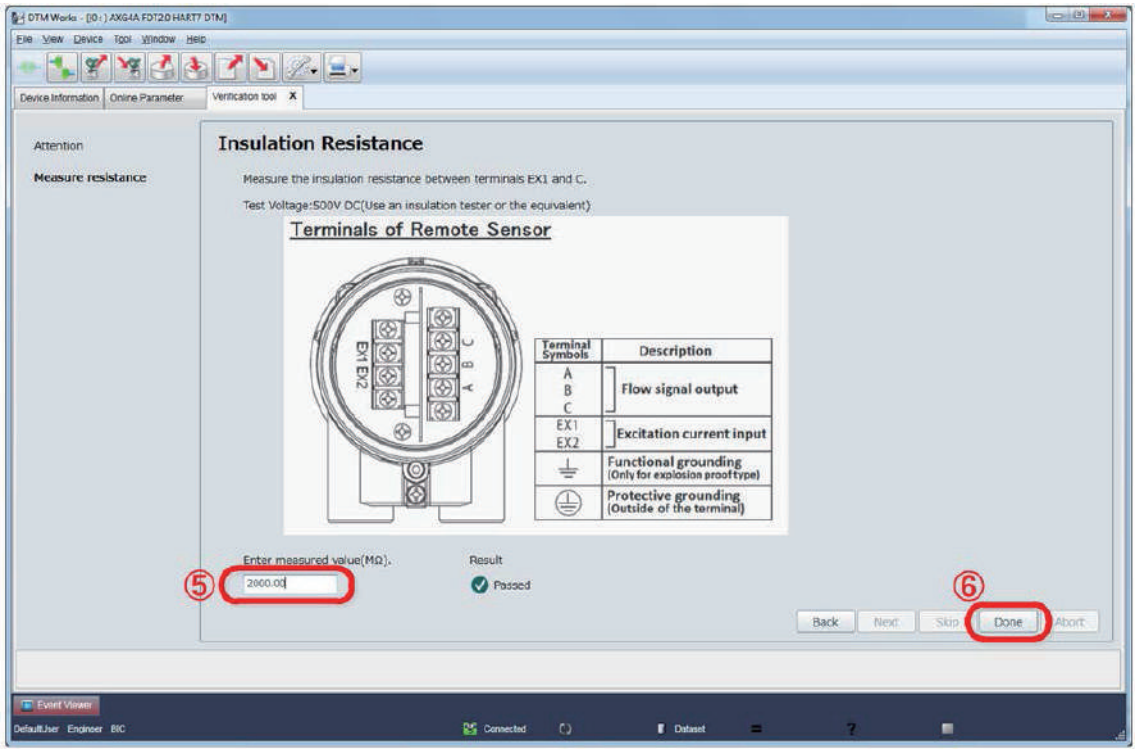


F070244.ai

Figure 7.2.44 Continuing Insulation Resistance Check

Step 5: Measure the resistance value between terminals EX1 and C. Enter the measured value in the “Enter measured value (MΩ)” field. If the measurement result is over the measurement range, enter the maximum value of the range, or go back to Step 2 and select “Open Loop (O.L.)” in the “Coil” column.

Step 6: Click “Done” to continue.

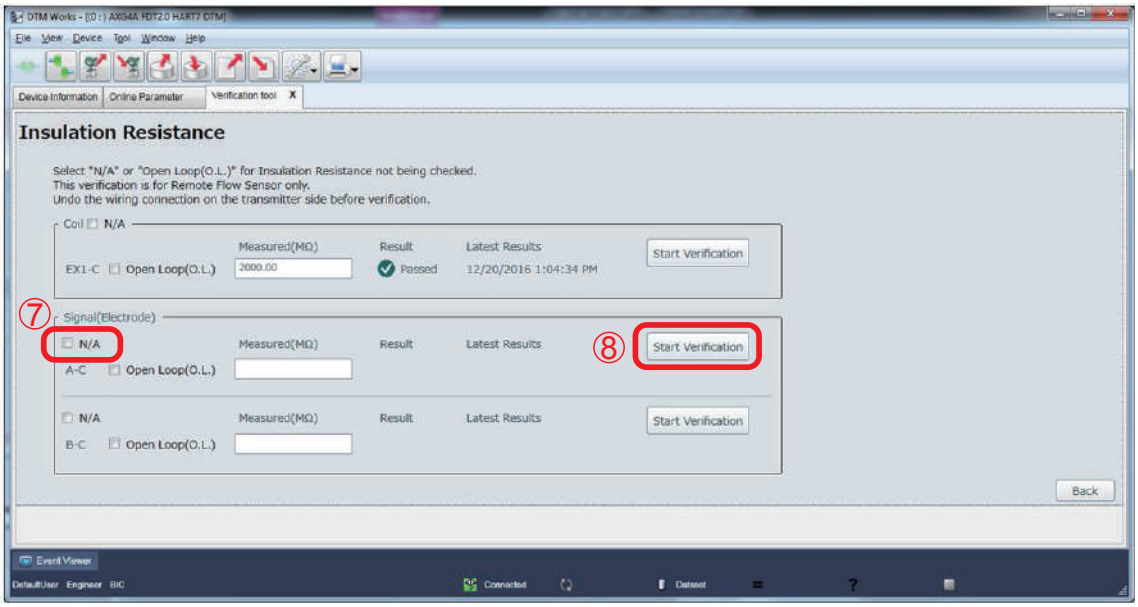


F070245.ai

Figure 7.2.45 Measuring Insulation Resistance

Step 7: To skip the check of insurance resistance for signal electrodes, select “N/A” in the “Signal (Electrode)” column. If it is sure that the insurance resistance is over the measurable range, select “Open Loop (O.L.)” in the “Signal (Electrode)” column and then this check can be passed.

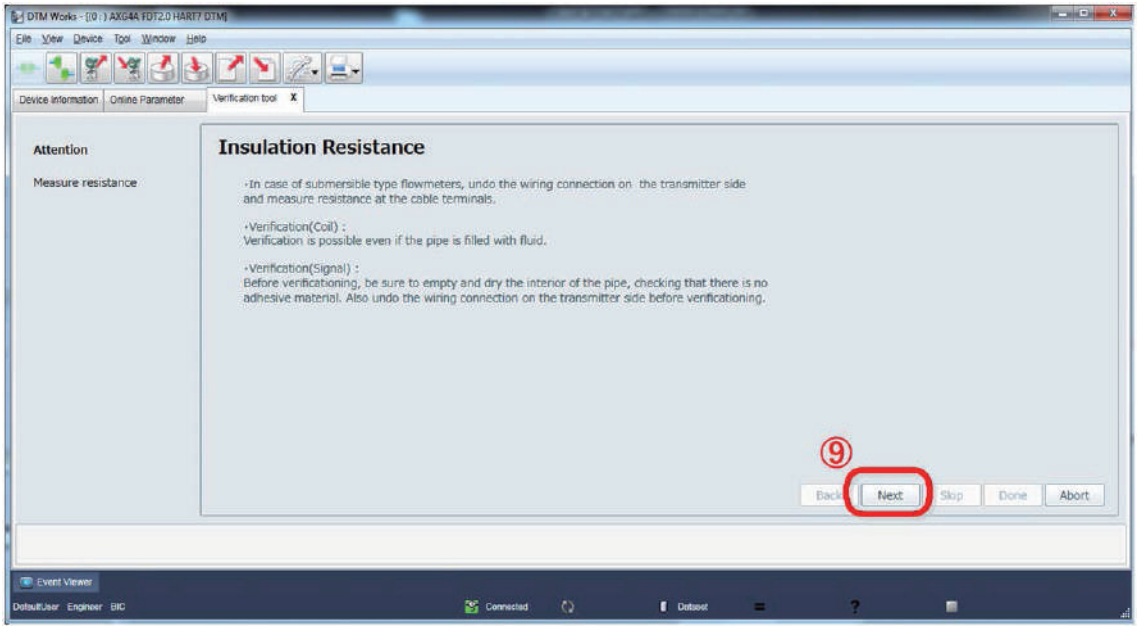
Step 8: Click “Start Verification” corresponding to terminals “A-C” to perform the check.



F070246.ai

Figure 7.2.46 Continuing Insulation Resistance Check

Step 9: Read the following explanation carefully and click “Next” to continue.

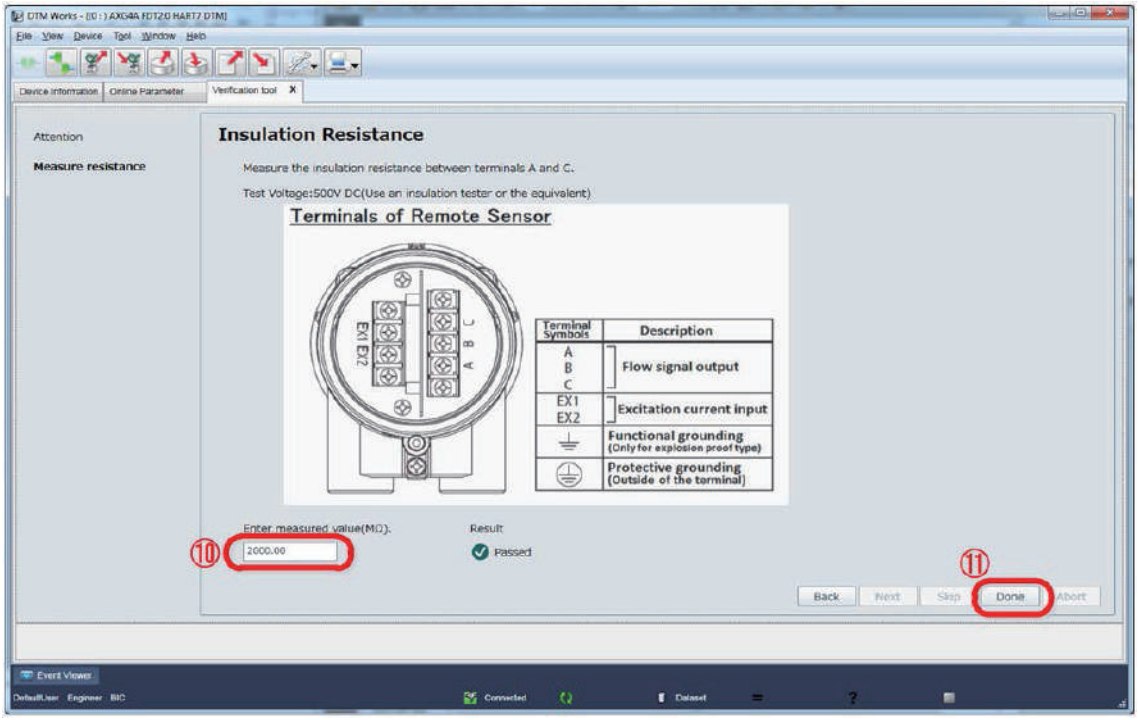


F070247.ai

Figure 7.2.47 Continuing Insulation Resistance Check

Step 10: Measure the resistance value between terminals A and C by an insulation resistance tester. Enter the measured value in the “Enter measured value (MΩ)” field. If the measured resistance exceeds the measurement range, enter the maximum value of the range, or go back to Step 7 and select “Open Loop (O.L.)” in the “Signal (Electrode)” column.

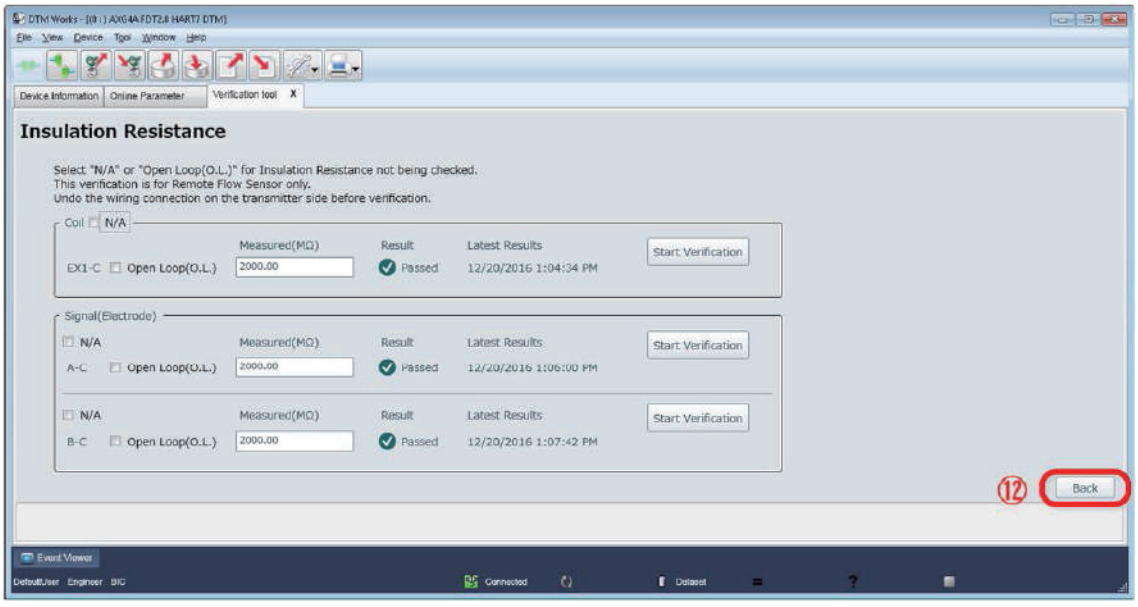
Step 11: Click “Done” to continue.



F070248.ai

Figure 7.2.48 Continuing Insulation Resistance Check

Step 12: Continue the same routine from Step 7 to Step 11 against terminals “B-C”. After that, the following result (for example) is displayed. Click “Back” to go back to the starting window of the verification operation.

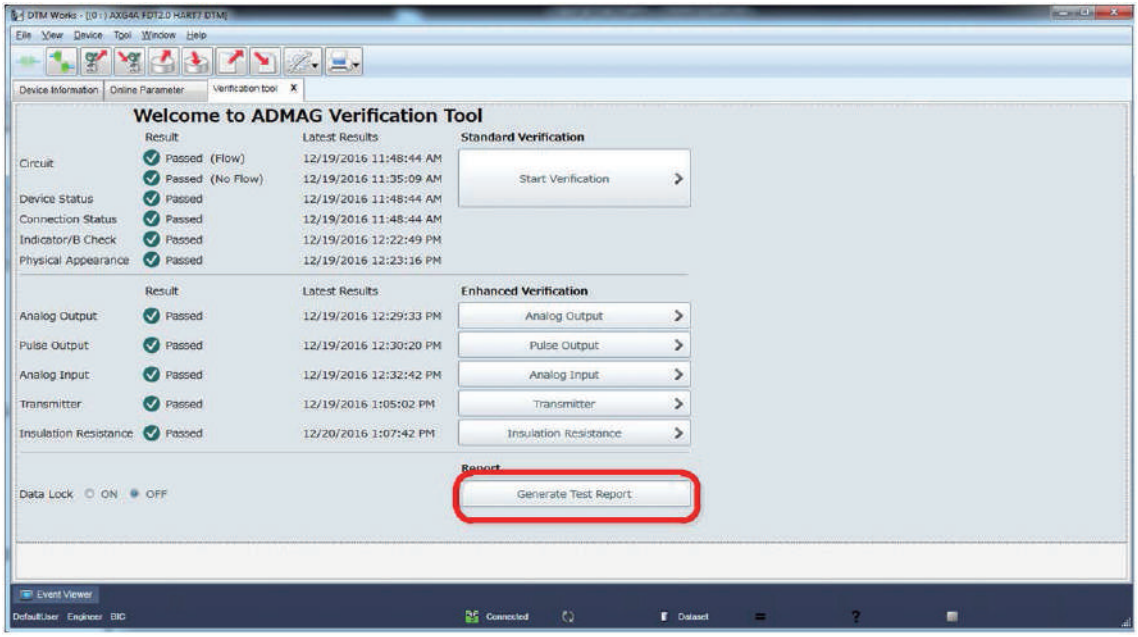


F070249.ai

Figure 7.2.49 Finishing Insulation Resistance Check

7.3 Generating Test Report

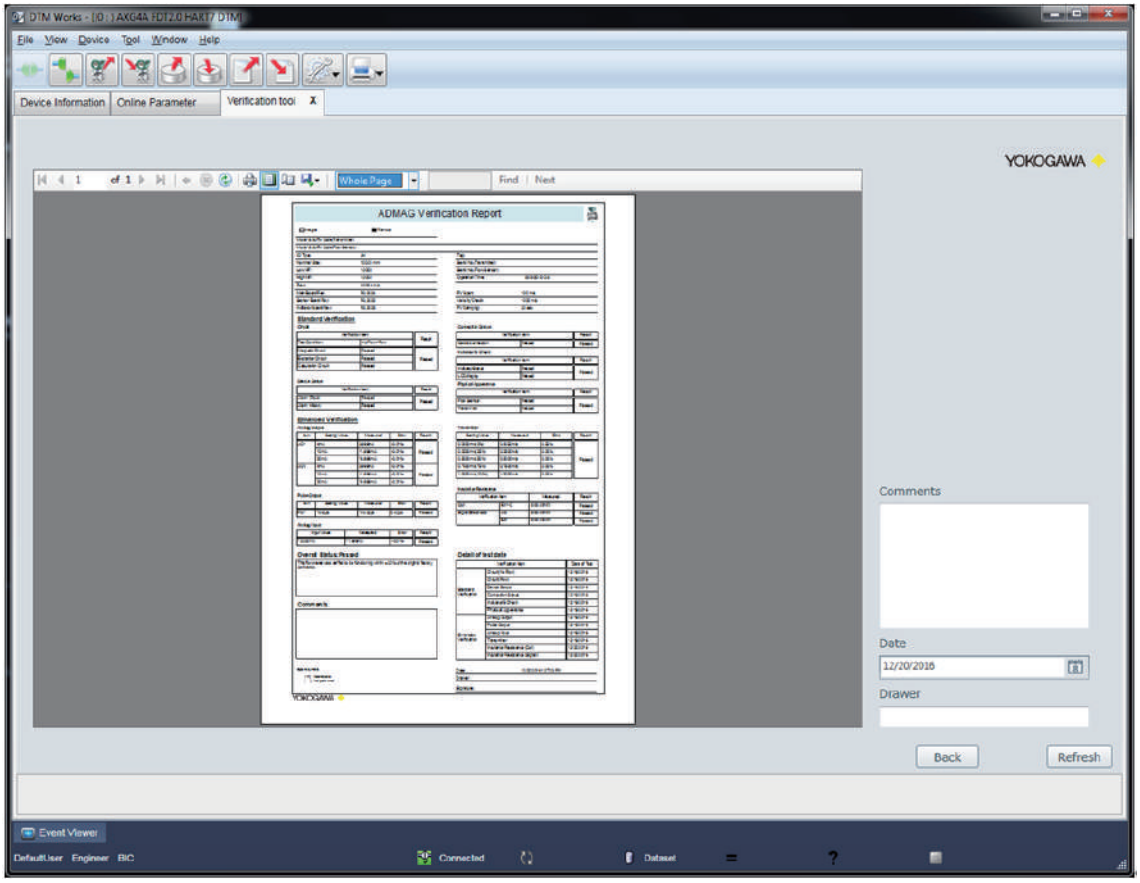
Click “Generate Test Report” after finishing the check items of verification.



F070301.ai

Figure 7.3.1 Generating Test Report

The window below is an example. Items are not displayed which were not selected or selectable depending on the specification of the verified device.

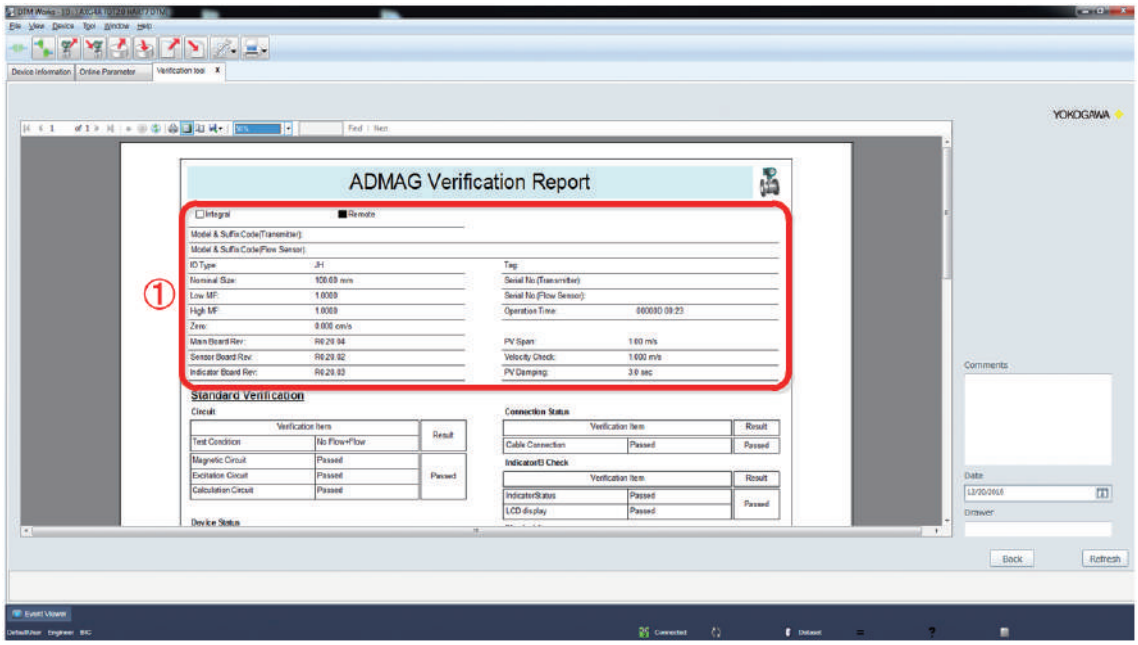


F070302.ai

Figure 7.3.2 Verification Report Window

The contents of each part of the verification report are shown in the figures and a table below.

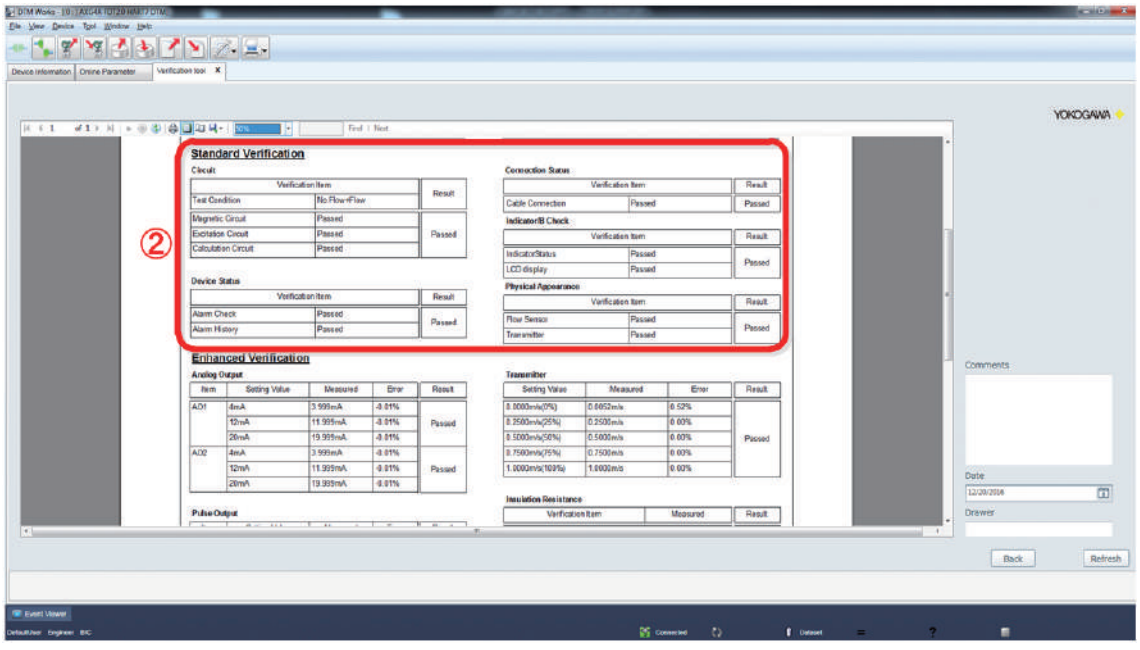
No.1: Device Information



F070303.ai

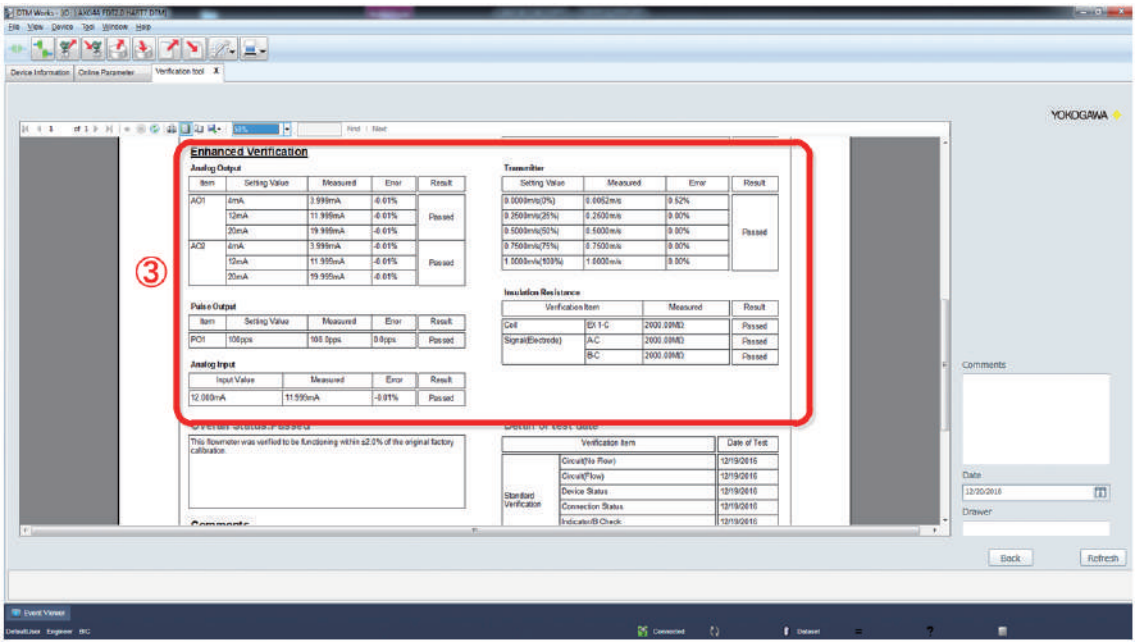
There is some differences in some of the displayed device information between the AXG/AXW model and the CA model.

No.2: Result of Standard Verification



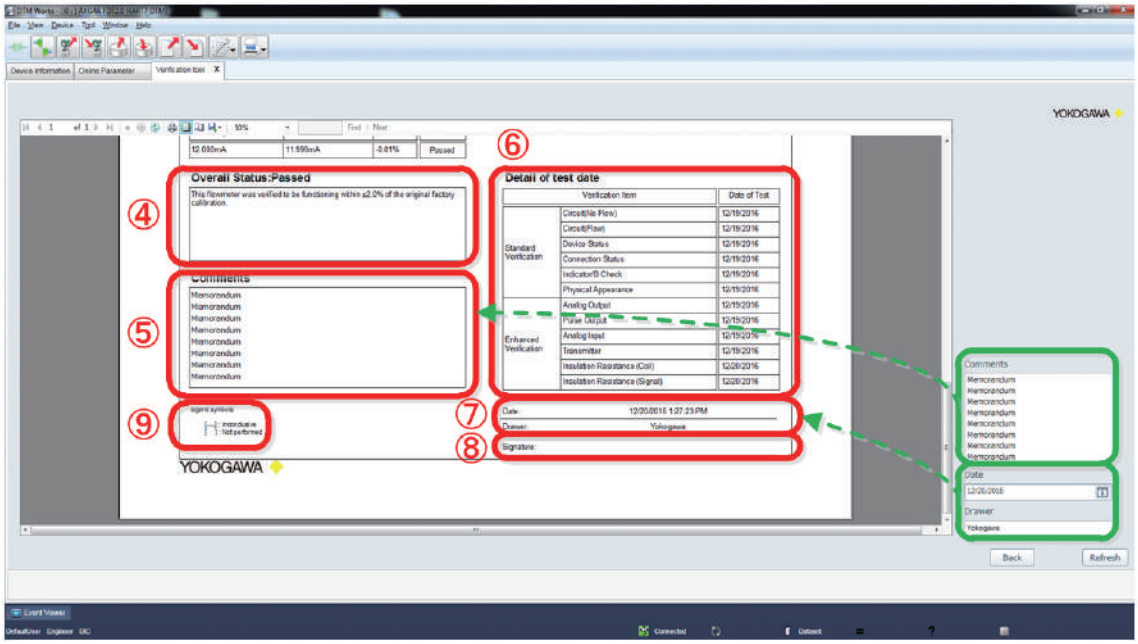
F070304.ai

No.3: Result of Enhanced Verification



F070305.ai

No. 4 to 9: Overall Status of Verification, etc.



F070306.ai

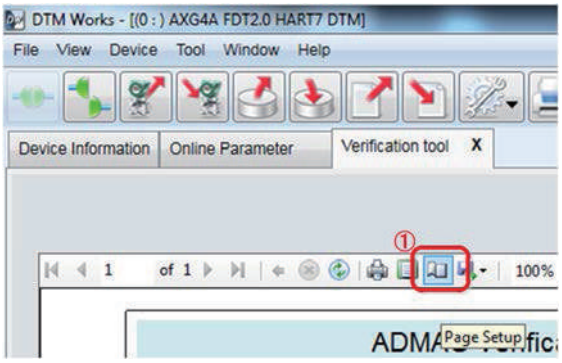
Table 7.3.1 Items in Verification Report Window

No.	Item Name	Description
1	Device Information	Information on the verified AXG/AXW/CA magnetic flowmeter is displayed.
2	Standard VF	The result of each item for the Standard VF is displayed.
3	Enhanced VF	The result of each item for the Enhanced VF is displayed.
4	Overall Status	Overall status of the verification result is displayed.
5	Comments	Comments (*) entered by customer can be displayed. They can be entered in the “Comments” field on the right side of the window. For example, this can be used for entering documentation number controlled by customer. Click “Refresh” and they are reflected in the report. *: Maximum 128 characters and 8 lines
6	Test Date	The date of test for each item of the Standard VF and Enhanced VF is displayed.
7	Report Information	The date when and the name of person by whom the verification was performed can be displayed (*). They can be entered in the “Date” and “Drawer” fields on the right side of the window. Click “Refresh” and they are reflected in the report. *: The default values are as below. Date: When “Generate Test Report” was clicked. Drawer: Blank
8	Signature	This is the signature column to be used after printing out the report.
9	Legend Symbol	Descriptions of the following symbols, shown in the result field of each checked item of the verification, are listed. [---] : Inconclusive [ ] : Not performed

7.4 Printing Test Report

Follow the procedure below to print the test report. The sizes of paper that can be printed properly are A4 and Letter size. Other sizes are not suitable for printing this report. The default setting is A4 size.

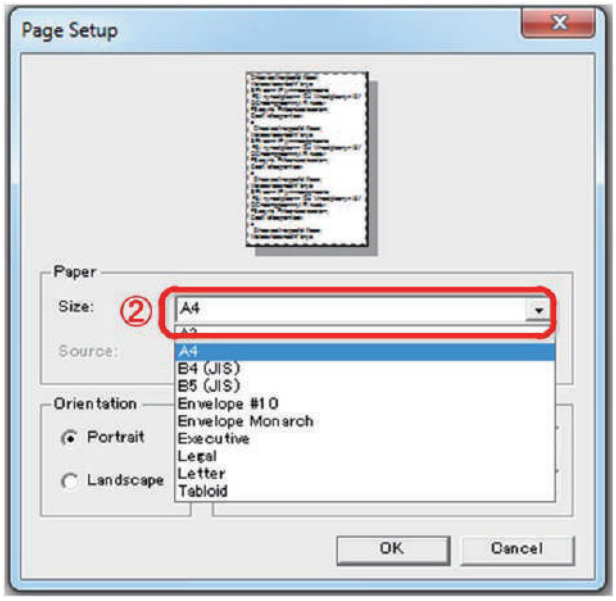
Step 1: Click “Page Setup” icon.



F070401.ai

Figure 7.4.1 Clicking Page Setup Icon

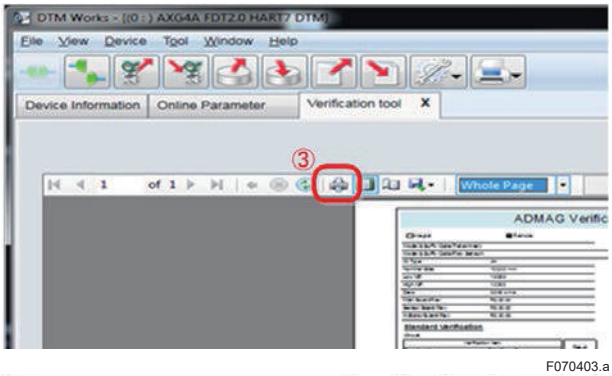
Step 2: Select the paper size.



F070402.ai

Figure 7.4.2 Selecting Paper Size

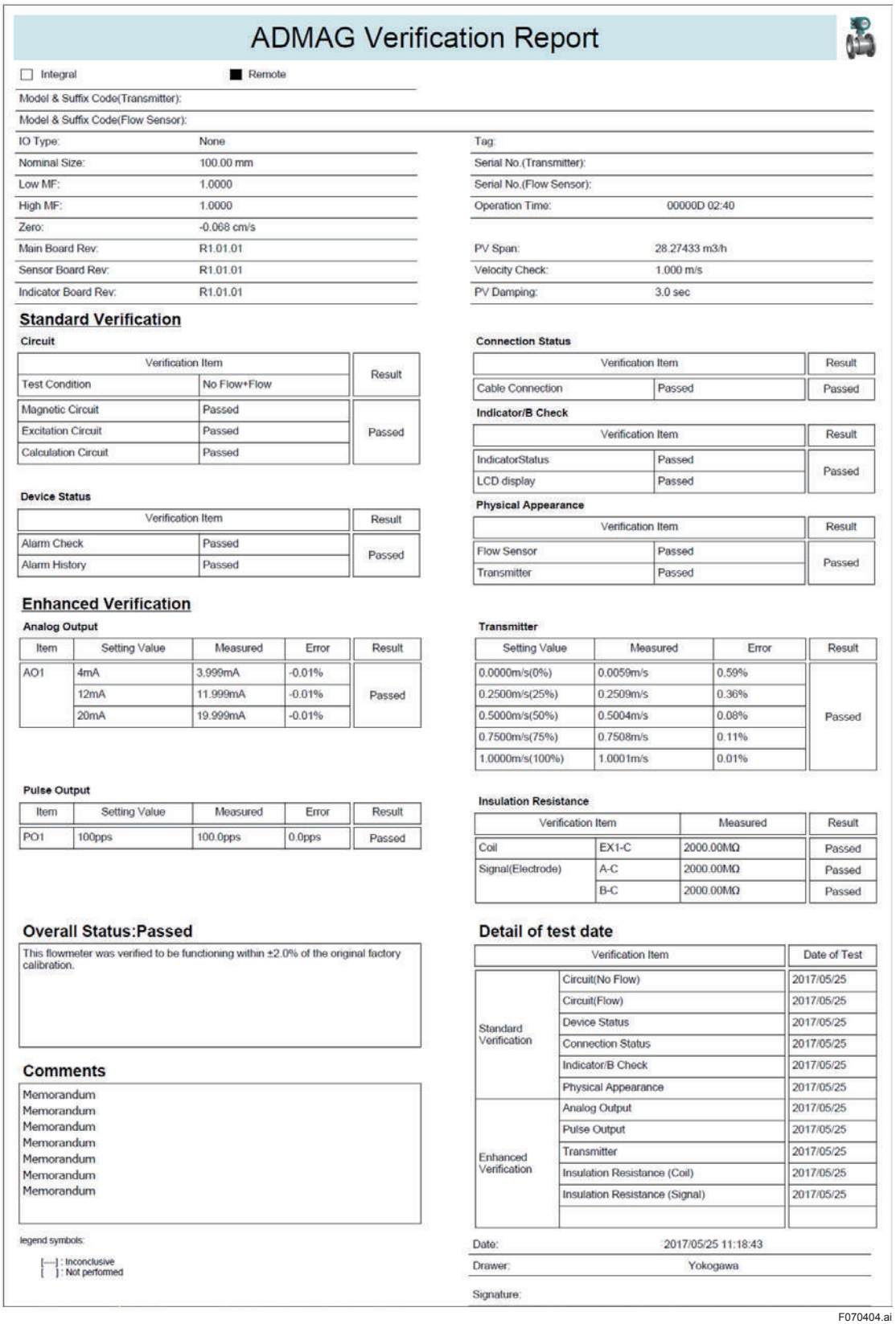
Step 3: Click “Print” icon and the report will be printed out.



F070403.a

Figure 7.4.3 Clicking Print Icon

A sample of the printed report is shown below.



ADMAG Verification Report

☐ Integral ■ Remote

Model & Suffix Code(Transmitter):	
Model & Suffix Code(Flow Sensor):	
IO Type:	None
Nominal Size:	100.00 mm
Low MF:	1.0000
High MF:	1.0000
Zero:	-0.068 cm/s
Main Board Rev:	R1.01.01
Sensor Board Rev:	R1.01.01
Indicator Board Rev:	R1.01.01
Tag:	
Serial No.(Transmitter):	
Serial No.(Flow Sensor):	
Operation Time:	00000D 02:40
PV Span:	28.27433 m3/h
Velocity Check:	1.000 m/s
PV Damping:	3.0 sec

Standard Verification

Circuit

Verification Item		Result
Test Condition	No Flow+Flow	
Magnetic Circuit	Passed	Passed
Excitation Circuit	Passed	
Calculation Circuit	Passed	

Device Status

Verification Item		Result
Alarm Check	Passed	Passed
Alarm History	Passed	

Connection Status

Verification Item		Result
Cable Connection	Passed	Passed

Indicator/B Check

Verification Item		Result
IndicatorStatus	Passed	Passed
LCD display	Passed	

Physical Appearance

Verification Item		Result
Flow Sensor	Passed	Passed
Transmitter	Passed	

Enhanced Verification

Analog Output

Item	Setting Value	Measured	Error	Result
AO1	4mA	3.999mA	-0.01%	Passed
	12mA	11.999mA	-0.01%	
	20mA	19.999mA	-0.01%	

Pulse Output

Item	Setting Value	Measured	Error	Result
PO1	100pps	100.0pps	0.0pps	Passed

Transmitter

Setting Value	Measured	Error	Result
0.0000m/s(0%)	0.0059m/s	0.59%	Passed
0.2500m/s(25%)	0.2509m/s	0.36%	
0.5000m/s(50%)	0.5004m/s	0.08%	
0.7500m/s(75%)	0.7508m/s	0.11%	
1.0000m/s(100%)	1.0001m/s	0.01%	

Insulation Resistance

Verification Item		Measured	Result
Coil	EX1-C	2000.00MΩ	Passed
Signal(Electrode)	A-C	2000.00MΩ	Passed
	B-C	2000.00MΩ	Passed

Overall Status:Passed

This flowmeter was verified to be functioning within ±2.0% of the original factory calibration.

Comments

Memorandum
Memorandum
Memorandum
Memorandum
Memorandum
Memorandum
Memorandum

legend symbols:

[—] : Inconclusive
[ ] : Not performed

Detail of test date

Verification Item		Date of Test
Standard Verification	Circuit(No Flow)	2017/05/25
	Circuit(Flow)	2017/05/25
	Device Status	2017/05/25
	Connection Status	2017/05/25
	Indicator/B Check	2017/05/25
	Physical Appearance	2017/05/25
Enhanced Verification	Analog Output	2017/05/25
	Pulse Output	2017/05/25
	Transmitter	2017/05/25
	Insulation Resistance (Coil)	2017/05/25
	Insulation Resistance (Signal)	2017/05/25

Date: 2017/05/25 11:18:43

Drawer: Yokogawa

Signature:

F070404.ai

Figure 7.4.4 Sample of Verification Report

8. Termination

This chapter describes “Normal Termination” and “Unexpected Termination”.

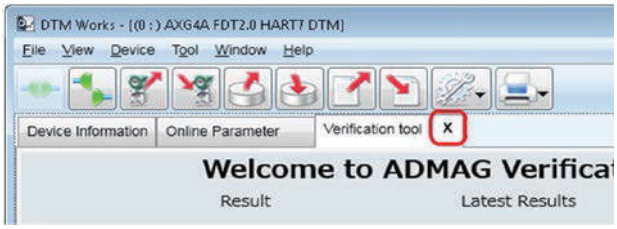
IMPORTANT

Make sure to keep the power for the AXG/AXW/CA magnetic flowmeter on at least for 10 minutes after finishing the verification. If you turn the power off immediately, parameters may be changed to different values from ones before performing the verification.

Also, when the software write protection function was disabled following Section 3.2, the protection will automatically become enabled within 10 minutes after finishing the verification. When the hardware write protection function switch was set OFF, set it ON again after 10 minutes or more from the finish of the verification.

8.1 Normal Termination

Save the verification data if necessary by referring to Section 6.1 before terminating the Verification Tool. Then click “X” on the “Verification tool” tab to terminate this tool.



F080101.ai

Figure 8.1.1 Termination of Verification Tool

8.2 Unexpected Termination

If the Verification Tool terminates abnormally, make sure that the AXG/AXW/CA magnetic flowmeter and the FieldMate are connected correctly and restart the Verification Tool.

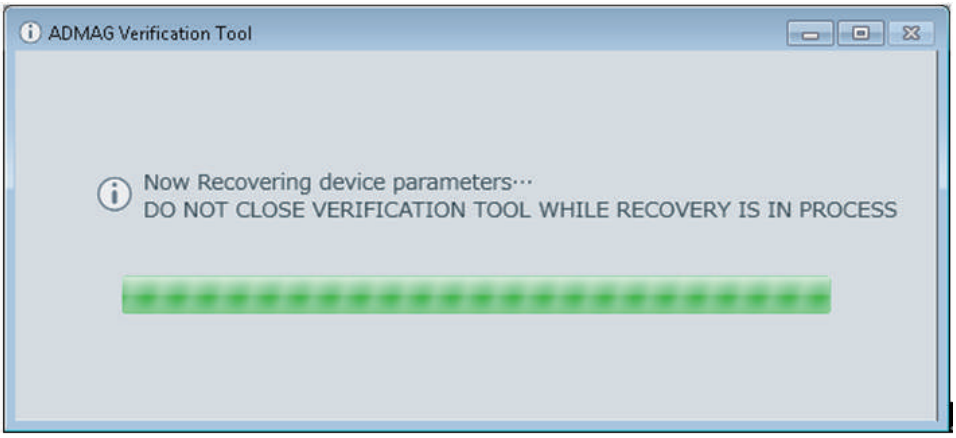
If there are parameters that have been changed during verification and have not been restored to the values before the verification, the following window is displayed. Refer to Chapter 9 for the list of error messages.

Step 1: Click “OK” and the parameter recovery process starts.



F080201.ai

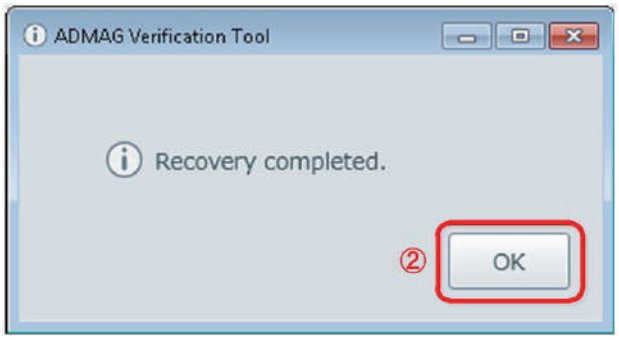
Figure 8.1.2 Recovery from Unexpected Termination



F080202.ai

Figure 8.1.3 Progress Bar in Recovery

Step 2: After the recovery, the window below is displayed. Click “OK” to continue.



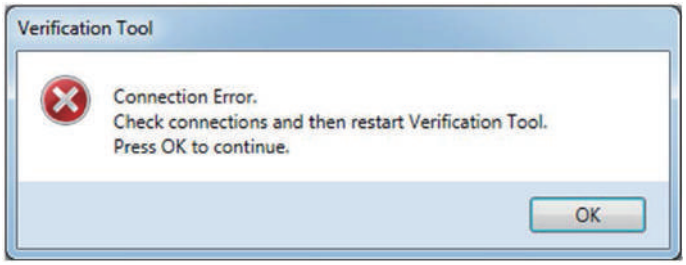
F080203.ai

Figure 8.1.4 Recovery Completed

9. Error Message

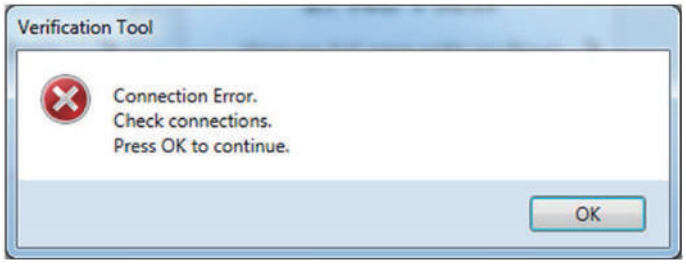
Error messages which may appear during verification are listed below. See the following table with error occurrence conditions and countermeasures.

Error Message 1:



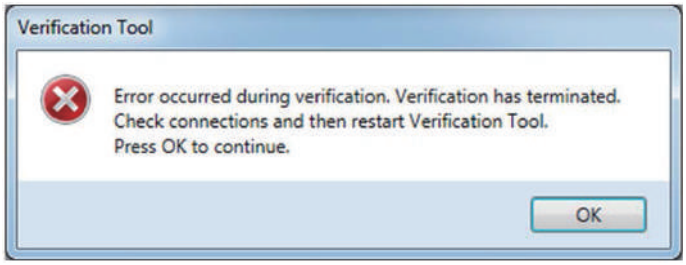
F090101.ai

Error Message 2:



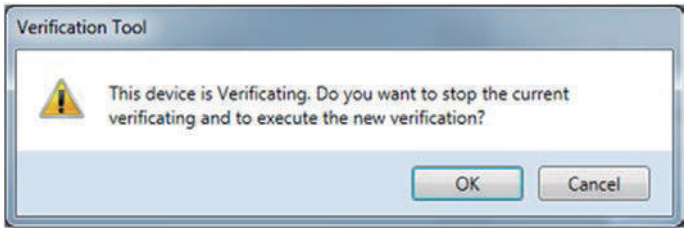
F090102.ai

Error Message 3:



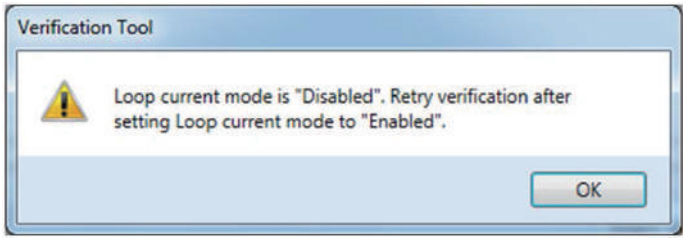
F090103.ai

Error Message 4:



F090104.ai

Error Message 5:



F090105.ai

Table 9.1.1 List of Error Message

Error Message No	Message	Error Occurrence Condition	Countermeasure
1	Connection Error. Check connections and then restart Verification Tool. Press OK to continue	Restoring parameters while starting up Verification Tool or after restarting up Verification Tool.	Click “OK” in the message window. Then the window of the Verification Tool will be closed. Check the communication connection and restart the Verification Tool.
2	Connection Error. Check connections. Press OK to continue.	Occurrence of communication error while any item of verification was going to start.	Click “OK” in the message window. Then the Standard VF will go back to the window for selecting “Flow” or “No Flow”. The Enhanced VF will go back to the starting window of each item to check. Check the communication connection and restart the aborted item to check.
3	Error occurred during verification. Verification has terminated. Check connections and then restart Verification Tool. Press OK to continue.	Occurrence of communication error while any item of verification was going on.	Click “OK” in the message window. Then the window of the Verification Tool will be closed. Check the communication connection and restart the Verification Tool. If the parameter recovery window shown in Section 8.2 appears, click “OK”. To display the data before this error, select “Last Result” at “Data load option:” referring to Section 5.2.
4	This device is verifying. Do you want to stop the current verification and to execute the new verification?	Action to start new verification while the built-in verification is being performed.	Click “OK” in the message window. Then abort the verification currently being performed to start the new verification with new settings. Or click “Cancel” and the verification tool will go back to the window for selecting “Flow” or “No Flow”.
5	Loop current mode is “Disabled”. Retry verification after setting Loop current mode to “Enabled”.	Action to start the verification of analog output when the parameter “Loop current mode” is set to “Disabled”.	Start the verification of analog output again after setting the parameter “Loop current mode” to “Enabled”.

Revision Information

Title: Magnetic Flowmeter Verification Tool

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Edition	Date	Page	Revised Item
1st	Aug. 2017	-	New publication
2nd	Oct. 2022	-	Added note on Magnetic flowmeter CA Series and AXG1A Changed title