

FA Sensor



Code Reader Setting Guide

-CF26-SR
-CF26-LR
-CF37-SR
-CF37-LR

Powered by

COGNEX

This product is designed and manufactured by Cognex Corporation.
*Note that the warranty and general specifications of this product differ from that of programmable controller products.

COGNEX



SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions for other modules, refer to their respective user's manuals.

In this manual, the safety precautions are classified into two levels: "⚠️ WARNING" and "⚠️ CAUTION".

 WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
 CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠️ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Installation Precautions]

WARNING

- Before handling the code reader, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Wearing a grounded antistatic wrist strap is recommended. Failure to discharge the static electricity may cause the code reader to fail or malfunction.
 - Be sure to install an I/O connector module to a main module. If not installed, dust or water-proof performance may not be obtained.
-

[Security Precautions]

WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.
-

[Installation Precautions]

CAUTION

- IP protection rating is guaranteed only when all the connectors are connected with cables or sealed with sealing caps.
 - The cable is designed to connect with its key aligned with the keyway of the connector on the code reader. Do not force the connections or damage may occur.
-

[Wiring Precautions]

CAUTION

- Use only 24 VDC and observe the indicated polarity. Otherwise, fire or damage may result.
-

[Startup and Maintenance Precautions]

CAUTION

- Do not clean the code reader with highly irritating or corrosive solvent such as caustic alkali solution, methyl ethyl ketone (MEK), and gasoline. Doing so may cause a fault.
-

[Disposal Precautions]

CAUTION

- When disposing of this product, treat it as industrial waste.
-

PRECAUTIONS FOR USE

Observe the following precautions when installing and operating the code reader, to reduce the risk of injury or equipment damage:

- This device requires the use of an LPS or NEC class 2 power supply.
- To reduce the risk of damage or malfunction due to over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply, route all cables away from high-voltage power sources.
- A code reader does not contain user-serviceable parts. Do not make electrical or mechanical modifications to a code reader.
Unauthorized modifications may void your warranty.
- Changes or modifications not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate the equipment.
- If the bend radius or service loop is smaller than 10 times of the cable diameter, the cable may cause cable shielding degradation, cable damage, or wear out in a short period. The bend radius must begin at least 152.4 mm from the connector.
- Use this device in accordance with this manual.

CONDITIONS OF USE FOR THE PRODUCT

(1) This code reader shall be used in conditions;

- i) where any problem, fault or failure occurring in the code reader, if any, shall not lead to any major or serious accident; and
- ii) where the backup and fail-safe function are systematically or automatically provided outside of the code reader for the case of any problem, fault or failure occurring in the code reader.

(2) This code reader has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY THIS CODE READER THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the CODE READER.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the code reader in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the code reader.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the code reader in one or more of the Prohibited Applications, provided that the usage of the code reader is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the code readers are required. For details, please contact the Mitsubishi Electric representative in your region.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving code reader trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric FA sensor, MELSENSOR.

This manual describes the basic operations of DataMan Setup Tool for MELSENSOR.

For detailed description, use [Q & A] or [Help] on the menu of DataMan Setup Tool for MELSENSOR.

Before using the product, please read this manual and relevant manuals carefully, and develop familiarity with the functions and performance of the code reader to handle the product correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

Please make sure that the end users read this manual.

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RELEVANT MANUALS

Manual name [Manual number]	Description	Available form
Code Reader Setting Guide [BCN-P5999-1258] (this manual)	Basic operations of DataMan Setup Tool for MELSENSOR	e-Manual PDF
Code Reader CF26 User's Manual [SH-082092ENG]	Functions, installation methods, system configuration, and required hardware components etc. of a code reader CF26	e-Manual PDF
Code Reader CF37 User's Manual [SH-082325ENG]	Functions, installation methods, system configuration, and required hardware components etc. of a code reader CF37	e-Manual PDF
Code Reader Connection Guide [BCN-P5999-1074]	Procedures for connecting a code reader to a MELSEC programmable controller to control a code reader through a CC-Link IE Field Network Basic connection, an SLMP connection, an RS-232 connection or an I/O connection	e-Manual PDF



e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

1 OVERVIEW

1.1 Overview of DataMan Setup Tool for MELSENSOR

DataMan Setup Tool for MELSENSOR (hereafter referred to as SetupTool) sets the operation of MELSENSOR Code Reader CF Series. Each process for connecting, adjusting, and testing MELSENSOR Code Reader CF Series can be set easily in accordance with application steps.

In this manual, a CF26 is used as an example to explain each setting.

Target code readers of SetupTool

Name	Model name
CF26	CF26-SR, CF26-LR
CF37	CF37-SR, CF37-LR

2 SetupTool INSTALLATION

2.1 Installation

Operating environment

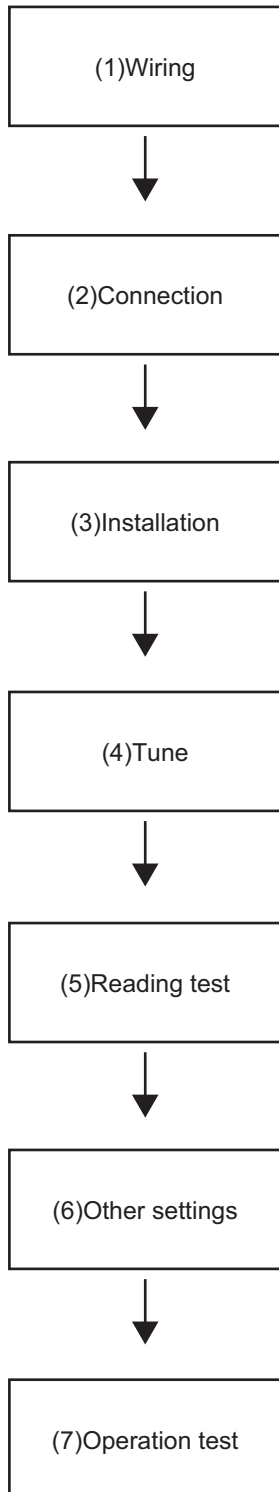
Item	Description
Operating system (English version)	Microsoft® Windows® 7 Professional, Service Pack 1 (32-bit, 64-bit) Microsoft® Windows® 10 Professional (32-bit, 64-bit)
Available hard disk capacity	2 GB or more
Ethernet	100 Mbps (1 Gbps recommended)

Installation procedure

1. Download the installer of SetupTool from the Mitsubishi Electric FA website.
www.MitsubishiElectric.co.jp/fa
2. Close all running applications.
3. Run the obtained installer.
4. Select or enter the necessary information according to the instructions shown in the screen.

3 CODE READER SETUP FLOW CHART

3.1 Setup Flow Chart



1. Wiring

Wire a code reader by referring to 'Chapter 4 Section 4.1 Configuration and Wiring of CF26/CF37 Series.' When communicating and controlling the code reader with industrial protocols such as SLMP, only power lines need to be wired.

2. Connection

Connect to a personal computer by referring to 'Chapter 5 CONNECTING with SetupTool.'

3. Installation

Install the code reader by referring to 'Chapter 7 Section 7.1 Installing a Code Reader.' (When pre-assessment and tests are executed, install the code reader in accordance with the results.) The distance from the code reader to an inspection target as well as the direction and angle of the code reader may affect the read rate significantly.

4. Tune

Tune the code reader by referring to 'Chapter 7 Section 7.2 Settings in Tune,' 'Appendix 4 Supplemental Remarks for Tuning (1),' or 'Appendix 5 Supplemental Remarks for Tuning (2).' Mainly, auto-tuning can be executed by configuring 'Optimize Image' → 'Tune.' In some cases, 'Exposure,' 'Gain,' 'Lightening pattern,' and 'Image Filter' need to be adjusted manually.

5. Reading test

A code is read and a reading test is performed by pressing the [Trigger] icon. The test can also be performed by enabling 'Test Mode'.

6. Other settings

Other settings such as a trigger type, multi-codes, data format, code quality, and communication are configured by referring to 'Chapter 8 Application Steps' as necessary.

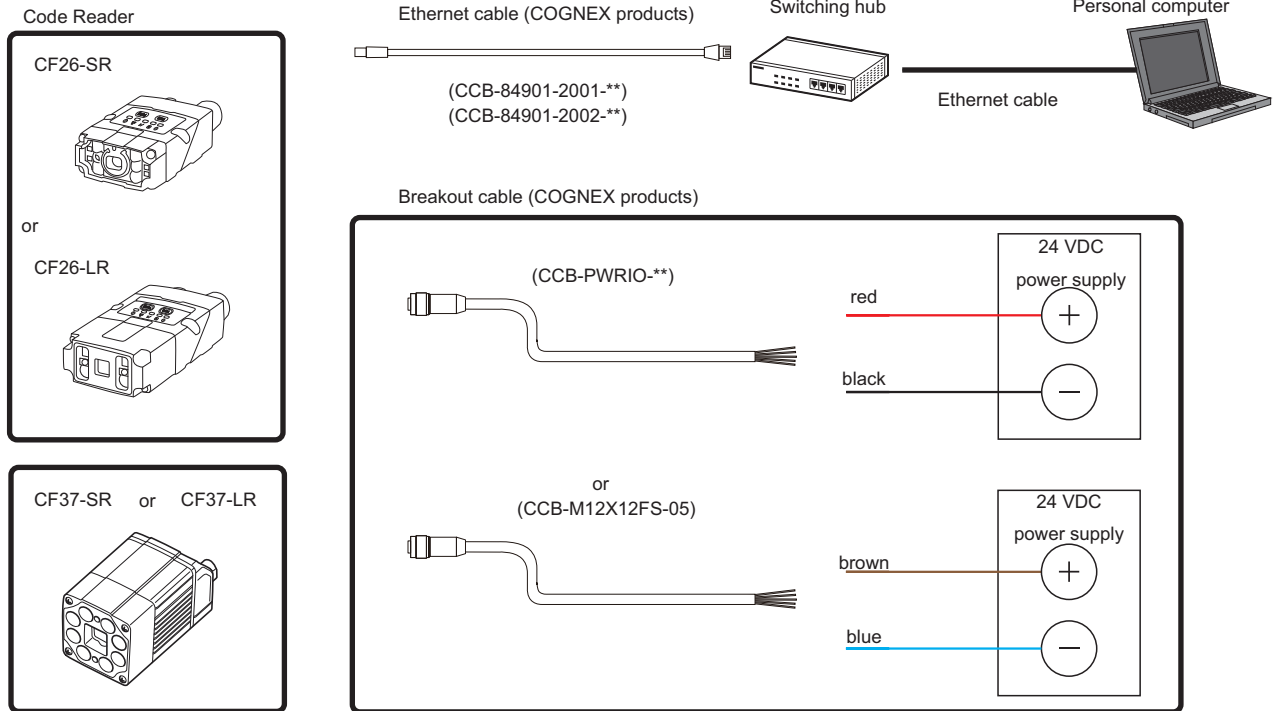
7. Operation test

A code is read and the operation test of the whole code reader settings is performed by a command from the [Trigger] icon or the external device.

4 CONFIGURATIONS

4.1 Configuration and Wiring of CF26/CF37 Series

Configuration



For details on the Ethernet cables (COGNEX products) and breakout cables (COGNEX products), refer to the user's manual for a code reader.

5 CONNECTING with SetupTool

Set an IP address for a personal computer and the code reader that matches each other to connect the code reader and SetupTool.

An IP address is an ID number assigned to a device to be communicated with Ethernet. To establish communication with devices, an IP address that matches with the IP address of each device needs to be set.

Set the IP address in accordance with the use situation.

- For using the code reader in a system, the IP address must be matched with that of a device to be communicated (mainly a programmable controller). Select "Use Static IP Address" for the code reader and "Use the following IP address" for the personal computer, and set the respective IP address according to a device to be communicated.
- For using the code reader by connecting only to the personal computer, the IP address of the code reader must be matched with that of the personal computer.
- When "Obtain an IP address automatically" is selected for the personal computer, select "Use DHCP Server" for the code reader.
- When "Use the following IP address" is selected for the personal computer, select "Use Static IP Address" for the code reader and set the code reader IP address that matches with the personal computer.
- For an IP address to be set when "Use Static IP Address" or "Use the following IP address" is selected, the rightmost set of numbers in the IP address must not be duplicated with that of the other devices. The setting of a subnet mask must be the same for the entire devices.

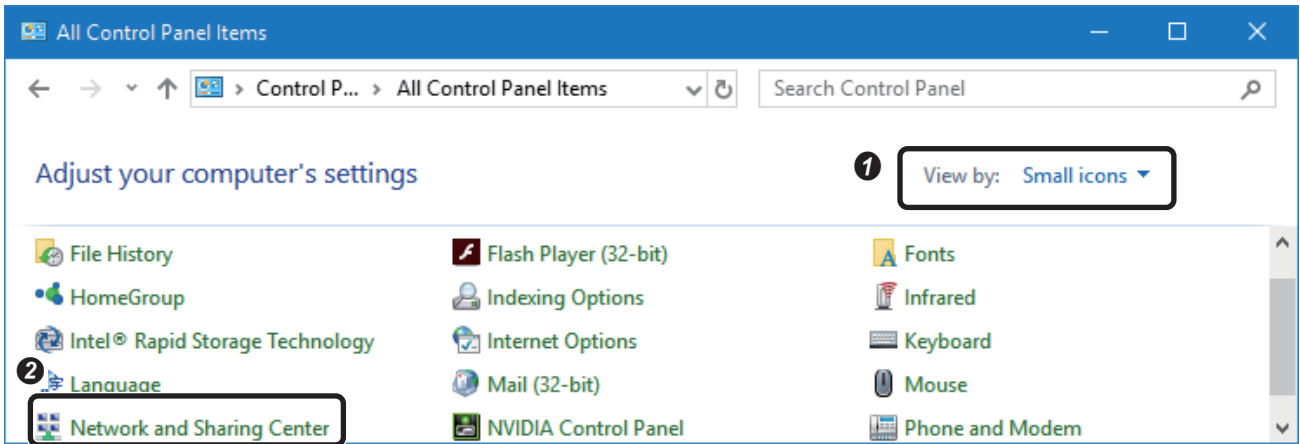
(An IP address setting example)

Setting item	Personal computer	Code reader
IP address	192.168.3.3	192.168.3.102
Subnet mask	255.255.255.0	255.255.255.0

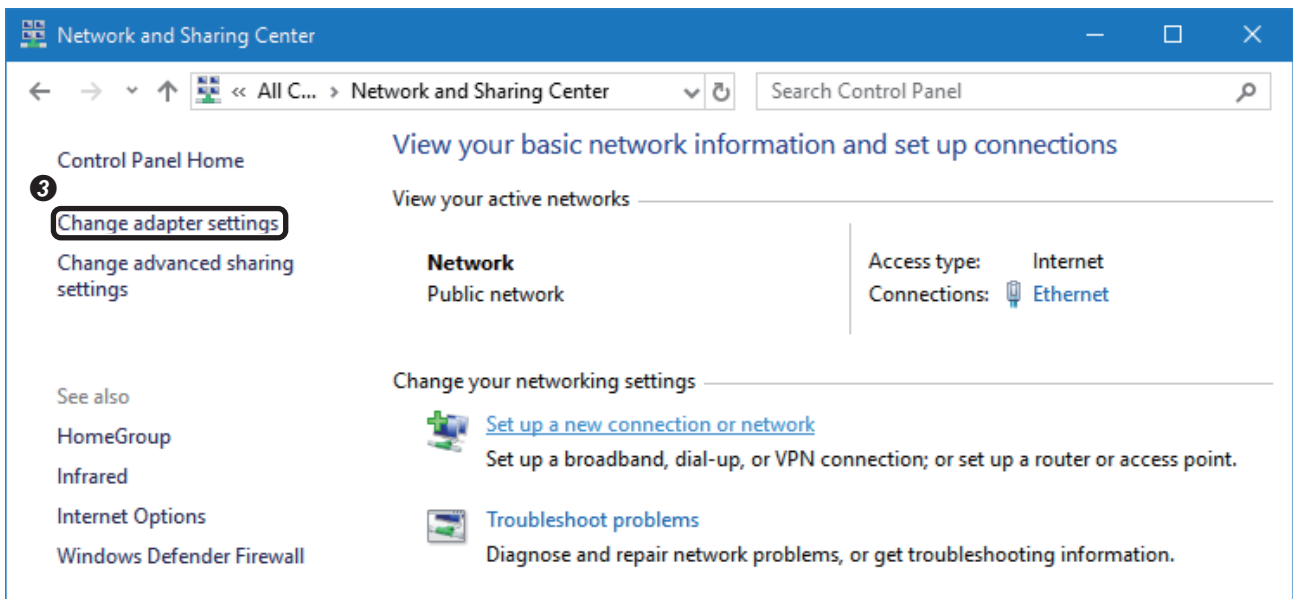
In this manual, the IP addresses shown above are used.

5.1 How to Check and Set Personal Computer IP Address

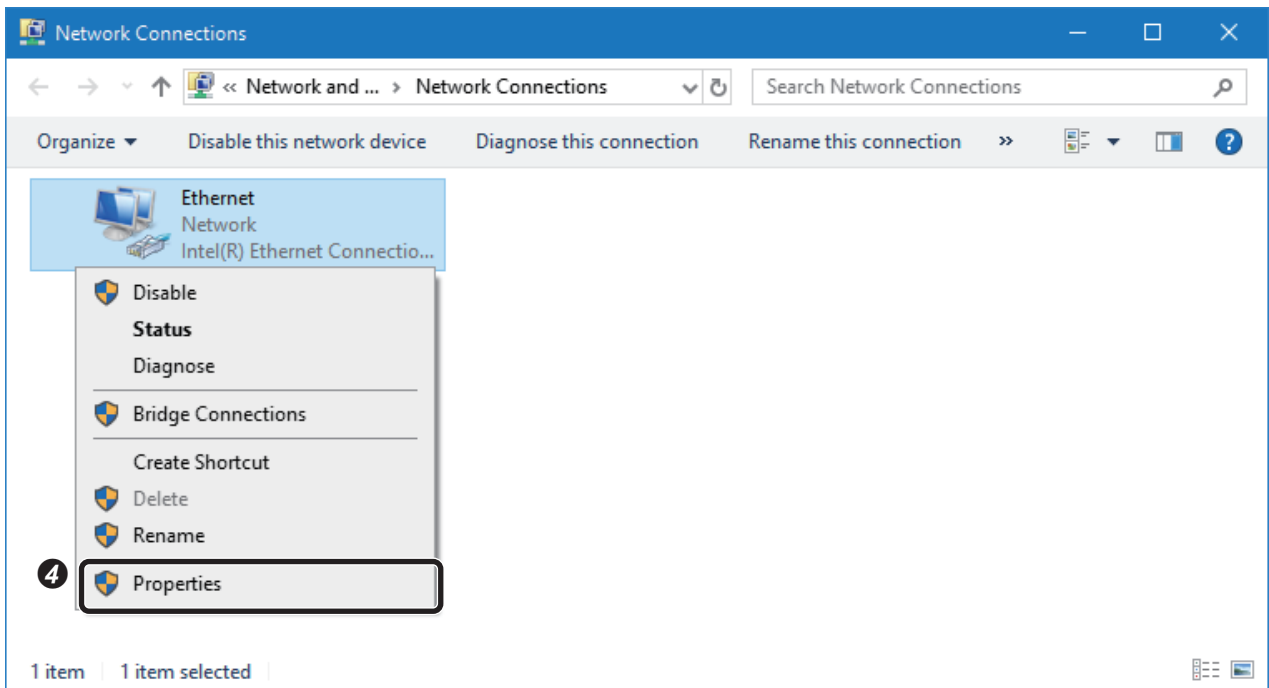
This section shows the method for checking and setting a personal computer IP address (Windows 7/Windows 10).



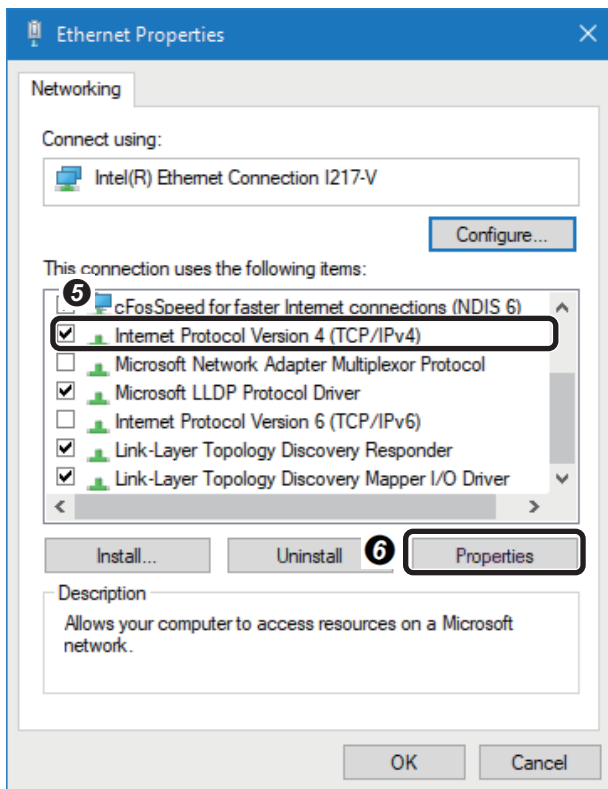
- 1 Open [Control Panel] and change the setting of "View by" to "Small icons."
- 2 Click [Network and Sharing Center].



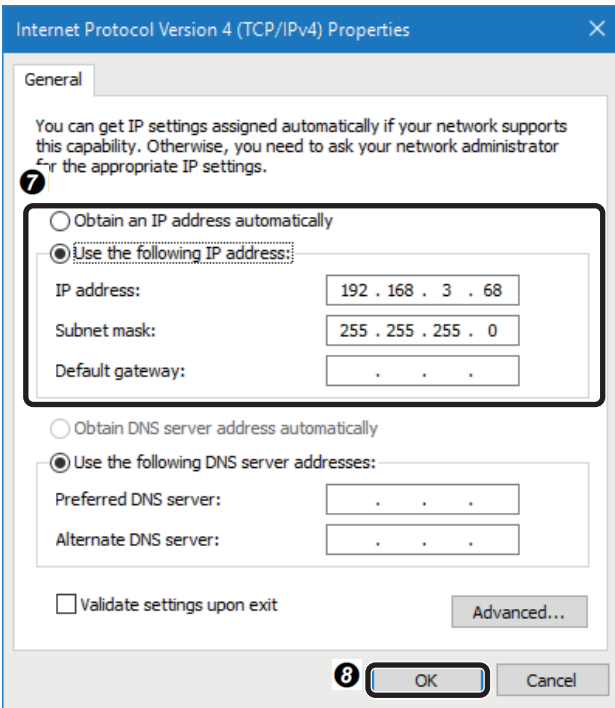
- 3 Click [Change adapter settings].



④ Right-click an adapter to be connected to a code reader (Ethernet 3 in this example), and select [Properties] from the shortcut menu.



- ⑤ Select "Internet Protocol Version 4 (TCP/IPv4)."
- ⑥ Click the [Properties] button.

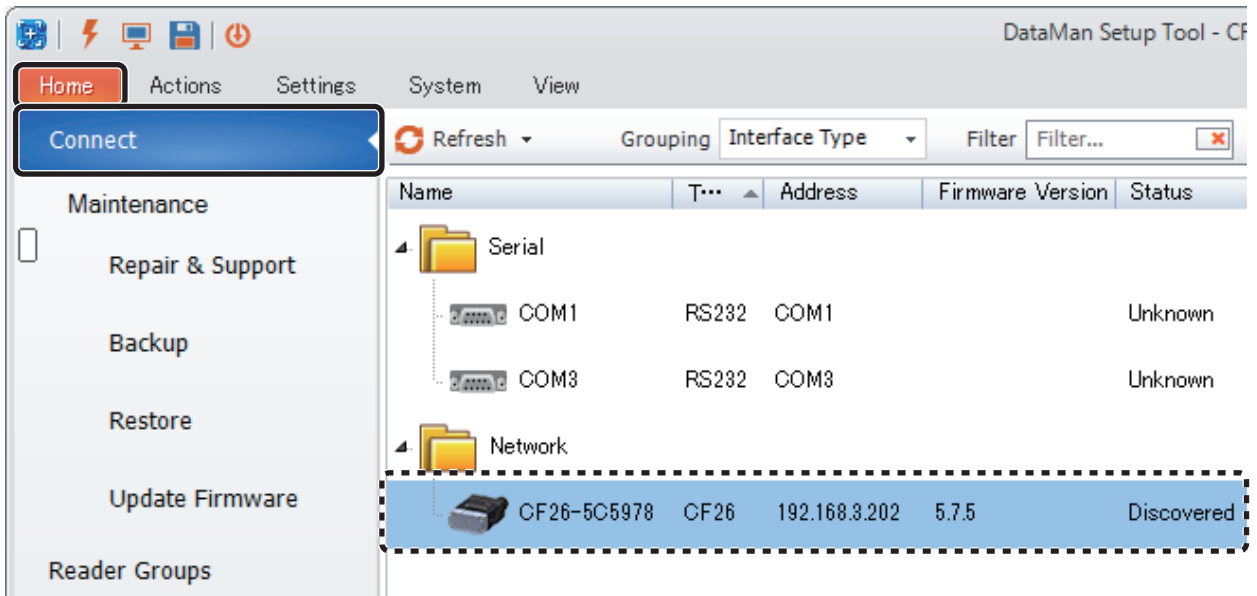


- 7 The setting of the IP address and the subnet mask can be checked or set as necessary.
- 8 Click the [OK] button.

5.2 Starting SetupTool

Start SetupTool.

The [Connect] in the [Home] tab is displayed immediately after starting SetupTool.



When SetupTool recognizes a code reader, "Name," "Address," "Firmware Version," and "Status" of the code reader are displayed under the "Network" section and the information can be checked.

Whether the IP address matches with the one set in the connected personal computer can be checked in "Status."

<When the status is "Misconfigured">

This indicates the IP address of the code reader and the personal computer are not matched. Either one of the addresses needs to be changed.

<When the status is "Discovered">

This indicates the IP addresses are matched. A connection can be made by selecting the code reader icon and click the [Connect] button on the lower right of the screen.

Precautions

■ When a code reader is not recognized

When a code reader is not recognized, try the following operations:

- Click [Update].
- Check that the cables are properly connected.
- Allow the communication in the settings of a firewall or security software.

For details, refer to the following:

☞ Page 21 When communication with DataMan Setup Tool is not allowed by a firewall

■When a warning message appears

A warning message may appear, which indicates that a function of DataMan Setup Tool is blocked by the Windows firewall. Select the checkboxes of "Private networks" and "Public networks," click the [Allow access] button, then continue the operation.



■When communication with DataMan Setup Tool is not allowed by a firewall

When a firewall is enabled and communication with DataMan Setup Tool is not allowed, a code reader may not be recognized since communication is not possible.

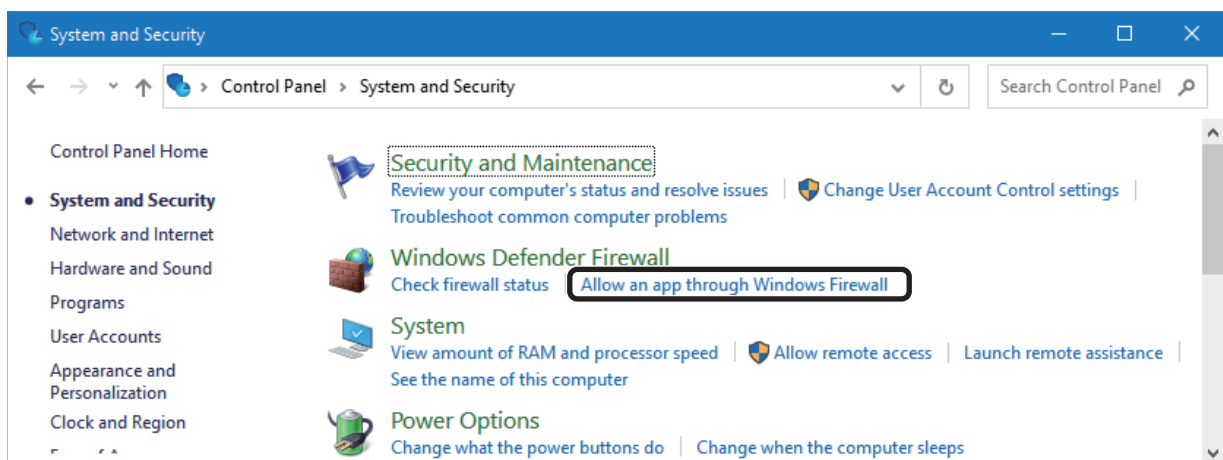
To allow the communication in the Windows firewall, refer to the procedure below.

When using other software with a firewall function, refer to the manual of the software and allow the communication with DataMan Setup Tool.

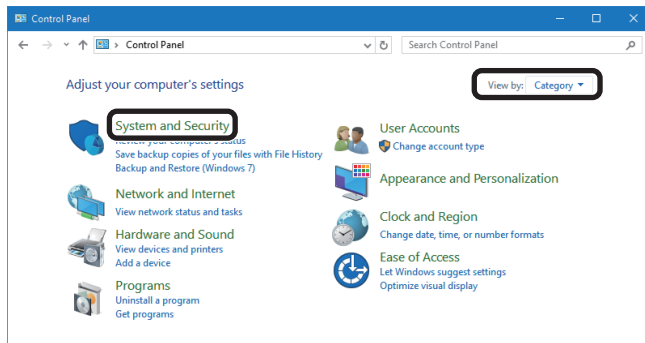
The following shows the procedure for Windows 10.

Operating procedure

- 1 Select [Control Panel] ⇒ [System and Security] ⇒ [Allow an app through Windows Firewall] from Windows Start.

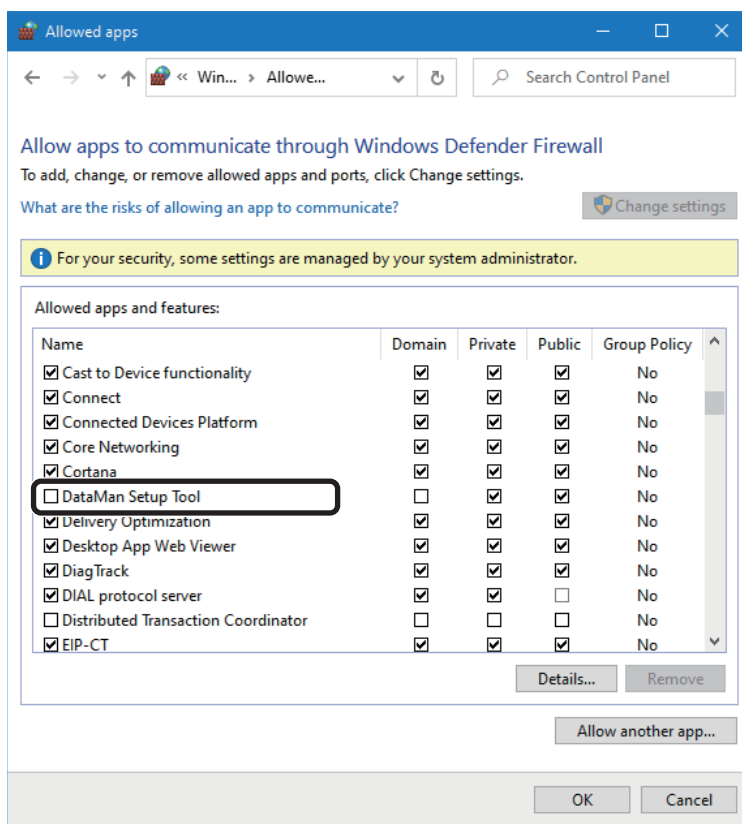


If [System and Security] cannot be found in [Control Panel], select "Category" for "View by."



2 Click the [Change settings] button.

Check if "DataMan Setup Tool" is displayed in the list. If it is displayed, the operations in step 3 and 4 are not necessary.



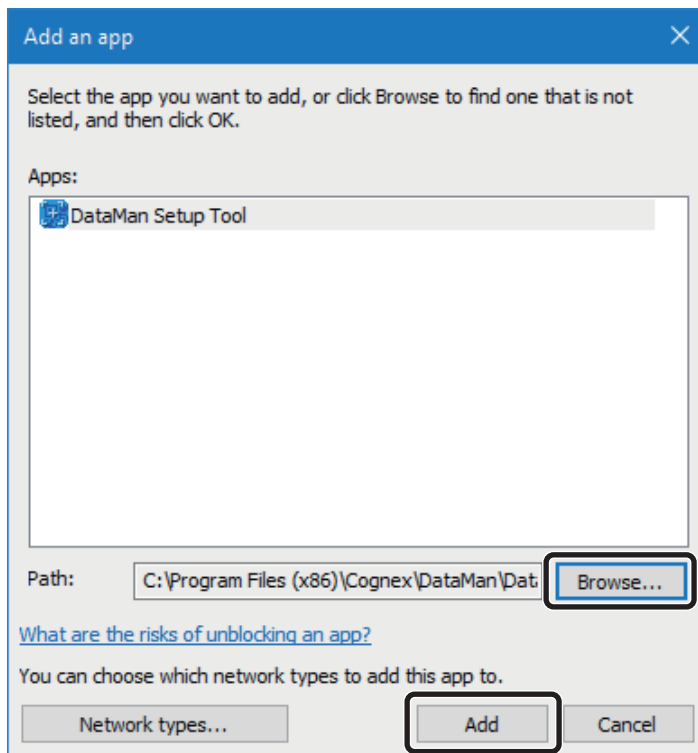
3 Click the [Allow another app] button.

4 Click the [Browse] button in the "Add an app" screen, select "SetupTool.exe" in the folder where SetupTool is installed, then click the [Add] button.

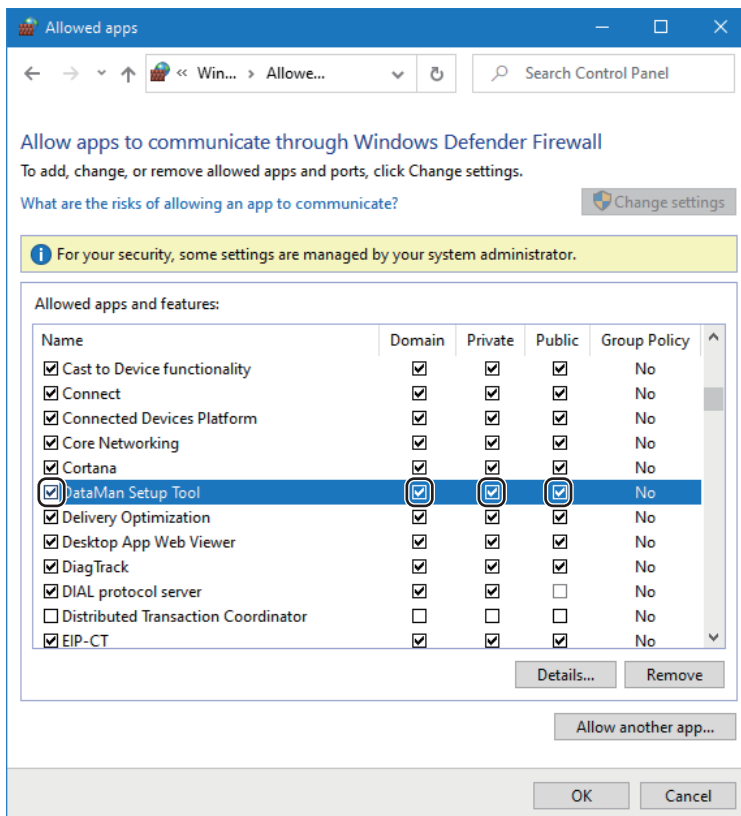
"SetupTool.exe" is stored in the following if the installation destination folder for SetupTool is not changed.

(Example) When the version of SetupTool is v6.1.5_SR1

C:\Program Files (x86)\Cognex\DataMan\DataMan Setup Tool for MELSENSOR Code Reader v6.1.5_SR1

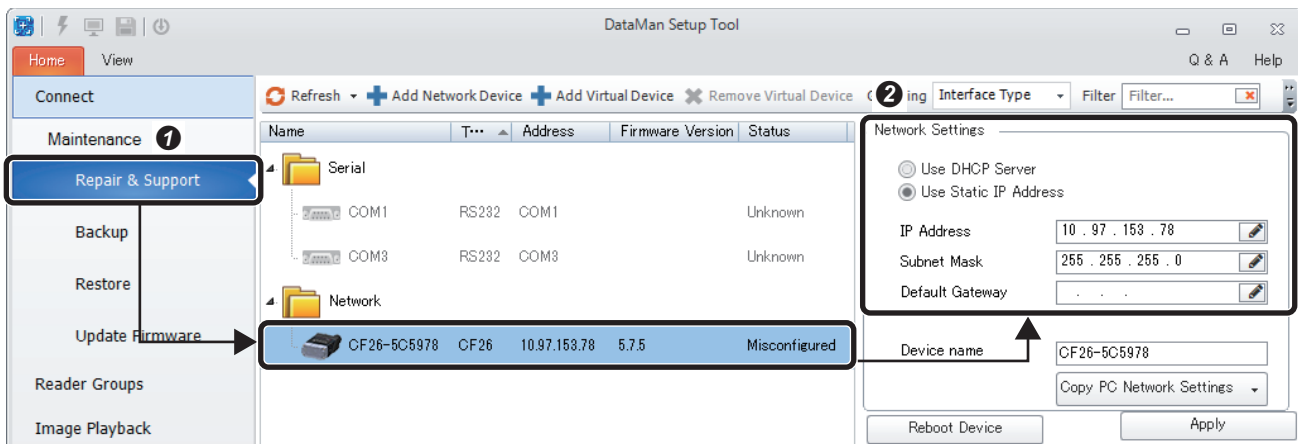


5 Select the checkboxes of "Name," "Domain," "Private," and "Public" for "DataMan Setup Tool" in the list, and click the [OK] button.



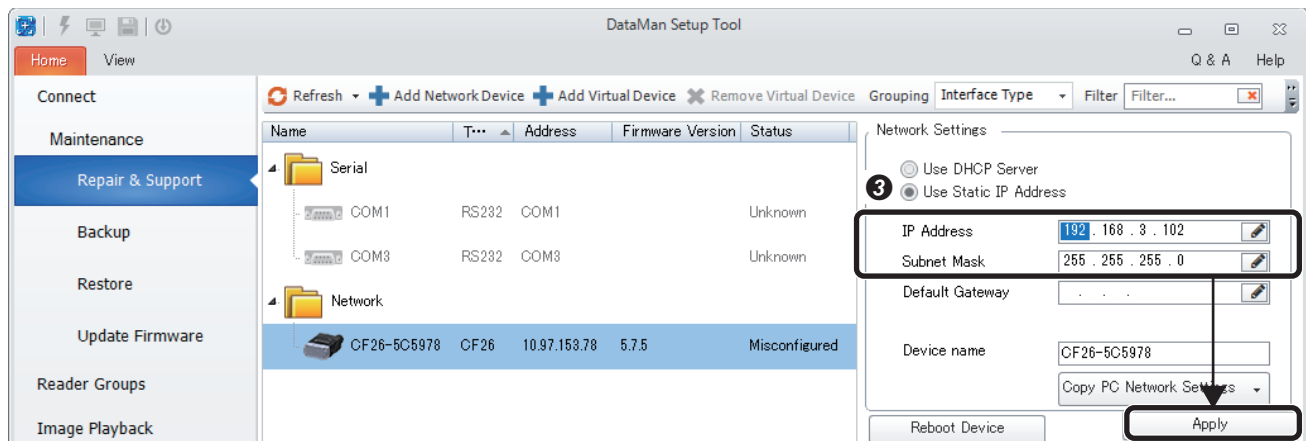
5.3 How to Check and Set Code Reader IP Address

Setting a static IP address to a code reader

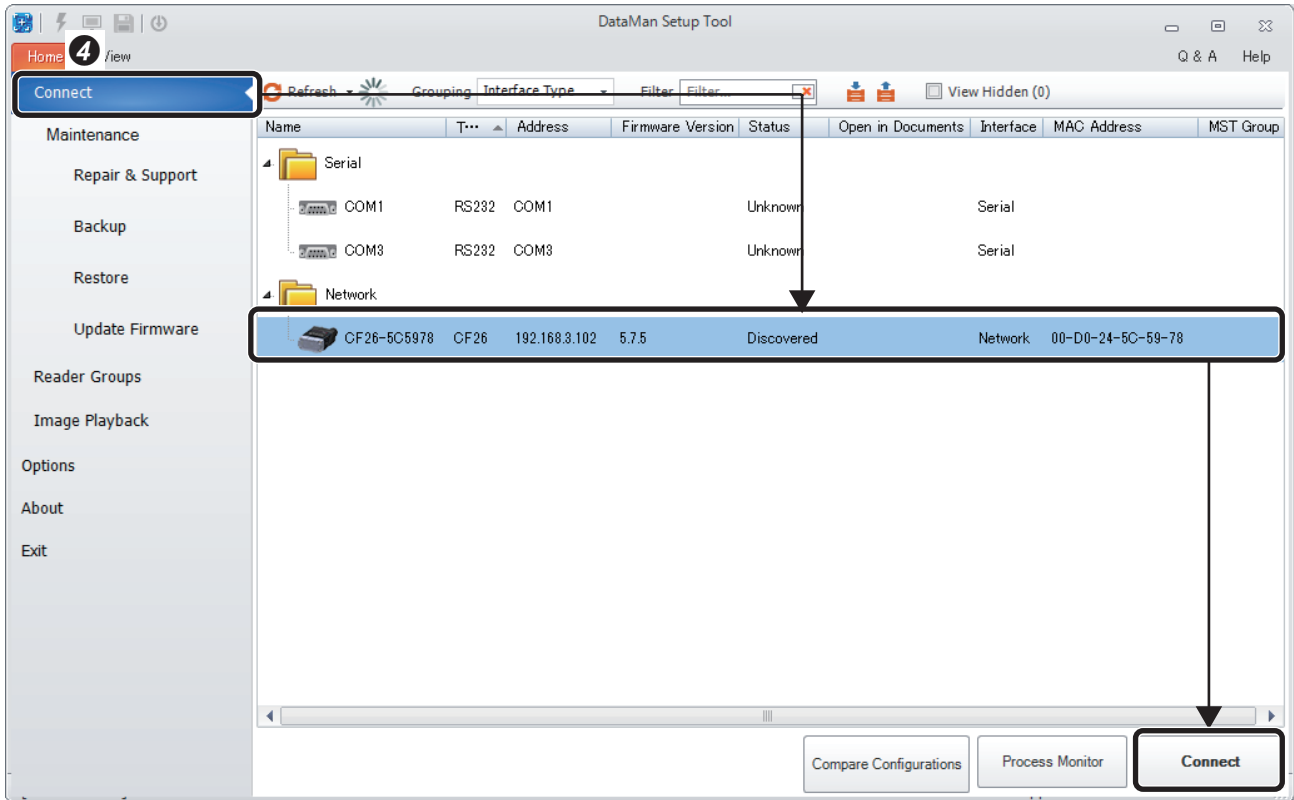


❶ Click [Repair & Support] on the left side of the SetupTool screen and select a code reader icon displayed under the "Network" section.

❷ When the setting status of a code reader IP address is displayed on the right side of the screen, select "Use Static IP Address."



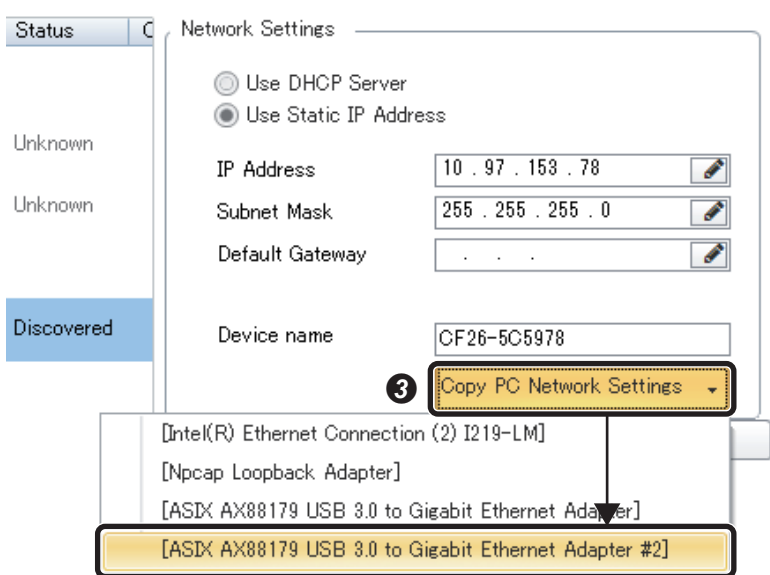
❸ Enter "192.168.3.102" for "IP Address" and "255.255.255.0" for "Subnet Mask" respectively, and click the [Apply] button. Wait for the code reader to be restarted and the IP address to be changed. (Time required: 30 sec)



4 When the IP address is changed, click [Connect] on the left side of the SetupTool screen. Select the code reader icon to be connected, and click the [Connect] button on the lower right of the screen or double-click the icon.

Copying the static IP address of a personal computer


1 2 Follow the same procedure as 1 and 2 in 'Section 5.3 Setting a static IP address to a code reader.'





3 Click [▼] on the right side of [Copy PC Network Settings] and select an Ethernet port to be connected. (Select the same port as the one selected in the procedure 3 in Section 5.1)

Network Settings

Use DHCP Server
 Use Static IP Address

IP Address **4** 192 . 168 . 3 . 0 

Subnet Mask 255 . 255 . 255 . 0 

Default Gateway . . . 

Device name CF26-5C5978

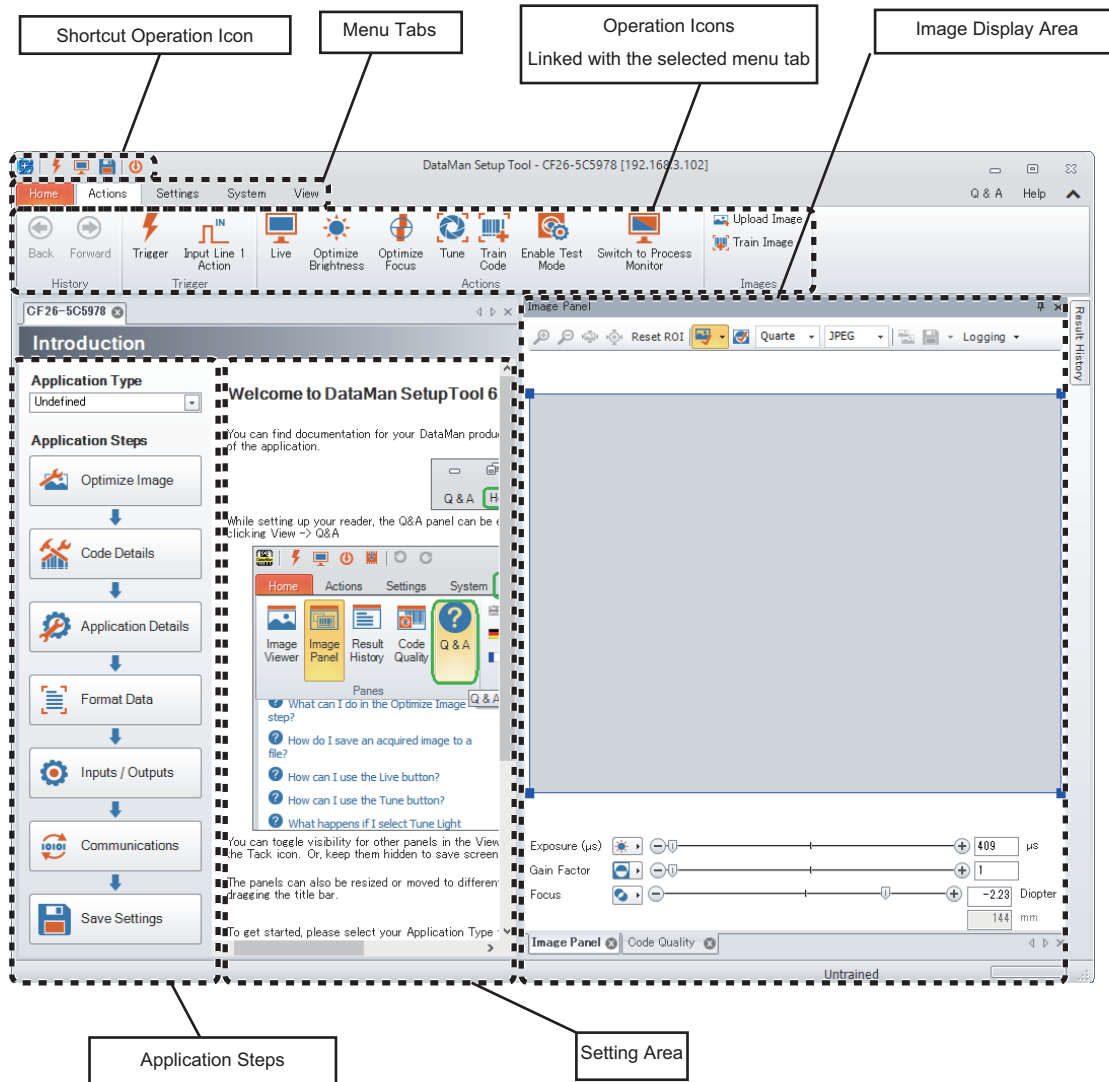
5

- 4** The IP address whose the fourth value of the selected Ethernet port is set to "0" is configured. Set the forth value "0" to the different value from other devices (102 is entered in this example).
- 5** Click the [Apply] button. Wait for the code reader to be restarted and the IP address to be changed. (Time required: 30 sec) Perform the procedure of **4** in Section 5.3 Setting a static IP address to a code reader to connect.

6 SetupTool SCREEN

6.1 Screen Configuration

The following shows the screen configuration when the code reader is connected. The details of each screen are explained in Section 6.2 or later.



- The layout can be changed.
- The size of "Setting area" and "Image display area (Image Panel)" can be changed.

Result History

Clear [Print] [Copy] [Paste] [Refresh] [Speaker] [Logging]

Result	Result Status	Arrival Time	Decode Time	Trigger Time
Mitsubishi MELSENSOR CF Serie...	Read	12:00:56.443	92ms	114ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:55.281	150ms	172ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:50.894	170ms	192ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:50.546	129ms	152ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:50.204	87ms	109ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:49.934	92ms	114ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:49.687	130ms	151ms
Mitsubishi MELSENSOR CF Serie...	Read	12:00:49.419	86ms	107ms

Code Quality

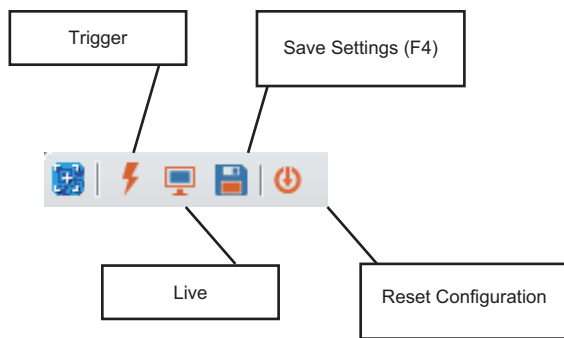
Pass (B) ✓

Property	Value	Grade	Average
AIM-DPM / ISO/IEC TR29158 (Data Matrix: Mitsubishi MELSENSOR CF Series<0x0D><0x0A>)			
Symbol Grade		B	✓
Cell Contrast	+0.760	A	✓ A
Axial Non-Uniformity	+0.006	A	✓ A
Print Growth	-0.035		
Unused Error Corre...	+1.000	A	✓ A
Cell Modulation		A	✓ A
Fixed Pattern Damage		B	✓ B
Grid Non-Uniformity	+0.040	A	✓ A

- "Result History" and "Code Quality" can be displayed.

6.2 Shortcut Operation Icon

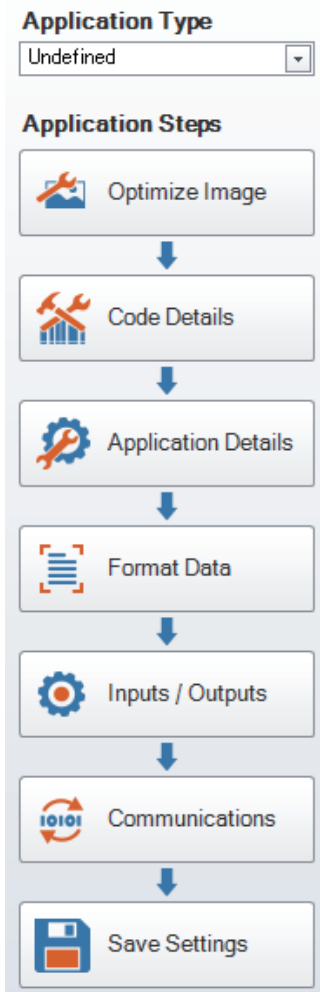
The following shows the operation icons which are always displayed on the upper left of the SetupTool screen.



- Trigger: To read codes using the code reader.
- Live: To switch a display mode between a motion video (Live) and a still image. It is switched to a still image during the operation.
- Save Settings (F4): To save the set parameters to the memory of the code reader.
- Reset Configuration: To reset the set parameters.

6.3 Application Steps

A setting flow is always displayed on the left side of the screen. The code reader can be set in order from the top. Not all the items need to be set.



Application Type

To select a reading condition from the pull-down menu. By doing so, the assistant functions in [Application Details] are enabled.

Even if the application type is set "Undefined," settings can be proceeded and codes can be read.

Optimize Image

To set for reading operation mainly. This is the area where 'Tune' is configured as the main setting of the code reader.

Code Details

To select codes to be read and set for the code reader to read multi-codes.

Most of the code types can be read using the initial setting, however, some code types such as 'GS1 DataBar' need to be enabled in this application step.

Application Details

To set 'Trigger Type,' 'Exposure,' and 'Gain' for acquiring images.

Assistant functions are enabled by linking with 'Application Type.'

Format Data

To set character strings to be output to a master device. This setting is configured by the following situation: appending control characters "STX" and "ETX," appending information including the code position to the character strings, and outputting a part of the read contents.

Inputs/Outputs

To set inputs and outputs using I/O lines.

Communications

To configure serial and Ethernet communication settings as well as industrial communication protocols such as SLMP protocol.

Save Settings

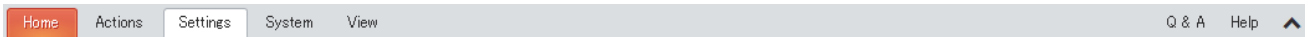
To save the set parameters to the memory of the code reader.

6.4 Menu Tabs and Operation Icons

Basic settings can be configured according to 'Application Steps.' However, when executing the specific operation such as "Update Firmware" and "Read saved data" individually, the target operation icon needs to be selected from the menu tabs ([Home], [Actions], [Settings], [System] and [View]).

Home

A setting tab for connecting a code reader.



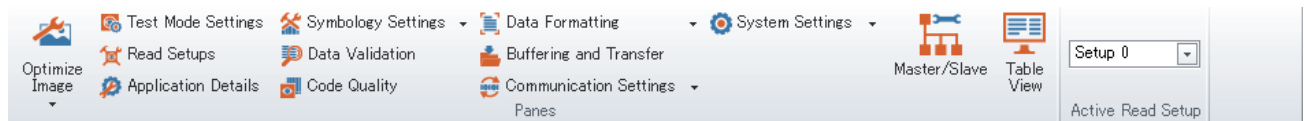
Actions

Operation icons that instruct operation to the code reader are displayed.



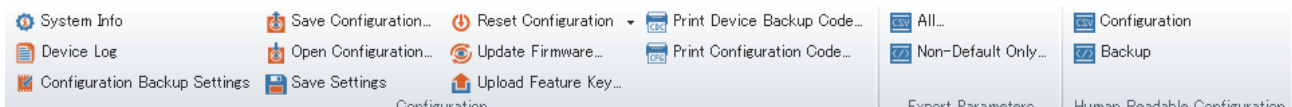
Settings

Operation icons for setting the code reader are displayed. The settings of 'Read Setups' and 'Code Quality' can be set in this tab.



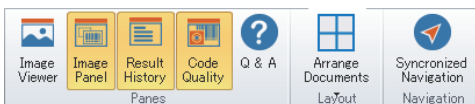
System

Operation icons for a code reader system are displayed. 'Acquiring backup data', 'Updating the firmware version of a code reader,' and 'Initializing the code reader' can be executed in this tab.



View

Operation icons regarding a screen display are displayed.



Q & A

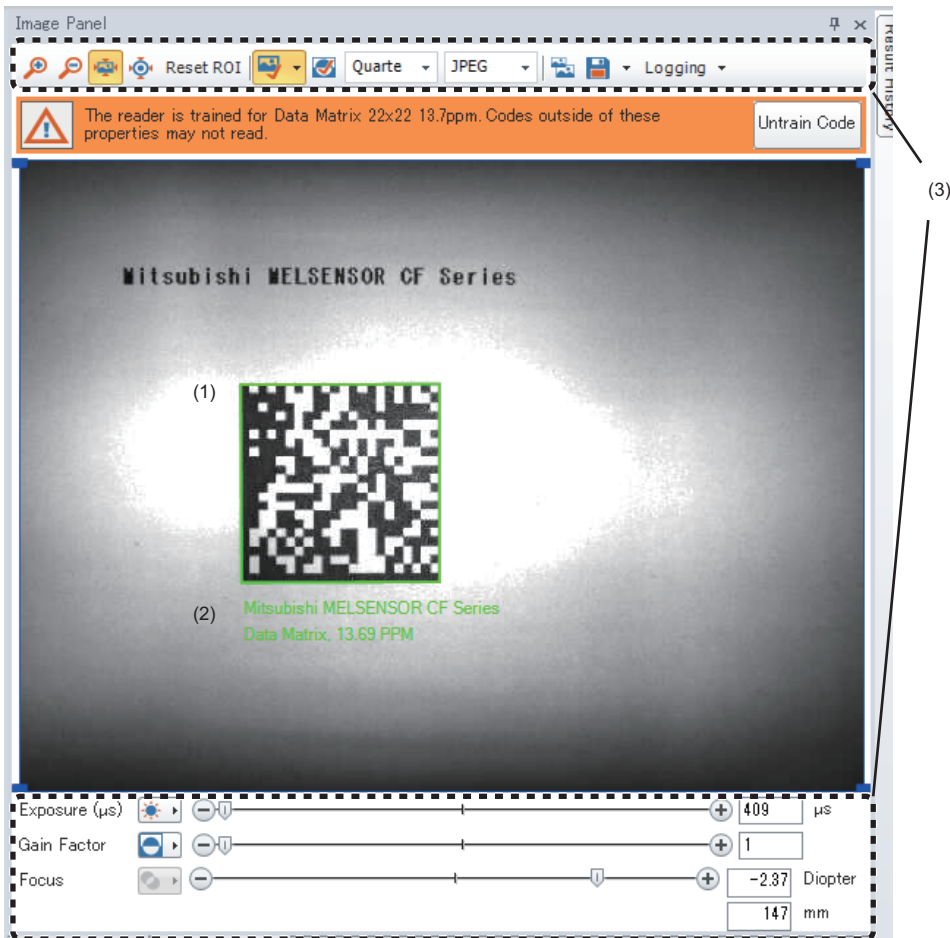
The description of each setting item is displayed.

Help

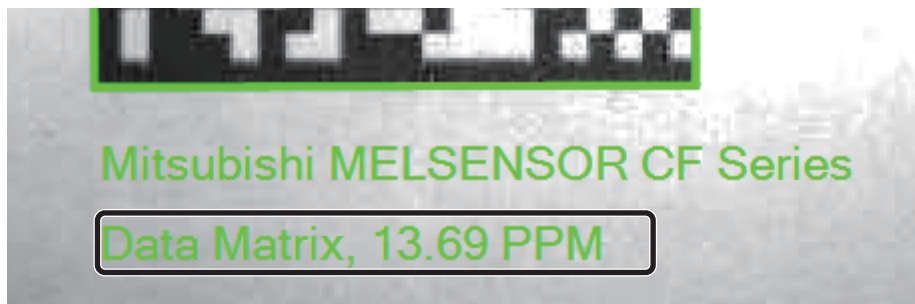
Various documents are displayed.

6.5 Image Panel

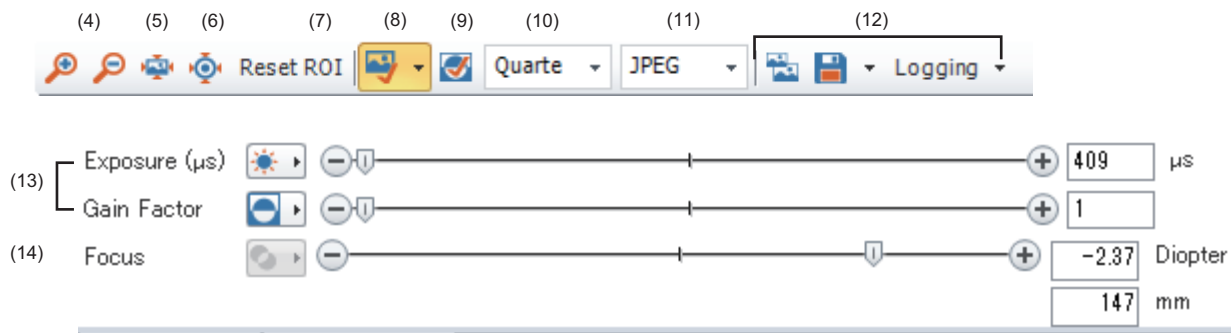
Image Panel displays an image when reading operation is completed.



- (1) When a code is read successfully, the code is enclosed with a green frame.
- (2) The read data and cell size of the code in units of PPM are displayed in the screen.



- (3) Operation and settings for the displayed image can be performed by using operation icons on the upper and lower part of the Image Panel.



(4) Magnifying glass icons

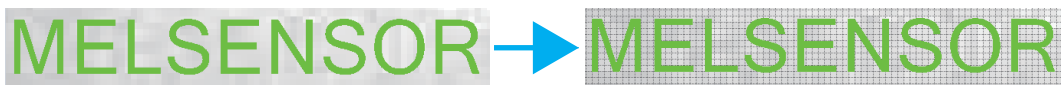
To zoom in and out the displaying image.

(5) Autofit Mode

To restore the zoomed-in or zoomed-out image to the normal size.

(6) Pixel to Pixel Mode

To display pixel grids emphatically when a zoomed image is used.



(7) Reset ROI

To restore the entire image to the standard size when a reading region (a blue frame within the image) is adjusted.

(8) Enable/disable image transfer

To stop displaying an image in SetupTool when this function is disabled. However, images are kept being acquired and read by the code reader even if the image transfer is disabled.

(9) Enable/disable Focus Feedback on image while in Live mode

When this function is enabled, a bar indicating the focus of the lens is displayed during Live mode.

(10) Size

To change the resolution of an image to be displayed. The size can be changed among four patterns: Full, Quarter, 1/16 and 1/64. Smaller image size can speed up the image transfer. The size also relates to the image quality of an image file to be saved. The reading time is not affected by changing the image size.

(11) Format

To change the file format of image data to be imported to a personal computer. The format can be switched among "JPEG," "Bitmap," and "PNG."

(12) Copy, Save Image, and Logging

"Copy" is for copying the displaying image and can be pasted on applications such as Excel and PowerPoint. "Save Image" is for saving the displaying image as an image file. "Logging" is for setting the function whose an image file is saved automatically.

(13) Exposure and Gain

To adjust the brightness of an image to be imported. Increasing the value can make the image brighter. Gain is adjusted when the exposure time cannot be extended.

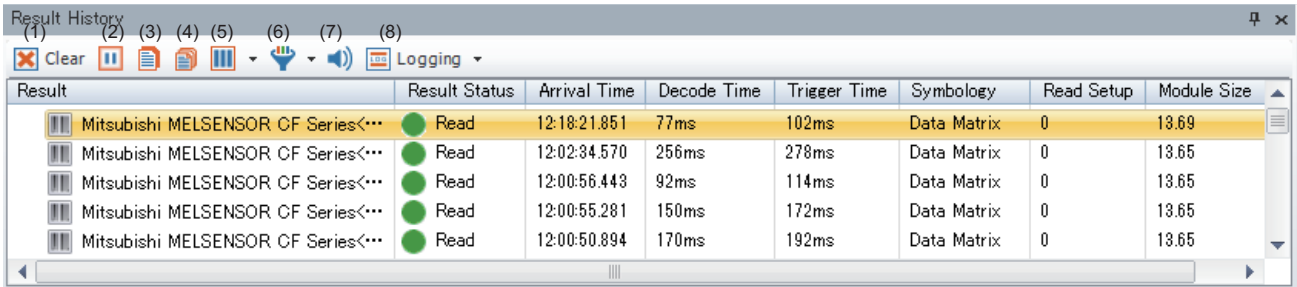
(14) Focus

To adjust the focus of liquid lens.

6.6 Result History

Result History displays reading result information such as read codes and reading time.

For the display of Result History, refer to 'View' in 'Section 6.4 Menu Tabs and Operation Icons.'



- (1) × Clear: To clear result histories.
- (2) Pause ↔ Play: When pausing, it stops to display information in Result History even if codes are read.
- (3) Copy: The selected contents of a result history can be pasted on other applications.
- (4) Copy All: The whole result history can be pasted on other applications.
- (5) Customize: To select items to be displayed in Result History.
- (6) Filter: To filter the results being displayed.
- (7) Enable Beeper on Good Read: This function cannot be used at this point.
- (8) Logging: To perform and set logging and reporting.

The item to display in Result History can be selected from 'Customize' on the upper part of the Result History.

Result: A content that is output by a code reader. It is basically a read code.

Result Status: A result indicating whether reading is successful or failed.

Arrival Time: A record of time when a reading result is arrived in a personal computer.

Decode Time: Analysis time of the acquired image data. It is basically a reading process time.

Trigger Time: Time required from when a trigger signal is received to when the reading is completed.

Symbology: A type of a read code.

Read Setup: A read setup number which is used when the reading is successful.

Module Size: An average pixel number of a read code module (Thin lines for 1-D code, one module for 2-D code). The value is the same as PPM (Pixels Per Module).

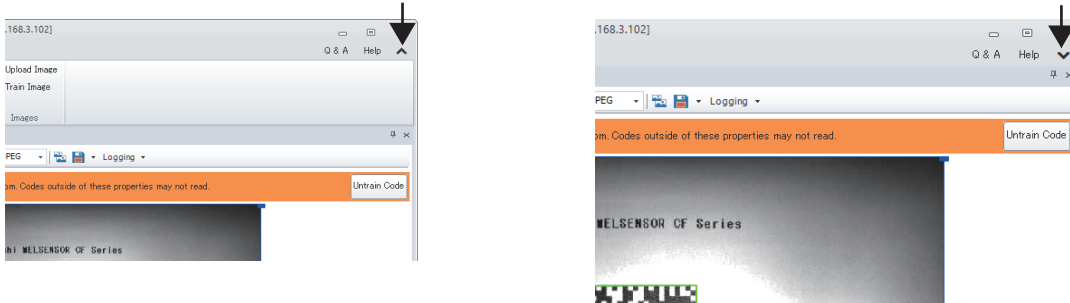
When selecting a result history, the state when the code is read is displayed in 'Image Panel.'

6.7 Screen Layout Customization (1)

The screen layout can be customized.

Hiding operation icons

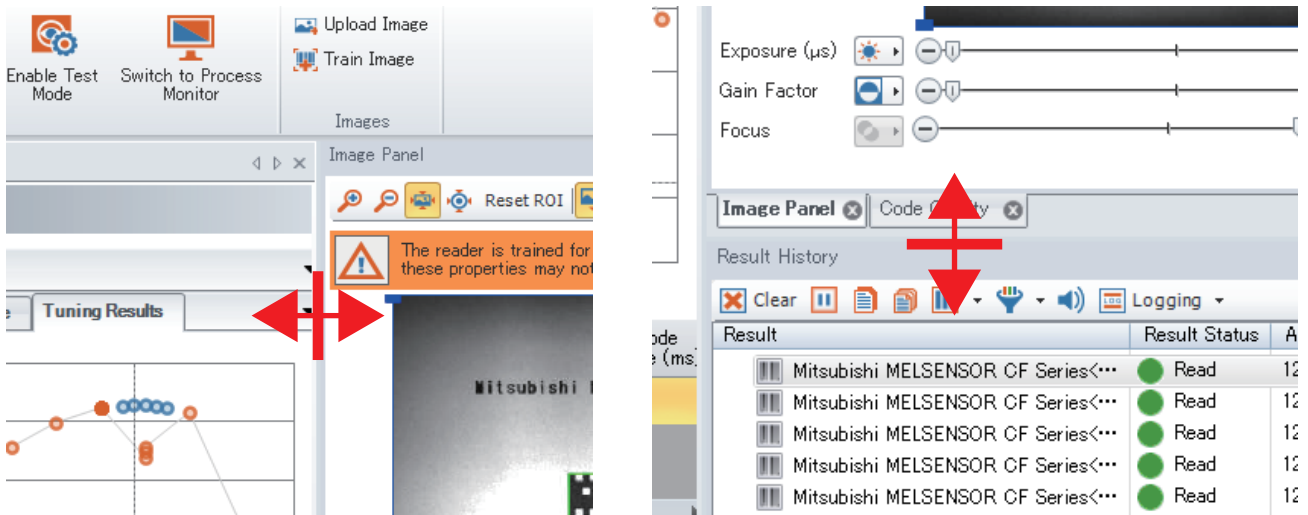
Operation icons are hidden by clicking [^], and are displayed by clicking [v] on the upper right of the screen.



Adjusting the area size

When moving a cursor which is close to a boundary between areas, the cursor is displayed as the mark shown below.

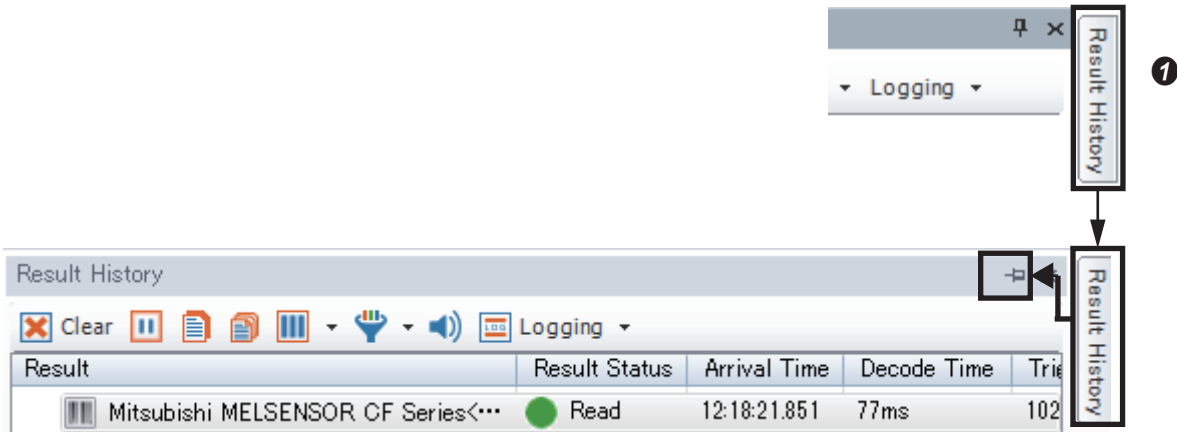
The area size can be adjusted by moving the mark vertically or horizontally with holding a mouse being clicked.



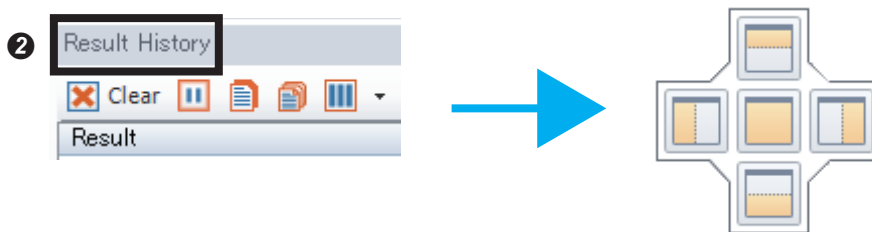
6.8 Screen Layout Customization (2)

Displaying 'Image Panel' and 'Result History' side by side

Click the [View] tab on the screen and check that 'Image Panel' and 'Result History' are turned ON. 'Result History' is displayed on the right-most side of the screen at the first startup. When it is not displayed on the screen, click the [View] tab and turn ON 'Result History.'



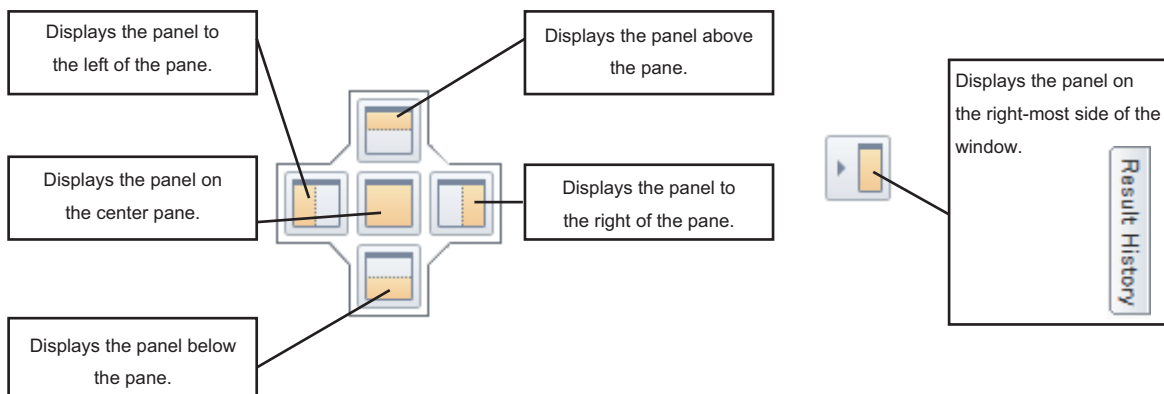
1 If 'Result History' is displayed on the right-most side of the screen, select it using a mouse and click the pin mark.



2 When holding the mouse being clicked on the character part of the 'Result History' in the 'Result History' area, the cross cursor appears.

When moving the cursor with the mouse being clicked, the mark which is shown in the above image next to the blue arrow is displayed.

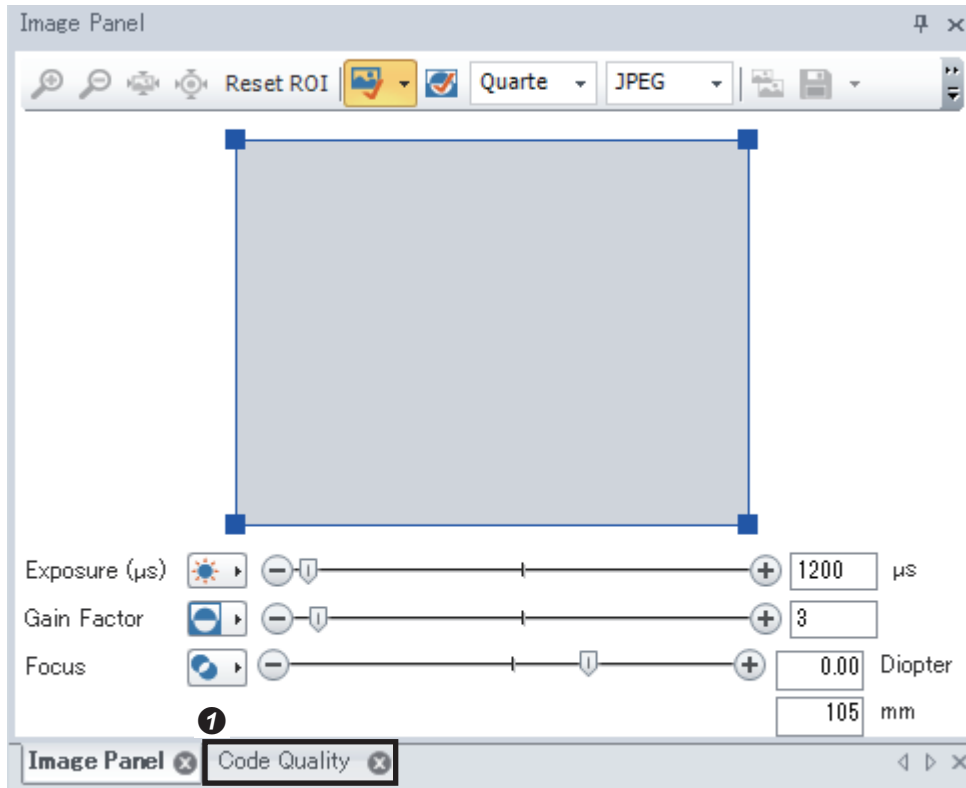
Move the cursor to a desired position to which the mark indicates. To display 'Image Panel' and 'Result History' vertically, move the cursor down.



6.9 Screen Layout Customization (3)

Displaying 'Image Panel' and 'Code Quality' side by side

Click the [View] tab on the screen and check that 'Image Panel' and 'Result History' are turned ON.

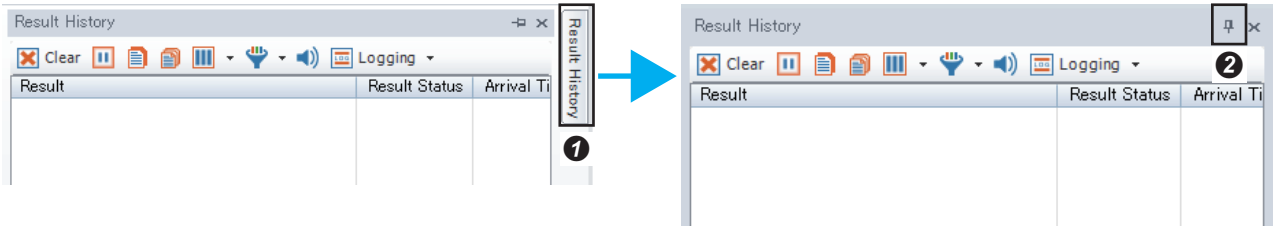


❶ By dragging the [Code Quality] tab at the bottom of 'Image Panel,' a cross cursor appears.

Arrange the tab to a desired position by following the same procedure as Section 6.8 Displaying 'Image Panel' and 'Result History' side by side.

When 'Code Quality' has already been displayed on the screen, the procedure will be the same as Section 6.8 Displaying 'Image Panel' and 'Result History' side by side.

'Pin mark' and '×' on 'Image Panel,' 'Result History,' and 'Code Quality'



- 1 The collapsed part is displayed by selecting the part at the right-most side of the screen ('Result History' in the example above).
- 2 By clicking the 'pin mark' to switch the direction of the mark from horizontal to vertical, the window is fixed and always displayed without collapsing to the side. By clicking the mark again to switch its direction from vertical to horizontal, the window is collapsed to the side.



- 3 By clicking [×], the window is removed from the screen. To display the removed window again, select it from the [View] tab on the screen.

7 SETTING CODE READER

7.1 Installing a Code Reader

Points for installation

Distance

When the distance between a code reader and a work is close, the imaging range gets narrower and the target is captured in the larger size.

When the distance is far, the imaging range gets wider and the target is captured in the smaller size. If the distance is set too far, codes may not be read. For the appropriate distance, refer to the product overview in Code Reader CF 26 User's Manual.

Installation angle

The installation angle is the most important setting to read direct part marking codes. Especially for works which have high reflection, installing the code reader by tilting at the angle (10 to 20 degrees) toward codes can reduce reflections and improve the reading rate.

Direction

For direct part marking, the direction of the code reader may also affect the reading rate.

Especially for a code on a column-shaped work, the direction of the code reader may be limited.

<A code on a curved surface and the direction of a code reader>

Appropriate direction



Inappropriate direction



Importance of pre-assessment and tests

Appropriate installation conditions need to be checked by executing pre-assessment and tests to stabilize reading.

7.2 Settings in Tune

Tune is a function to optimize focus, brightness (exposure and gain), and lightning patterns. The code reader can be configured easily by using tuning function.

The following shows the procedure for setting parameters using Tune.

Preparation for tuning

- Set symbols to be read in [Code Details] of [Application Steps]. Some symbols are initially set as an enabled symbol.

Point

A codes which is not set as an enabled symbol is not detected during tuning. Check if the symbol of the target code is enabled before tuning.

- Click the [Live] button in [Optimize Image] of [Application Steps] to switch to Live mode.
- Locate a target code close to the center of the reading range while checking 'Image Panel.'
- * However, the image is blurred at this point because the image is not focused.
- A green light emitted from a code reader is a sighting light called aimer. Locate a read target code to the center of the aimer.
- * "Aimer Enabled" needs to be enabled.



- High Frequency Lights
- Aimer Enabled

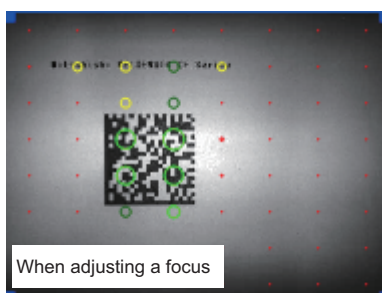
- When the installation location of the read target code is determined, click the [Live] button again to end Live mode.

Execute tuning

Tuning is started by clicking the [Tune] button.

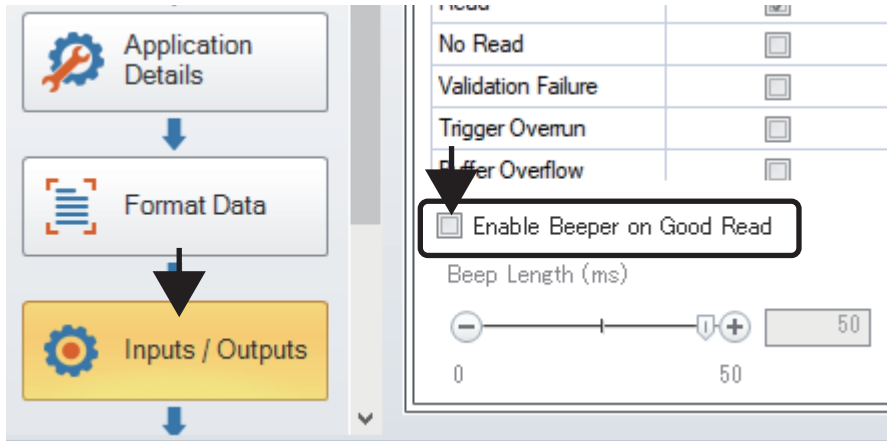
The [Tune] button is switched to [Cancel] button during tuning.

During tuning, red, yellow and green circles are displayed on Image Panel and the process of adjusting a focus can be checked. A code surrounded by a green frame indicates that the code is recognized by the code reader. Additionally, a fine adjustment of a focus, brightness adjustment, and lightning pattern adjustment are performed.



When tuning is completed, the [Cancel] button is switched to [Tune].

By enabling "Enable Beeper on Good Read" in [Inputs/Outputs] of [Application Steps], a beep sound is generated when a code is recognized during tuning.



Reading test

By clicking the [Test] button, an image is decoded according to the parameters set by tuning results.

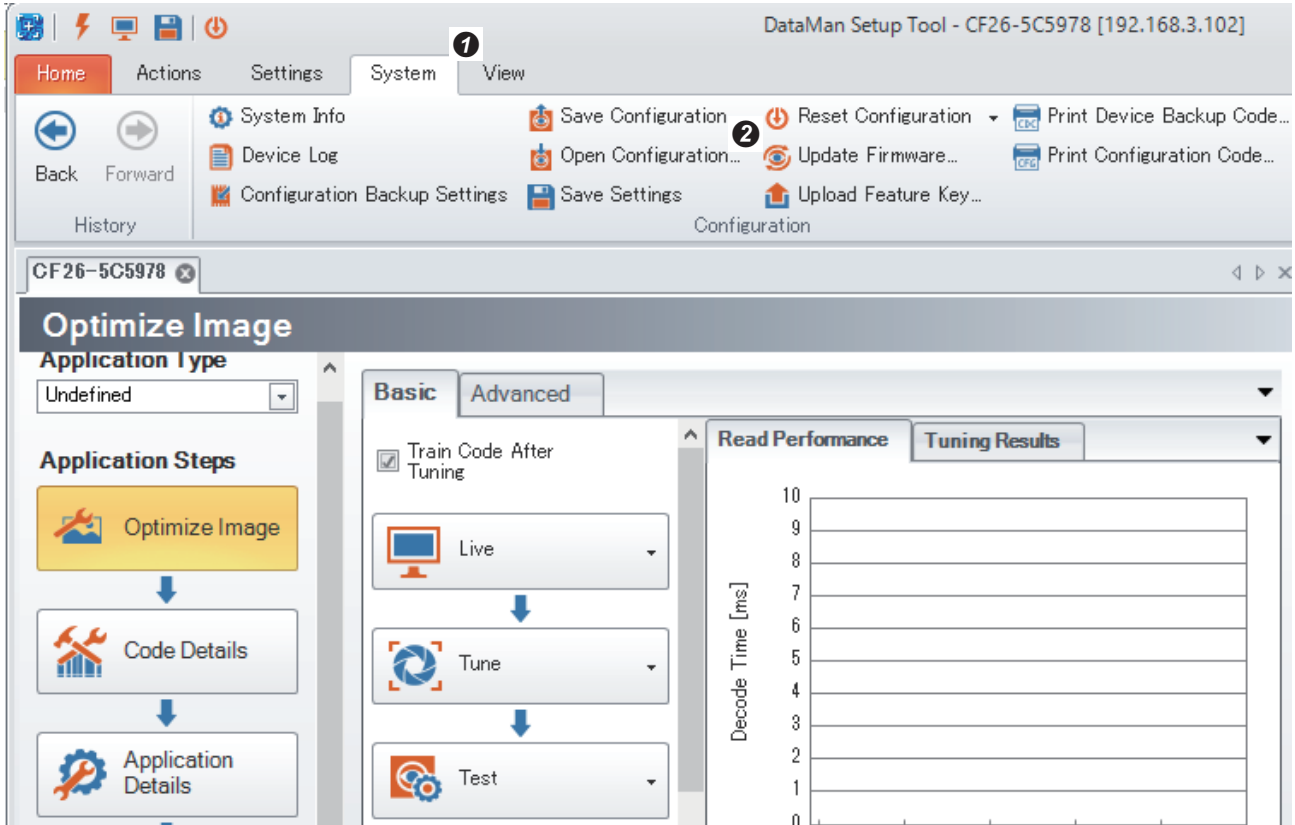
The decoding status of the following items can be checked at a reading test.

- Current Read Rate: A success rate of decoding from the latest 20 times.
- Decode Time [ms]: Decode processing time (* excluding image acquisition time)
- Min/Max Decode Time: The minimum and maximum decode time displayed on a graph in the "Read Performance" pane.
- Found Symbolologies: Types of detected symbols
- Read Strings: Information read from a code

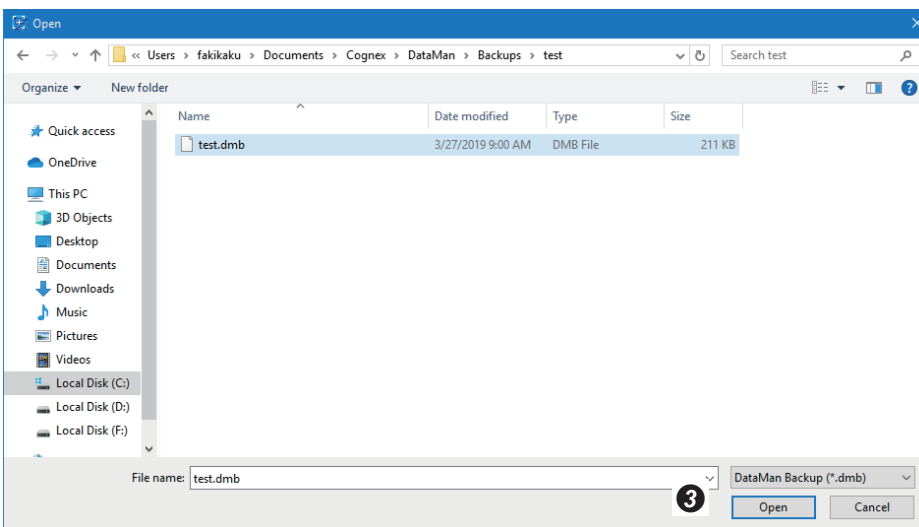
7.3 Parameter Setting Using a Configuration File

Past parameter settings can be reflected to the code reader by using a configuration file which is saved previously. The following shows the procedure of setting parameter using a configuration file.

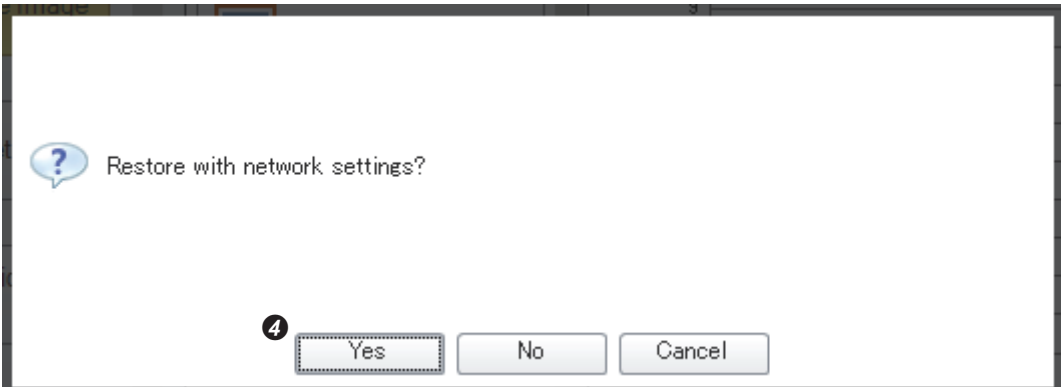
Open Configuration



- 1 Select the [System] tab.
- 2 Click the [Open Configuration] button.



- 3 Specify a configuration file in the file selection dialog to be displayed, and click the [Open] button.



4 After specifying the file, a message whether to restore network settings appears. Select [Yes] or [No] as necessary.

8 Application Steps

8.1 Optimize Image

Mainly, settings for reading operation are configured. This is the area where 'Tune' is configured as the main setting of the code reader.

Optimize Image consists of three buttons: [Live], [Tune], and [Test]. Each button has a drop-down window to set additional options.

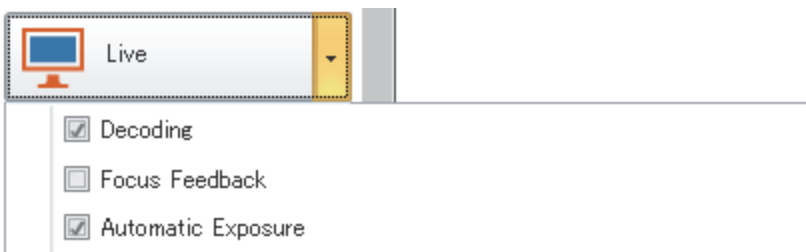
Precautions

Do not perform 'Save Settings' during tuning and testing in Live mode. Settings cannot be saved correctly.

Live

This function can be used to monitor images whose the code reader captures and include codes to be read within the field of vision.

Operation options for performing a live display can be set by the drop-down window of the [Live] button.



Precautions

Use the [Test] button instead of the [Live] button to check the operation after tuning because the operation in Live mode is performed with the unique exposure control.

■Decoding

Select this checkbox to read codes from captured images.

■Focus Feedback

By selecting this checkbox, a bar which indicates the focus of lens is displayed on the right side of the Image Panel.



When the code is focused



When the code is out of focus

■Automatic Exposure

Select this checkbox to make the code reader automatically determine the best exposure time.

Precautions

When changing the settings of automatic exposure and high frequency lights in Live mode, the changed contents are discarded when Live stops.

Tune

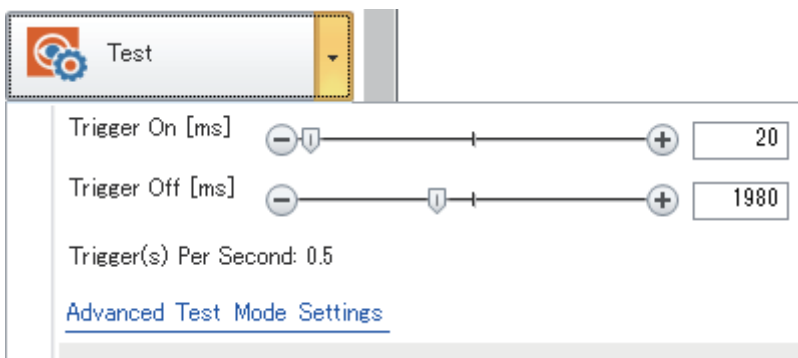
This function automatically configures the settings according to the reading environment.

For details, refer to 'Chapter 7 Section 7.2 Settings in Tune.'

Test

This function can actually test for reading codes by using created settings.

Additionally, the number of trigger input can be set by using "Trigger On" and "Trigger Off" in the drop-down window of the [Test] button.



Trigger On	Trigger Off	Trigger occurrence frequency
20 ms	1980 ms	0.5 times (0.5 Hz) per second
20 ms	980 ms	1 time (1 Hz) per second
20 ms	480 ms	2 times (1 Hz) per second
20 ms	180 ms	5 times (1 Hz) per second
20 ms	80 ms	10 times (1 Hz) per second

Note: The image transmission may be disabled when codes are read at high-speed because the speed may be limited by reading settings, codes to be read, or a connection interface.

Code reading time can be checked on a graph. Click the [Clear] button to reset the graph.

Current Read Rate	100%
Decode Time [ms]	28 ms
Min/Max Decode Time	27 ms - 28 ms
Found Symbologies	Codabar
Read Strings	Decode time:28Read setup index:4...

8.2 Code Details

Code types (symbols) to be read by using the code reader are specified. By selecting the checkbox of each symbol, the symbol is specified as the reading target code. The unselected symbols cannot be read. The selected symbols are displayed with the orange background.

The screenshot shows a software interface for configuring code reader settings. It has two tabs: 'Basic' and 'Advanced'. Under the 'Basic' tab, there is a checkbox for 'Disable Untrained Symbologies' which is checked. Below this is the question 'Which symbologies do you need to read?'. There are three buttons: 'Disable All Symbologies', 'Enable All Symbologies', and 'Automatic Symbology Detection'. The main area is divided into three sections: '2D (Enabled symbologies: 1)', '1D (Enabled symbologies: 0)', and 'Stacked (Enabled symbologies: 0)'. In the 2D section, 'Data Matrix' is selected and highlighted with an orange background, while 'QR Code', 'MaxiCode', 'Aztec Code', and 'VeriCode' are unselected. In the 1D section, various barcode types like Code 128, Code 25, Code 93, Code 39, Pharmacode, Codabar, Interleaved..., UPC/EAN, and MSI are listed but none are selected. In the Stacked section, PDF417, EAN.UCC..., Micro PDF4..., and DataBar are listed but none are selected. At the bottom, there is a question 'How many codes do you need to read for each trigger?' with a dropdown menu set to '1'.

Note: A license needs to be purchased for VeriCode. EAN.UCC Composite of a stacked code is used with DataBar.

Disable Untrained Symbologies

When codes are trained with this checkbox being selected, all the other symbols except for the trained symbols cannot be selected.

When codes are trained without selecting this checkbox, target symbols can be added after training the codes.

Disable All Symbologies

All checkboxes of set symbols are cleared.

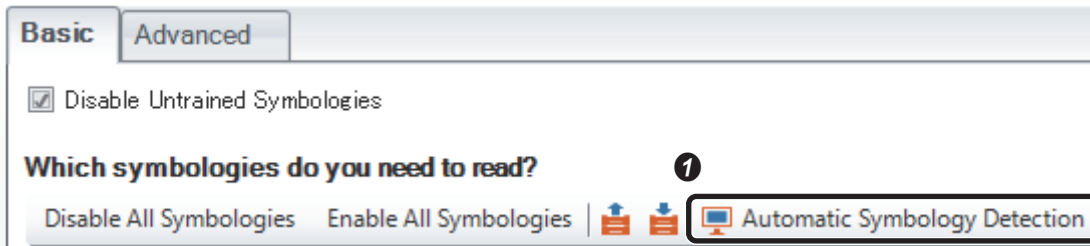
Enable All Symbologies

All checkboxes are selected.

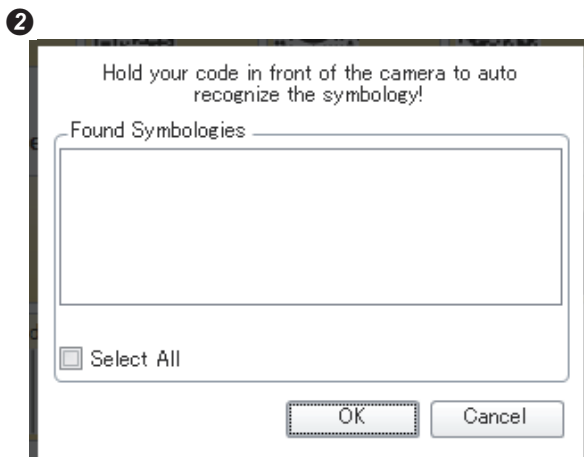
Automatic Symbology Detection

This button is clicked when the code symbols to be read are uncertain.

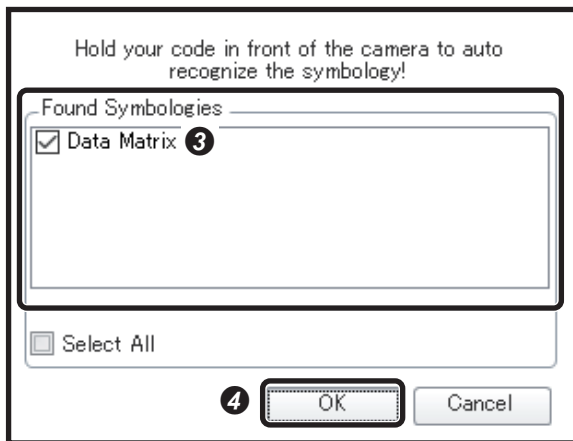
Perform the Live display in advance for a focus adjustment to acquire an image which is focused on a code.



1 Click [Automatic Symbology Detection].

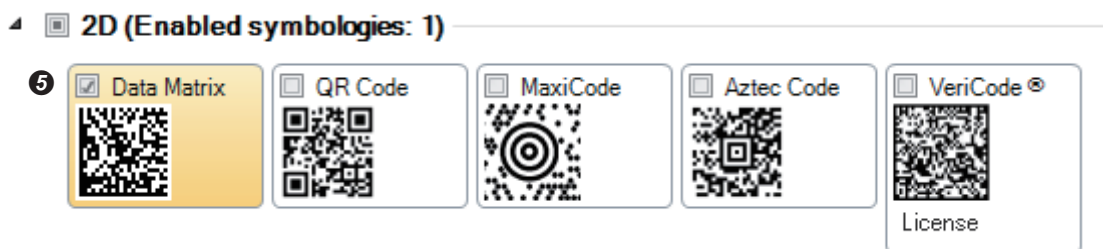


2 This is the mode that the code reader captures an image automatically and determine the code type.



3 A symbol which is detected from the captured image is displayed in the "Found Symbologies" area.

4 Click the [OK] button.



5 The checkbox of the symbol is selected to read the detected symbol.

How many codes do you need to read for each trigger?

The number of codes to be read is specified (1 is set as a default). It can be set if a captured image contains multiple codes.

How many codes do you need to read for each trigger?

Number of Codes ⑥

Should partial result be reported as a good-read? ⑦

- Yes
 No

⑧

Maximum number of codes per symbology you need to find

Data Matrix

▶ QR / Maxi / Aztec

▶ 1D / Stacked / Postal

How should the multiple codes get sorted?

Sorting Priority

Data Matrix, QR Code, MaxiCode, Aztec Code, Barcode
Image Order
Position (Top to Bottom)
Position (Left to Right)

Up

Reverse

Down

- ⑥ Set the number of codes to be read in "Number of Codes."
- ⑦ When "No" is selected for "Should partial result be reported as a good-read?" and when the code reader is set to read multiple codes, the read result is not returned until the same number of codes are read as the set number of codes. (For example, when 2 is set for the number of codes, the result is not returned until two codes are read.) To make the read result return even if only one code is read, select "Yes" for "Should partial result be reported as a good-read?."
- ⑧ Set values for "Maximum number of codes per symbology you need to find." In the example, the setting is configured to read two Data Matrix codes in an image.

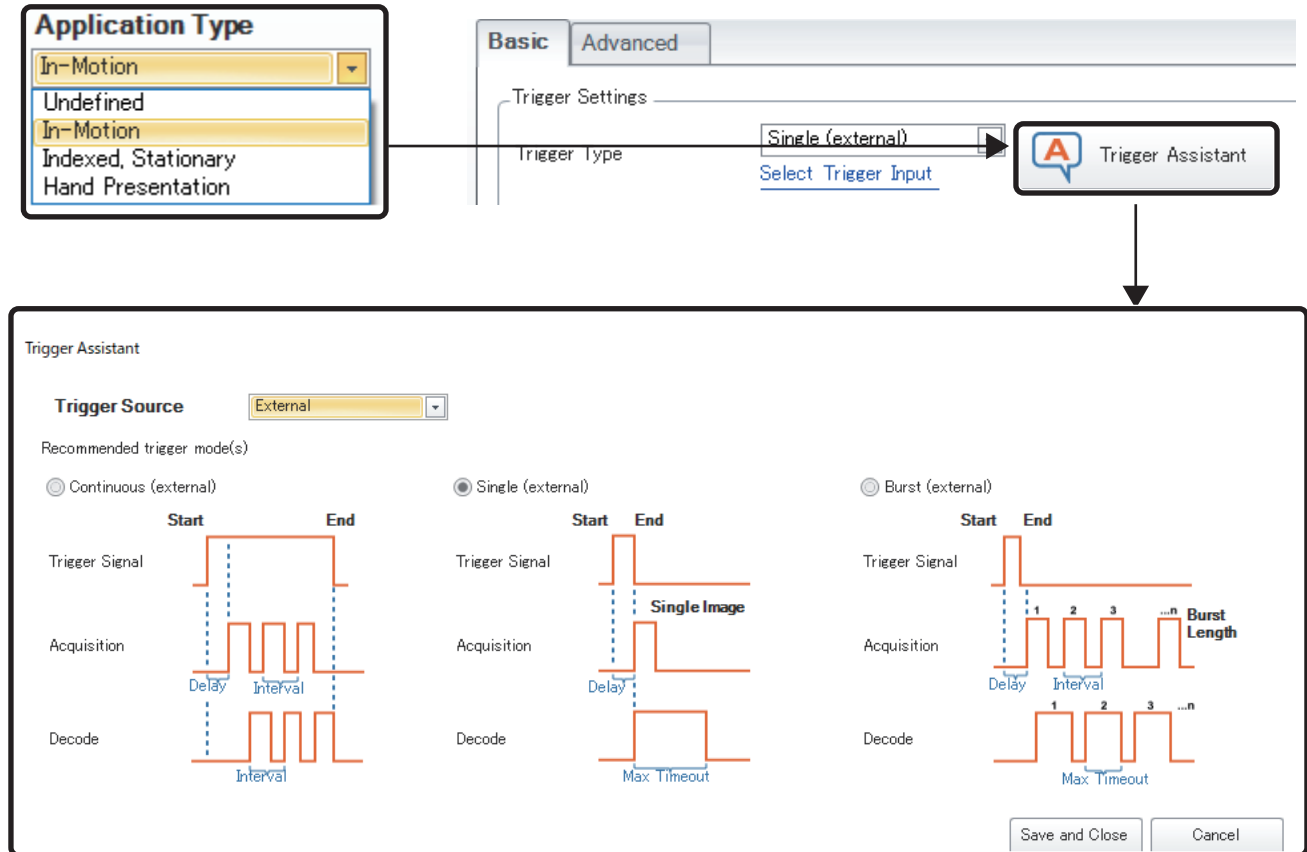
8.3 Application Details

Settings such as trigger type, delay type, timeout, interval, burst length, exposure, and gain can be configured by using assistant functions that can help for configuring these settings.

Trigger settings

Trigger Assistant

By selecting an application type, trigger options suitable for the application type can be checked and set using the trigger assistant function.



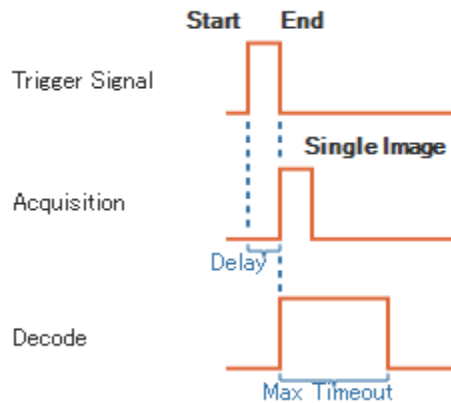
Trigger Type

- Single (external)

Exposure and image acquisition are performed once per trigger.

Additionally, this trigger mode supports for a timeout setting.

- Single (external)

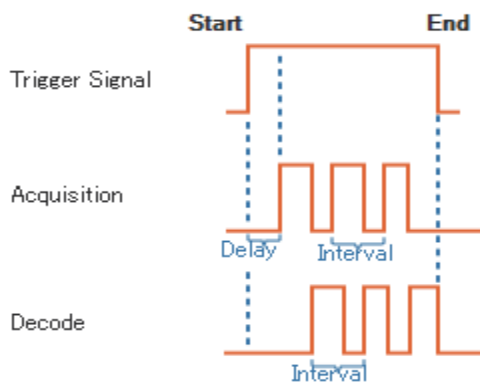


- Continuous (external)

Images are acquired at the specified image acquisition interval as long as the trigger signal remains active. The code reader stops receiving the trigger signal once a code is read. The timeout setting value is equivalent to the trigger interval in this trigger mode.

If the code cannot be read when the trigger signal stops, the result will be "No Read" indicating that a readable code is not contained in an image.

- Continuous (external)



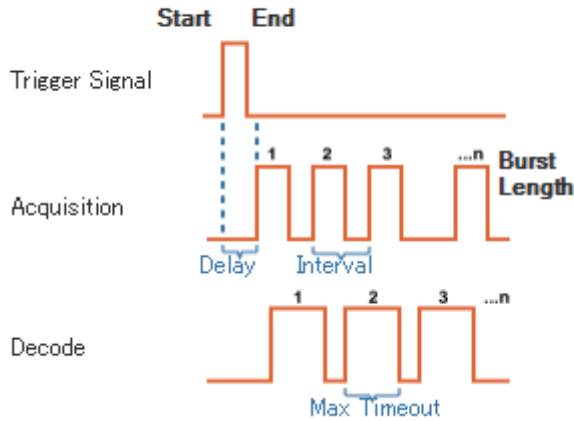
- Burst (external)

Multiple images are acquired per trigger and the first symbol detected among the images is decoded.

The number of image to be acquired and the interval between each image acquisition can be set. Additionally, this trigger mode supports a timeout setting.

A timeout setting value is set to read for each acquired image, not for the whole burst.

Burst (external)



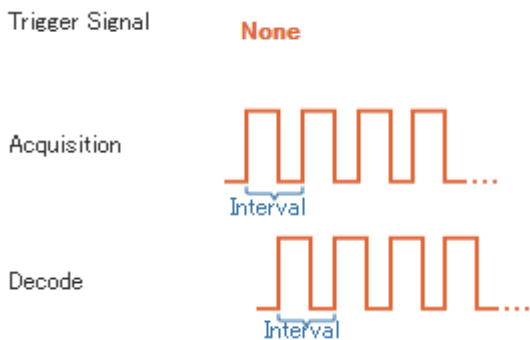
- Self (internal)

Codes are read by acquiring images at the set interval configured in "Interval" without external trigger inputs. Additionally, the timeout time is equivalent to the value of the set "Interval" in this trigger mode.

Some parameters can be configured to set standby time until the next code is read, and whether the code reader reads the same code repeatedly.

This trigger mode does not support automatic exposure.

Self (internal)



- Presentation (internal)

Images are acquired and codes are read without external trigger inputs. Unlike the trigger type of "Self" which acquires images at equal intervals, the image acquisition interval varies depending on each code. This trigger mode does not support a timeout setting.

Some parameters can be configured to set standby time until the next code is read, and whether the code reader reads the same code repeatedly.

This trigger mode supports automatic exposure.

Presentation (internal)

Trigger Signal

None

Acquisition



Decode



Motion Detection

This setting can be configured when "Self (internal)" or "Presentation (internal)" is selected for a trigger type.

The code reader starts the operation of a set trigger type by detecting moving objects within the field of vision.

Motion Detection

Enabled

Timeout [s]

Motion Detection Sensitivity

■Enabled

The code reader does not acquire images, but it detects in the background whether there are any moving objects within the field of view.

When any motions are detected, the code reader starts operation in the "Presentation (internal)" or "Self (internal)" trigger mode.

■Timeouts

The time from when the code reader enables triggers to when it returns to the motion detection mode can be specified in seconds. However, the timeout time is reset each time when motion detection or reading a code is successful.

■Motion Detection Sensitivity

The degree to which the code reader detects motion can be set in three stages: Low, Medium and High.

Interval Assistant

When "Self (internal)" or "Continuous (external)" is selected for a trigger type, the image acquisition interval can be calculated by using Interval Assistant. Select one of the application details to be input such as the field of view size, distance to code and code element size, and set the required values to calculate the interval.



Interval Assistant

Units:

1. Select one of the below application details to input!

Field of View Size Lens / Distance to Code Code Element Size

2. Measure the field of view size in the direction of travel at the closest reading distance!

mm

3. Enter your maximum line speed

mm/s

4. Enter the length of the longest code (in the direction of travel)

mm

The absolute maximum interval time is: μ s

Exposure

Exposure Assistant

When an application type other than "Indexed, Stationary" is selected, the optimized exposure time can be set by using Exposure Assistant. Select one of the application details to be input such as the field of view size, distance to code, and code element size, and set the required values to calculate the exposure time.

The diagram illustrates the process of using the Exposure Assistant. It starts with an 'Application Type' dropdown menu containing options: In-Motion, Undefined, In-Motion, Indexed, Stationary, and Hand Presentation. An arrow points from the 'In-Motion' selection to the 'Exposure' control panel. This panel has two radio buttons: 'Automatic Exposure' and 'Manual Exposure'. An arrow points from the 'Manual Exposure' option to the 'Exposure Assistant' dialog box. The 'Exposure' panel also features a slider for 'Exposure (μs)' with values 58 and 200000, and a text input field containing '409'. The 'Exposure Assistant' dialog box is titled 'Exposure Assistant' and contains the following elements:

- 1. Select one of the below application details to input!** (Units: Metric)
- Three radio buttons: Field of View Size, Lens / Distance to Code, Code Element Size
- 2. Measure the field of view size in the direction of travel at the closest reading distance!**
- A 'Live' camera view icon.
- Two diagrams showing a barcode with blue arrows indicating measurement directions: vertical (up/down) and horizontal (left/right).
- A text input field for field of view size in mm.
- 3. Enter your maximum line speed**
- A text input field for line speed in mm/s.
- Current Exposure is: 409 μs
- Absolute maximum exposure is: [input field] μs
- Buttons: Save and Close, Cancel

Automatic Exposure

The best exposure settings are automatically determined in the code reader.

Manual Exposure

The exposure time can be set in microseconds.

Maximum Exposure

Configure the maximum exposure time that can be set when executing [Optimize Brightness] in the [Action] tab. By clicking the [Optimize Brightness] icon, the appropriate exposure setting with the value below the 'Maximum Exposure' value can be obtained.

Maximum Exposure (μs)

Gain Factor

The sensitivity of an image sensor. Increasing the value can make an acquiring image brighter but the image quality becomes lower. Increase the 'Gain Factor' value when the 'Exposure' value cannot be increased.

Gain Factor

Low High

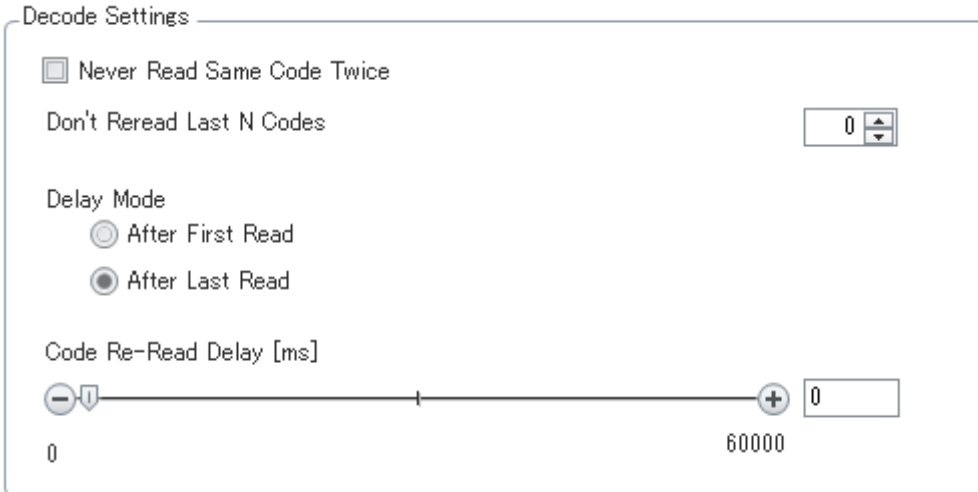
Maximum Gain Factor

Configure the maximum gain factor value that can be set when executing 'Optimize Brightness' in the [Action] tab. By clicking the [Optimize Brightness] button, the appropriate gain factor which is below the value of the 'Maximum Gain Factor' value can be obtained.

Maximum Gain Factor

Decode Settings

For trigger types whose codes are read by external trigger inputs, triggers can be input at the required timing. For example, when a code reader reads a code from a target object flowing on a conveyor, the code can be read by inputting triggers at the appropriate timing. However, when the code reader generates triggers internally for reading codes, it cannot be triggered at an arbitrary timing; the same target object code may be read multiple times. The following can be set to prevent the occurrence of such an event.

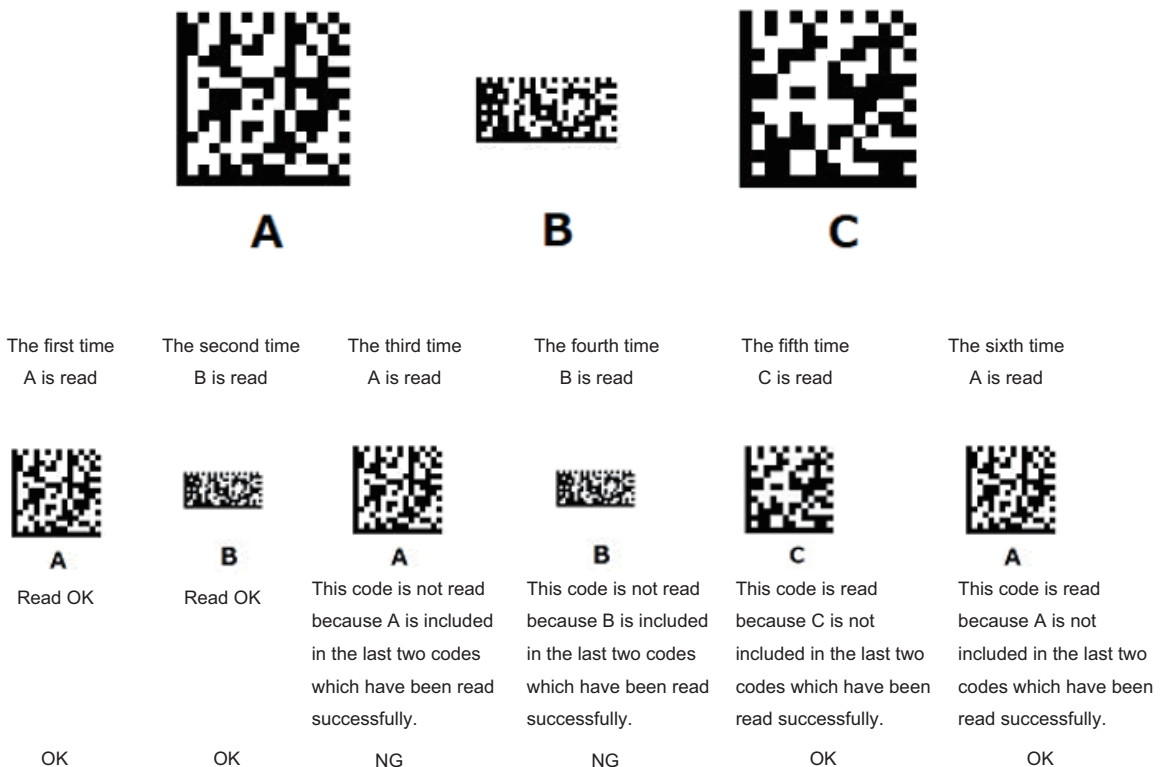


Never Read Same Code Twice

This setting prohibits the code reader to read the same code continuously.

Don't Reread Last N Codes

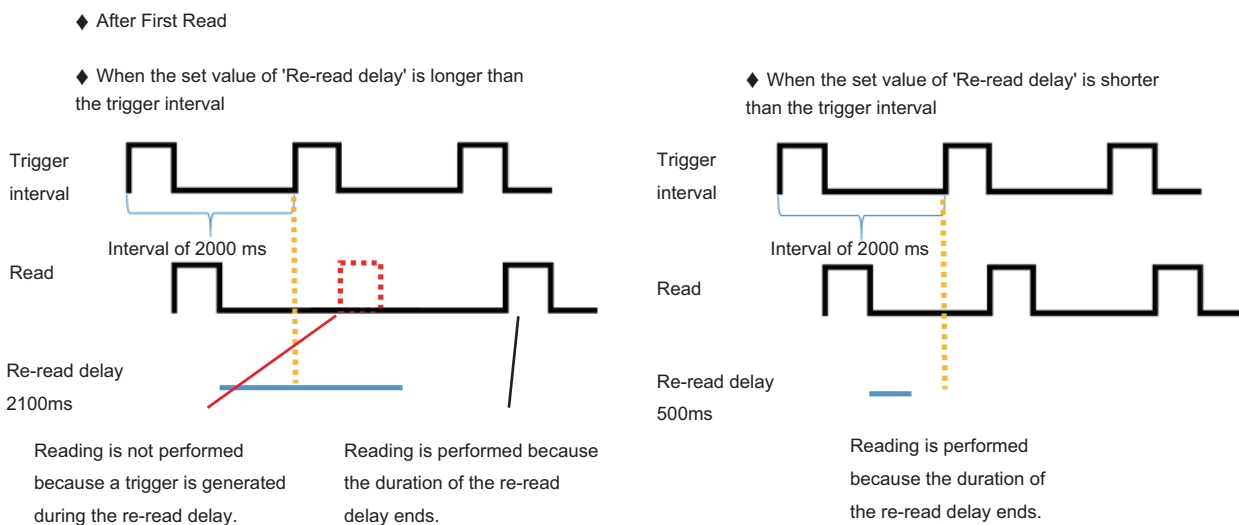
When reading multiple types of codes, N codes read from the last are not read again. The example is shown as below. When setting 2 for N, the three different types of codes (A,B, and C) are read by the following operation.



Delay Mode

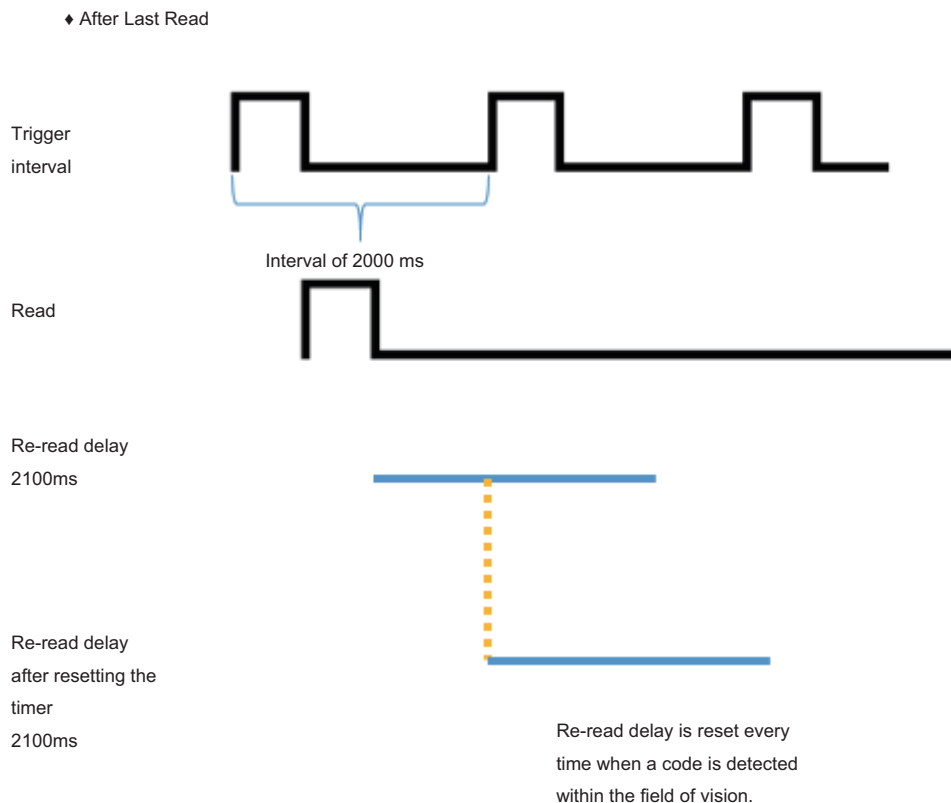
After First Read: A delay occurs after the first code is read; therefore, a timer is not reset.

This means, in a trigger mode which handles multiple images by reading codes continuously, a code is read repeatedly when the code is kept in front of the code reader for an interval longer than 'Re-read delay.'



After Last Read: A timer is reset every time when the code reader detects a code.

The code is not read again even if the code is kept in front of the code reader.



8.4 Format Data

The format of output character strings and output contents for each reading code are set.

The screenshot shows a configuration window with three tabs: 'Basic', 'Standard', and 'Perl Style'. The 'Basic' tab is active. Under the heading 'Basic Formatting', there are four rows of options. Each row has a label on the left and two radio buttons on the right, labeled 'Standard' and 'Perl Style'. The 'Data Matrix' row has the 'Standard' radio button selected. Below these options is a text input field with the label 'No Read Output String'.

Option	Standard	Perl Style
Universal	<input type="checkbox"/>	<input type="checkbox"/>
Data Matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1D / Stacked / Postal	<input type="checkbox"/>	<input type="checkbox"/>
QR Code / MaxiCode / Aztec Code	<input type="checkbox"/>	<input type="checkbox"/>

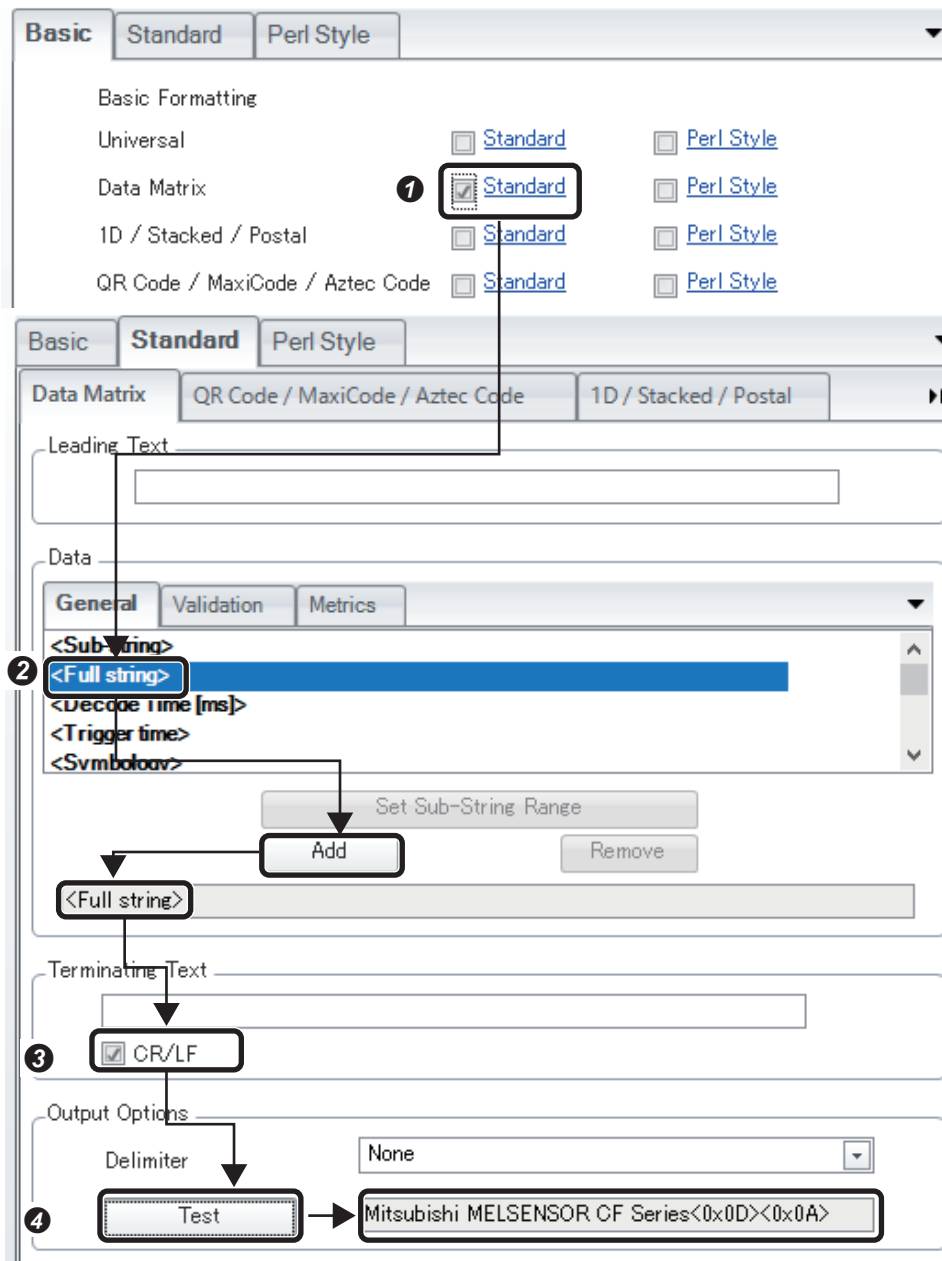
No Read Output String

No Read Output String

Character strings to be output when code read has failed can be set. If this item is not set, no character strings will be output when a code cannot be read.

Basic Formatting

The type of a format which is used when outputting codes read by the code reader can be set. Output contents can be configured for each code separately, or common output settings can be configured under the [Universal] tab. Configuring either one of the settings is recommended.



- 1 Select the checkbox of "Standard" for codes to set.
- 2 After selecting contents to be output in "Data," click the [Add] button to add output data.
- 3 When adding CR/LF to the end of output data, select the checkbox of "CR/LF."
- 4 By clicking the [Test] button, the result of the last read code which is output by the set format can be checked on the right side window.

* When outputting the read code result enclosed by control character codes such as STX (Start of Text) and ETX (End of Text), set hexadecimal ASCII codes for leading and terminating text respectively.

Leading Text: \x02 Terminating Text: \x03 (Hexadecimal characters can be specified by entering \xnn (nn indicates hexadecimal ASCII codes).)

8.5 Inputs/Outputs

The operation of the [TRIG] button and the [TUNE] button, inputs, and outputs can be set.

TRIG Button

By pressing the [TRIG] button for three seconds, all the selected operations can be performed.

The screenshot shows a software configuration window with two tabs: 'Basic' and 'Advanced'. The 'Basic' tab is active. At the top, there are two input fields: 'Device Name' containing 'CF26-5C5978' and 'Device Description' which is empty. Below these are two sub-tabs: 'Pulse Encoder' and 'Buffering and Transfer'. The 'TRIG Button' sub-tab is selected and highlighted with a red box. Other sub-tabs include 'TUNE Button', 'Inputs', 'Outputs', and 'Output Delay'. The main area of the 'TRIG Button' sub-tab is titled '3 second button press action' and contains a list of checkboxes: 'Optimize Brightness' (checked), 'Optimize Focus' (unchecked), 'Read Configuration Code' (checked), 'Train Code' (checked), 'Set Match String' (unchecked), 'Test Mode' (unchecked), and 'Disable Reader Button' (unchecked).

Optimize Brightness

Exposure time is optimized.

Optimize Focus

A focus is optimized.

Read Configuration Code

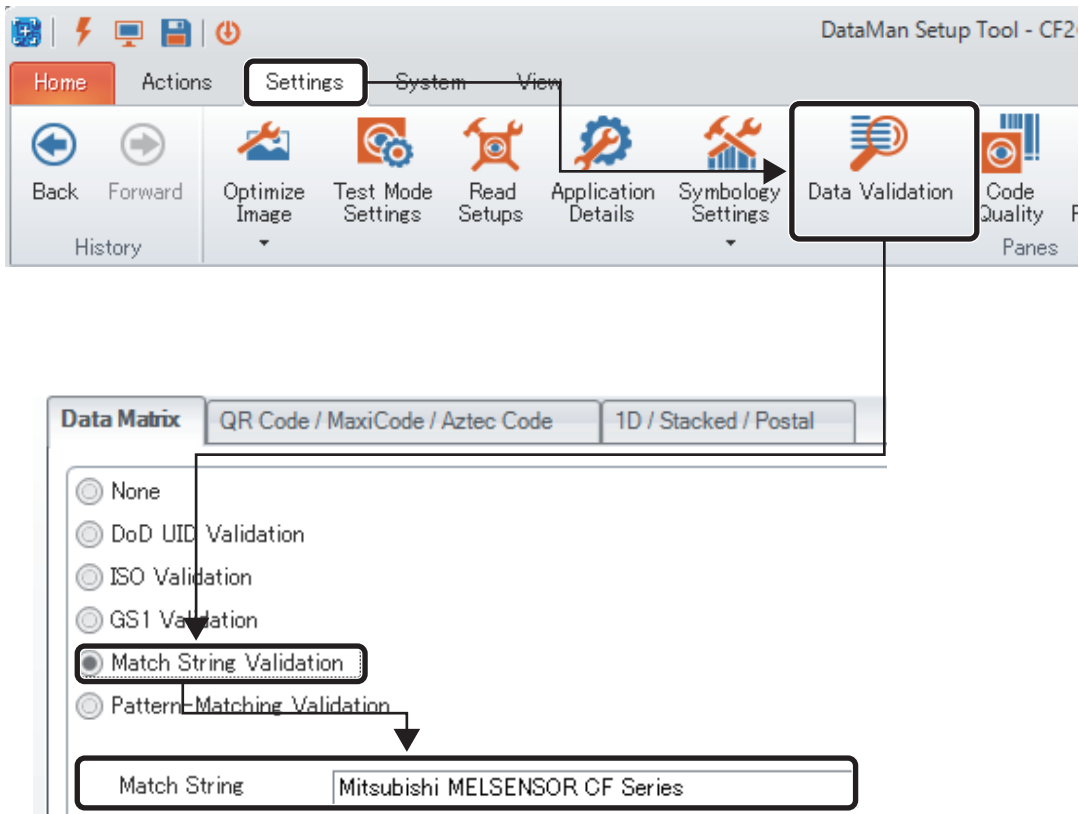
Read Configuration Codes are executed.

Train Code

Codes are trained.

Set Match String

When executing 'Match String Validation' of Data Validation, set the read data to "Match String."



Test Mode

This mode can be used when "Single," "Burst," or "Self" is set for trigger type.

Additionally, it can be selected by unselecting all the other checkboxes in the [TRIG Button] tab.

A reading test is performed by inputting triggers at the trigger interval specified in the test mode.

For the trigger setting of the test mode, refer to the Test section in 'Section 8.1 Optimize Image.'

To end the test mode, press the [TRIG] button for three seconds again.

Disable Reader Button

The [TRIG] button is disabled.

TUNE Button

Tuning is executed by pressing the [TUNE] button for three seconds.

The screenshot shows a configuration window with two tabs: 'Basic' and 'Advanced'. Under the 'Basic' tab, there are two input fields: 'Device Name' containing 'CF26-5C5978' and an empty 'Device Description' field. Below these are sub-tabs: 'Pulse Encoder' and 'Buffering and Transfer'. Under 'Buffering and Transfer', there are five sub-tabs: 'TRIG Button', 'TUNE Button' (which is highlighted with a black border), 'Inputs', 'Outputs', and 'Output Delay'. At the bottom of the window, there is a checkbox labeled 'Disable Reader Button' which is currently unchecked.

Disable Reader Button

The [TUNE] button is disabled.

Inputs

The operation of the code reader can be set in the "Inputs" tab. The code reader performs the set functions by receiving signals externally.

	0	1
Actions		
Trigger On	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Trigger Off	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Encoder	<input type="checkbox"/>	<input type="checkbox"/>
Encoder Direction	<input type="checkbox"/>	<input type="checkbox"/>
Train Code	<input type="checkbox"/>	<input type="checkbox"/>
Optimize Brightness	<input type="checkbox"/>	<input type="checkbox"/>
Train Match String	<input type="checkbox"/>	<input type="checkbox"/>
Optimize Focus	<input type="checkbox"/>	<input type="checkbox"/>
Read Configuration Code	<input type="checkbox"/>	<input type="checkbox"/>
Tune	<input type="checkbox"/>	<input type="checkbox"/>
Allow Buffered No Read Images	<input type="checkbox"/>	<input type="checkbox"/>
Clear Outputs	<input type="checkbox"/>	<input type="checkbox"/>
Polarity		
Rising Edge	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Falling Edge	<input type="checkbox"/>	<input type="checkbox"/>

Trigger Detection
Debounce Delay

Short Long

Trigger On

Codes are read by input signals.

Trigger Off

Reading operation ends by input signals.

An operation example is shown as below when the following settings are configured.

Trigger Type: Continuous

Input 0: Trigger On

Input 1: Trigger Off

When input 0 receives signals, reading operation starts. When a code is read, the reading operation ends. However, when a code cannot be read and "Continuous" is set for a trigger type, the operation continues until the code is read. To end the operation, input the "Trigger Off" signal.

Train Code, Optimize Brightness, and Train Match String

Refer to 'TRIG Button' in 'Section 8.5 Inputs/Outputs.'

Optimize Focus and Read Configuration Code

Refer to 'TRIG Button' in 'Section 8.5 Inputs/Outputs.'

Tune

Refer to 'TUNE Button' in 'Section 8.5 Inputs/Outputs.'

Allow Buffered No Read Images

This function can be used only when "Continuous" is selected for a trigger type.

When "Continuous" is set for a trigger type, even if a buffer setting is configured to save all images, the images which cannot be read are not saved to a buffer. By using this function, only the images which cannot be read can be stored in the buffer.

Clear Outputs

This is a function to reset all the outputs immediately after the signal is input. An output delay setting is not reset.

Debounce Delay

Detection time required for the code reader to recognize a trigger signal being enabled is set.

Set a small value for fixing the line-noise of electrostatic discharge (ESD), and a large value for fixing the noise of electromechanical relays. Adjustment of the setting may be required to select the best value that fits the manufacturing environment.

Outputs

Output signals are set.

	0	1	2	3
Events				
Strobe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No Read	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Validation Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trigger Overrun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buffer Overflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Event 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Event 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Action				
Open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Closed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pulse Width [ms]	5	5	5	5

Strobe

When using external lights, this function can provide strobe signals to the lights.

Read/No Read

This function can output signals respectively when a code is read or not read.

Validation Failure

A signal is output when validation is failed.

Trigger Overrun/Buffer Overflow

A signal is output when each error occurs.

Trigger Overrun: It occurs when a trigger is input before the code reader prepares for an image acquisition, such as when a trigger is input while an image is acquired.

Buffer Overflow: It occurs when there is no storage area for acquired images. This indicates that the processing cannot keep up with the volume of acquired images. The overflow occurs when the decoding time takes longer than the image/trigger interval.

Open/Closed

A signal is output as follows when an event is occurred.

Open: A signal ON → OFF

Closed: A signal OFF → ON

Pulse Width

The pulse width of a signal is set.

Output Delay

This function can delay signal outputs.

It can be used when "Manual," "Single," "Burst," or "Continuous" is selected for a trigger type.

8.6 Communications


The settings for connecting the code reader with the connected devices via serial or Ethernet (SLMP, CC-Link IE Field Network Basic, EtherNet/IP^{*1}, and MODBUS/TCP^{*1}) communication are configured.

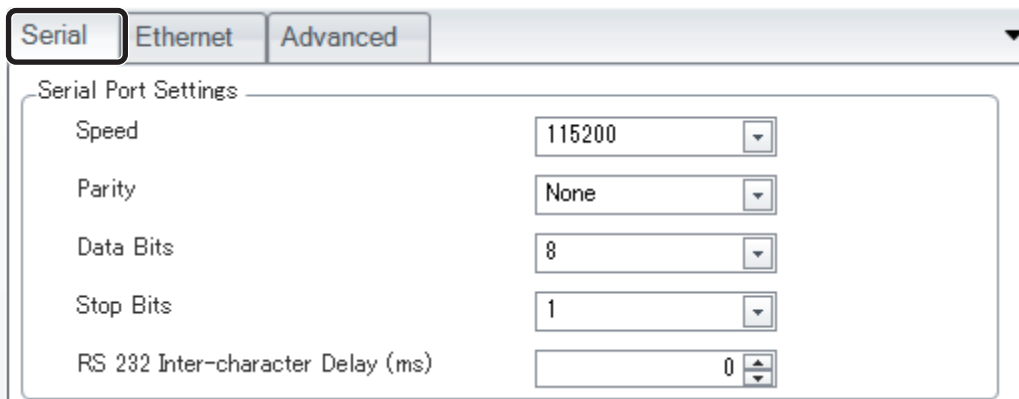
*1 Only the CF37 series supports it.

Serial

Configure serial port settings.

For a setting example when communicating the code reader with a programmable controller via serial communication, refer to the following:

 Code Reader Connection Guide



Setting	Value
Speed	115200
Parity	None
Data Bits	8
Stop Bits	1
RS 232 Inter-character Delay (ms)	0

Speed, Parity, Data Bits, and Stop Bits must be configured same as the communication target.

Ethernet

Select the checkbox of a protocol to be used on Ethernet.

For a setting example when communicating the code reader with a programmable controller, refer to the following:


 Code Reader Connection Guide



Industrial Protocols

EtherNet/IP™ PROFINET SLMP CC-Link IE Field Basic

Modbus TCP

 Only one protocol may be enabled.

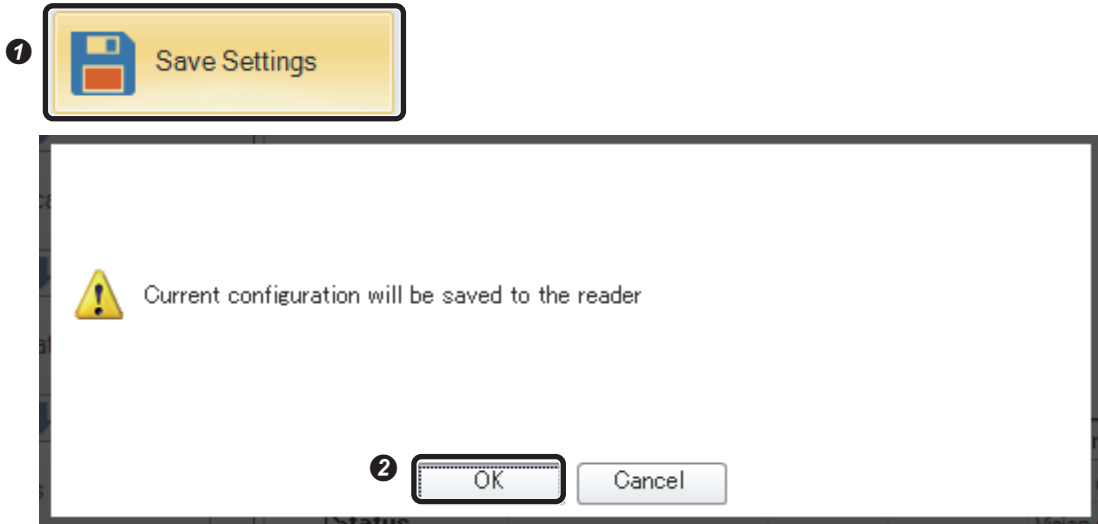
Status:

8.7 Save Settings

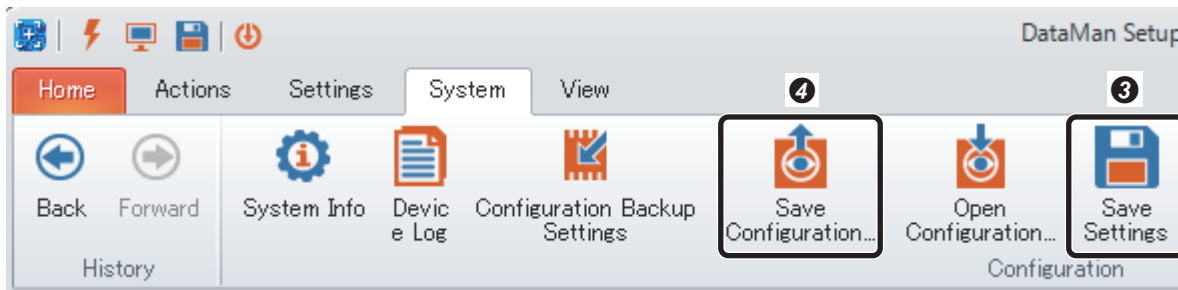
'Save Settings' is rather a required work item than a work step. It saves current settings to the persistent memory of the code reader so that the same settings can be applied when restarting the code reader. SetupTool also saves a backup file to a default backup folder in the personal computer in use.

Precautions

Do not perform 'Save Settings' during tuning and testing in Live mode. Settings cannot be saved correctly.



- 1 Click [Save Settings] of [Application Steps].
- 2 Click the [OK] button after a confirmation dialog appears.



- 3 'Save Settings' can also be performed from the [System] tab.
- 4 Additionally, settings can be saved to a personal computer as a file by clicking [Save Configuration...].

9 HOME TAB FUNCTIONS

9.1 Backup

This is a function to create a code reader backup file.

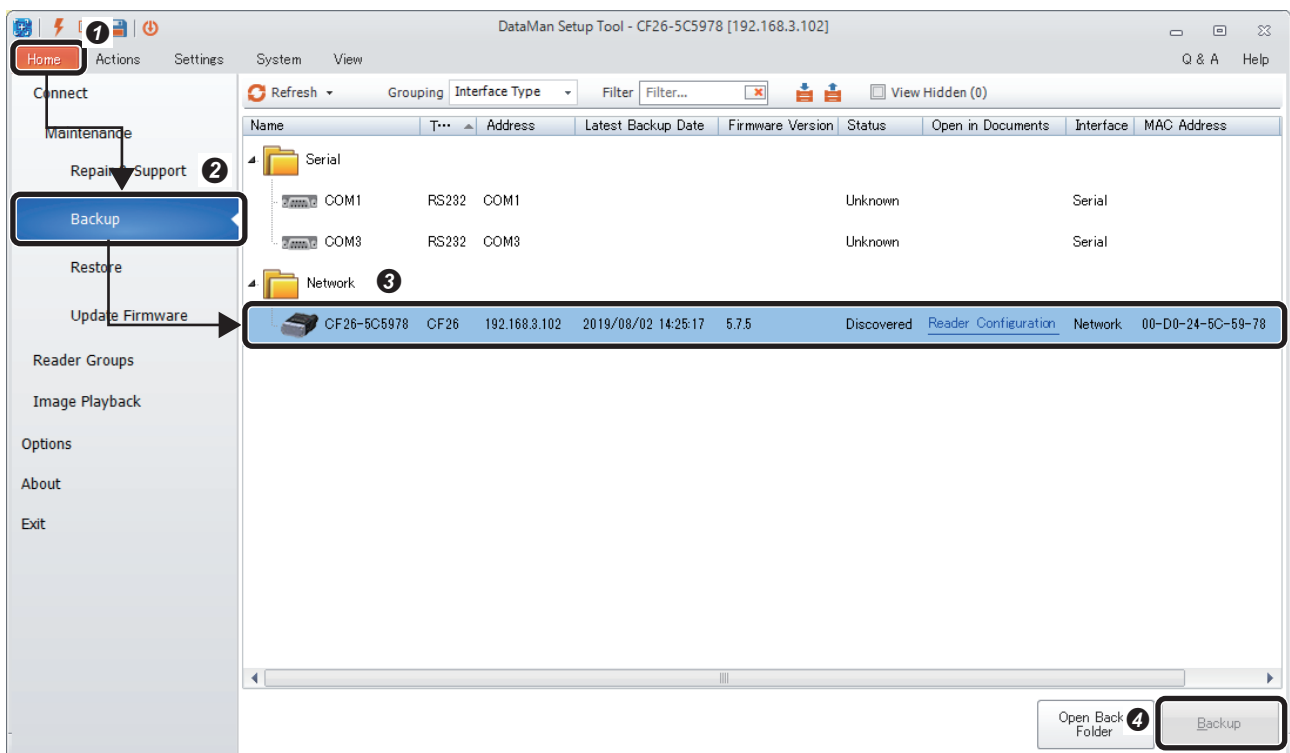
Even when multiple code readers are selected, the backup files can be created at once.

Precautions

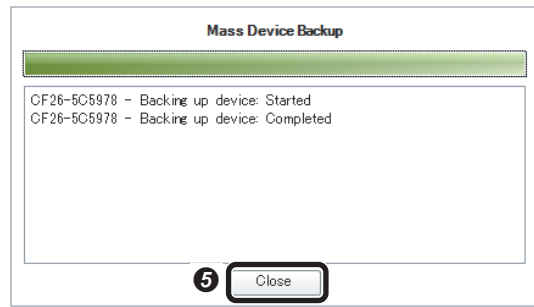
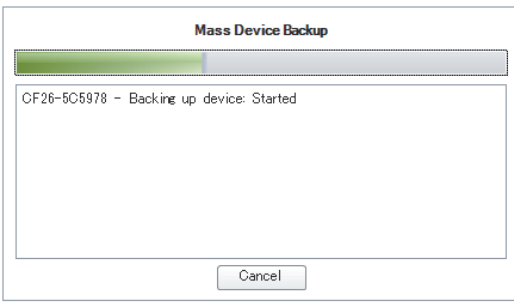
In the following cases, the [Backup] button is grayed out and the button cannot be clicked.

- A matched IP address is not set.
- The code reader is connected with SetupTool.

The backup procedure is shown as below.



- 1 Select the [Home] tab.
- 2 Click [Backup].
- 3 Select a code reader to create a backup file.
- 4 Click the [Backup] button.



5 The backup status is displayed in the "Mass Device Backup" dialog. Check that "Completed" is displayed and click the [Close] button.

9.2 Restore

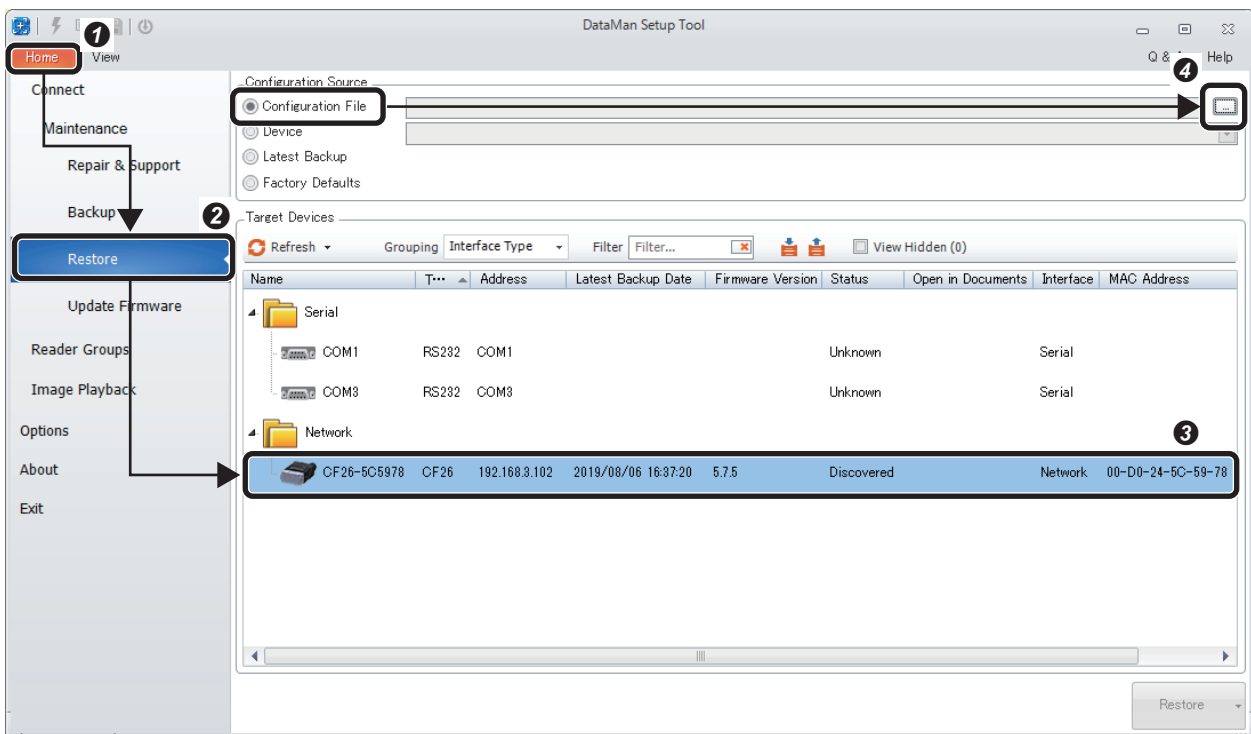
This is a function to restore a code reader using a backup file.

Precautions

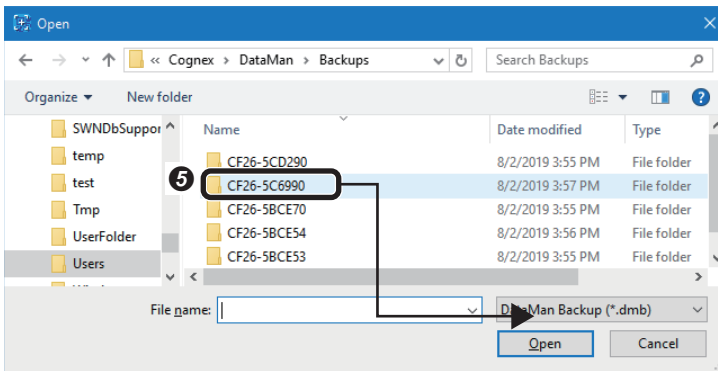
In the following cases, the [Restore] button is grayed out and the button cannot be clicked.

- A matched IP address is not set.
- The code reader is connected with SetupTool.
- A valid configuration source is not specified.

The restoring procedure is shown as below.



- 1 Select the [Home] tab.
- 2 Click [Restore].
- 3 Select a code reader to restore.
- 4 Select 'Configuration File' from the "Configuration Source" section, and click the file specification button on the right side of the item.

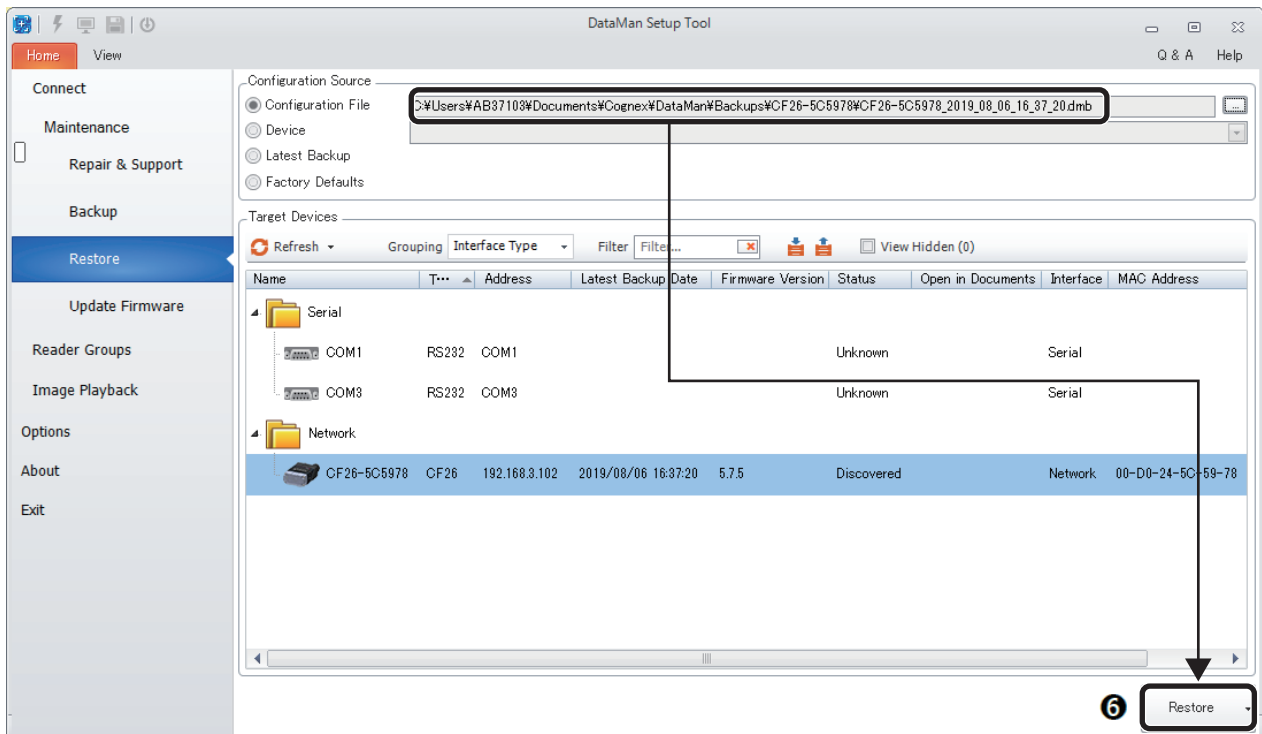


Point

The following four options are available as a configuration source.

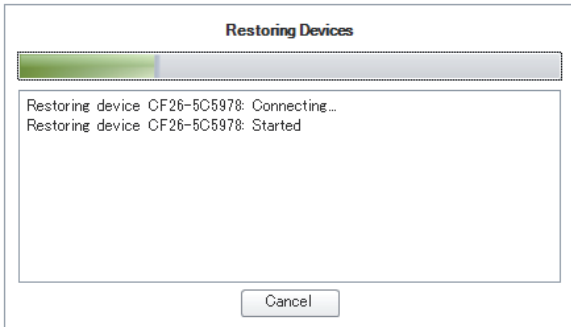
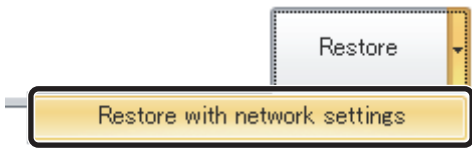
- Configuration File
To restore with a specified backup file.
- Device
To select a code reader which exists on a current network, and restore with the setting information of the selected code reader.
- Latest Backup
To restore with the newest backup file among the backup files of the selected code reader.
- Factory Defaults
To restore values to the factory defaults.

5 The "Backups" folder is displayed and each folder with the name of the code reader is displayed. The previously saved backup files are stored within each folder. Select a backup file to be used for restoration among the backup files.



6 Check that the selected backup file is correct according to the displayed file name, and click the [Restore] button.

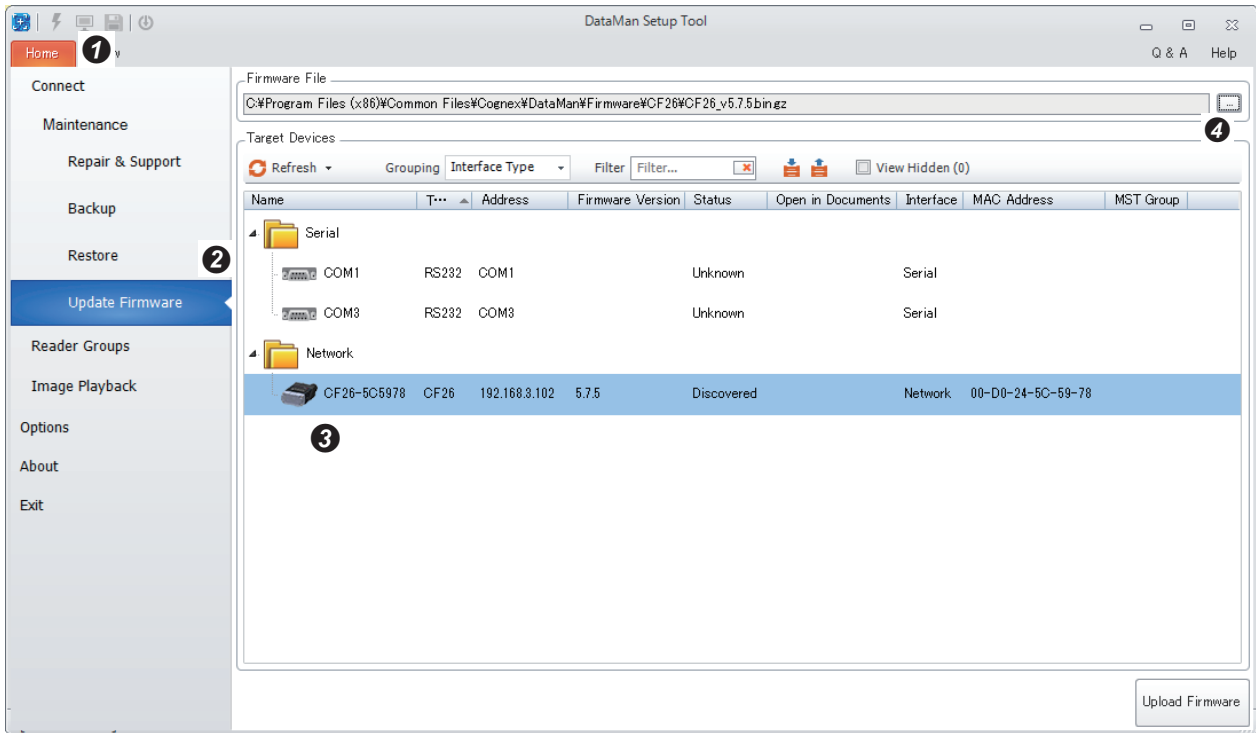
When restoring communication settings, click the [Restore with network settings] button from the submenu of the [Restore] button.



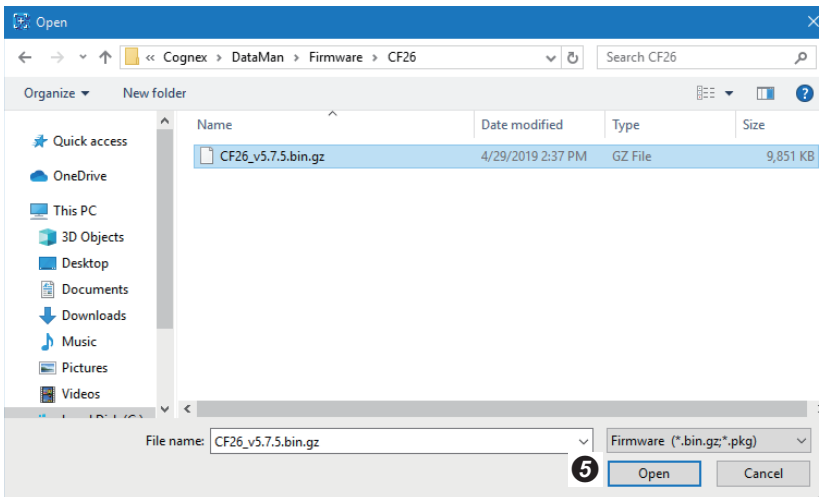
7 The restoring status is displayed in the "Restoring Devices" dialog. Check that "Completed" is displayed and click the [Close] button.

9.3 Update Firmware

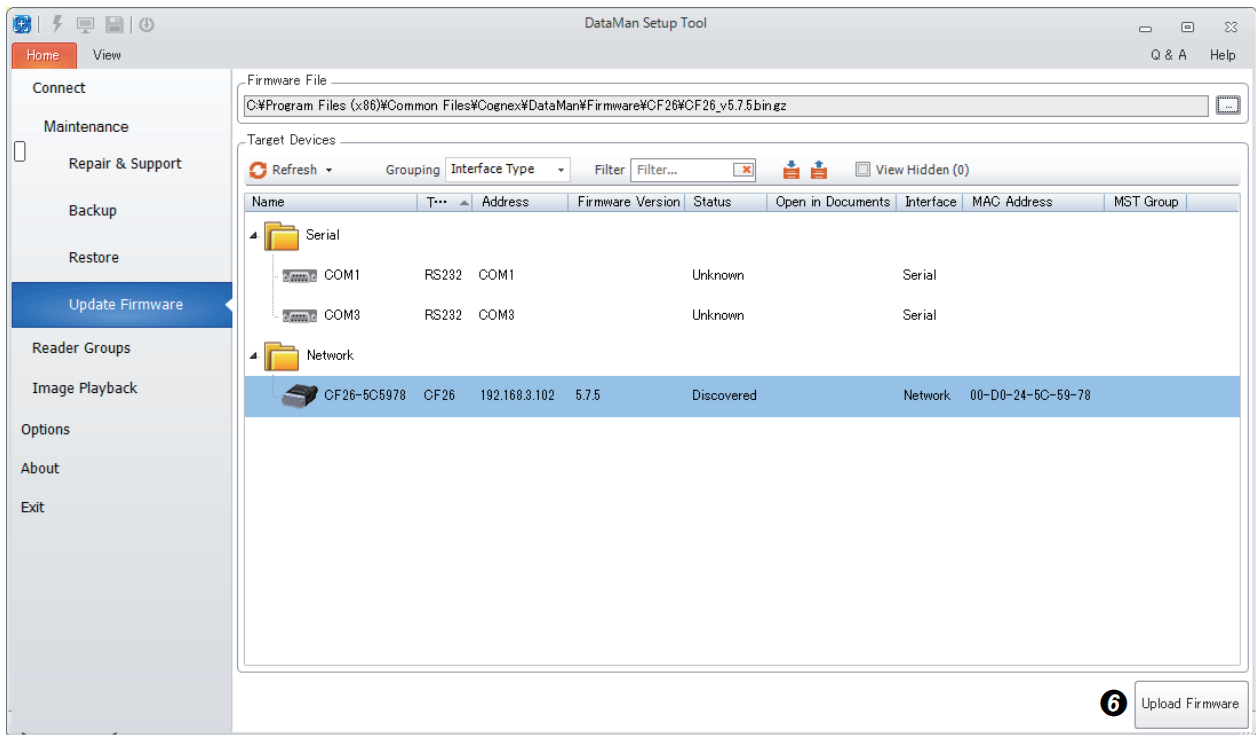
This is a function to update a code reader firmware.
The procedure for updating a firmware is shown as below.



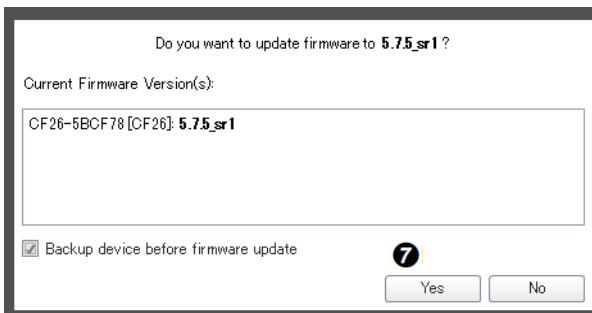
- 1 Select the [Home] tab.
- 2 Click [Update Firmware].
- 3 Select a code reader to update the firmware.
- 4 Click the file specification button on the right side of "Firmware File."



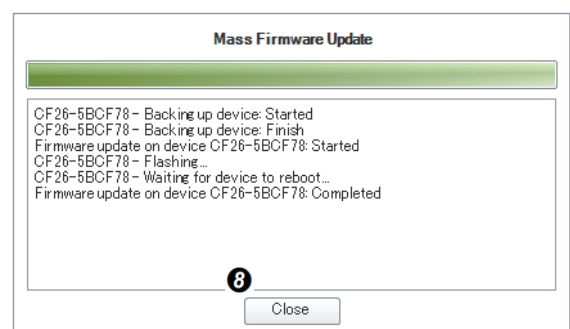
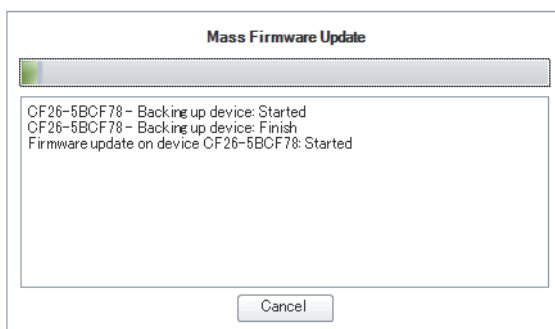
- 5 Specify a firmware file (a GZ file) in the file selection dialog to be displayed.



6 Check that the selected firmware file is correct according to the displayed file name, and click the [Upload Firmware] button.



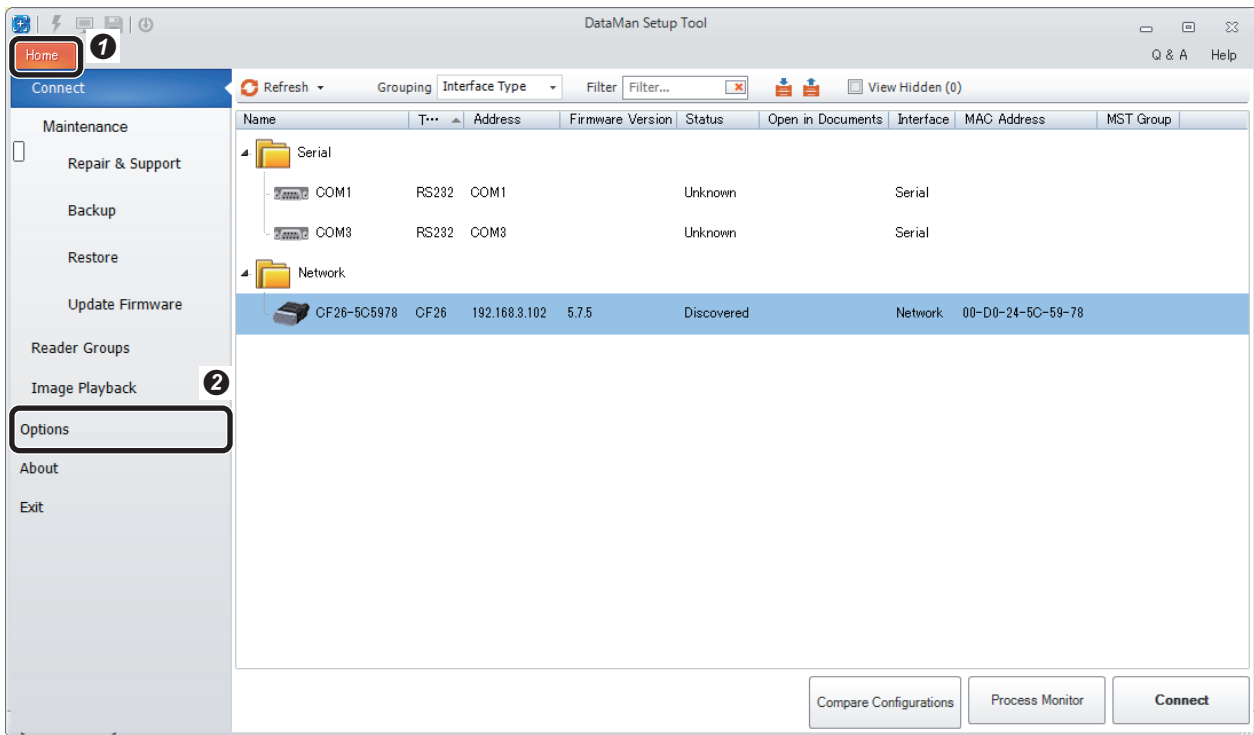
7 Click the [Yes] button in the confirmation dialog to be displayed.



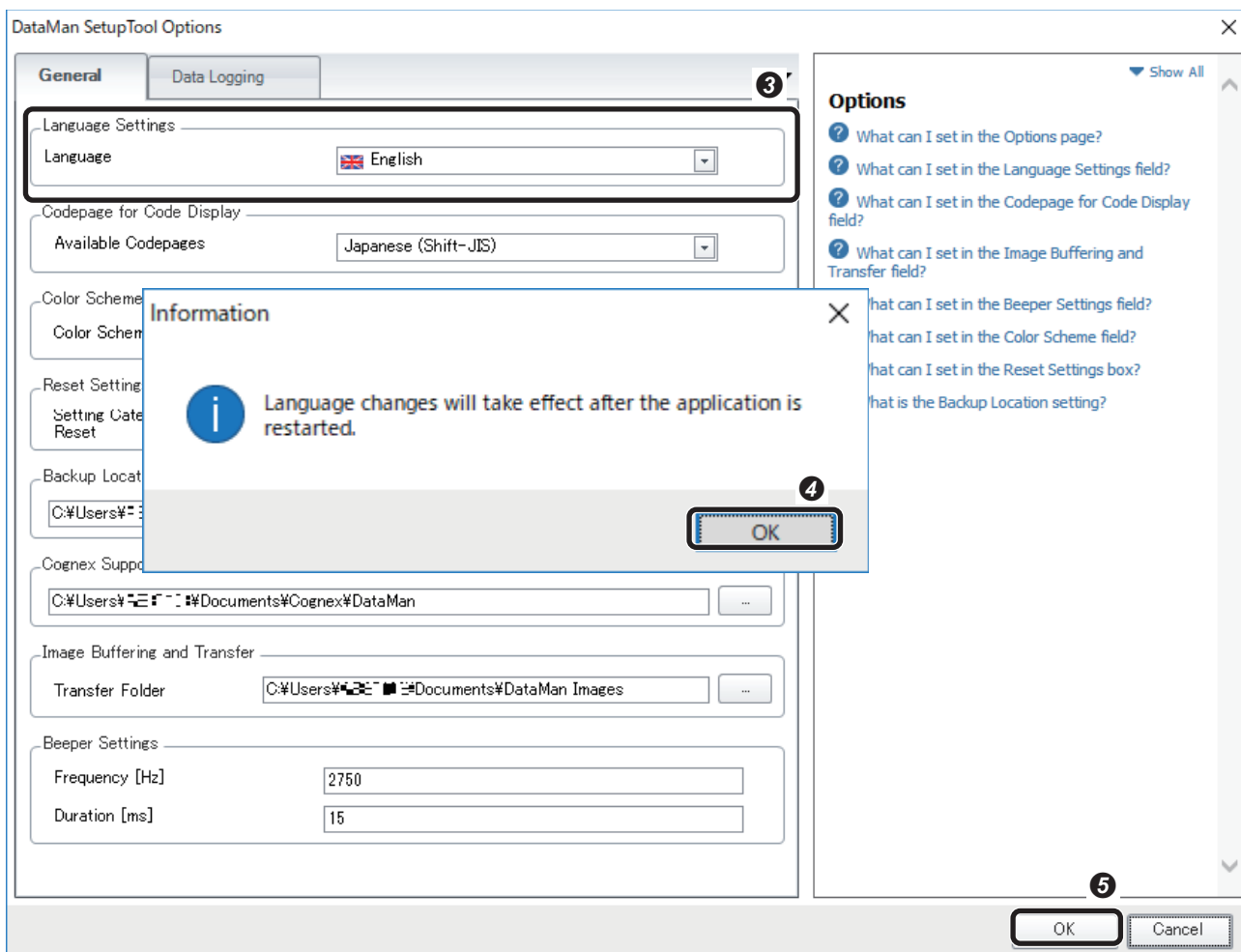
8 The update status is displayed in the "Mass Firmware Update" dialog. Check that "Completed" is displayed and click the [Close] button.

9.4 Language Settings

SetupTool can switch a language between Japanese and English.
The procedure for switching a language in SetupTool is shown as below.



- 1 Select the [Home] tab.
- 2 Click [Options].



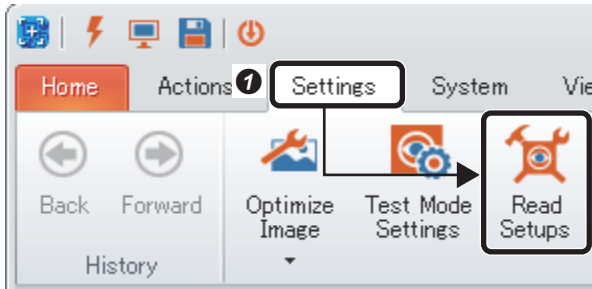
- ③ Select "Language" in the Options screen to be displayed.
- ④ Click the [OK] button in the information dialog to be displayed.
- ⑤ Click the [OK] button in the Options screen.
- ⑥ Restart SetupTool.

APPENDIX

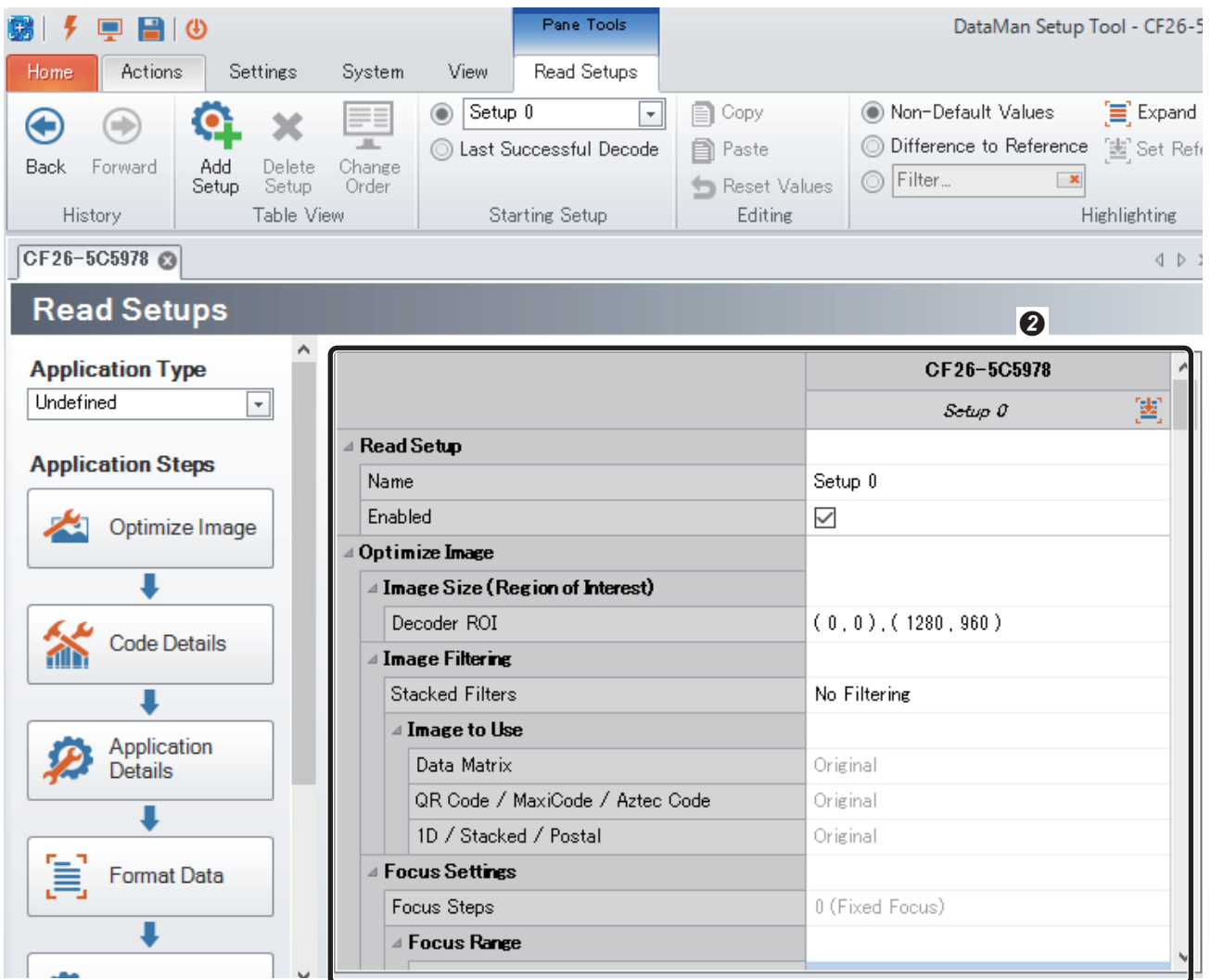
Appendix 1 Read Setups

A code reader can have up to 16 different settings. This means a code can be read by using up to 16 settings. If the code is failed to read by the first setting, the second setting is used, and if the reading is failed, the third setting is used and so on. When the code is read successfully during the process, the reading ends at that time and no further reading is performed. Additionally the code can be trained for each setting.

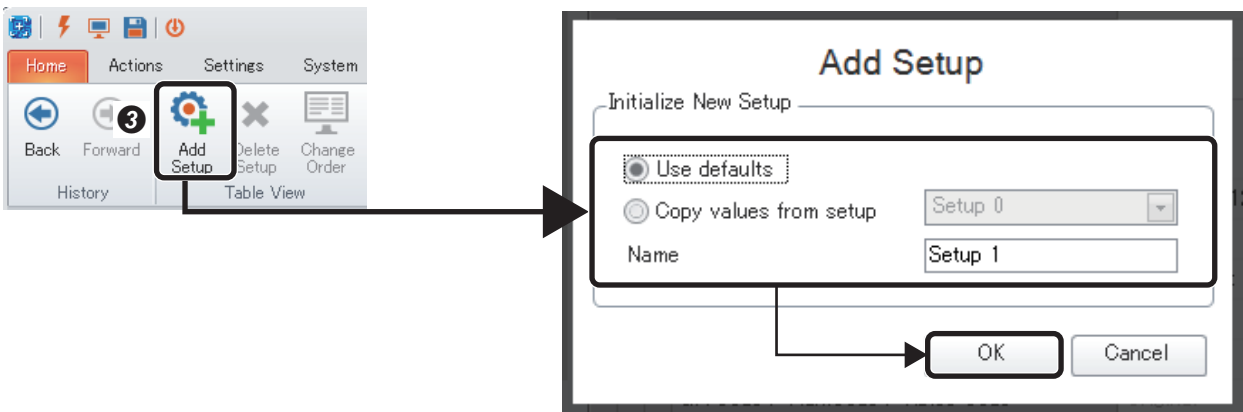
The procedure for setting read setups is shown as below.



1 Select [Read Setups] in the [Settings] tab.



2 Current setting information is displayed.



- ③ By selecting [Add Setup], the "Add Setup" dialog is displayed.
 Select "Use defaults" or "Copy values from setup" and click the [OK] button to add the setting.

Use defaults

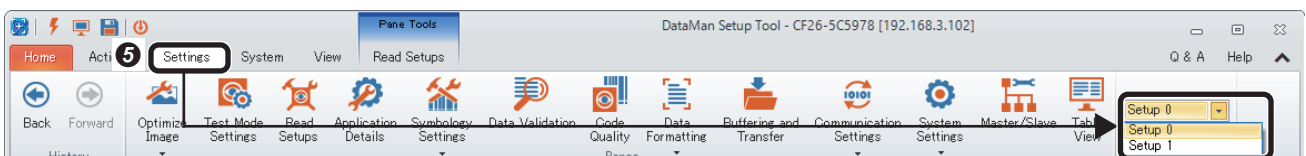
Add new settings from default values.

Copy values from setup

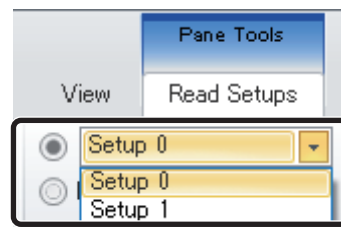
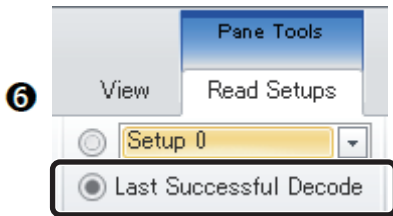
Copy values from existing settings and add new settings.

	Setup 0	Setup 1
Read Setup		
Name	Setup 0	Setup 1
Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Optimize Image		
Image Size (Region of Interest)		
Decoder ROI	(0 , 0) , (1280 , 960)	(0 , 0) , (1280 , 960)
Image Filtering		
Stacked Filters	No Filtering	No Filtering

- ④ Setup 1 is added.



- ⑤ For changing each parameter of the added settings, change the settings on the table displayed in the Read Setups screen as indicated in the procedure ④. Alternatively, the settings can be changed by clicking the icon of each setting in each application step screen or in the [Settings] tab.
 When tuning the code reader in each read setup setting, it must be performed by selecting a read setup in the [Settings] tab.



6 Set the execution order of created read setups.

Last Successful Decode

When two settings, Setup 0 and Setup 1, are present and the last code is read using Setup 1, the next code reading will be started using Setup1 at first.

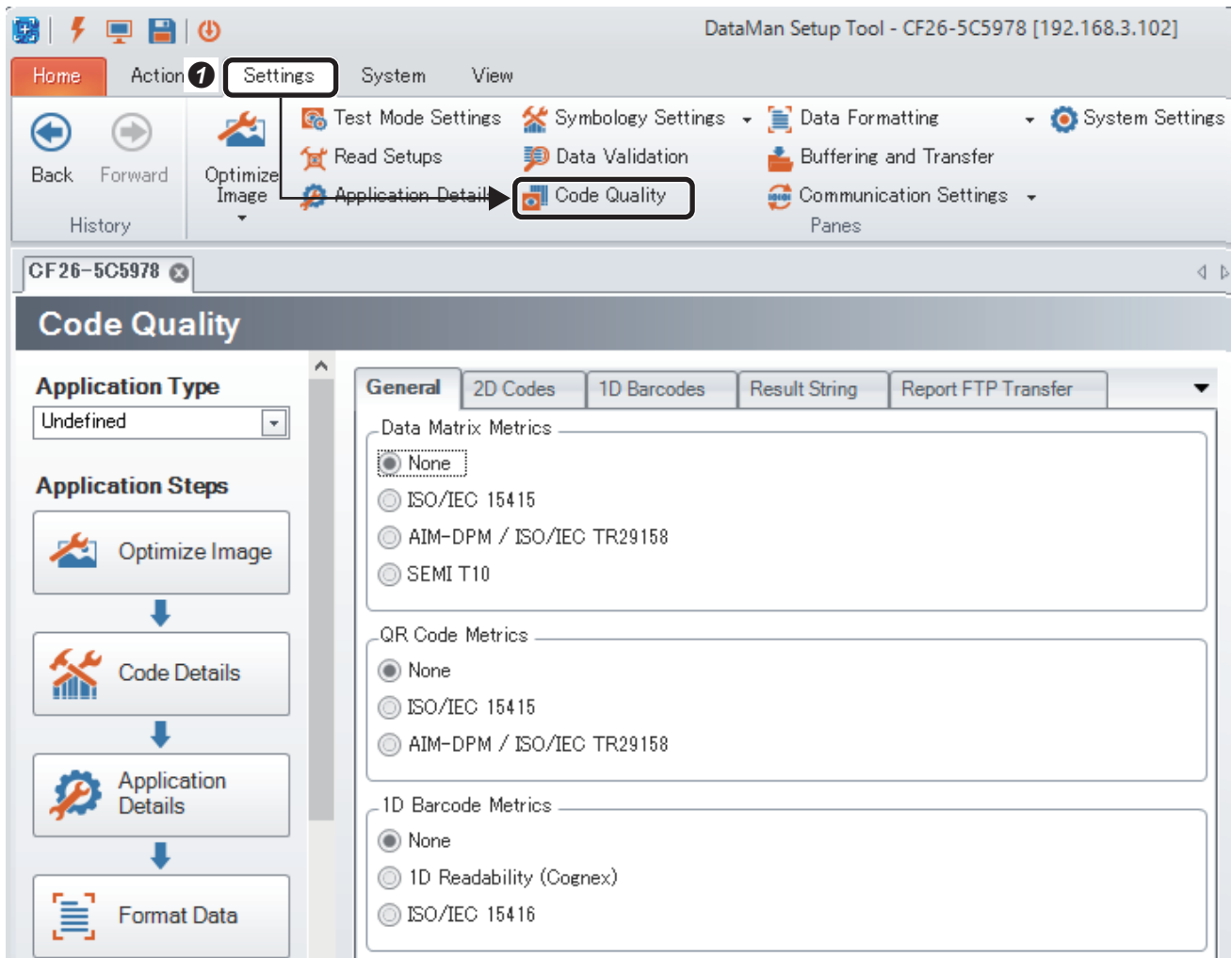
Setup 0

A code is always read by determined settings. A setting to be used at first can be selected. When Setup 2 is selected among Setup 0, 1, 2, and 3, the execution order of the read setups will be Setup 2 → 3 → 0 → 1. (Note that the order can be changed from the [Change Order] icon.)



Appendix 2 Code Quality

CF Series can verify whether or not the acquired image satisfies a quality guideline which is defined by the code quality standard. For further information on the specific code quality standard and metrics, refer to 'DataMan Communications and Programming Guide.'



- 1 Select [Code Quality] from the [Settings] tab.

General 2D Codes 1D Barcodes Result String Report FTP Transfer

Data Matrix Metrics

None
 ISO/IEC 15415
 AIM-DPM / ISO/IEC TR29158
 SEMI T10

QR Code Metrics

None
 ISO/IEC 15415
 AIM-DPM / ISO/IEC TR29158

1D Barcode Metrics

None
 1D Readability (Cognex)
 ISO/IEC 15416

2 Select the metric of a reading target code. (AIM-DPM is selected for Data Matrix in this example.)

Code Quality

Pass (A) ✓

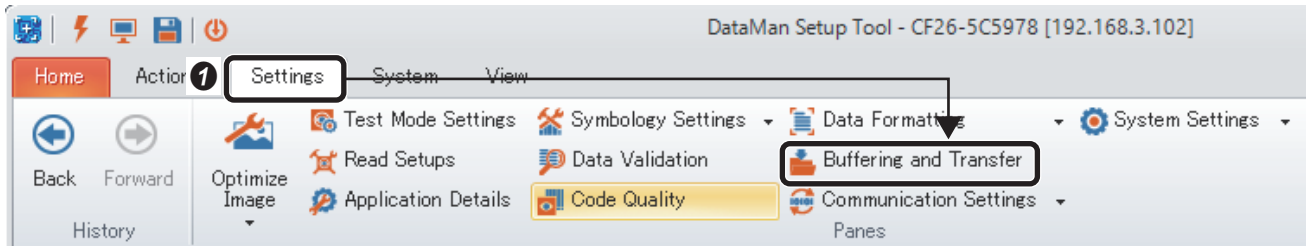
Property	Value	Grade	Average
AIM-DPM / ISO/IEC TR29158 (Data Matrix: Mitsubishi MELSENSOR CF Series<0x0D><0x0A>)			
Symbol Grade		A	✓
Cell Contrast	+0.762	A	✓ A
Axial Non-Uniformity	+0.003	A	✓ A
Print Growth	-0.023		
Unused Error Corre...	+1.000	A	✓ A
Cell Modulation		A	✓ A
Fixed Pattern Damage		A	✓ A
Grid Non-Uniformity	+0.067	A	✓ A

3 By clicking the [Trigger] button to acquire an image and read the code, the result is displayed in the "Code Quality" screen. The reading result can be output with the whole grades or the grade of each item being added. For details, refer to 'Appendix 8 Adding code quality results (grades).'

A

Appendix 3 External Transfer of Images and Reading Results Using FTP

CF Series can transfer and save images (from successful reads, unsuccessful reads, or both) as well as read results to an external location using FTP. The following describes the method of saving images which cannot be read and saving code reading information.



- 1 Select [Buffering and Transfer] from the [Settings] tab.

Saving an image which cannot be read

2 **Image Buffering** Image PC Transfer Image FTP Transfer Result FTP Transfer

Buffering Settings

What Results to Buffer: No Read

What Images to Buffer for a Result: Auto

Images per Result Limit: 0

Image Buffer Maximum Size: 6

Available for Setup Tool / DMCC: 10

No Read Image Mode

No Read Image Mode: No Read Image Period

No Read Image Period: 1

No Read Image Number: 1

No Read Image Rate: 1 / Second

No Read Image Rate Burst: 1

Good Read Image Mode

Good Read Image Mode: Unlimited

Good Read Image Rate: 1 / Second

Good Read Image Rate Burst: 1

Buffer State

Number of Buffered Images: 0

Allow Buffer Overwrite

Delete After Transfer

Clear

Buffered Image Settings

Size: Full

Format: Bitmap

Quality: [Slider: Lowest (fast display) to Highest (slow display)]

Overlay Graphics

2 Configure the following settings.

"What Results to Buffer": No Read

"What Images to Buffer for a Result": Auto

"No Read Image Mode": No Read Image Period

"Size": Full

"Format": Bitmap

(Set "Full" and "Bitmap" to save the image for reproducing the phenomenon.)

A

③ Configure the following settings in the [Image FTP Transfer] tab.

Set information according to the FTP server to be used (Server Address, FTP port (normally 21), Username, and Password)

"File Name": Set a file name to be used as an image (default) file name. Additionally, when storing the file in a different place from the root directory, set a path name together.

When saving the file in the 'test' folder under the root folder: \test\image

"Max Append Value": Set the maximum number of files can be saved. The initial value is 999. Change the value as necessary.

"Transfer Mode": FTP - Runtime

Saving code reading information

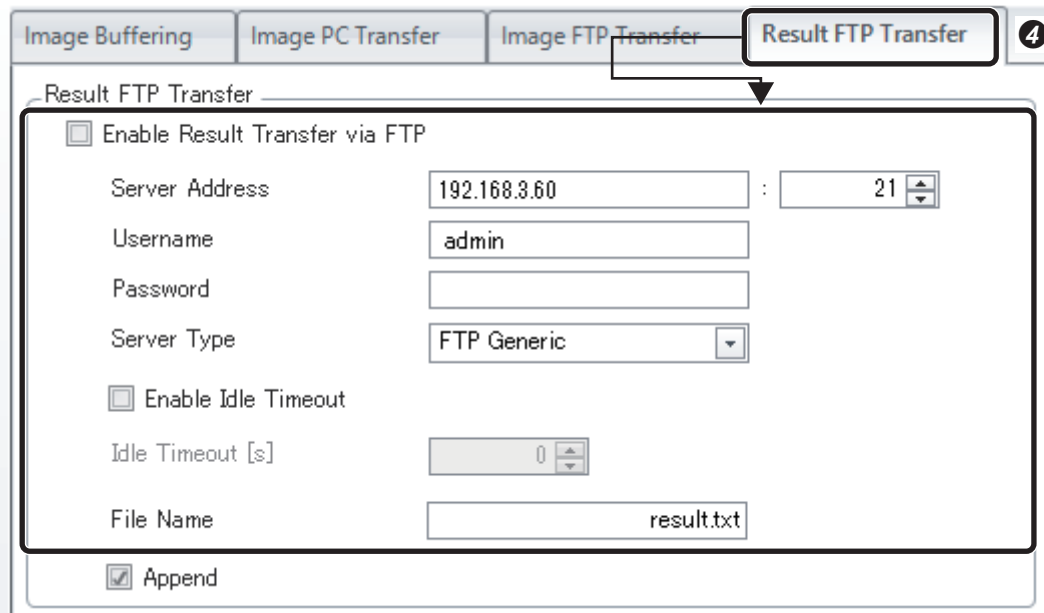


Image Buffering | Image PC Transfer | Image FTP Transfer | **Result FTP Transfer** 4

Result FTP Transfer

Enable Result Transfer via FTP

Server Address: 192.168.3.60 : 21

Username: admin

Password:

Server Type: FTP Generic

Enable Idle Timeout

Idle Timeout [s]: 0

File Name: result.txt

Append

4 Configure the following settings in the [Result FTP Transfer] tab.

Set information according to the FTP server to be used (Server Address, FTP port (normally 21), Username, and Password)
"File Name": Set a file name to be used as a result.txt (default) file name. Additionally, when storing the file in a different place from the root directory, set a path name together.

When saving the file in the 'test' folder under the root folder: \test\result.txt

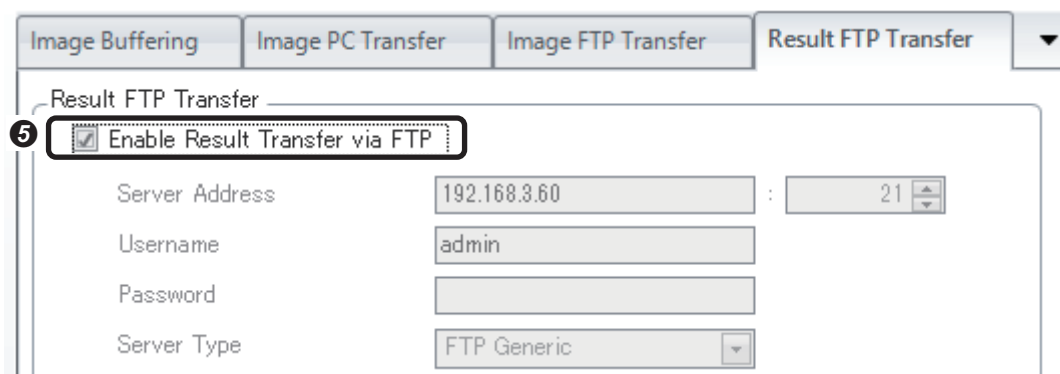


Image Buffering | Image PC Transfer | Image FTP Transfer | **Result FTP Transfer** ▼

Result FTP Transfer

5 Enable Result Transfer via FTP

Server Address: 192.168.3.60 : 21

Username: admin

Password:

Server Type: FTP Generic

5 Select the checkbox of "Enable Result Transfer via FTP."

A

Appendix 4 Supplemental Remarks for Tuning (1)

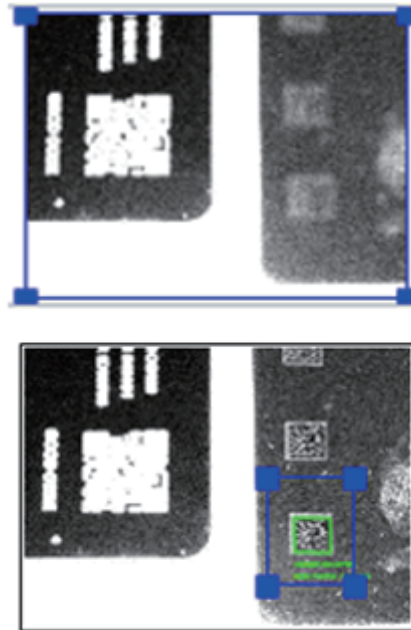
Adjusting a reading region

Focus adjustment in Tune may be failed if a work is a 3D object.

Additionally, a specific code may not be tuned when multiple codes are present within the reading range.

The corrective action for these cases can be taken by adjusting the reading region. The right image shows works with different height that are captured on the right and left side of the image. The bottom right code of the image is tuned by adjusting the reading region which is displayed with a blue frame.

Smaller reading region can shorten the tuning and reading time, and improve the reading rate.



Tuning after setting a lightening pattern

A lightening pattern can be set to turn ON and OFF the lights by clicking each light on the front view of the code reader which is displayed in [Optimize Image] of [Application Steps].

When executing tuning by clicking [▼] on the right side of the [Tune] button and disabling "Tune Light Banks," tuning with the set lightening pattern is executed.



- Tune Light Banks
- Enable Filter Tuning

- Force Exhaustive Tuning
- Optimize Focus During Tuning

Appendix 5 Supplemental Remarks for Tuning (2)

Tuning condition setting

Conditions for executing tuning can be set by clicking [▼] on the right side of [Tune].

- Tune Light Banks
- Force Exhaustive Tuning
- Enable Filter Tuning
- Optimize Focus During Tuning
- Exclude Ambient Light Results

Tune Light Banks: To execute tuning for optimizing a lightening pattern.

Force Exhaustive Tuning: To execute tuning by attempting all the lightening patterns.

Enable Filter Tuning: To execute tuning by using image filters.

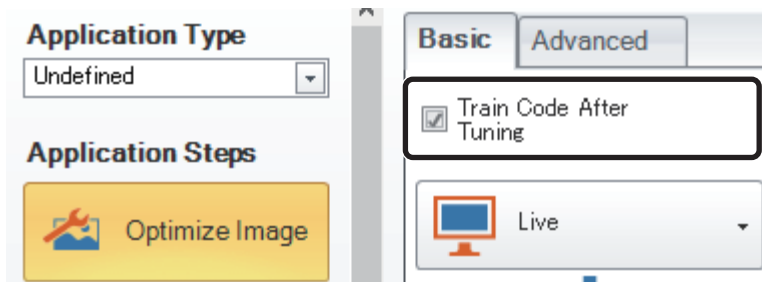
Optimize Focus During Tuning: To execute tuning for optimizing a focus of variable focus liquid lens.

Exclude Ambient Light Results: By enabling the setting, the pattern setting that keeps all the code reader lights turned OFF (reading codes using ambient light) is not selected.

When disabling "Train Code After Tuning" which is above the [Live] button, a code is not trained after tuning.

Whether or not a code is trained successfully can be checked by a completion message displayed in 'Image Panel' after tuning.

To cancel the code training, click [Untrain Code] on the upper right of 'Image Panel.'



A

Train Code

When 'Train Code' is executed, only codes that are matched with trained conditions are read in the read settings.

Information such as a code type, code size, module size, and polarity is trained.

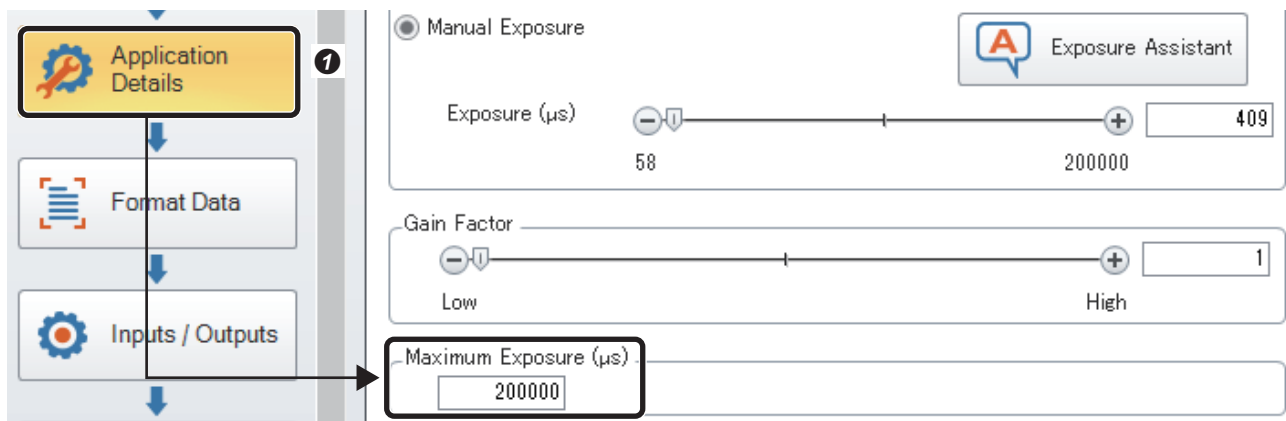
Appendix 6 Tuning After Optimizing Maximum Exposure Time

Exposure time indicates the time for acquiring an image. The longer the exposure time, the brighter the image becomes. However, if a target code moves (including vibration), the image blur is likely to be occurred. Additionally, the exposure time is added to the reading time; therefore, the whole processing time is prolonged.

The maximum exposure time of this code reader is '200,000 μs (200 ms).' When executing tuning with the initial setting for a CF26 Series type using a polarized filter ('LR' at the end of the type name), note that the maximum value may be set for the exposure time.

It is important to execute tuning after optimizing the maximum exposure time.

Restricting the maximum exposure time

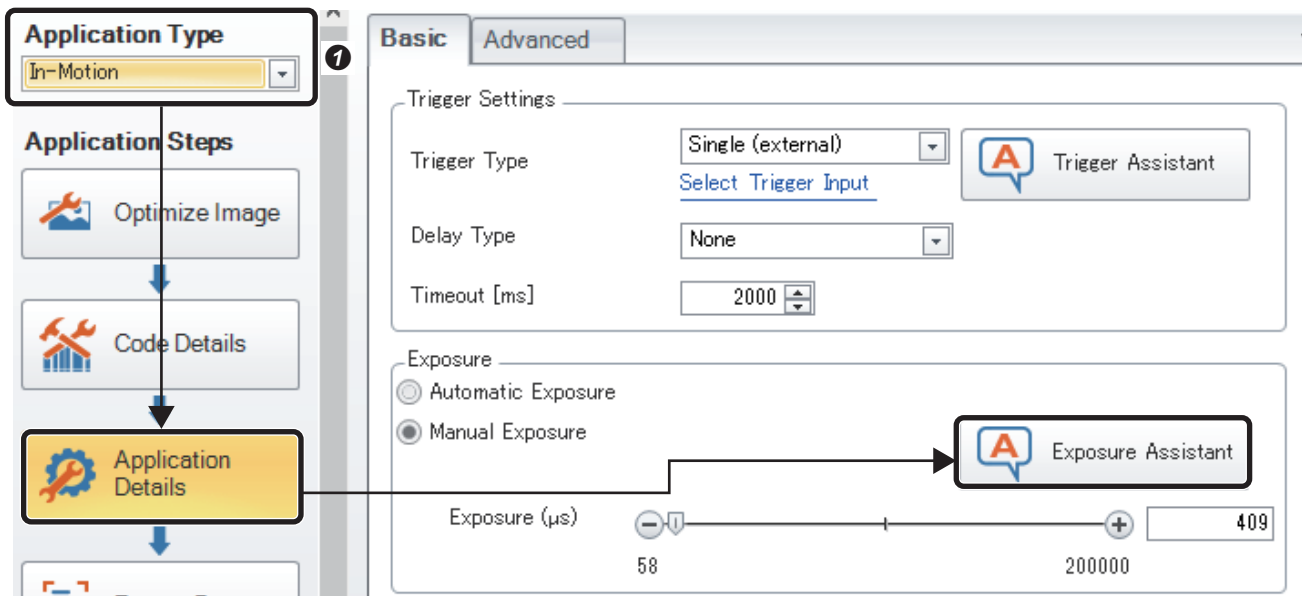


1 Click [Application Details] of [Application Steps].

Enter a value of "Maximum Exposure (μs)."

* Setting too small value may cause to fail tuning.

Setting exposure time adapted to the moving speed of a work



1 Set "In-Motion" for [Application Type] of [Application Steps].

Click [Application Details] and click [Exposure Assistant].

Exposure Assistant

1. Select one of the below application details to input!

Field of View Size

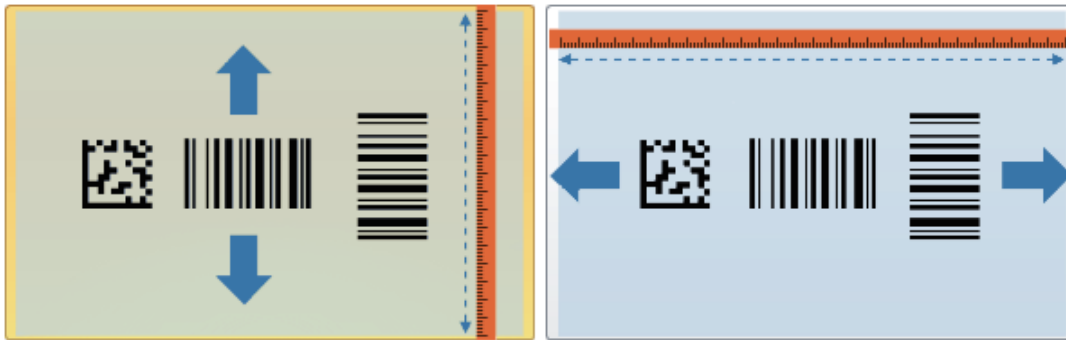
Lens / Distance to Code

Code Element Size

Units

Metric

2. Measure the field of view size in the direction of travel at the closest reading distance!



2 mm

3. Enter your maximum line speed

mm/s

Current Exposure is: μs

Absolute maximum exposure is: μs

Save and Close

Cancel

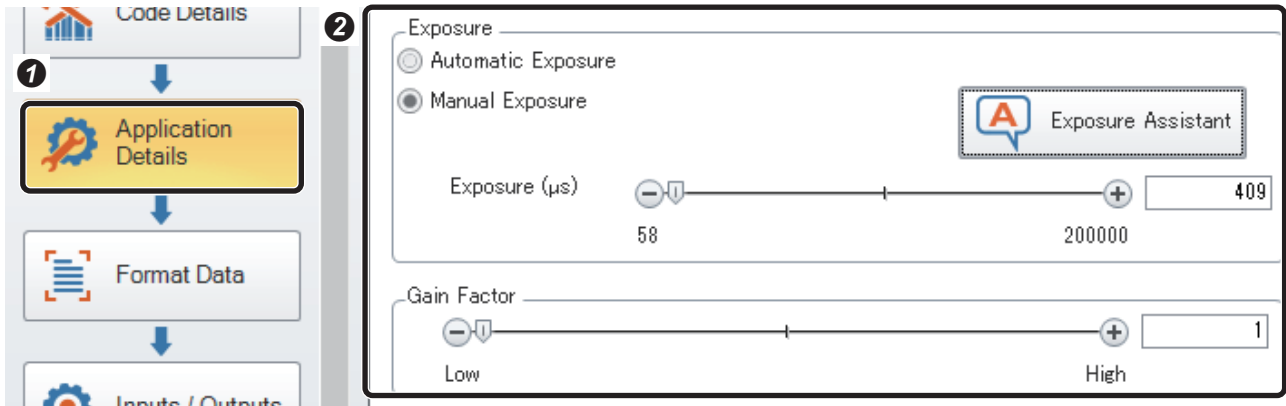
2 Enter a value of each required parameter and click [Save and Close].

A

Appendix 7 Exposure Time, Gain Factor, and Image Filtering

Adjusting exposure time and gain factor

The larger the values of 'Exposure' and 'Gain Factor,' the brighter the acquiring image becomes. Increase the "Gain Factor" value when the 'Exposure' value cannot be increased. 'Gain' indicates the sensitivity of an image sensor. Increasing the value can make an image brighter but the image quality becomes lower.



- 1 Click [Application Details] of [Application Steps].
- 2 Adjust values of 'Exposure' and 'Gain Factor.'

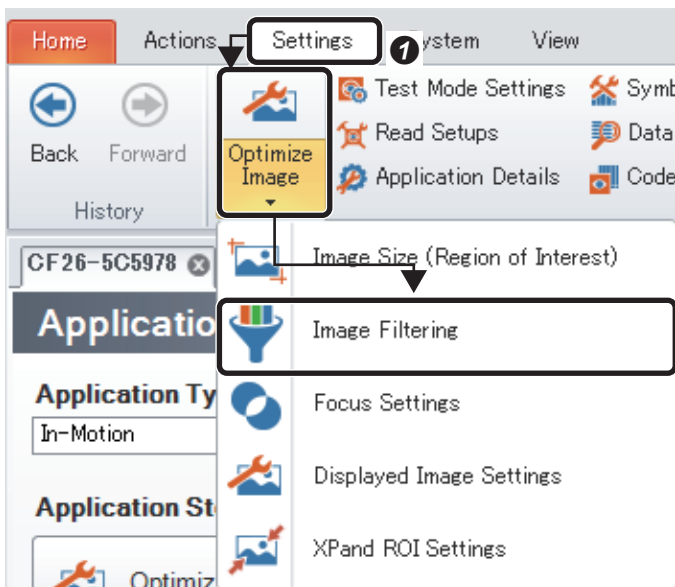
Image filtering

'Image Filtering' performs filtering processing on an acquired image and adjusts the image for making it easy to be read.

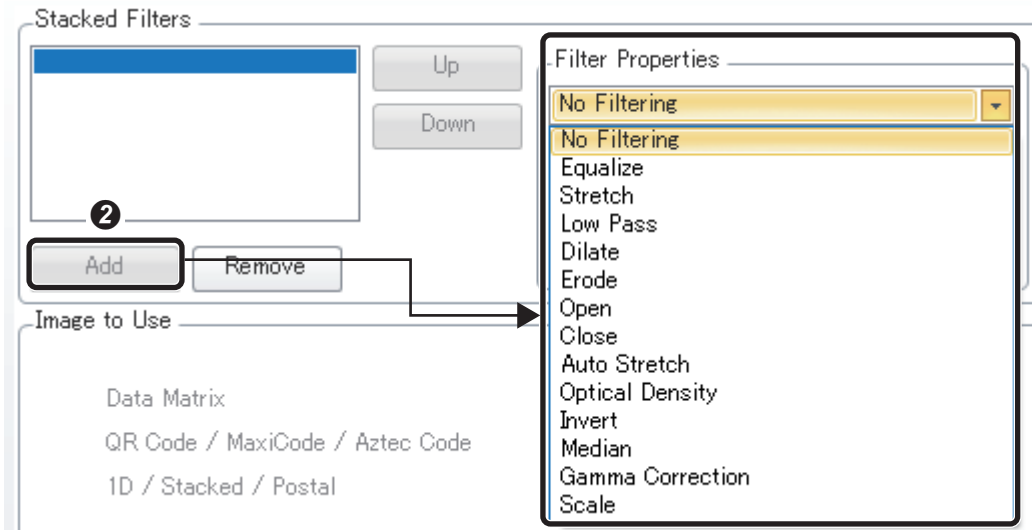
It is recommended to use only when a code is very difficult to be read.

It is based on the conditions (such as lightening patterns including installation conditions and external lights) of reading codes without 'Image Filtering' that are set by performing pre-assessment and test. 'Image Filtering' is taken into 'Read Setups.'

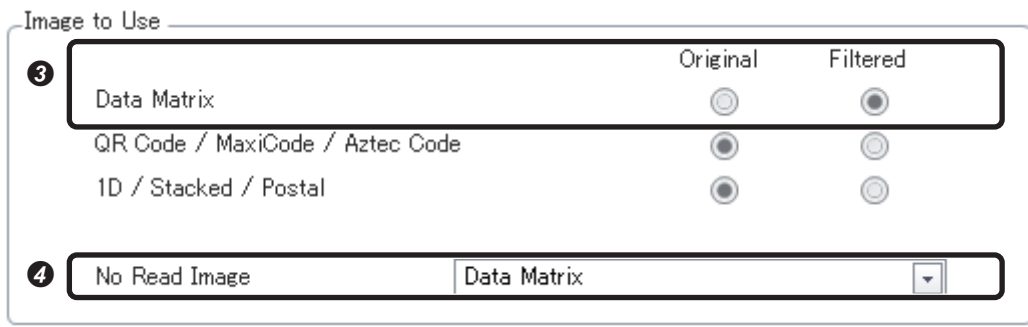
'Read Setups' is a function to switch set read parameter patterns internally. For details, refer to 'Appendix 1 Read Setups.'



- 1 Click the character part of [Optimize Image] in the [Settings] tab.



2 Click the [Add] button and select a filter type to use from "Filter Properties" to set the filter parameters.



3 Set an image to use for reading codes.

Original: Read an acquired image.

Filtered: Read a filtered image.

(In this example, the set filtered image is used for reading DataMatrix codes.)

4 By selecting a code to be read for "No Read Image" (DataMatrix in this example), a filtered image is displayed even when code reading is failed.

<Frequently used filter types>

Dilate: An image with a bright part being dilated.

Erode: An image with a dark part being dilated.

Stretch: To enlarge a difference of brightness and darkness of an image. When increasing the 'Low' value, the gray color in the image will become closer to black. When decreasing the 'High' value, the gray color will become closer to white.

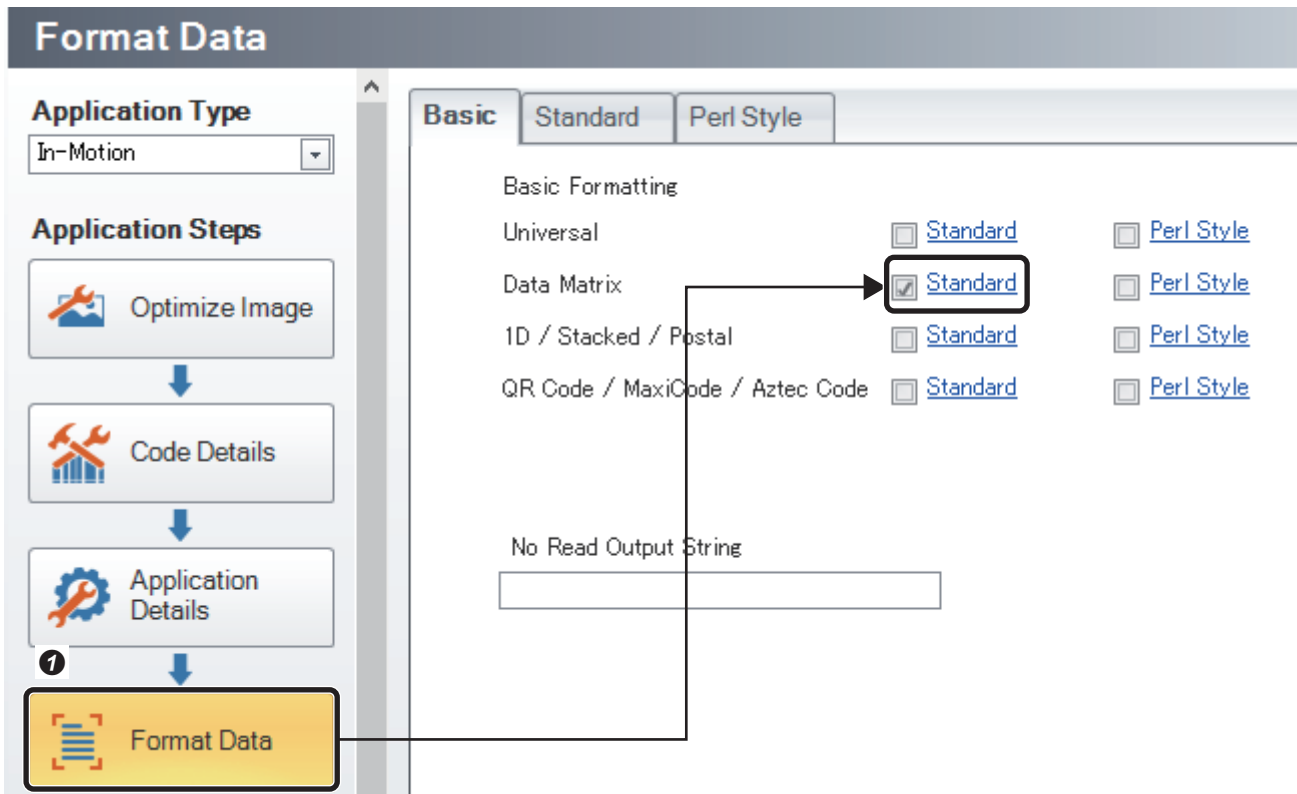


Appendix 8 Customizing Output Data

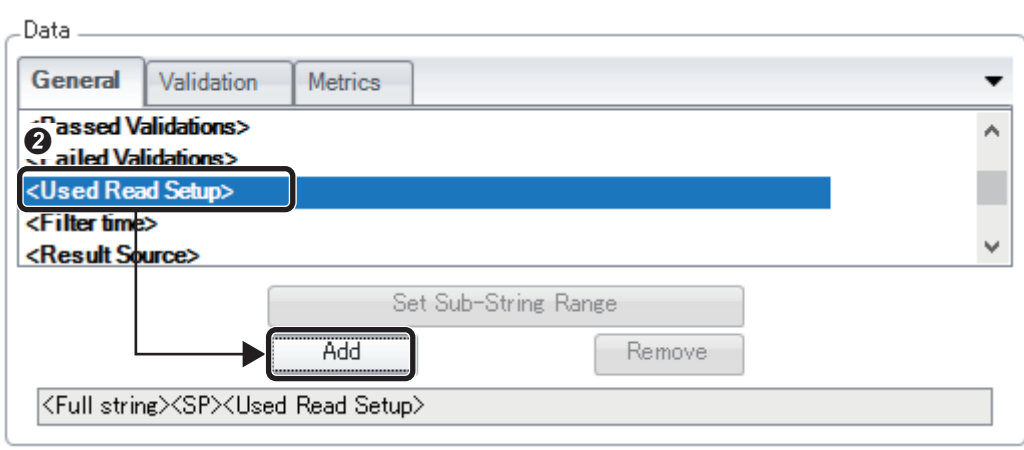
Adding the number of a read setup whose reading is succeeded to output data

For details of the read setups settings, refer to 'Appendix 1 Read Setups.'

The following describes the setting method when the target code is Data Matrix.



1 Select the [Format Data] of [Application Steps] and select the checkbox of "Standard" for "Data Matrix." Click "Standard" to move to the link.



2 Add "<Used Read Setup>" from "Data." When two read setups are trained and a code is read with the first read setup setting, read data is output with "0" being added to the data. For the second read setup, "1" added to the read data. (In the example above, <Used Read Setup> is added on top of <Full string> and <SP> which have already been added in advance.)

The following shows the output image with or without setting <Use Read Setup>.

<Full string>:

1234567890

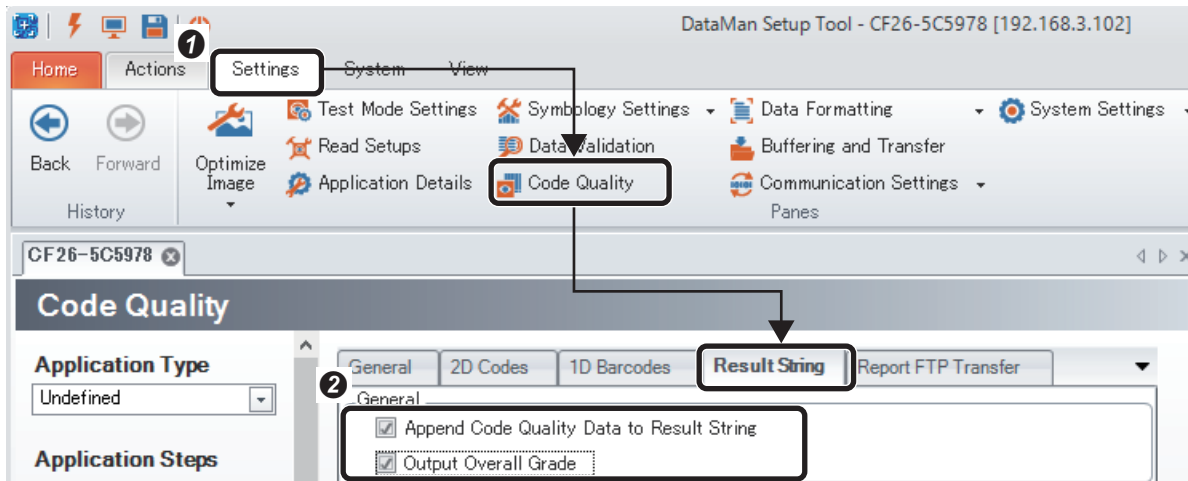
<Full string><SP><Used Read Setup>:

1234567890 1

Adding code quality results (grades)

It is assumed that the setting for executing Code Quality has already been set.

When other settings are required, add the settings to "Universal" as this setting is added to "Universal" of [Format Data].



1 Select [Code Quality] from the [Settings] tab, and select the [Result String] tab.

2 Select the checkbox of "Append Code Quality Data to Result String." By doing so, data is output by adding the data of each quality item to a reading result. The display example is shown below.

<A read result only>

1234567890

<With selecting the checkbox (Data prefix: abbreviation, data report: when a grade is set) >

1234567890 -SC:A,AN:A,PG:-,UEC:A,MOD:A,FPD:B,GN:A<0x0D><0x0A><0x0D><0x0A>

<With selecting the checkbox (Data prefix: abbreviation, data report: when a grade is set) >

1234567890 -Cell Contrast:A,Axial Non Uniformity:A,Print Growth:-,UEC:A,Cell Modulation:A,Fixed Pattern Damage:B,Grid Non Uniformity:A<0x0D><0x0A><0x0D><0x0A>

1234567890 -Cell Contrast:A,Axial Non Uniformity:A,Print Growth:-,
UEC:A,Cell Modulation:A,Fixed Pattern Damage:B,Grid Non Uniformity:A<0x0D><0x0A><0x0D><0x0A>

The checkbox of "Output Overall Grade" can also be selected when adding the whole grades. ("Output Overall Grade" cannot be executed without outputting data of each quality item.)

<With selecting "Output Overall Grade" (Data prefix: abbreviation, data report: when a grade is set) >

Without selecting the "Output Overall Grade" checkbox

1234567890 -SC:A,AN:A,PG:-,UEC:A,MOD:A,FPD:B,GN:A<0x0D><0x0A><0x0D><0x0A>

With selecting the "Output Overall Grade" checkbox

1234567890 -OG:B,SC:A,AN:A,PG:-,UEC:A,MOD:A,FPD:B,GN:A<0x0D><0x0A><0x0D><0x0A>

Overall Grade



Precautions

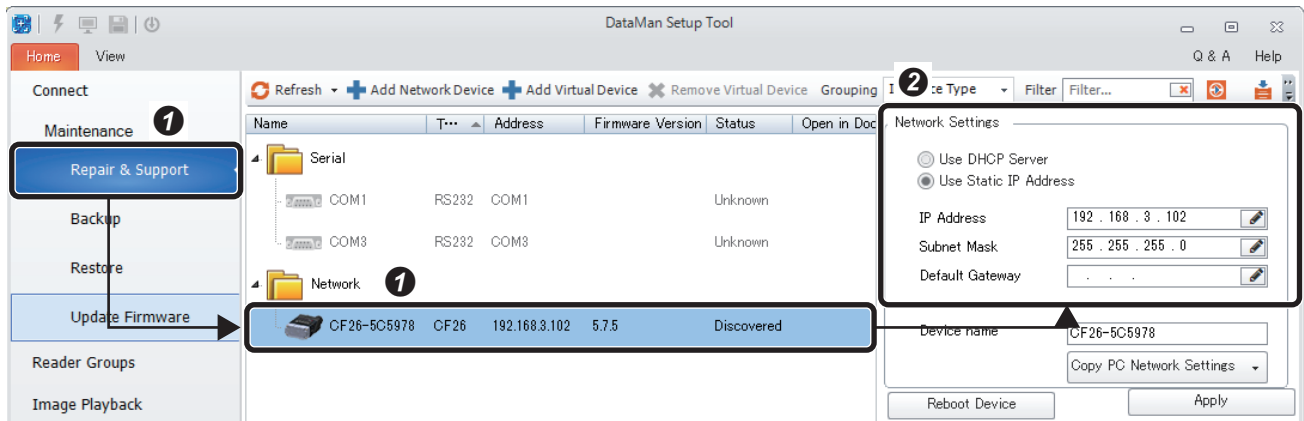
The following parameters of CF37 series cannot be changed from the default.

- "Output Overall Grade" [default: selected (output)]
- Prefix For Data [default: Acronym]
- Reported Data [default: Grade]
- Separator Before First PCM Value [default: - (hyphen)]
- Separator Between PCM Values [default: , (comma)]

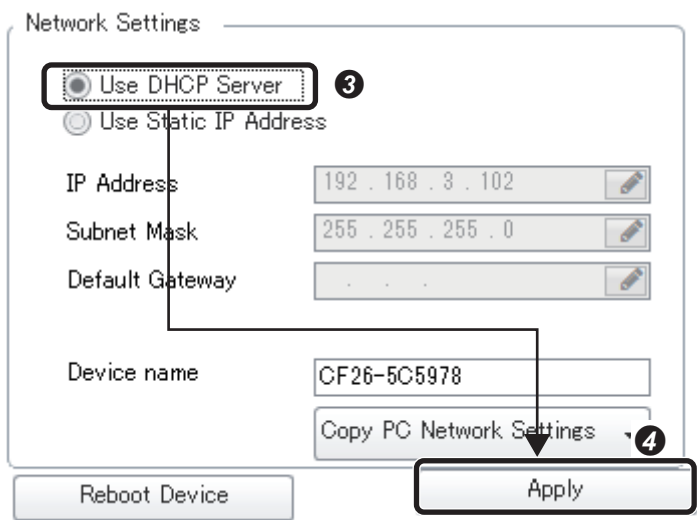
Appendix 9 Setting an IP Address to a Code Reader (DHCP)

In the default setting of a code reader, the IP address is automatically set using DHCP server. This section explains the procedure for changing the setting of the code reader in which a static IP address has already been set to the setting whose the IP address is automatically set using DHCP.

Start SetupTool.



- 1 Click [Repair & Support] on the left side of the SetupTool screen and select a code reader icon displayed under the "Network" section.
- 2 After the setting status of the code reader IP address is displayed on the right side of the screen, check that "Use Static IP Address" is selected.



- 3 Select "Use DHCP Server."
- 4 Click the [Apply] button.

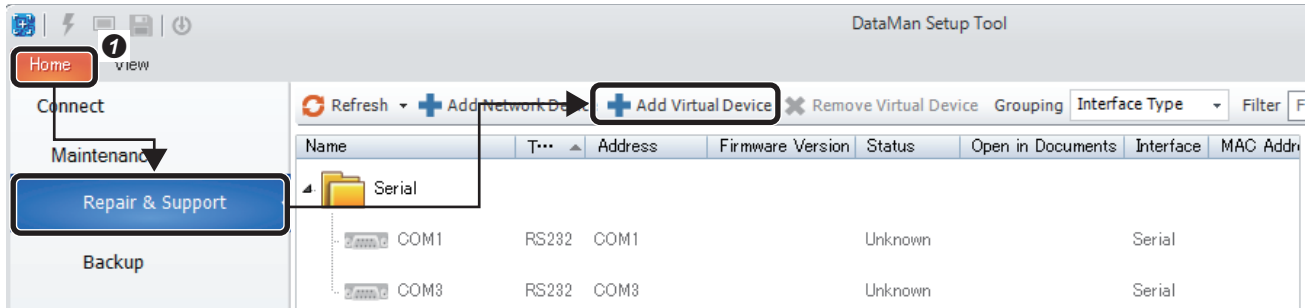
Wait for the code reader to be restarted and the IP address to be changed. (Time required: 30 sec)

The IP address is automatically set after starting the code reader.

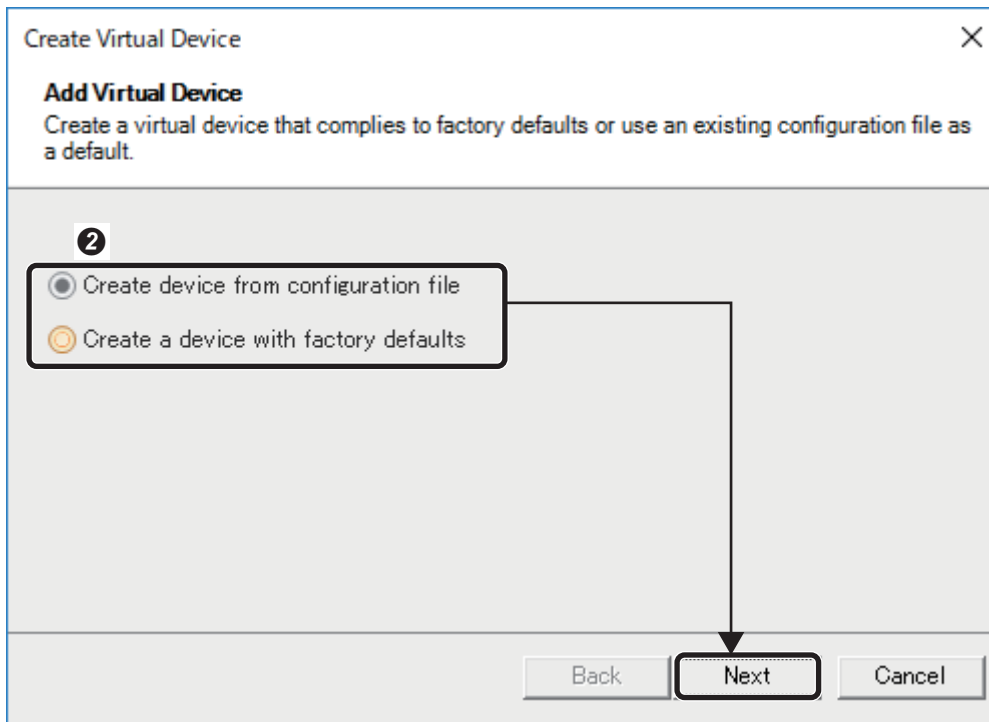


Appendix 10 Virtual Device

A virtual device can be created based on a configuration file or a default setting device. The created virtual device can be connected from SetupTool in the same way as a regular device. However, all settings are read-only and therefore the settings cannot be changed and operated. The virtual device is mainly used for checking the content of a saved configuration file in SetupTool.



- 1 Select [Repair & Support] in the [Home] tab and select [Add Virtual Device].



- 2 Select either "Create device from configuration file" or "Create a device with factory defaults" and click the [Next] button.

When "Create device from configuration file" is selected

The dialog box is titled "Create Virtual Device" and has a "Settings" section with the instruction "Provide information about the virtual device." It contains the following fields:

- Configuration File: C:\temp\test1.dmb (with a browse button and a circled '3' next to it)
- Valid configuration Firmware Version: 5.7.5
- Device Name: CF26-V0001
- Firmware Version: 5.7.5
- Model: CF26 (highlighted in yellow)

At the bottom are "Back", "Finish", and "Cancel" buttons. Arrows point from the "Finish" button to the "Model" dropdown and from the "Model" dropdown to the "Finish" button.

3 After selecting a configuration file, select a model and click the [Finish] button.

When "Create a device with factory defaults" is selected

The dialog box is titled "Create Virtual Device" and has a "Settings" section with the instruction "Provide information about the virtual device." It contains the following fields:

- Device Name: CF26-V0001
- Device Type: CF26 Devices
- Firmware Version: 5.7.5
- Model: CF26 (highlighted in yellow)

At the bottom are "Back", "Finish", and "Cancel" buttons. A circled '3' is next to the "Device Name" field. Arrows point from the "Finish" button to the "Device Name" field and from the "Model" dropdown to the "Finish" button.

3 Set "Device Name," "Device Type," "Firmware Version," and "Model" and then click the [Finish] button.



4

Name	T...	Address	Firmware Version	Status	Open in Documents	Interface
Serial						
COM1	RS232	COM1		Unknown		Serial
COM3	RS232	COM3		Unknown		Serial
Network						
CF26-5C5978	CF26	192.168.3.102	5.7.5	Discovered		Network
Virtual						
CF26-V0001	CF26		5.7.5	Discovered		Virtual

4 A virtual device is created. A character "V" which indicates a virtual device is displayed on the code reader icon.



Appendix 11 Outputting any characters from a decoded character string

A character string read with a code reader can be output by setting a range.

The output range can be set either on a code reader or programmable controller side.

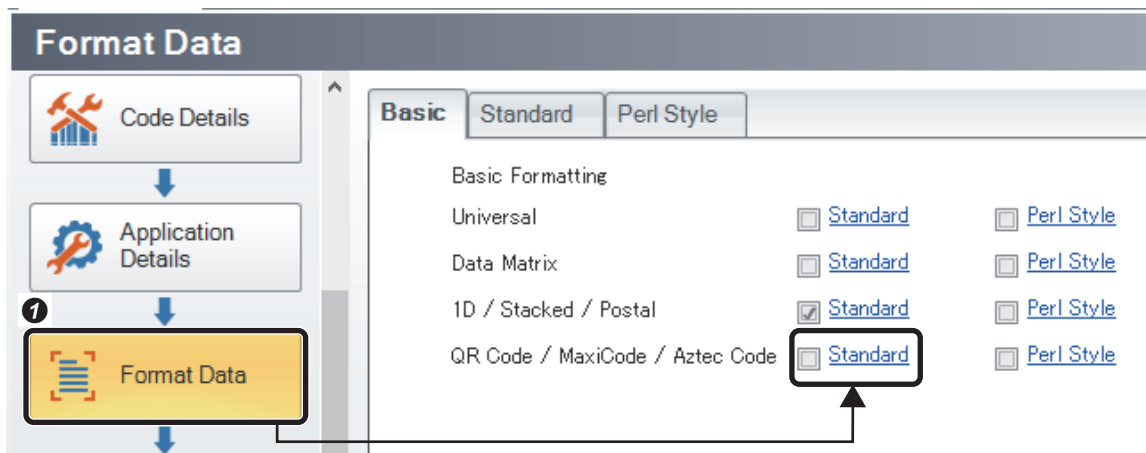
This section shows a procedure to specify a range using a string of 10 characters (1234567890).

On a code reader side

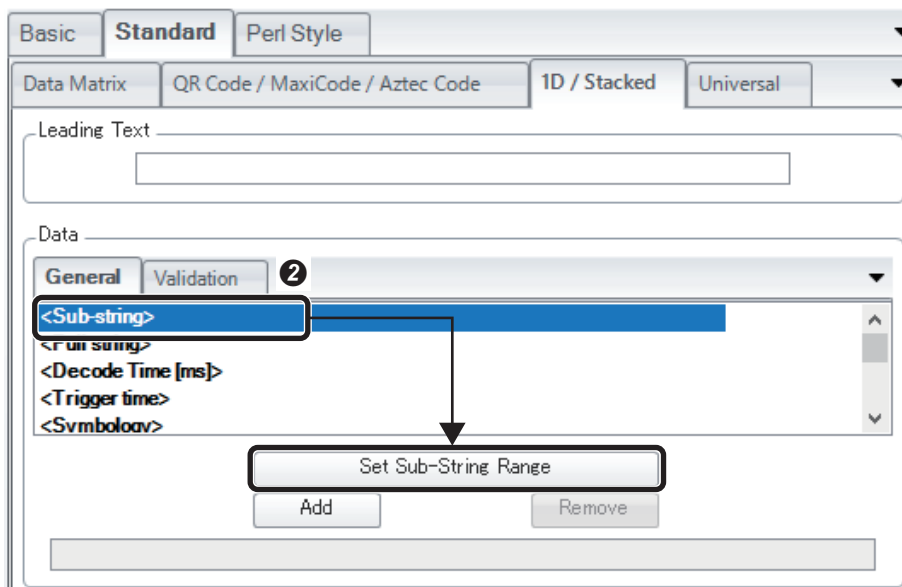
When specifying an output range on a code reader side, use SetupTool.

Setting an output range of a character string

1 Select the [Format Data] of [Application Steps] and select the checkbox of "Standard" for a code to be set. Click "Standard" to move to the link.



2 Select "<Sub-string>" of "Data," and click the [Set Sub-String Range] button.



3 Enter an output range in "Sub-string range," and click the [OK] button.

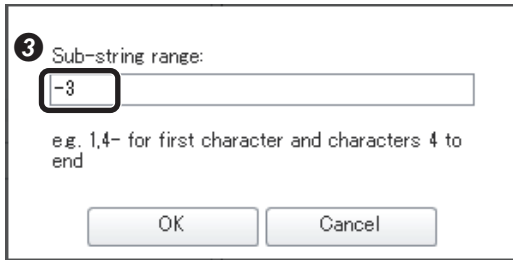
Examples of an output range which can be specified are as follows:

Output range	Sub-string range
From the 1st to 3rd characters	-3
From the 2nd to 5th characters	2-5
From the 8th to last characters	8-

Ex.

Output range: from the 1st to 3rd characters

Enter "-3."

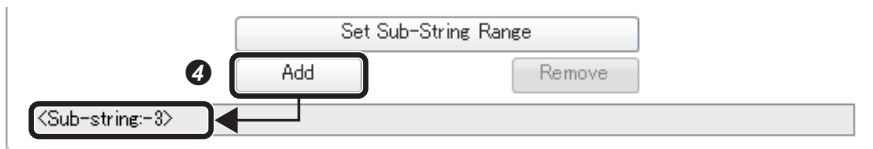


4 Click the [Add] button. The specified output range is displayed.

Ex.

Output range: from the 1st to 3rd characters

"<Sub-string:-3>" is displayed.



5 Click the [Test] button in "Output Options." A string based on the specified output range is displayed.

Ex.

Output range: from the 1st to 3rd characters

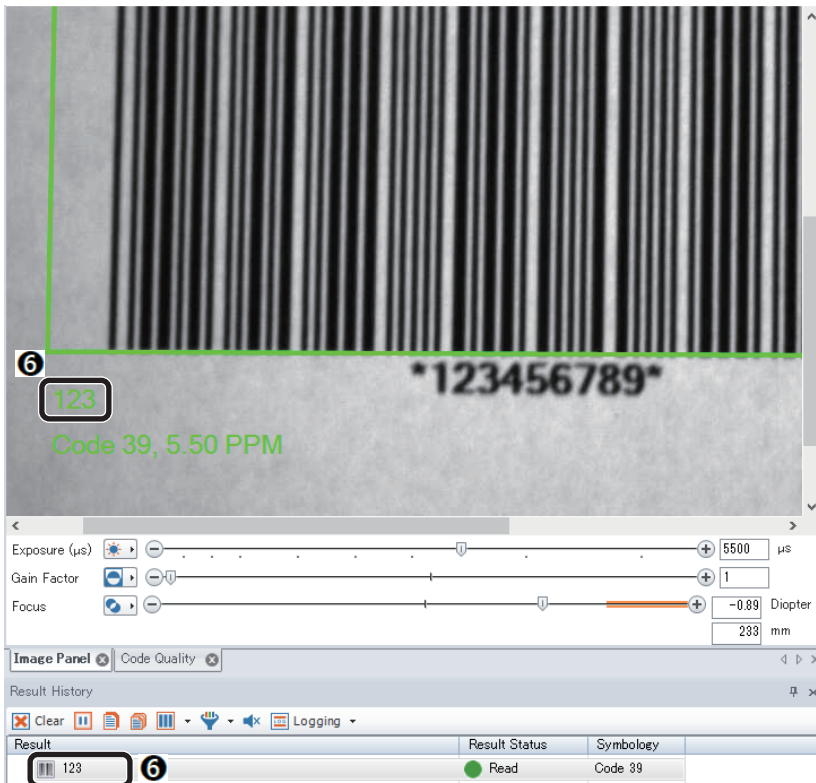
"123" is displayed.



6 Input a trigger, and a character string of the set range is output in the screen and "Result."

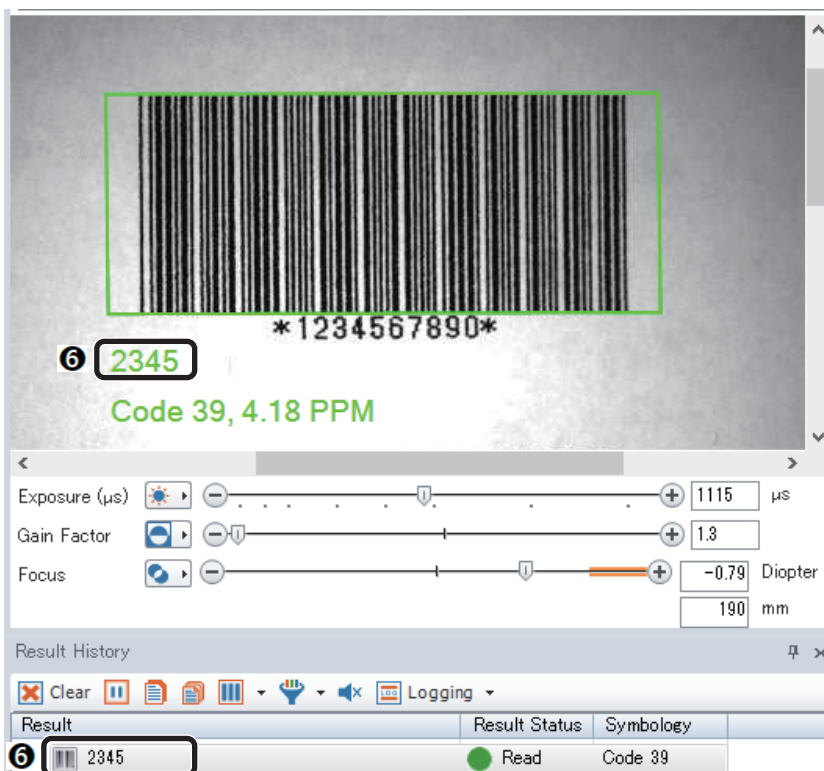
Ex.

Output range: from the 1st to 3rd characters



Ex.

Output range: from the 2nd to 5th characters



Ex.

Output range: from the 8th to last characters

The image shows a barcode scanner interface. At the top, a barcode is displayed with the number ***1234567890*** below it. A green box highlights the last three characters, **890**, which is also shown in a separate box with a circled '6' next to it. Below this, the text **Code 39, 4.68 PPM** is displayed. The interface includes three sliders: Exposure (1115 µs), Gain Factor (1.3), and Focus (-0.79 Diopter, 190 mm). Below the sliders is a 'Result History' section with a table:

Result	Result Status	Symbology
890	Read	Code 39

Point

To add CR/LF at the end of an output data, select the checkbox of "CR/LF" for "Terminating Text."

Terminating Text

 CR/LF

A

On a programmable controller side

When specifying an output range of a character string on a programmable controller side, the range can be specified by creating a program using the MIDR instruction.

The specifications and operation examples when using the MIDR instruction in MELSEC iQ-R series CPU modules are shown below.



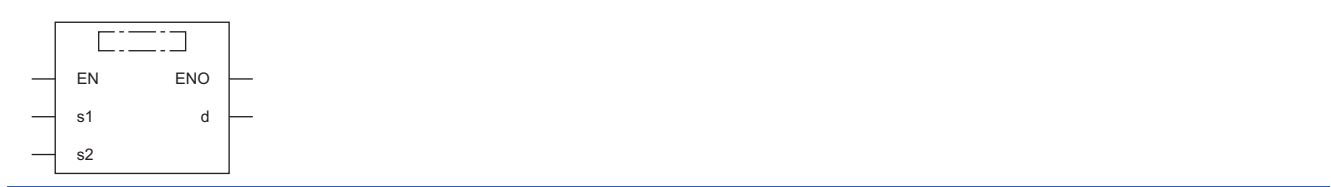
For details on the MIDR instruction, check in the manual of the CPU module used.

Extracting the specified string data MIDR(P)

These instructions extract data at any position in string data, and store the extracted data in the device number specified by (d) and later.

Ladder	ST
	ENO:=MIDR(EN,s1,s2,d); ENO:=MIDRP(EN,s1,s2,d);

FBD/LD



Execution condition

Instruction	Execution condition
MIDR	
MIDRP	

Setting data

Description, range, data type

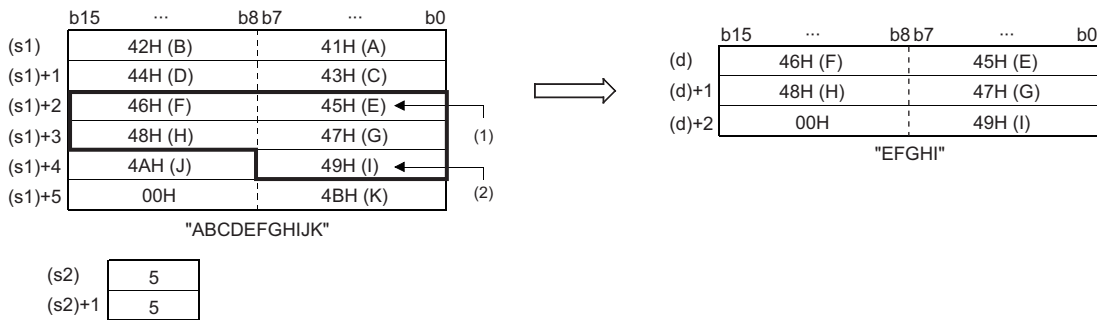
Operand	Description	Range	Data type	Data type (label)
(s1)	Character string or the start device containing the character string	—	Character string	ANYSTRING_SINGLE
(d)	Start device for storing the character string data of the operation result	—	Character string	ANYSTRING_SINGLE
(s2)	Start device for storing the location of the start character and the number of characters (s2): Location of start character, (s2)+1: Number of characters	—	16-bit signed binary	ANY16_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

Applicable devices

Operand	Bit		Word			Double word		Indirect specification	Constant			Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\□(H)G□	Z	LT, LST, LC	LZ		K, H	E	\$	
(s1)	—	—	○	—	—	—	—	○	—	—	○	—
(d)	—	—	○	—	—	—	—	○	—	—	—	—
(s2)	○	○	○	○	○	—	—	○	—	—	—	—

Processing details

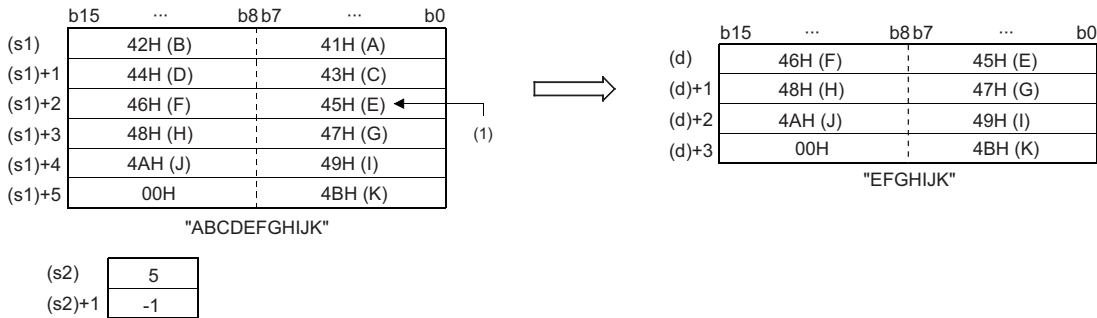
- These instructions extract the data by the number of characters specify by (s2)+1 from the location specified by (s2) in the character string data stored in the device number specified by (s1) and later, and store the extracted data in the device number specified by (d) and later.



(1) Position specified by (s2): 5th character

(2) ASCII code ((s2)+1)th character from the specified position

- The NULL code (00H) indicating the end of a character string is automatically added to the end of the character string data.
- If the number of characters in the device specified by (s2)+1 is '0', no processing is performed.
- When the number of characters of the data in the device specified by (s2)+1 is '-1', the data till the last character data in the device specified by (s1) is stored in the device specified by (d) and later.



(1) Position specified by (s2): 5th character

Operation error

Error code (SD0)	Description
2820H	There is no NULL code (00H) in each setting area in the device/label memory in the device specified by (s1) and later.
3405H	<p>The number of characters of the character string in the device specified by (s1) exceeds 16383.</p> <p>An out-of-range value is set to (s2).</p> <ul style="list-style-type: none"> • The value in the device specified by (s2) is 0 or less. • The value in the device specified by (s2)+1 is other than the valid values (-1, 0, 1 or bigger). • The value in the device specify by (s2) exceeds the number of characters in the device specified by (s1). • The value obtained by adding those in the devices specify by (s2) and (s2)+1 exceeds the number of characters in the device specified by (s1).

Operation examples

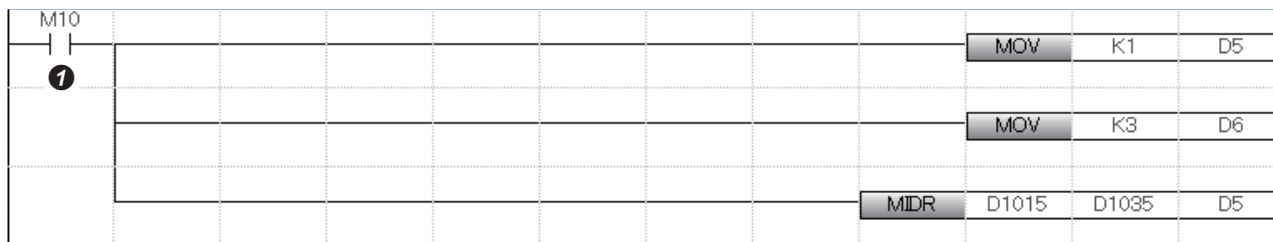
Check the operation with an engineering tool.

The following table shows operation conditions.

Device	Description
D5	Location of the first extracted character
D6(D5+1)	Number of extracted characters (However, '-1' means the number of characters from the first extracted character to last one.)
D1015	Storage location of read result (1234567890 has set)
D1035	Storage location of extracted character string

■When outputting a string from the 1st to 3rd characters

① Turn ON "M10."

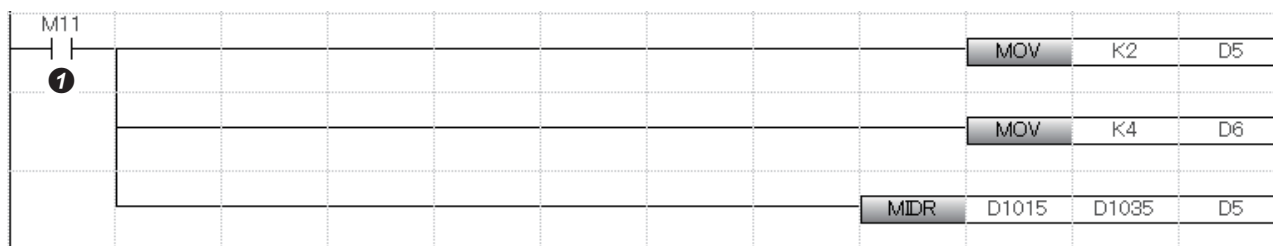


② A string of the 1st to 3rd characters "123" is displayed in "D1035" and later.

D1035	0 0 1 1 0 0 1 0 0 0 1 1 0 0 0 1	12849	12
D1036	0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 1	51	3.

■When outputting a string from the 2nd to 5th characters

① Turn ON "M11."

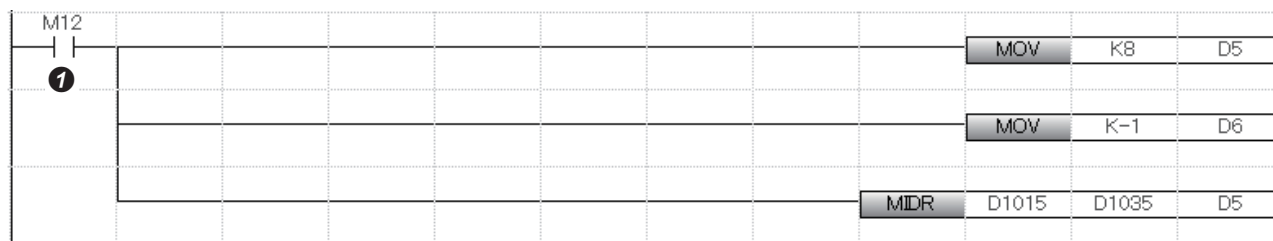


② A string of the 2nd to 5th characters "2345" is displayed in "D1035" and later.

D1035	0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 0	13106	23
D1036	0 0 1 1 0 1 0 1 0 0 1 1 0 1 0 0	13620	45

■When outputting a string from the 8th to last characters

① Turn ON "M12."



② A string of the 8th to last characters "890" is displayed in "D1035" and later.

D1035	0 0 1 1 1 0 0 1 0 0 1 1 1 0 0 0	14648	89
D1036	0 0 0 0 1 1 0 1 0 0 1 1 1 0 0 0	3376	0.

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
October 2019	BCN-P5999-1258-A	First edition
June 2020	BCN-P5999-1258-B	■Added or modified parts Section 6.8, Appendix 11
May 2021	BCN-P5999-1258-C	■Added or modified parts Section 1.1, Section 1.2, Section 2.1, Section 4.1, Section 5.2, Section 8.6, Appendix 11
September 2022	BCN-P5999-1258-D	■Added or modified parts CONDITIONS OF USE FOR THE PRODUCT, Section 8.1, Section 8.7, Appendix 8, COPYRIGHTS
March 2024	BCN-P5999-1258-E	■Added or modified parts SAFETY PRECAUTIONS, Section 5.2, Section 6.9, Section 9.3

Japanese manual number: BCN-P5999-1257-F

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BCN-P5999-1258-E(2403)

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS: 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA 461-8670, JAPAN

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