

SLP-F7M

Smart Loader Package

for the F7M Micro Flow Rate

Liquid Flow Meter

User's Manual

Thank you for purchasing the Smart Loader Package.

This manual contains information for ensuring correct use of the SLP-F7M. It also provides necessary information for installation, maintenance, and troubleshooting.

This manual should be read by those who design and maintain devices that use the SLP-F7M. Be sure to keep this manual nearby for handy reference.

Azbil Corporation

NOTICE

Be sure that the user receives this manual before the product is used.



Copying or duplicating this user's manual in part or in whole is forbidden. The information and specifications in this manual are subject to change without notice.

Considerable effort has been made to ensure that this manual is free from inaccuracies and omissions. If you should find an error or omission, please contact the azbil Group.

In no event is Azbil Corporation liable to anyone for any indirect, special or consequential damages as a result of using this product.

Conventions Used in This Manual

- The safety precautions explained in the following section aim to prevent injury to the operator and others, and to prevent property damage.

	WARNING	Warnings are indicated when mishandling this product might result in death or serious injury.
	CAUTION	Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to the product.

- In describing the product, this manual uses the icons and conventions listed below.



Handling Precautions:

Handling Precautions indicate items that the user should pay attention to when handling the product.



Note:

Notes indicate information that might benefit the user.



:

This indicates the item or page that the user is requested to refer to.

(1) (2) (3):

Numbers within parentheses indicate steps in a sequence or parts of an explanation.

[OK] button:

Indicates a selectable button on a personal computer screen.

[File]:

Indicates messages and menus displayed on the personal computer.

[File] →

Indicates menu selection on a personal computer.

[Initialization]:

>>:

Indicates the result of an operation, details displayed on the personal computer or other devices, or the state of the device after operation.

[Ctrl] key:

Indicates keys on the keyboard.

[Ctrl]+[A] key:

Indicates the operation of pressing the [A] key on the keyboard while the [Ctrl] key is pressed.

Safety Precautions

CAUTION



To use loader communications, remove the cable from the F7M waterproof connector and connect it to the adapter for loader communication cable. When handling the cable, make sure that the electrodes of the connector are free from water drops and dust. Otherwise, a failure or abnormal output might result. Also, be sure to turn off the F7M before removing or connecting the connector. Otherwise, the F7M or the adapter for loader communication cable may fail, and the power supply for the equipment may fail or catch fire.



The adapter for loader communication cable is not water resistant. Water drops or dust entering inside or accumulating around the electrodes may damage the F7M or the adapter, or may cause external devices to catch fire or fail.



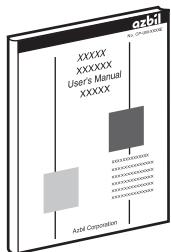
Do not apply excessive force to the plug of the USB loader cable when it is connected to the adapter for loader communication cable. Doing so might damage the plug or the adapter.



After using loader communications, remove the cable for the F7M waterproof connector from the adapter for loader communication cable, and insert it all the way into the waterproof connector. If the cable is not inserted properly, the device's water resistance will be impaired, the F7M or connected equipment may fail, and the connected equipment may catch fire.

The Role of This Manual

A total of 3 different manuals are available for the SLP-F7M. Read them as necessary for your specific requirements. If a manual you require is not available, contact the azbil Group or its dealer.



SLP-F7M Smart Loader Package for the F7M Micro Flow Rate Liquid Flow Meter User's Manual

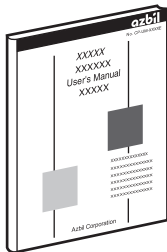
Manual No. CP-SP-1423E

This manual.

The user can specify and check parameters of the F7M on a PC using the SLP-F7M smart loader package.

Personnel in charge of the design or manufacture of equipment that incorporates the F7M should read this manual thoroughly.

This manual describes the installation of the software on a PC, the method for connecting the loader to the F7M, various functions and operations of the SLP-F7M, and procedures for configuring the F7M.

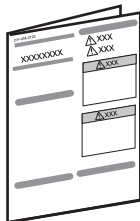


F7M Micro Flow Rate Liquid Flow Meter User's Manual

Manual No. CP-SP-1421E

This manual describes the hardware and all the functions of the F7M. Personnel in charge of the design, manufacturing, operation, or maintenance of equipment that incorporates the F7M should read this manual thoroughly.

This manual covers installation, connections for wiring, all functions and operating procedures of the F7M, troubleshooting, and detailed specifications.



F7M9010/9030 Micro Flow Rate Liquid Flow Meter User's Manual

Manual No. CP-UM-5922JE

This manual is supplied with the product.

Personnel in charge of the design or manufacture of equipment that incorporates the F7M and personnel in charge of installation of this device should read this manual thoroughly.

The manual covers safety precautions, installation, wiring, and main specifications.

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-MEMO-

Chapter 1. INTRODUCTION

1-1 Overview

The SLP-F7M Smart Loader Package (hereafter “the loader”) is a simplified engineering tool for the F7M Micro Flow Rate Liquid Flow Meter (“the device”). The user can configure various settings of the device and monitor the flow rate and the operational status.

The loader runs on Windows 10 (32-bit and 64-bit) English version PCs.

■ Features of the loader

Functions	Description
Configuration	Various settings can be read from the device, checked or edited, and written to the device. In addition, parameter files can be created when the loader is not connected to the device.
Monitoring	The operational status of the device and alarms can be checked.
Device operation	The zero point of the device can be adjusted.
File functions	Various settings and monitored data can be saved to a file. Saved files can be opened to check the data.

1 - 2 System Requirements

The following system environment is required for use of the loader.

■ System Environment

Item	Description	
PC	Compatible equipment	Windows PC with an Intel CPU Recommended: Core i3–i7, 1.5 GHz or more. Minimum: 1 GHz
	Operating system*1 *2	Windows 10 (64-bit and 32-bit English versions)
	Memory	Recommended: 4 GB or more. Minimum: 2 GB
	Hard disk	Recommended free space: 20 GB or more. Minimum: 10 GB or more
	Display	Recommended: 1366 × 768 dot or more, 32-bit color or more
	Pointing device	A mouse or an equivalent device compatible with Windows.
	USB port	1 port
Other hardware	Adapter for loader communication cable	Adapter for loader communication cable (azbil brand, model No. F9Y7A1)
	USB loader cable	USB loader cable (azbil brand, model No. 81441177-001)*3
	Cable for waterproof connector	Cable (azbil brand, model No. F9Y7H_1)*4
Software	Microsoft .NET Framework 4.6 If this software is not installed on the PC, download it from the Microsoft website*5 and install it.	
	USB loader cable device driver Install the driver using its installation software, which is different from the installer for the loader.	
	Adobe Acrobat Reader XI or later version This software is necessary for viewing PDF user's manuals. If the software is not installed on the PC, download it from the Adobe's website and install it.	

*1. The performance of the loader cannot be guaranteed if it is used on other operating systems.

*2. Specify "Smaller – 100%" (default) as the font size on Windows. Otherwise, loader windows may not be displayed properly.

*3. Use Rev. 05 or later version of the USB loader cable.

*4. The underscore represents a digit that tells the material of the cable.

*5. English version Windows [https://msdn.microsoft.com/en-us/library/5a4x27ek\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/5a4x27ek(v=vs.110).aspx) (as of 12/11/2017)

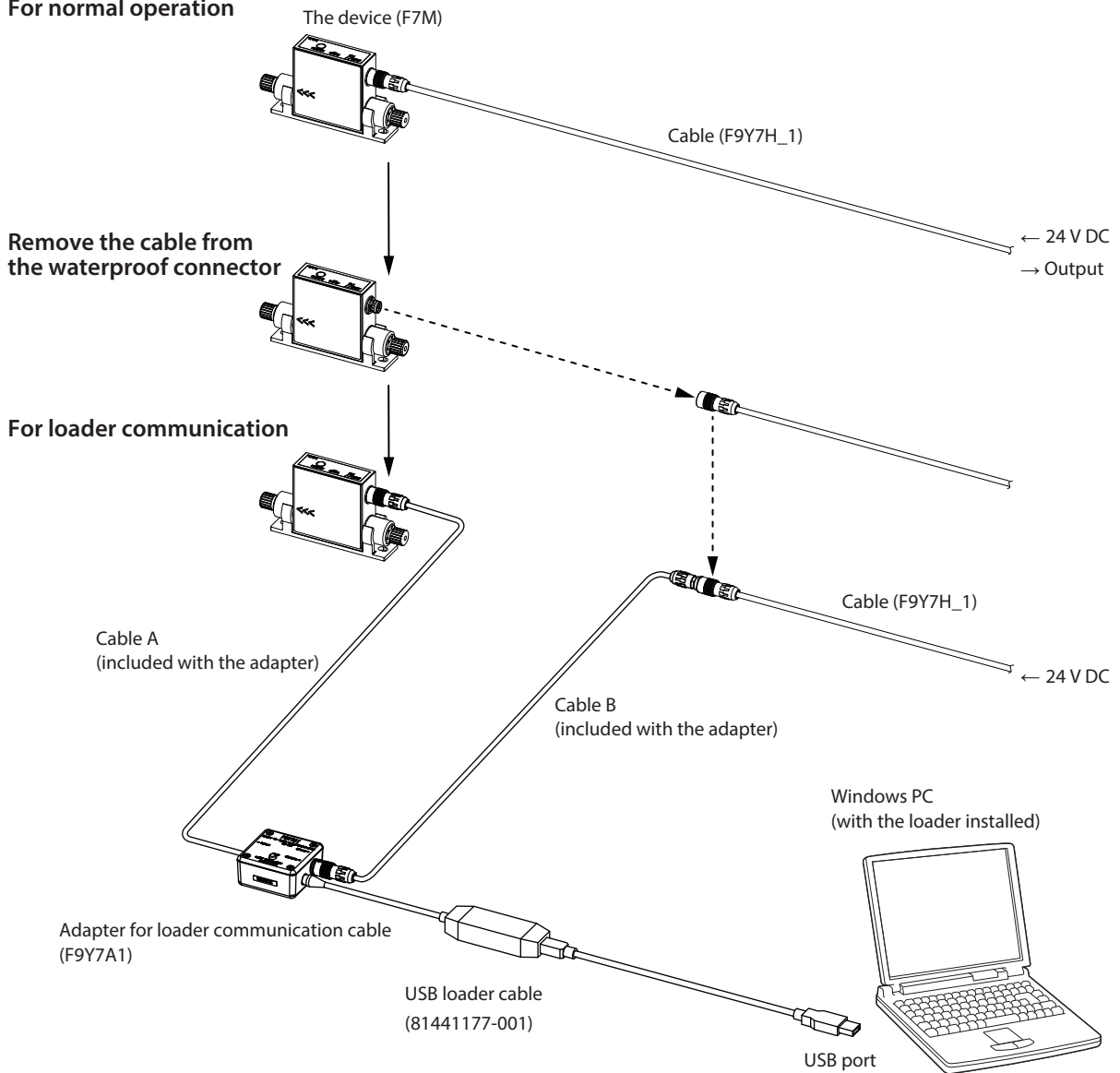
■ Hardware Configuration

The hardware configuration for loader communication is explained below.

● Connection method

- Turn off the supply of power to the device.
- Remove the cable from the waterproof connector on the device, and connect the cable to the adapter for loader communication cable with cable B, which is supplied with the adapter.
- Connect cable A, which is also supplied with the adapter, to the waterproof connector on the device and to the adapter for loader communication cable.
- The device can now be turned on or off with the power switch on the adapter for loader communication cable.

For normal operation





Note

- It is also possible, without using cable B, to directly connect the adapter for loader communication cable to the cable removed from the waterproof connector on the device.



Handling Precautions

- To use loader communications, remove the cable from the device waterproof connector and connect it to the adapter for loader communication cable.
- When handling the cable, make sure that the electrodes of the connector are free from water drops and dust. Otherwise, a failure or abnormal output might result. Also, be sure to turn off the device before removing or connecting the connector. Otherwise, the device or the adapter for loader communication cable may fail, and the power supply for the equipment may fail or catch fire.
- The adapter for loader communication cable is not water resistant. Water drops or dust entering inside or accumulating around the electrodes may damage the F7M or the adapter, or may cause external devices to catch fire or fail.
- After using loader communications, remove the cable from the device waterproof connector from the adapter for loader communication cable, and insert it all the way into the waterproof connector. If the cable is not inserted properly, the device's water resistance will be impaired, the F7M or connected equipment may fail, and the connected equipment may catch fire.
- Application of excessive force to the plug of the USB loader cable might interfere with communications. If this happens, reconnect the plug correctly and restart communications.

● Separately sold products

- Adapter for loader communication cable (F9Y7A1)
- USB loader cable (81441177-001)
- Cable (F9Y7H_1)*

* The underscore represents a digit that tells the material of the cable.

1-3 Installation

Please download the installer for the loader from the following website (in Japanese only):

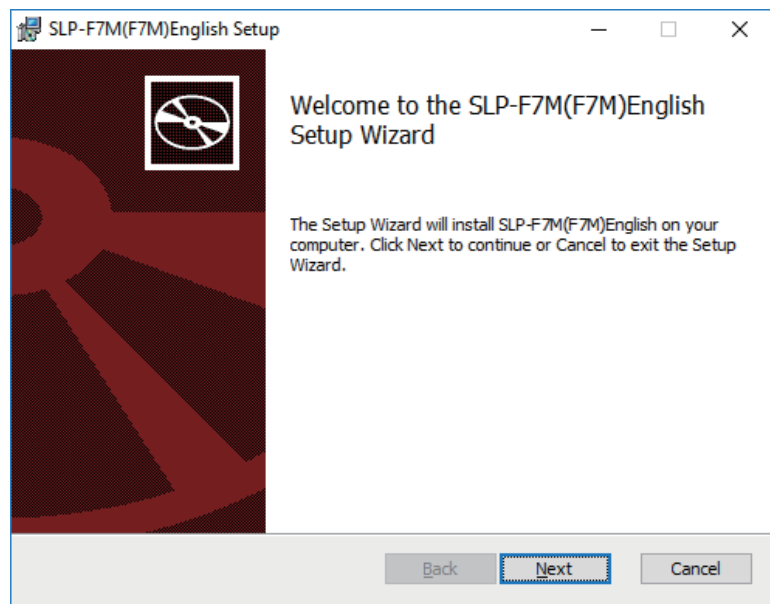
<http://www.compoclub.com/> The installer file is compressed. Expand it before use. (Expanded file name example: setup_SLPSP7_en_V1_0_15.msi)

■ Installing the Loader

The following explanation of the loader installation and screens use 64-bit Windows 10 as an example.

- (1) Double-click setup_SLPF7M_en_V□_□_□.msi* to launch the installer.

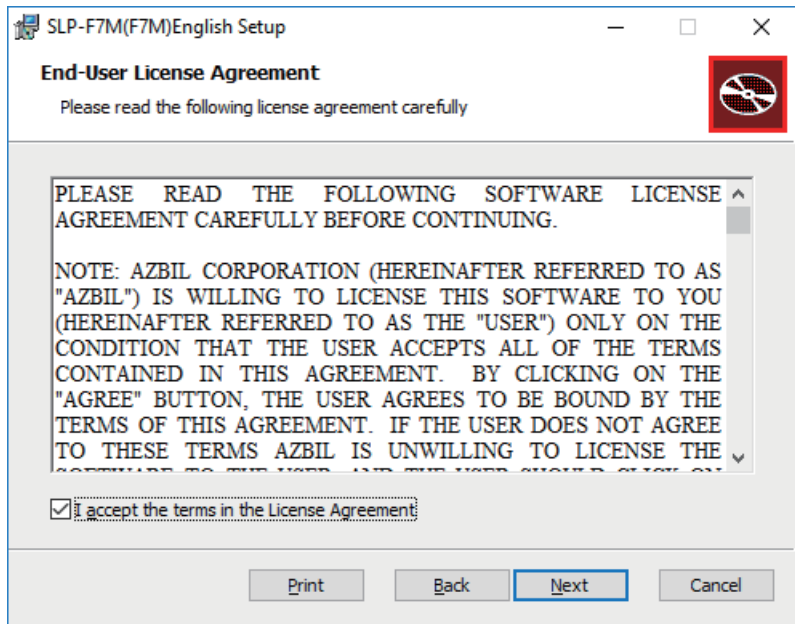
>> The setup wizard opens.



* □ represents a number. For example: setup_SLPF7M_en_V1_0_09.msi

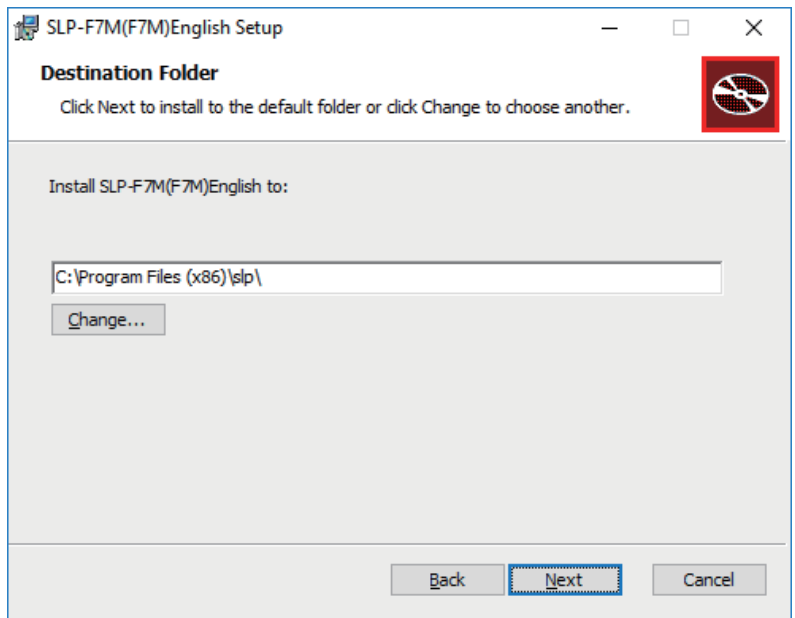
- (2) Click the [Next] button.

>> The following screen is displayed.



- (3) If you accept the software license agreement and wish to install the software, check the check box for [I accept the terms in the License Agreement] and click the [Next] button.

>> The following screen is displayed.

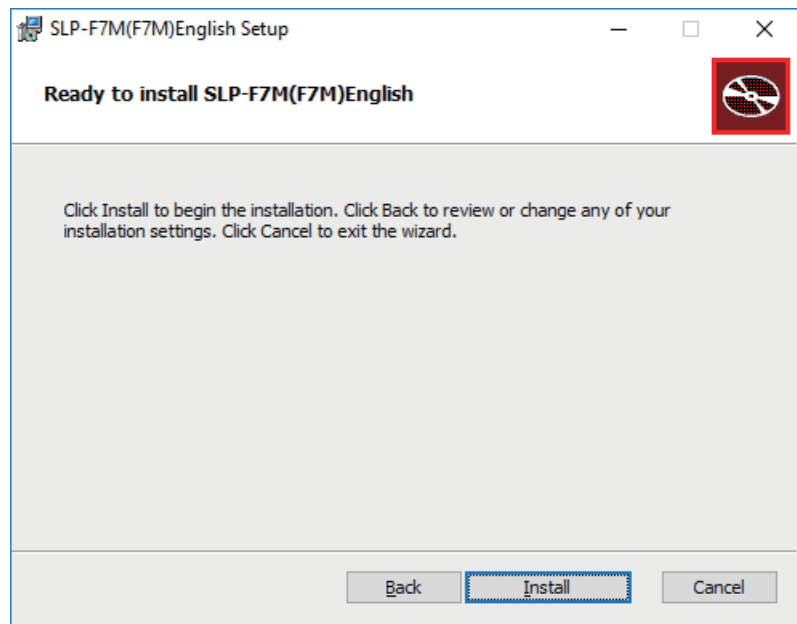


 **Note**

- Click the [Change...] button to change the destination folder.

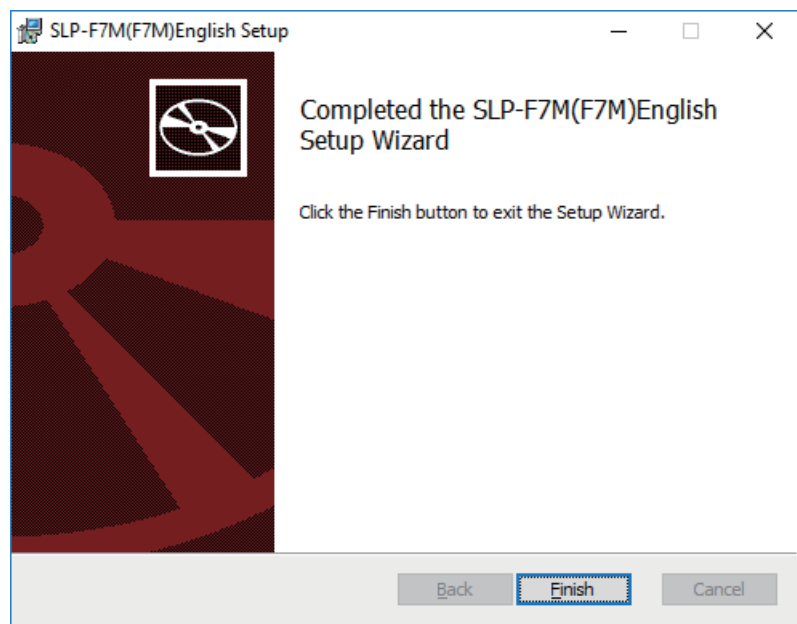
- (4) Click the [Next] button.

>> The following screen is displayed.



(5) Click the [Install] button.

>> When installation is complete, the following screen is displayed.



Handling Precautions

- A warning message about user account control might appear, depending on the PC settings. Allow the software to make changes to the computer.
- (6) Click the [Finish] button.
This completes the loader installation. Close the installer.
- (7) If the installation files are no longer needed, delete the entire folder.

■ Installing the USB Loader Cable Device Driver

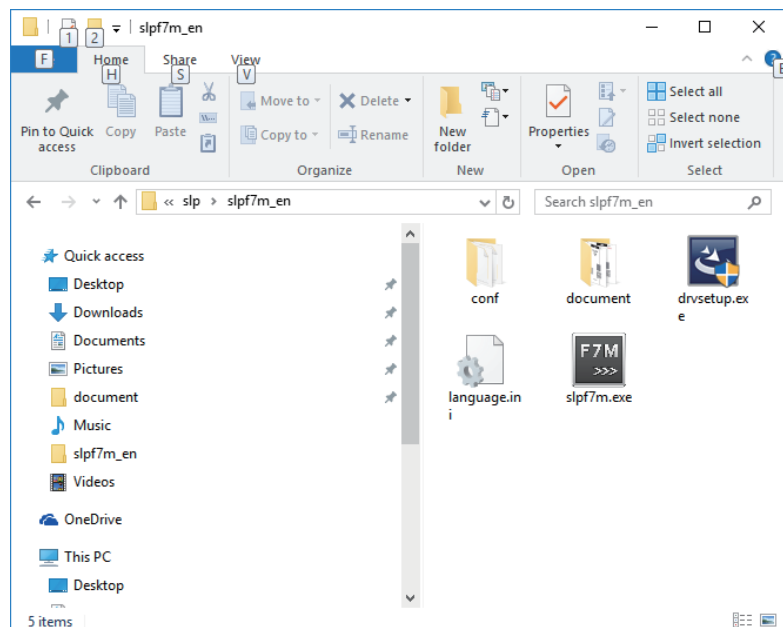
A device driver must be installed before using the USB loader cable. Follow the procedure below to install the device driver on the PC.

■ Installing the device driver


! Handling Precautions

- Before installing the device driver, unplug the USB loader cable from the PC.
- Be sure to follow the procedure below when installing the device driver. The USB cable may not be recognized if the procedure is not followed. If the loader cable is not recognized, uninstall the device driver and reinstall it.
- If a problem occurs and installation is not successful, uninstall the driver and reinstall it.
- To install the device driver, administrator rights on the computer are required. Installation should be done by the administrator or by a user who belongs to the administrator group.
- A USB loader cable with a label that does not indicate a revision number is not compatible with Windows 10. (As of 12/11/2017, available USB loader cables have a label saying "REV.06," and are compatible with Windows 10.)

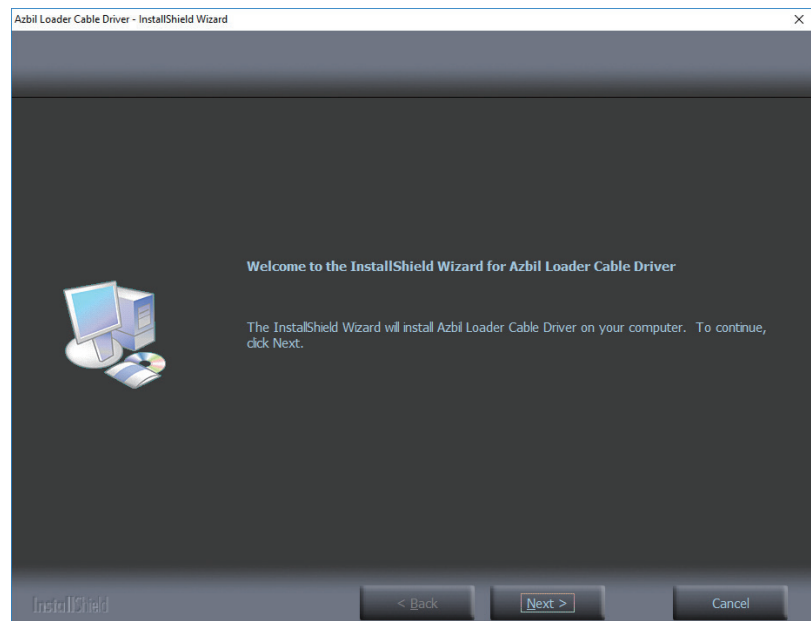
- (1) Open the [slpf7m_en] folder where the loader was installed and double-click drvsetup.exe.



Note

- If you did not change the destination folder in  ■ Installing the Loader (P. 1-5), the file is stored in the following default folder:
 - 64-bit Windows: C:\Program Files(x86)\slp\slpf7m_en
 - 32-bit Windows: C:\Program Files\slp\slpf7m_en

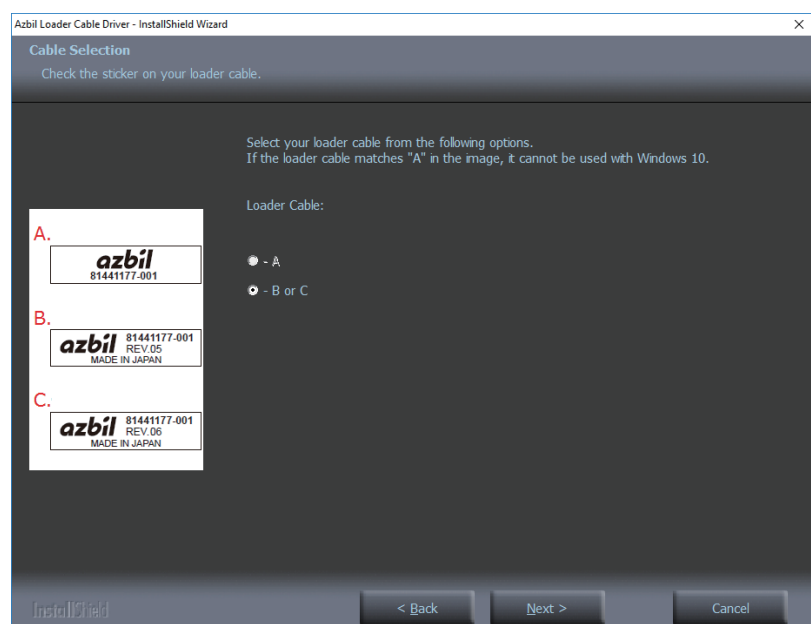
>> The installer is launched and the following window is displayed.



! Handling Precautions

- A warning message about user account control might appear, depending on the PC settings. Click the [Yes] button to allow the software to make changes to the computer.
- (2) Click the [Next] button.

>> The following screen is displayed.

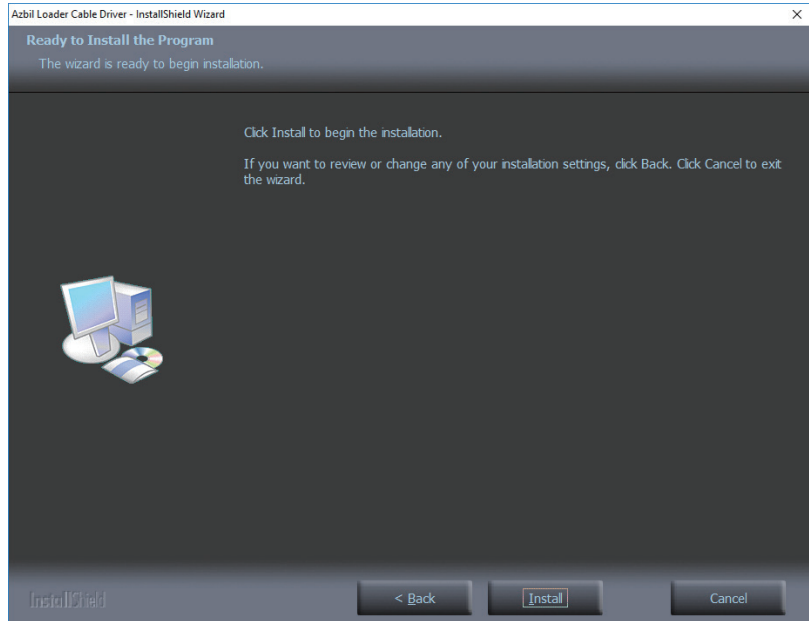


! Handling Precautions


- The USB loader cable with label A cannot be used with Windows 10. (USB loader cables that are available as of 12/11/2017 have label C with "REV.06" printed, so they can be used for Windows 10.)

- (3) Select the label code A, B, or C of your USB loader cable in the window, and click the [Next] button.

>> The following screen is displayed.

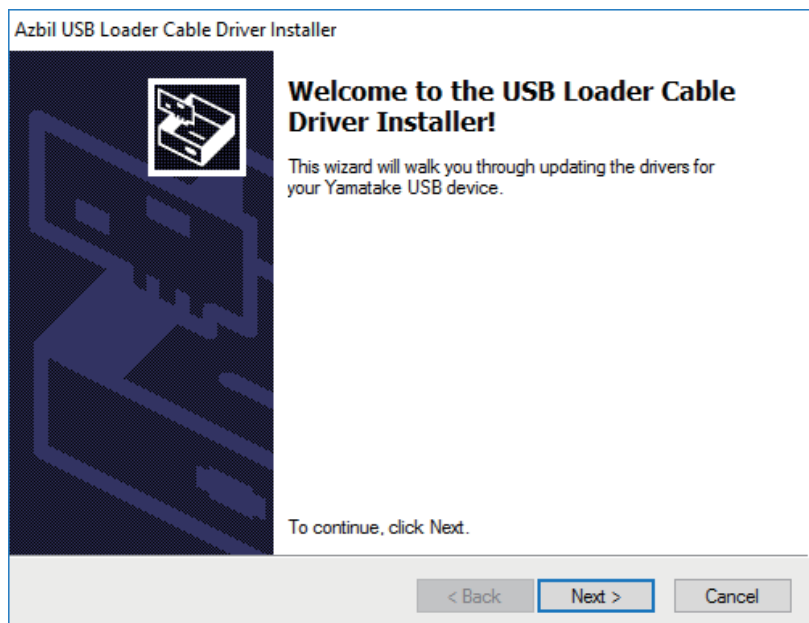


! Handling Precautions

- If a message saying that the USB loader cable driver has already been installed on your computer appears even if you uninstalled the driver in the past, follow the procedure described in  ■ If the USB loader cable device driver cannot be installed (P. 1-12).

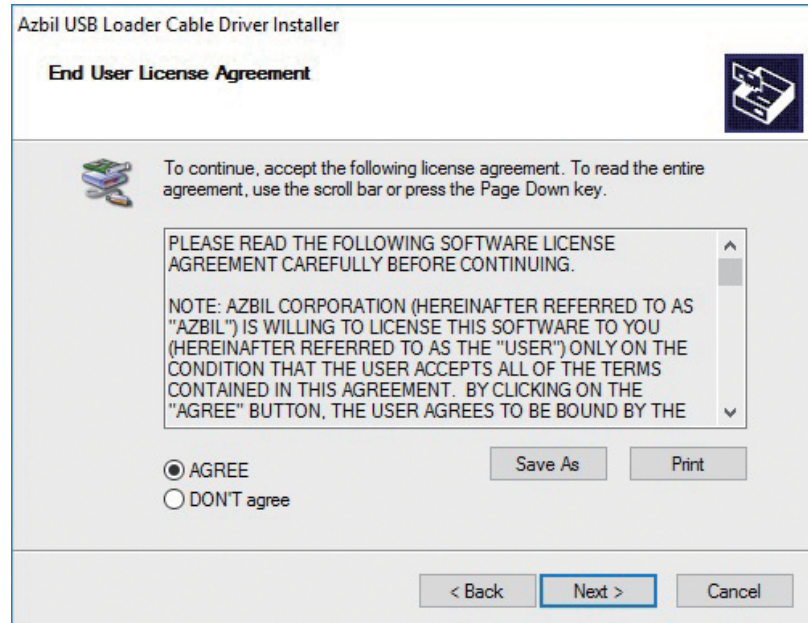
- (4) Click the [Install] button.

>> The following screen is displayed.



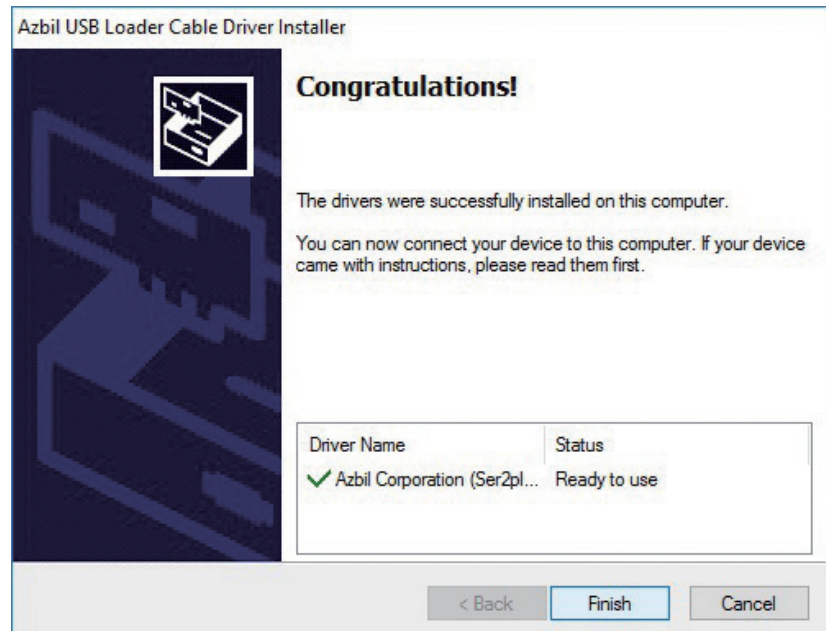
(5) Click the [Next] button.

>> The following screen is displayed.



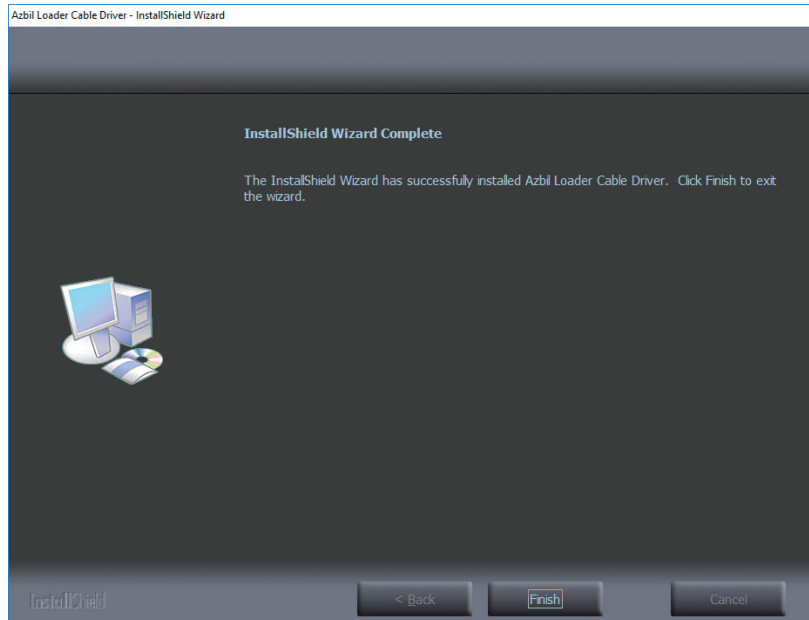
(6) If you accept the software license agreement and wish to install the software, select [AGREE] and click the [Next] button.

>> Installation of the device driver starts and the following window is displayed.



(7) Click the [Finish] button.

>> The following screen is displayed.



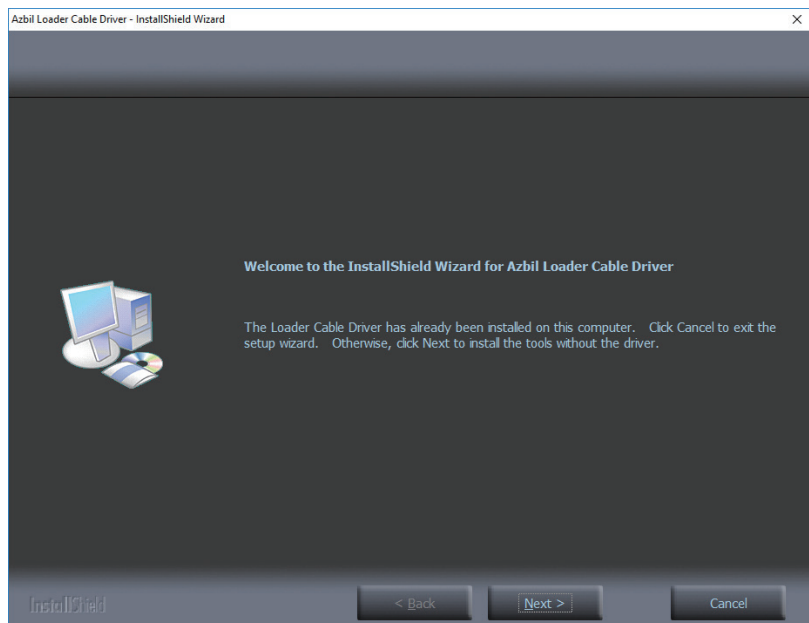
(8) Click the [Finish] button.

Installation of the device driver is complete.

■ **If the USB loader cable device driver cannot be installed**

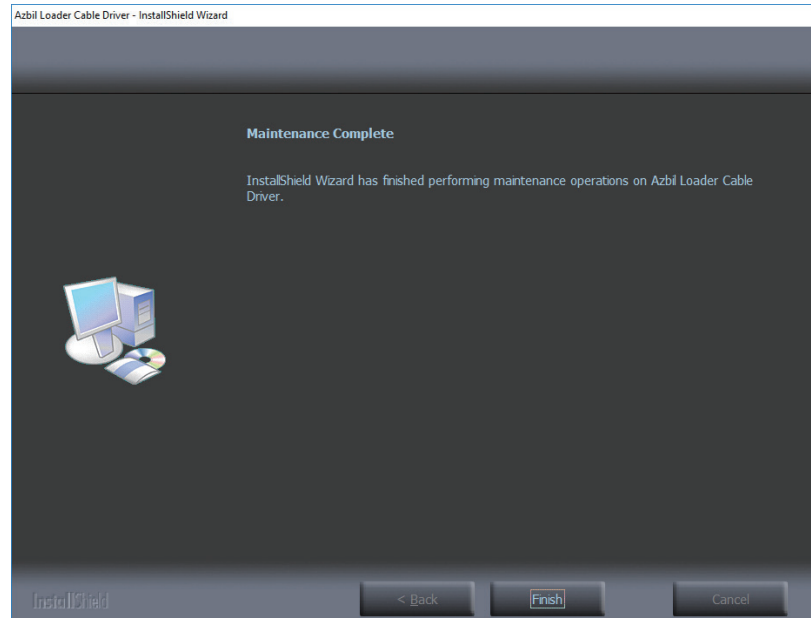
When attempting to install the device driver on a PC on which a USB loader cable was used in the past, the following window may appear, and it may not be possible to install the driver, even if the previous device driver has already been uninstalled. In this case, follow the procedure below.

Step 1. Install tools other than the driver as instructed in the window.



(1) Click the [Next] button.

>> Once the installation process is complete, the following screen is displayed.



(2) Click the [Finish] button.

>> The installer for the device driver closes.

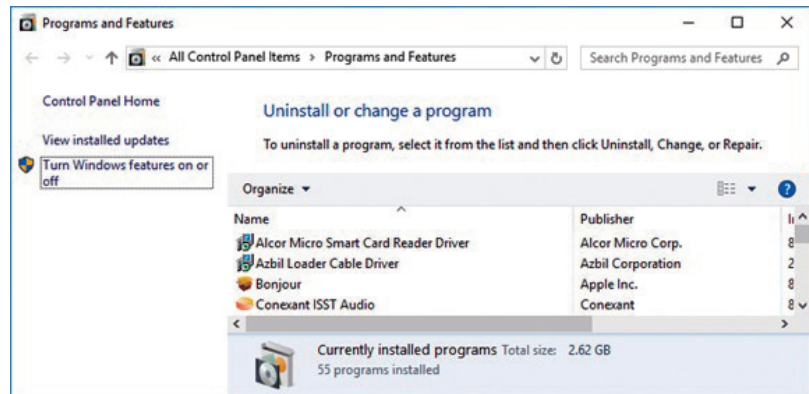
Step 2. Follow the procedure described in  ■ Uninstalling the device driver (P. 1-15).

Step 3. Install the driver following the procedure described in  ■ Installing the USB Loader Cable Device Driver (P. 1-8).

■ Checking and Installing Microsoft .NET Framework

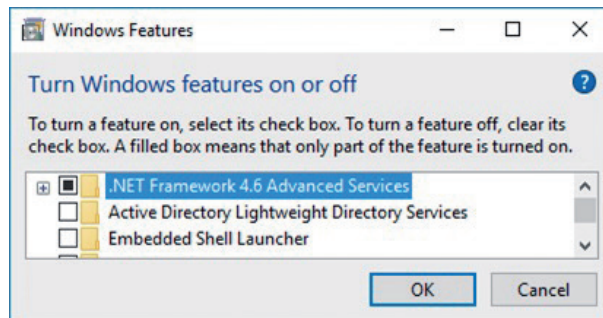
- (1) Right-click the [Start] button and select [Programs and Features].

>> The following screen is displayed.



- (2) Select [Turn Windows features on or off].

>> The following screen appears:



- (3) Check that .NET Framework is enabled.

If not, click the checkbox to enable .NET Framework. If “.NET Framework” is not displayed, the software has not been installed.

After confirming that .NET Framework is enabled, close the window.

Note

- If the software has not been installed on the PC, download it from the Microsoft website* and install it. Before installing .NET Framework, execute Windows Update to make sure that Windows is in up to date.

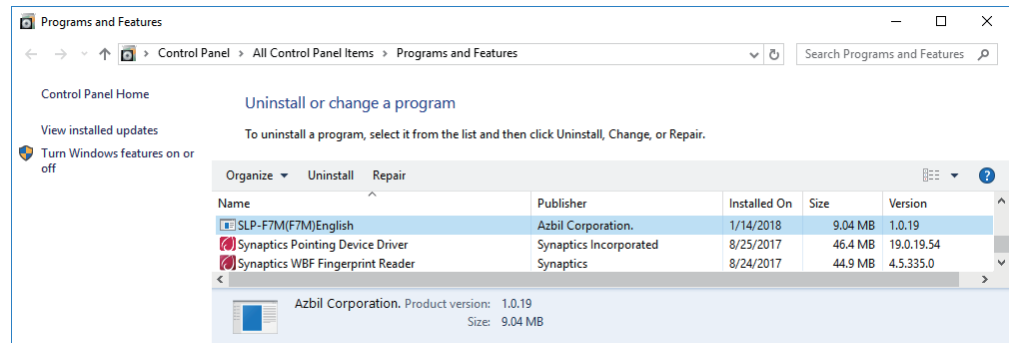
* .NET Framework for English version Windows [https://msdn.microsoft.com/en-us/library/5a4x27ek\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/5a4x27ek(v=vs.110).aspx) (as of 12/11/2017)

1-4 Uninstallation

■ Uninstalling the Loader

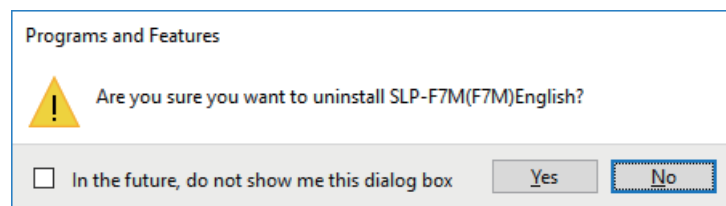
- (1) Right-click the [Start] button and select [Programs and Features].

>> The following screen is displayed.



- (2) Double-click “SLP-F7M (F7M) English” under [Name].

>> The following screen is displayed.



- (3) Click the [Yes] button. The program and related files will be deleted.

! Handling Precautions

- A warning message about user account control might appear, depending on the PC settings. Click the [Yes] button to allow the software to make changes to the computer.

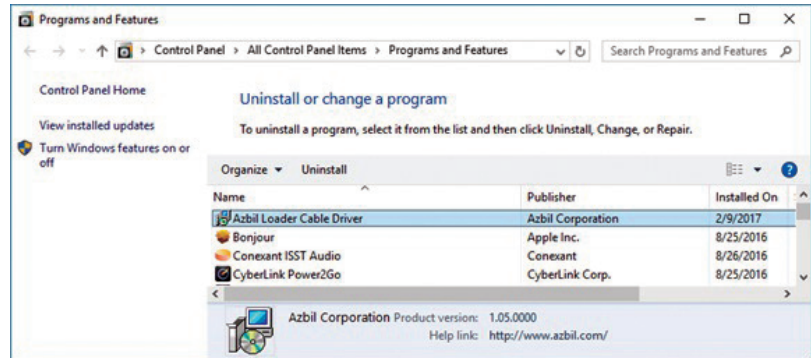
■ Uninstalling the device driver

! Handling Precautions

- Before uninstalling the device driver, unplug the USB loader cable from the PC.
- After uninstalling the driver, restart the computer.
- To uninstall the driver, administrator rights on the computer are required. Installation should be done by the administrator or by a user who belongs to the administrator group.

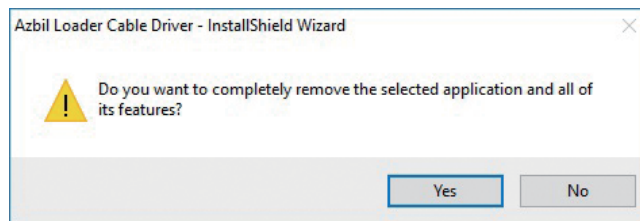
- (1) Right-click the [Start] button and select [Programs and Features].

>> The following screen is displayed.



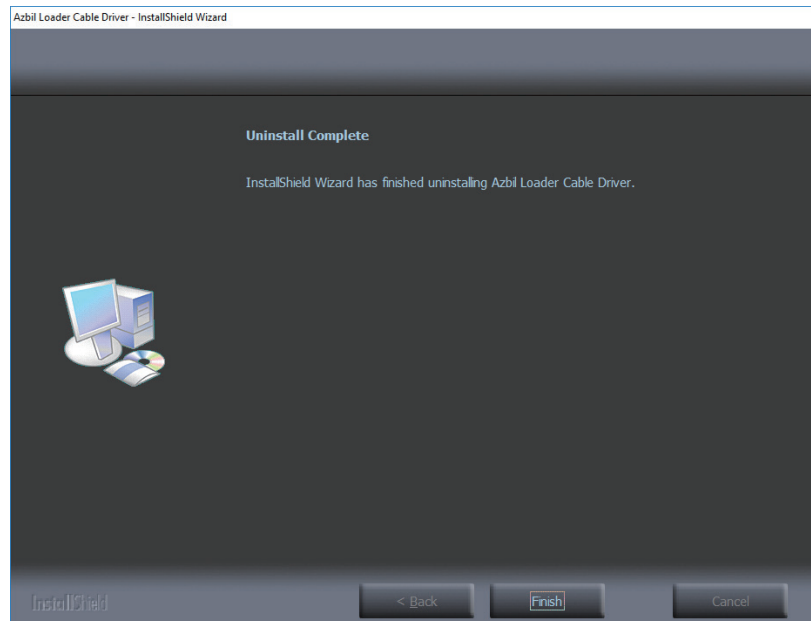
- (2) Double-click "Azbil Loader Cable Driver."

>> The following screen is displayed.



- (3) Click the [Yes] button.

>> The device driver is deleted and the following window is displayed.



- (4) Click the [Finish] button.
- (5) Restart the computer.

Chapter 2. STARTING AND EXITING THE LOADER

! Handling Precautions

- If there are multiple USB ports, connect the USB loader cable to the same port every time. If it is connected to a different port, driver reinstallation might be required.
- Do not unplug the loader cable from the PC while the loader is running. Doing so may cause faulty loader operation.
- Before starting the loader, close all other application software. Otherwise, the loader may not work properly due to a particular combination of other applications and drivers.
- In the Windows settings, select [Control Panel] → [Region] and press the [Additional settings] button to check that "" is set for [Decimal symbol]. If any other symbol is set, the loader will not work properly.
- Check the Windows power option settings and make sure that the PC will not automatically enter sleep mode. If the PC enters sleep mode, communication with the device will stop.
- For details on Windows and PC settings, refer to the user's manuals provided with Windows and your PC.
- Do not start multiple instances of the loader program at the same time. Doing so may cause faulty loader operation.

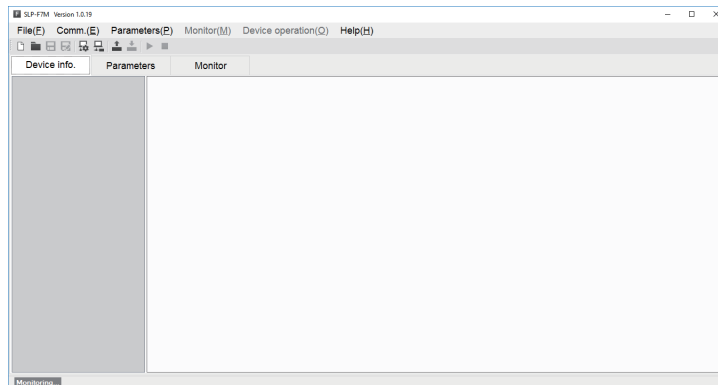
■ Starting the loader

Double-click the [SLP-F7M (F7M) English] icon on the desktop, or click the [Start] button at the bottom left of the screen and select [All Apps] → [SLP] → [SLP-F7M (F7M) English].

>> The following splash screen is displayed for 3 seconds.



>> After 3 seconds, the following initial screen is displayed.



 **Note**

- For details on the OS or the mouse, see the user's manuals provided with those products.

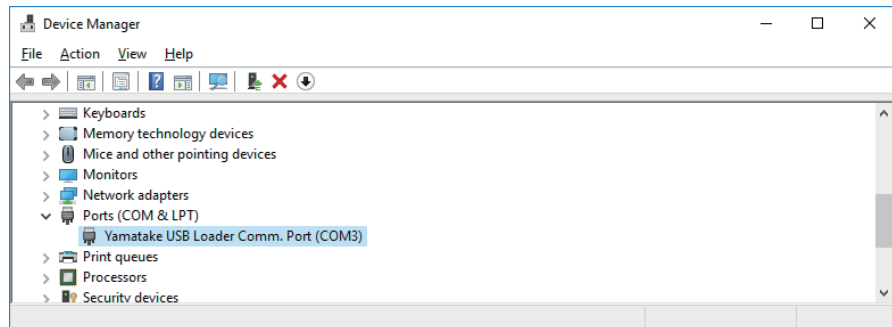
■ **Exiting the loader**

Select [File] → [Exit] or click the [X] icon in the upper right corner of the screen.

>>The loader closes.

■ **Checking the communication port number**

Select [Control Panel] → [Device Manager] and see [Port (COM and LPT)] to check the COM number for “Yamatake USB Loader Comm.port.”



Chapter 3. HOW TO USE THE LOADER

3-1 Overview

Overview of functions

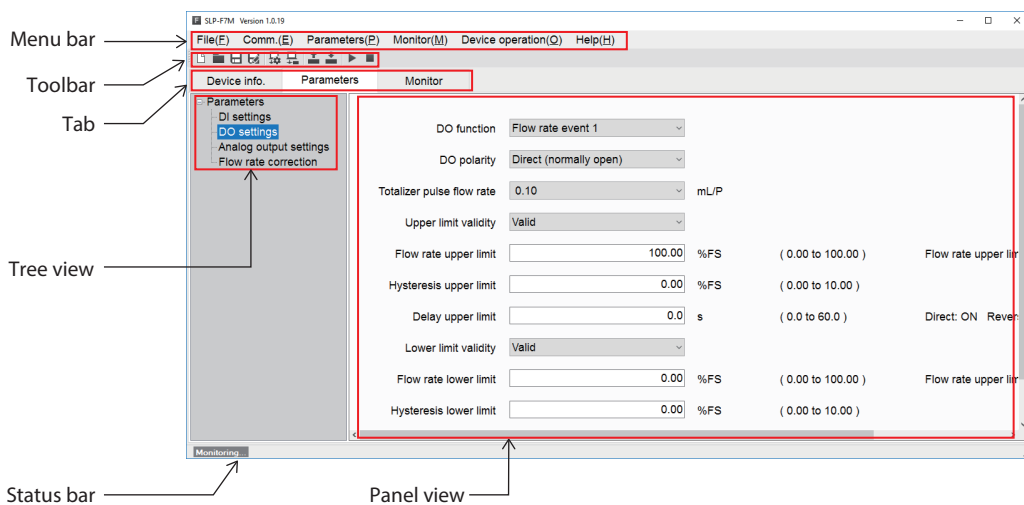
Connect the loader to the device in order to change the parameters, monitor the flow rate and device status, and for other operations (zero point adjustment, etc.). Parameters and monitoring results can be saved to a file. The saved file can be opened to check the data, and parameters can be written to the device.

In addition, with the device not connected, it is possible to edit new parameter settings and save them to a file, and connect the device afterward to write the parameters to the device.

Handling Precautions

- As a result of internal calculation (rounding), the value of the least significant digit displayed on the loader might differ from the value the device has internally.
- As a result of internal calculation, the least significant digit near either the range high or range low limit may be judged to be outside the range limit, with the result that the number cannot be input.

Components of the screen




Name	Description
Menu bar	All functions of the loader can be accessed from here by selecting any of the menus with the mouse or keys.
Toolbar	Icons for frequently used functions of the loader are provided for easy access to the necessary function.
Tab	Information on the device is sorted into tabs. Clicking any of the tabs displays the tree of related items. Device info.: Model No., etc. Parameters: Device parameters (configurable in this tab) Monitor: Process values, abnormal status, etc., of the device
Tree view	Items in the tab are grouped by the device functions. Selecting any of the groups displays related device information in the panel view.
Panel view	Information on the device (status, parameters, etc.) is displayed. Parameter settings can be changed, with the exception of the items with a gray background.
Status bar	The status of communications between the loader and the device is displayed.











■ Loader functions

The table below shows the functions of the loader. They can be executed from the menu bar.

The functions with icons can also be executed from the toolbar.

 3-4 List of Parameters (P. 3-13)(for device information and a list of parameters)

- File (F): The submenu includes file operations and exit from the loader.
- Comm. (E): The submenu includes the function to execute before starting communications with the device.
- Parameters (P): The submenu includes functions for reading all parameters from the device and writing all parameters to the device.
- Monitor (M): The submenu includes functions for starting and stopping monitoring.
- Device operation (O): Certain device functions can be executed from the submenu.
- Help (H): Loader information, etc., can be displayed from the submenu.

Menu bar		Overview of functions	Toolbar	Shortcut keys
Menu	Submenu			
File	New	Creates a file of parameters to be written to a device, while the loader is not connected to the device.		Ctrl + N
	Open	Reads parameters that were saved to a file and displays them on the loader screen. The parameters can be changed and written to the device.		Ctrl + O
	Save	Saves the current parameters.		Ctrl + S
	Rename and save...	Saves the current parameters to a file with a different file name.		Shift + Ctrl + S
	Exit	Ends the loader program.	-	Alt + F4
Comm.	Comm. settings	Communication settings of the loader can be changed.		Ctrl + G
	Activate comm.	Execute this function before starting communication.		Ctrl + A
Parameter	Read all parameters from device	Reads device information and parameters from the device.		F1
	Write parameters to device	Writes only parameters to the device. Device information is not written. Settings cannot be written if the model No. of the connected the device differs from the number in the loader.		F2
Monitor	Start monitoring	Reads the process value and device status from the device and updates the monitoring display.		F4
	End monitoring	Ends updating of values on the monitor screen.		F5
Device operation	Zero point adjustment	Automatically adjusts the zero point of the instantaneous flow rate.	-	F6
Help	User's Manual for SLP-F7M Smart Loader Package for F7M (PDF)	The user's manual for the loader can be viewed.*	-	-
	F7M Micro Flow Rate Liquid Flow Meter User's Manual (PDF)	The user's manual for the device can be viewed.*	-	-
	Version information	The version information for the loader, etc., is displayed.	-	-

* Adobe Acrobat Reader XI or later version is required to view the document.

3-2 Connecting the Loader to the Device

In order to check or change the data on the device, the loader must first be connected to the device.

The procedure for connection is as follows.

Steps 1–2: Connect the PC to the device.

Step 3: Start the loader.

Steps 4–5: Set the communication conditions.


Steps 6–8: Execute “Activate comm.”

! Handling Precautions

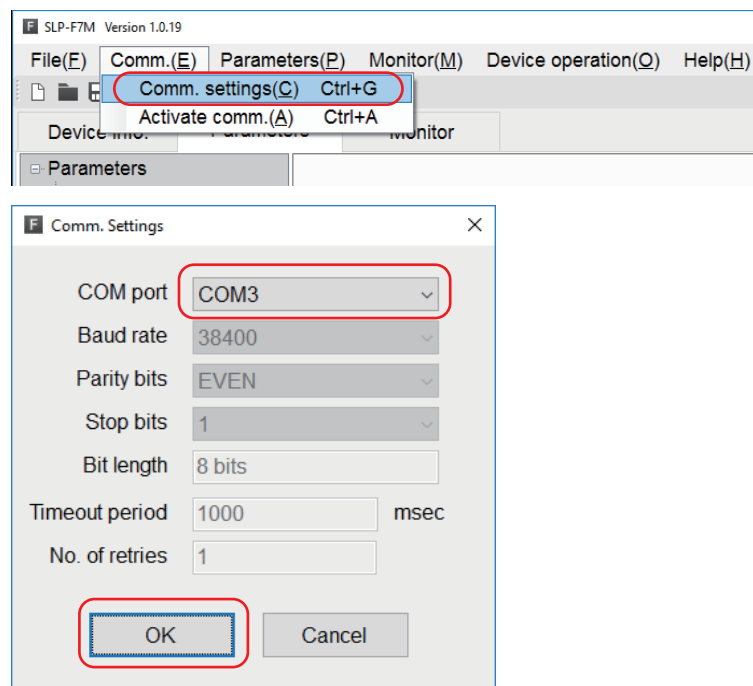
- After the above procedure, a different device can be connected without exiting the loader. To do so, change the device that is connected to the PC, and activate communication with the device using steps (6)–(8).

■ Procedures for device connection

In order to connect the loader to the device, it is necessary to specify communication settings for the loader and activate communication with the device.

- (1) Turn the device off.
- (2) Connect the device to the PC.
- (3) Start the loader.
- (4) Select [Comm. (E)] → [Comm. settings] on the menu bar, or click the  button on the toolbar.

>> The following screen is displayed.

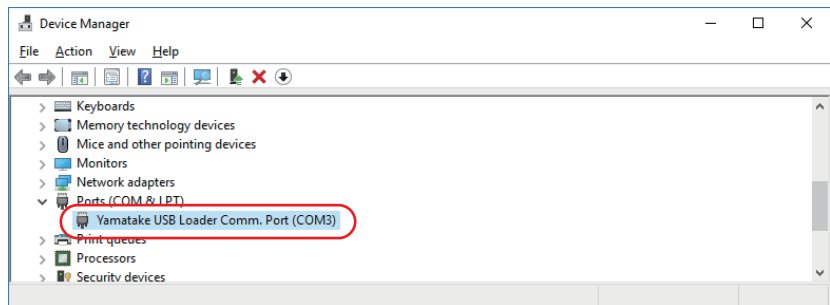


- (5) In the COM port field, select the COM number for the USB loader cable, and click the [OK] button.

>> The window closes.

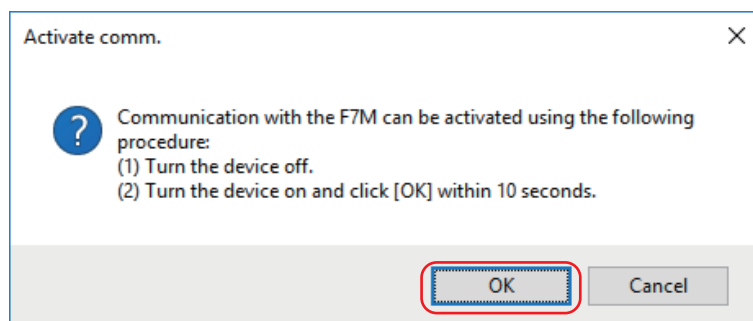
Note

- To identify which of multiple communication ports is used, in Windows select [Control Panel] → [Device Manager] and view [Ports (COM & LPT)] to check the communication port number for “Yamatake USB Loader Comm. Port.”

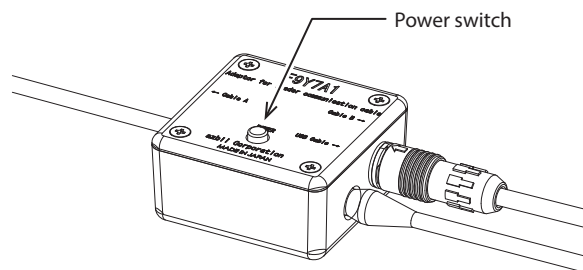


- (6) Select [Comm. (E)] → [A]ctivate comm.] on the menu bar, or click the  button on the toolbar.

>> The following screen is displayed.

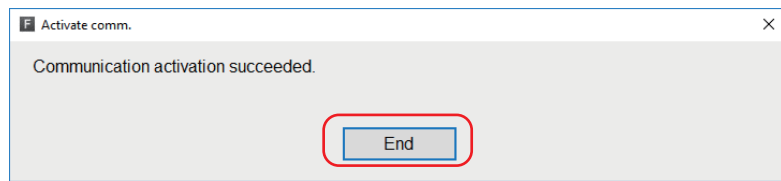


- (7) Turn off the power switch on the adapter for loader communication cable.

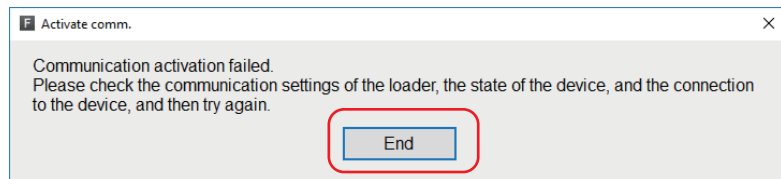


- (8) Turn on the power switch and click the [OK] button within 10 seconds.

>> If communication activation is successful, the following screen is displayed. Click the [End] button. Now you can execute functions that require communication with the device.



>> If communication activation failed, the following screen is displayed.
Click the [End] button. Check the communication settings of the loader, the state of the device, and the connection to the device, and then repeat steps (1)–(8).



3 - 3 Checking and Changing Parameters

Parameters can be checked or changed by the following methods.

- Create a parameter file
- Open a parameter file
- Read all parameters from the device*


Changed parameters can be written to the device or saved by the following methods.

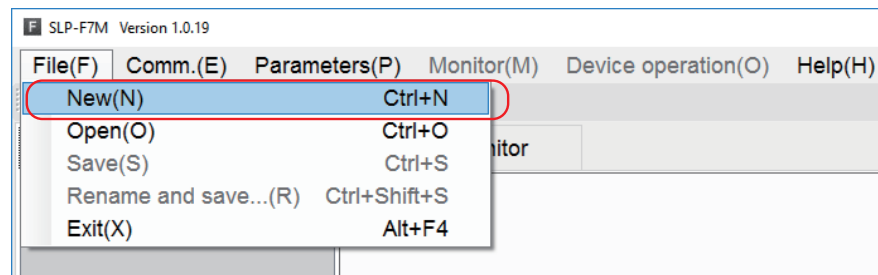
- Write all parameters to the device*
- Save the file
- Rename and save the file

* It is necessary to connect the loader to the device in advance. (☞ 3-2 Connecting the Loader to the Device (P. 3-3))

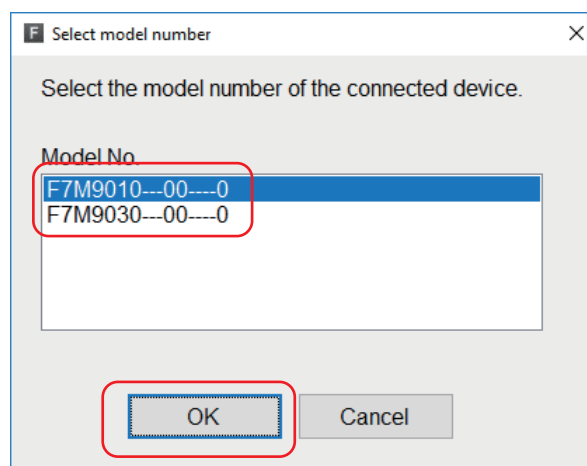
■ Creating a parameter file without connecting the loader to the device

It is possible to create a parameter file for a device before connecting it to the loader, and to write the saved parameters to the device afterward.

- (1) Select [File] → [New] on the menu bar, or click the  button on the toolbar.

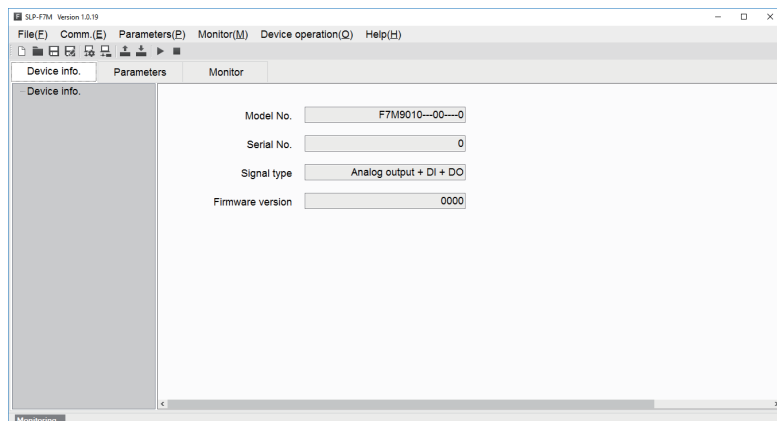


>> The following window is displayed:



- (2) Select the model number of the device whose parameter file is to be created, and click the [OK] button.

>> The following screen is displayed.



! Handling Precautions

- The following device information is displayed after a model number is selected.

Model No.: The model number selected in the [Select model number] window.

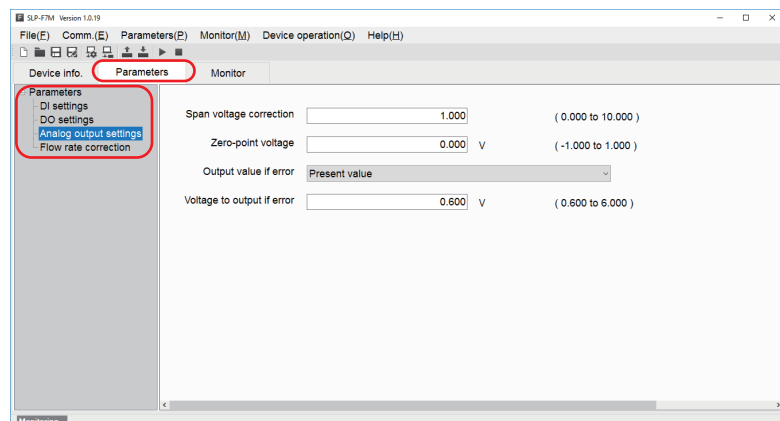
(The digits representing the device specifications that do not affect the loader function are displayed with hyphens.)


Serial No.: 0

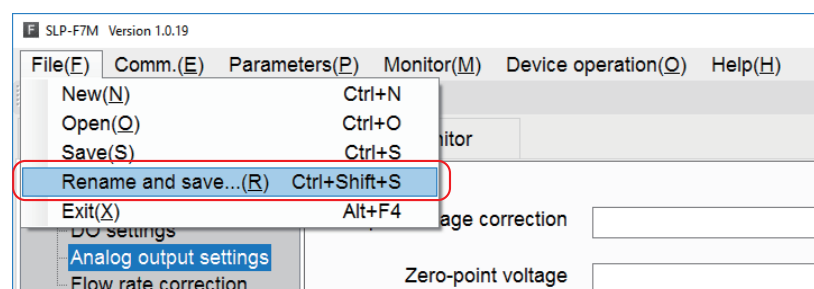
Signal type: Analog output + DI + DO

Firmware version: 0000

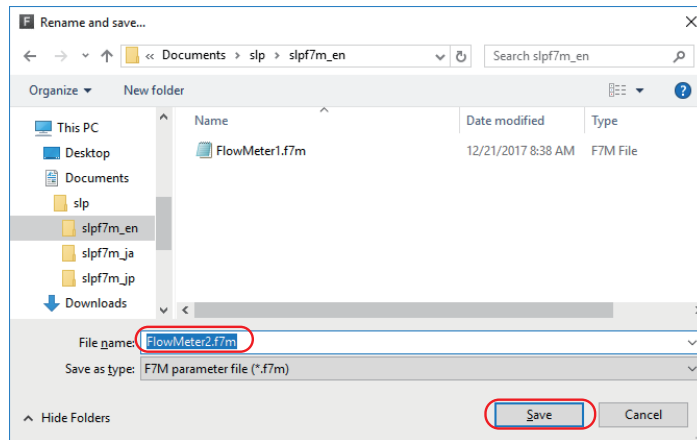
- Check that the model number and the signal type are correct. Click the [Parameters] tab and select a parameter group in the tree view, and make necessary changes to the parameters.



- Select [File] → [Rename and save...] on the menu bar, or click the  button on the toolbar.



>> The following screen is displayed.



- (5) Enter any name in the [File name] field (example: F7M_N1_1.f7m) and click the [Save] button.

Note

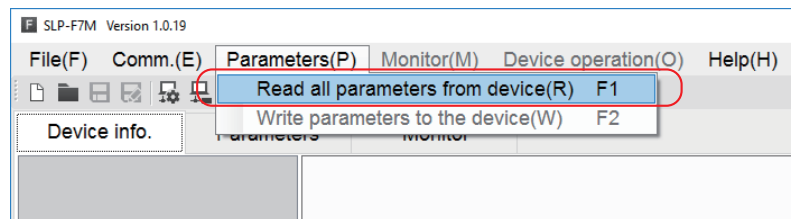
- ■ Writing parameters to the device (P. 3-10), ■ Saving parameters to a file (P. 3-11) (for opening saved files and writing parameters to the device)

■ Checking parameters of the connected device

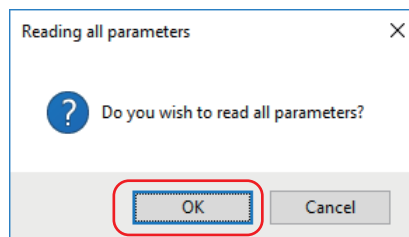
The method of reading and displaying all parameters of the connected device is explained below.

“All parameters” means all data on the [Device info.] and [Parameters] tabs.

- (1) Connect the loader to the device. (3-2 Connecting the Loader to the Device (P. 3-3))
- (2) On the menu bar, select [Parameters] → [Read all parameters from device].

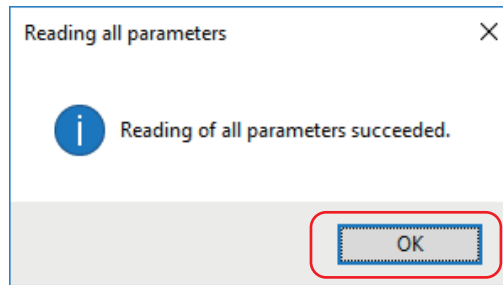


>> The following screen is displayed.



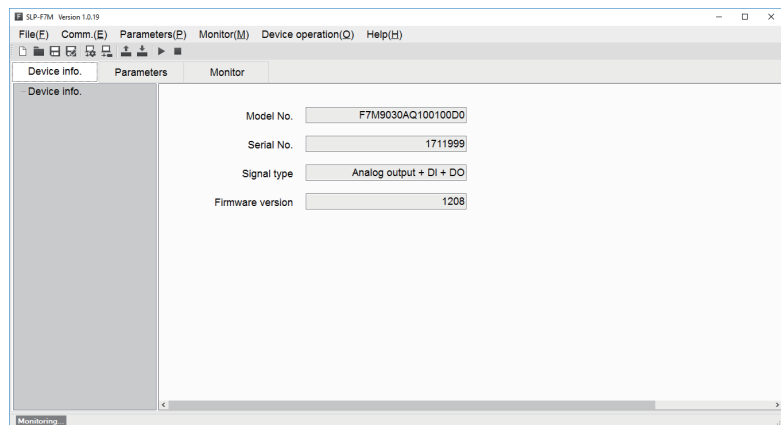
- (3) Click the [OK] button.

>> The following screen is displayed.



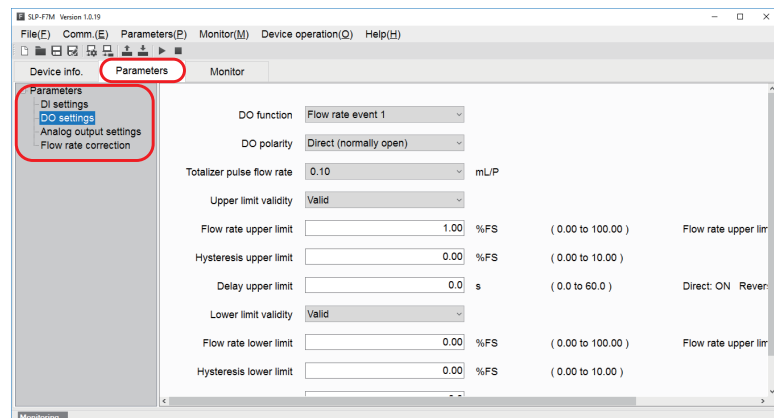
(4) Click the [OK] button.

>> The following screen is displayed.



(5) Click the [Parameters] tab and select the item to check in the tree view.

>> The following screen is displayed.




■ Writing parameters to the device

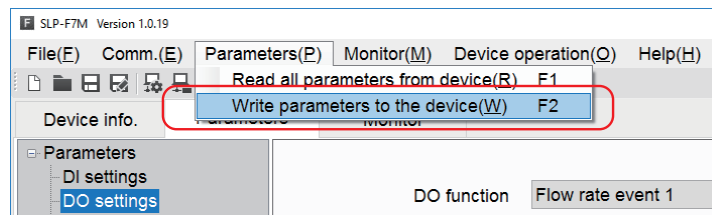
This section describes the procedure for writing parameters to the device.

After reading parameters to the loader, perform the following operations.

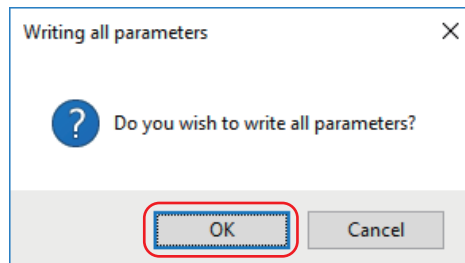
! Handling Precautions

- Parameters cannot be written to the device if the model number of the device is different from the number in the [Device info.] tab. However, because the underlined digits in the following example represent the device specifications that do not affect the loader function, even if there are discrepancies in these digits, parameters can be written to the device. Example: F7M9010AQ100100Y0

- Activate communication with the device.
(☞ 3-2 Connecting the Loader to the Device (P. 3-3))
- On the menu bar, select [Parameters] → [Write parameters to the device], or click the  button on the toolbar.

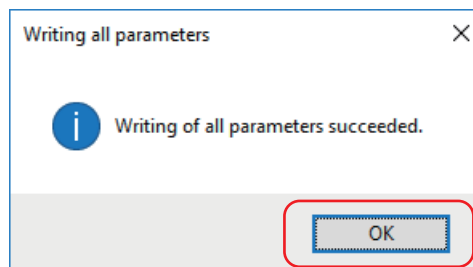


>> The following screen is displayed.



- Click the [OK] button.


>> The following screen is displayed.

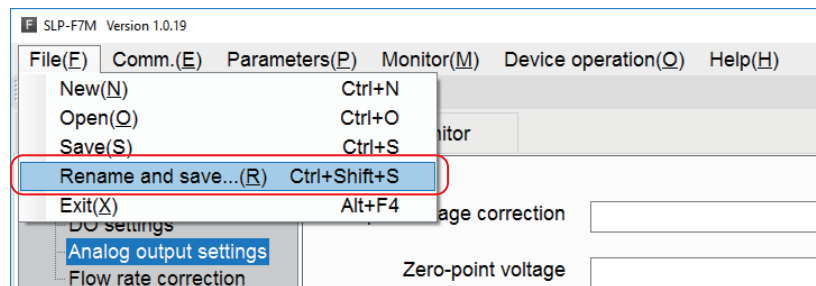


- Click the [OK] button.

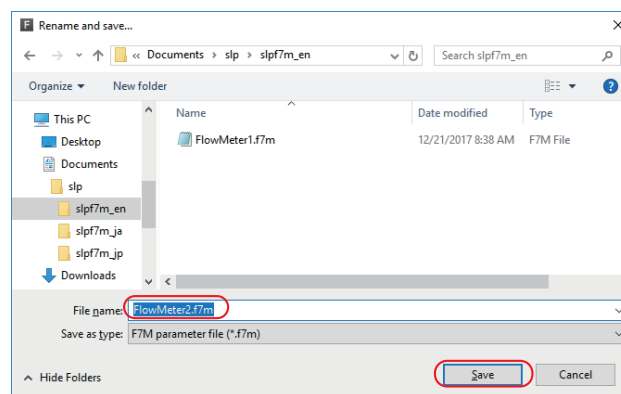
■ Saving parameters to a file

Parameters that were read from the device or that were changed can be saved to a file using the following procedure.

- (1) Select [File] → [Rename and save...] on the menu bar, or click the  button on the toolbar.




>> The following screen is displayed.

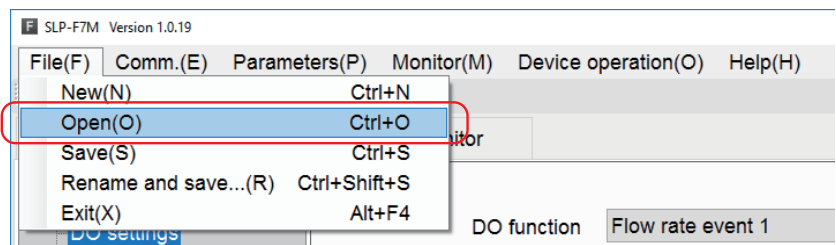


- (2) Enter any name in the [File name] field and click the [Save] button.

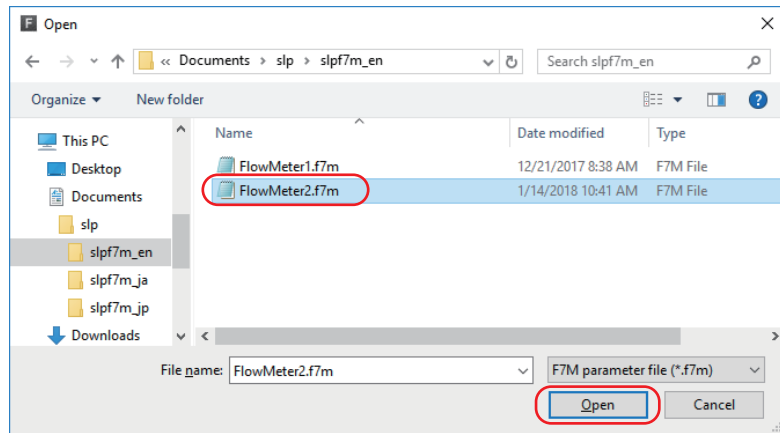
■ Checking saved parameters

This section describes the procedure for displaying data (parameters) that have been saved to a file.

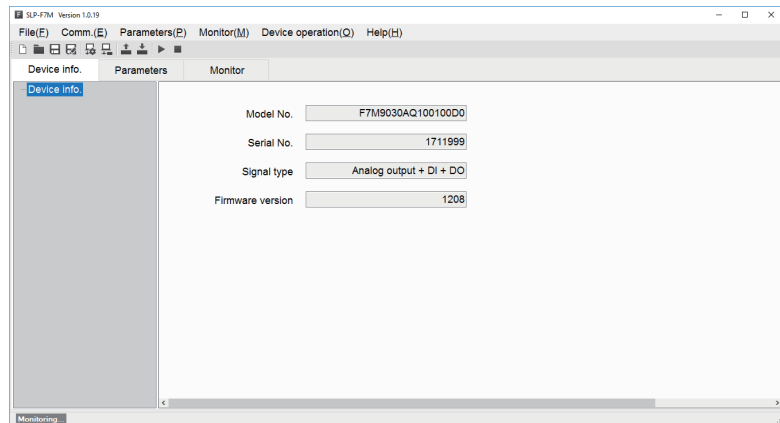
- (1) Select [File] → [Open] on the menu bar, or click the  button on the toolbar.



>> The following screen is displayed.



- (2) Select the parameter file to open (extension: f7m) and click the [Open] button.
>> The following screen is displayed.




- (3) Select a tab and an item in the tree view to check parameter settings.

3-4 List of Parameters

The following tables show the parameters that can be accessed by the loader.

Note

-  F7M Micro Flow Rate Liquid Flow Meter User's Manual CP-SP-1421E (for details on parameters)

■ [Device info.] tab

Displays information such as model number. The settings of these parameters cannot be changed.

Parameters	Unit	Description	Factory default
Model No.	–	Model No. of the device (17 alphanumeric characters) Example: F7M9030AQ10010000	Depends on the device specifications.
Serial No.	–	Serial number of the device represented by a 9-digit number	Depends on the device.
Signal type	–	Indicates the signal type of the device.	Analog output + DI + DO
Firmware version	–	Indicates the firmware version of the device.	–

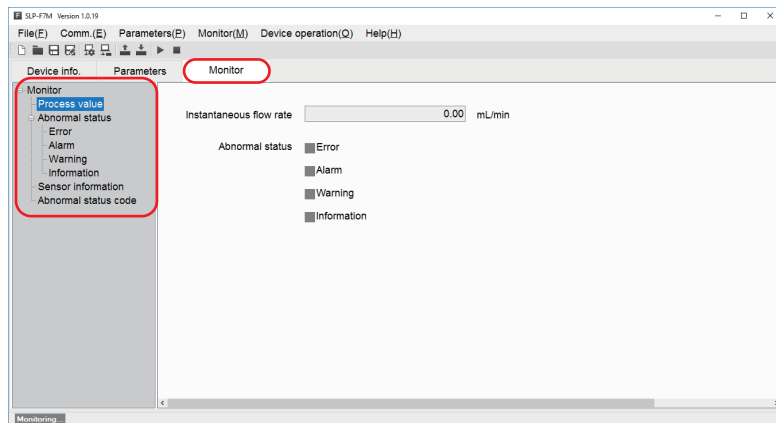
■ [Parameters] tab

Parameters	Unit	Description	Factory default	
DI settings	DI function	–	Zero point adjustment Error reset	Error reset
DO settings	DO function	–	Flow rate event 1 Flow rate event 2 Error indication output Totalizer pulse output	Flow rate event 1
	DO polarity	–	Direct (normally open) Reverse (normally closed)	Direct
	Totalizer pulse flow rate	mL/pulse	0.01, 0.1, 1, 10	0.1
	Upper limit validity	–	Invalid Valid	Valid
	Flow rate upper limit	% FS	0.00–100.00	100.00
	Hysteresis upper limit	% FS	0.00–10.00	0.00
	Delay upper limit	s	0.0–60.0	0.0
	Lower limit validity	–	Invalid Valid	Valid
	Flow rate lower limit	% FS	0.00–100.00	0.00
	Hysteresis lower limit	% FS	0.00–10.00	0.00
Delay lower limit	s	0.0–60.0	0.0	
Analog output settings	Span voltage correction factor	–	0.000–10.000	1.000
	Zero-point voltage correction value	V	-1.000 – +1.000	0.000
	Output value if error occurs	–	Present value Last good value (before error) Specified value (set in [Voltage to output if error occurs])	Present value
	Voltage to output if error occurs	V	0.600–6.000	0.600
Flow rate correction	Flow rate correction factor (CCF)	–	0.000–100.000	1.000
	Flow rate offset correction value	mL/min	-10.00 – +10.00	0.00
	Amount of zero point adjustment	mW	This value cannot be changed.	0.00
	Low-flow cutoff value	% FS	0.0–100.0	1.0
	Filter time constant	s	0.0–60.0	0.0

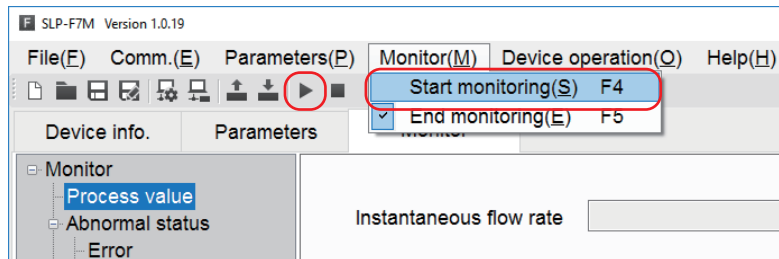
3 - 5 Checking Measured Values and Status

■ Displaying measured values and status of the device

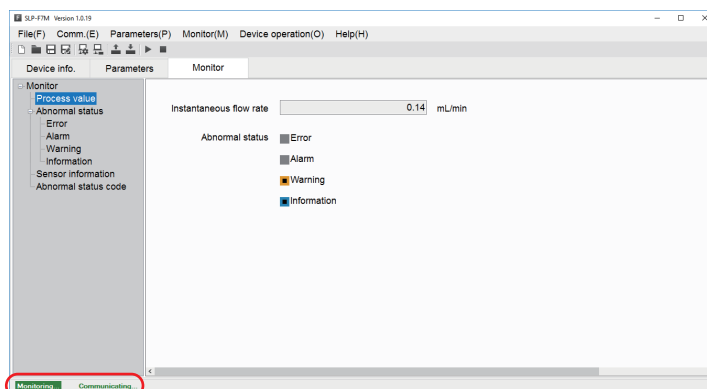
- (1) Connect the loader to the device. (☞ 3-2 Connecting the Loader to the Device (P. 3-3))
- (2) Obtain device information by executing steps 1 to 4 in ■ Checking parameters of the connected device (P. 3-8). If you have already executed steps 1 to 4, this process is unnecessary.
- (3) Click the [Monitor] tab and select the item to display in the tree view. Monitoring information has not yet been read from the device. (The following are the screens displayed when [Monitor] → [Process value] is selected)



- (4) Click the [Monitor] → [Start monitoring] on the menu bar, or click the ► button on the toolbar.







>> The following screen is displayed. The loader starts updating values and information. When monitoring is in progress, “Monitoring” at the bottom left of the screen is displayed in green and the word “Communicating...” blinks.



3-6 List of Monitoring Parameters


■ [Monitor] tab

	Parameters	Unit	Description
Process value	Instantaneous flow rate	mL/min	Indicates the value calculated from the measured flow rate signal.
	Abnormal status	–	Indicates the type of abnormal status.
Abnormal status	Error	–	An error has a significant impact on the operation of the device.  Chapter 4. TROUBLESHOOTING (for details and corrective actions)
	Alarm	–	An alarm affects the measurement of flow rate.  Chapter 4. TROUBLESHOOTING (for details and corrective actions)
	Warning	–	A warning has a small impact on the measurement of flow rate.  Chapter 4. TROUBLESHOOTING (for details and corrective actions)
	Information	–	This is not technically an abnormal status. Information is displayed for reference.  Chapter 4. TROUBLESHOOTING (for details and corrective actions)
Sensor information	Flow path temperature	°C	Displays an approximate temperature in the flow path.
	Circuit temperature	°C	Displays the approximate temperature of the circuit.
	Heater power	mW	Displays power consumption by the heater used for flow rate measurement.
	Amount of zero point adjustment	mW	Displays the amount of zero point adjustment.
Abnormal status code	Abnormal status code 0	–	For maintenance
	Abnormal status code 1	–	For maintenance
	Abnormal status code 2	–	For maintenance
	Abnormal status code 3	–	For maintenance
	Abnormal status code 4	–	For maintenance
	Abnormal status code 5	–	For maintenance
	Abnormal status code 6	–	For maintenance
	Abnormal status code 7	–	For maintenance

3-7 Operating the Device

■ Adjusting the zero point


Note

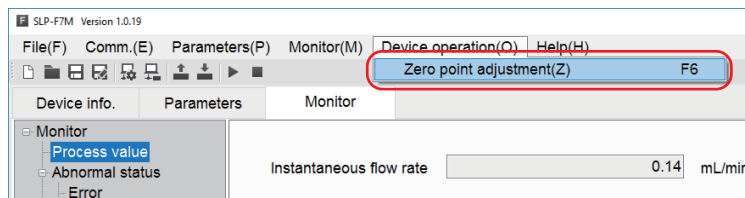
- The default zero point cannot be restored using the loader. To revert the zero point to the factory setting, use the switch on the device.  F7M Micro Flow Rate Liquid Flow Meter User's Manual CP-SP-1421E (for details)

Handling Precautions

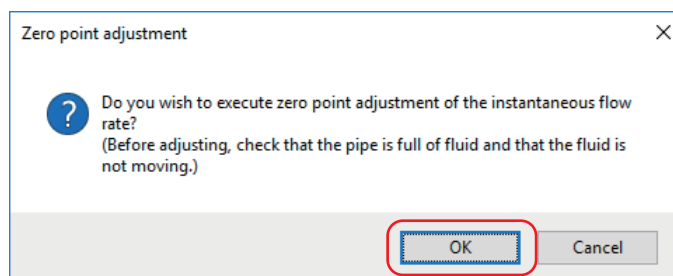
- When zero point adjustment is in progress, do not turn off the device.
- Parameters other than zero point adjustment are written to the device by [Writing all parameters], but the amount of zero point adjustment is written to the device when zero point adjustment is complete.

The procedure for adjusting the zero point of the instantaneous flow rate after connecting the loader to the device is given below.

- (1) Connect the loader to the device. ( 3-2 Connecting the Loader to the Device (P. 3-3))
- (2) Obtain device information by executing steps 1 to 4 in ■ Checking parameters of the connected device (P. 3-8). If you have already executed steps 1 to 4, this process is unnecessary.
- (3) Select [Device operation] → [Zero point adjustment] on the menu bar.

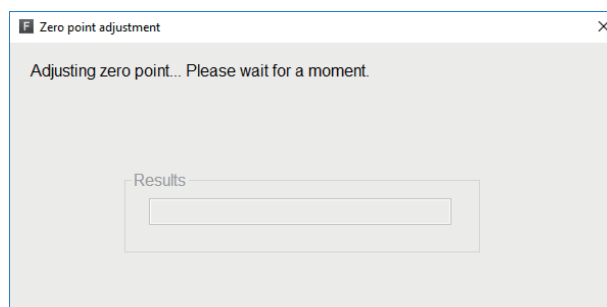


>> The following screen is displayed.

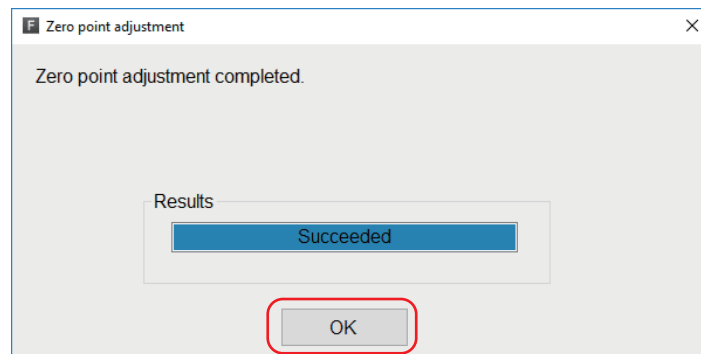


- (4) Check that the pipe is full of fluid and that the fluid is not moving, and then click the [OK] button.

>> The following screen is displayed.



>> When zero point adjustment is complete, the following screen is displayed.



(5) Pressing the [OK] button returns the display to the original screen.

-MEMO-

Chapter 4. TROUBLESHOOTING

■ Types of abnormal status

There are four types of abnormal status of the device: Error, alarm, warning, and information.

Abnormal status can be checked by the loader.

Abnormal status of the device	Description
Error	An error has a significant impact on the operation of this device. If an error occurs, flow rate measurement stops. If the problem is caused by a transient failure such as electrical noise, the device may return to normal after the power is turned off and back on. If not, request repair.
Alarm	An alarm affects the measurement of flow rate. If an alarm occurs, flow rate measurement continues, but the accuracy of the flow rate is not guaranteed.
Warning	A warning has a small impact on the measurement of flow rate. If a warning occurs, digital output remains off when "DO function" is set to "Error indication output." Whether a warning has occurred can be checked with the LED indicator or by the loader. If a warning occurs, flow rate measurement continues.
Information	This is not technically an abnormal status. Information is displayed for reference. Abnormal status can be checked by the loader.

■ Abnormal status and corrective actions

Type

Er : Error

Al : Alarm

Wn : Warning

Inf : Information

Automatic recovery ✓ : Yes (when the cause is removed, the abnormal status indication disappears)

– : No

No.	Type	Description	Likely cause	Corrective action	Automatic recovery
0	Al	Zero point adjustment error (correction of more than $\pm 40\%$ FS)	The zero point was adjusted when the fluid was moving.	Check that the pipe is full of the fluid to be measured and that the fluid is not moving, and try again.	✓
	Wn	Zero point adjustment completed (correction of more than $\pm 25\%$ FS)			
	Inf	Zero point adjustment completed. (succeeded)	Zero point adjustment succeeded.	–	

Chapter 4. TROUBLESHOOTING

No.	Type	Description	Likely cause	Corrective action	Automatic recovery
1	Wn	Empty (flow path not full)	The flow path of this device has not been full for some time.	Fill the flow path with the fluid.	✓
	Inf	Flow rate measurement error	A flow rate measurement error occurred due to a cause such as bubbles in the flow path of the device.	Check for problems in the installation environment or instrumentation.	
2	Wn	Accuracy-guaranteed flow rate exceeded	Fluid is flowing at a rate greater than the rated (accuracy-guaranteed) flow rate.	Use this device within the rated flow rate range.	✓
3	Wn	Analog output range exceeded	The rated flow rate was exceeded, or an analog output correction parameter value is invalid.	Use this device within the rated flow rate range. Set a valid parameter value.	✓
4	Wn	Parameter error (1) Checksum error (2) Number of write cycles exceeded	(1) A checksum error occurred during parameter data reading or writing. (2) Parameters were written more than the specified number of times.	(1) Write parameters again. (2) Replace the product.	–
5	Wn	Watchdog time-out	A reset by a communication command, or malfunction due to electrical noise, etc.	If the warning persists after turning the power off and back on, request repair.	–
6	Al	Flow path or circuit temperature out of range	The sensor unit has failed.	<ul style="list-style-type: none"> • Check that the fluid temperature and the ambient temperature meet the specified operating conditions. • If the alarm persists after turning the power off and back on, request repair. 	–
	Wn		The fluid temperature or the ambient temperature does not meet the specified operating conditions.		
7	Al	Measurable flow rate exceeded	The flow rate is greater than 115 % of the measurable range.	Use this device within the rated flow rate range.	✓
8	Al	Totalizer pulse output error (flow over range)	When totalizer pulse was being output, the flow rate exceeded the rated measurable range for a certain period of time.	Use this device within the rated flow rate range.	✓
	Wn		When totalizer pulse was being output, the flow rate far exceeded the rated measurable range for a certain period of time.		
9	–	(Not used)	–	–	–
10	Al	Heater control error	The heater, temperature sensor, or electric circuit has failed, so the heater cannot be controlled.	If the alarm persists after turning the power off and back on, request repair.	✓
11	Er	Parameter error	A type of parameter not supported by this device, or an illegal parameter value, was downloaded by the loader.	If the error, alarm, or information persists after changing the parameter and turning the power off and back on, request repair.	–
	Al	Parameter mismatch	Parameter values are abnormal, etc.		
	Inf	Out-of-range parameter	Parameter values are out of range.		

No.	Type	Description	Likely cause	Corrective action	Automatic recovery
12	Er	Nonvolatile memory error	The data in the device is corrupt.	If the error or information persists after changing the parameter setting and turning the power off and back on, request repair.	–
	Inf	Backup parameter error	The data in the backup area is corrupt.		–
13	Er	Software execution error	<ul style="list-style-type: none"> • The heater or temperature sensor has failed. • The electric circuit has failed. 	If the error persists after turning the power off and back on, request repair.	–
14	Er	Hardware error	<ul style="list-style-type: none"> • The heater or temperature sensor has failed. • The electric circuit has failed. 	If the error persists after turning the power off and back on, request repair.	–
15	Er	Program ROM error	A data discrepancy was detected in a cyclic redundancy check (CRC) of the ROM.	If the error persists after turning the power off and back on, request repair.	–

■ Error messages and corrective actions

Menu	Message	Description	Corrective action
[Comm. (E)] → [Comm. settings]	No COM port has been selected.	The [OK] button was pressed with no COM port selected.	Select the COM port that is assigned for communications with the device, and click the [OK] button.
[Comm. (E)] → [Activate comm.]	Communication activation failed. Please check the communication settings of the loader, the state of the device, and the connection to the device, and then try again.	Communication activation failed and the loader cannot communicate with the device.	Please check the communication settings of the loader, the state of the device, and the connection to the device, and then try again.
[File] → [New]	No model number has been selected.	The [OK] button was pressed with no model number selected.	A model number must be specified. Select the model number of the device to be connected and press the [OK] button.
[File] → [Open]	The model is not supported by the loader. Reading of the file failed.	The selected file is for a model that is not supported by the loader, so the file could not be opened.	If a new version of the loader is available on the Azbil website (Compo Club), it might be possible to open the file by upgrading the loader. If the file still cannot be opened, it might be corrupt. Take the same corrective action as for "The read data contains errors."
	The read data contains errors.	The file could not be opened due to errors in the file. The file is probably corrupt.	Specify the parameters again and save them to a file. (Execute [Read all parameters from device] or select [File] → [New] to display parameters, change the settings, and save them to a file.)
	[File name] File not found. Check the file name and try again	The specified file cannot be opened because the loader cannot find it.	Please enter the correct file name.
[File] → [Save]	No file is open.	The user attempted to save a file but no file was open.	Execute [Rename and save...].
[File] → [Rename and save...]	[File name] already exists. Do you want to replace it?	A file with the same name was found when [Rename and save...] was executed. It is possible to overwrite the file data with the current parameter settings.	To overwrite the data, press the [Yes] button. If you wish not to overwrite the data, press the [No] button, change the file name, and save it.
	[File name] This file is set to read-only Try again with a different file name.	The specified file is read-only and cannot be overwritten.	Change the file name and save it.
	[File name] You don't have permission to save in this location. Contact the administrator to obtain permission. Would you like to save in the [Document] folder instead?	You do not have access rights for the specified destination folder.	To save the file to the Documents folder, press the [Yes] button. To save the file to another folder, select a folder that you are permitted to access and save the file.

Menu	Message	Description	Corrective action
[Parameters] → [Read all parameters from device]	The model is not supported by the loader. Reading of parameters failed.	A product other than the device is connected or the device model not supported by the loader is specified, so parameters cannot be read from the device.	Check the connected product. Download the latest version of the loader software from the Azbil website (Compo Club), install the loader, and try again.
	Reading of parameters failed.	Reading of parameters from the device was aborted because a communication error, etc., occurred.	Please check the communication settings for the loader, the power to the device, and the cable connections, and then try again.
[Parameters] → [Write parameters to the device]	Parameters could not be written to the device because the model number of the device is different from the number specified by the loader. The model number in the loader's device information must be the same as the model number of the connected device. Model number specified by the loader: F7Mxxxxxxx Model number of the connected device: F7Mxxxxxxx	Parameters could not be written to the device because the model number of the connected device is different from the model number currently specified for work using the loader.	The model number in the loader's device information must be the same as the model number of the connected device.
	Parameters could not be written to the device because some of the values were invalid. Please specify valid values for the following items and then try again.	Parameters could not be written to the device because the specified parameters include out-of-range values, or because the combination of the specified parameters is prohibited.	Please correct the value of the parameter(s) displayed under the message and try again.
	Writing of parameters failed.	Writing parameters to the device was aborted because a communication error, etc., occurred.	Please check the communication settings for the loader, the power to the device, and the cable connections, and then try again.

Menu	Message	Description	Corrective action
[Monitor] → [Start monitoring]	Monitoring could not be started because the model number of the device is different from the number specified by the loader. Please execute reading of all parameters from the device and try again. Model number specified by the loader: F7Mxxxxxxx Model number of the connected device: F7Mxxxxxxx	Monitoring could not begin because the model number of the connected device is different from the model number currently specified for work using the loader.	The model number in the loader's device information must be the same as the model number of the connected device.
	A communication error occurred. Monitor startup failed.	A communication error occurred during monitor startup.	Please check the communication settings for the loader, the power to the device, and the cable connections, and then try again.
	Monitoring stopped due to a communication error.	A communication error occurred during monitoring.	Please check the communication settings for the loader, the power to the device, and the cable connections, and then try again.
[Device operation] → [Zero point adjustment]	Zero point adjustment failed. Zero point cannot be adjusted if the flow rate exceeds the range ($\pm 40\%$ FS).	The flow rate is outside the adjustment range.	Check that the pipe is full of fluid and that the fluid is not moving, and try again.
	Zero point adjustment failed. Zero point cannot be adjusted if an error or alarm occurred or if zero point adjustment has already been executed by pressing the operation switch on the device. Or, a communication error occurred.	The zero point cannot be adjusted if an error or alarm occurred, if zero point adjustment is in progress, or if a communication error occurred.	Remove all errors or alarms, if any. If zero point adjustment is in progress, wait until it is complete. If a communications error occurred, check the communication settings for the loader, the power to the device, and the cable connections. Then, try again.
[Help] → Menu to open a user's manual	The specified file cannot be opened.	The software required to display the user's manual (a PDF file) is not installed on the PC.	Download Adobe Acrobat Reader XI or later version from Adobe's website, install it, and try again.
Parameter values	The value is out of range.	The entered value could not be set because it is out of range.	Enter a value that is between the lower and upper limits that are indicated within the parentheses next to the parameter.
	The input value is invalid.	The specified value could not be set because it includes non-numeric values such as letters or double-width Asian characters, which are not treated as numeric values.	Enter a numeric value.
	The number of characters exceeds the limit.	The character string is too long.	The number of characters must be within the limit.

■ Other troubleshooting

Type	Problem	Description	Corrective action
Display	Values are not displayed properly. Files cannot be opened.	If a symbol other than "." is set as the decimal point symbol in the Windows settings, the loader will not work properly.	In the Windows settings, select [Control Panel] → [Region] and press the [[Additional settings] button. Check that "." is set as the decimal point symbol.
Other	Some or all functions of the loader (screen display, operation, etc.) cannot be executed.	Due to unknown errors, the loader does not operate properly.	Exit the loader using the following procedure and then restart the loader: Press the Ctrl + Alt + Delete keys. Click [Task Manager]. Select [SLP-F7MJ91 for F7M (32bit)] and click the [End Task] button.

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Revision History of CP-SP-1423E

Date	Rev.	Revised pages	Description
Apr. 2018	1		

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