

FA Sensor



Code Reader CF26 User's Manual

-CF26-SR
-CF26-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

PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS

Code readers are designed and manufactured by Cognex Corporation. Note that the warranty and general specifications of code readers differ from that of programmable controller products.

- Warranty

Item	Description
Free warranty period	18 months after delivery or 24 months after manufacture
Repair period after discontinuation of manufacture	7 years

- General specifications

Item	Specifications
Ambient operating temperature	0 to 40°C
Ambient storage temperature	-10 to 60°C
Maximum humidity	Less than 95% RH, non-condensing
Vibration resistance	IEC 60068-2-6: A vibration of 10 G (10 to 500 Hz at 100 m/s ² with 15 mm width) was applied to each of the three main axes for 2 hours.
Shock resistance	IEC 60068-2-27: 1000 half sinusoidal shocks with 11 G (10 ms) were applied.
Protective structure	IP65
Installation location ^{*1}	Outside a control panel

*1 Do not install it in the following places:

- Where the ambient temperature or humidity exceed the applicable ranges
- Where condensation occurs due to sudden temperature changes
- Where there is corrosive or flammable gas
- Where there are a lot of conductible dust, iron filings, or salt
- Where in danger of organic solvents, such as benzene, thinner, and alcohol or strong alkaline substances such as caustic soda to adhere
- Where subject to much vibration or shock
- Where in danger of liquid such as water, oil, or chemicals to adhere

CE

This section describes a summary of precautions when bringing into CE conformance the machinery formed by using the code reader.

Note that the descriptive content is material created based on regulation requirements and standards obtained by Mitsubishi Electric Corporation. However, machinery manufactured in accordance with this content is not necessarily guaranteed to conform with the above commands.

Final judgment regarding CE conformance or the method of conformance must be the judgment of the machinery manufacturer itself.

To meet the CE compliant conditions, implement the following items.

- Significant amount of noise on the power source may cause malfunction. Use an isolating transformer for the power supply. Additionally, install a noise filter (RSEN-2006 by TDK-Lambda or an equivalent product) between the code reader and the regulated DC power supply.

Precautions

Ground the FG terminal with the ground cable as short as possible (with the length of 30 cm or shorter).

- EMC application

Item	Description
EMC applicable standard	EN61131-2: 2007



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 the 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 to 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.
-

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 specifications, functions, system configuration, system construction, installation, maintenance and inspection, and troubleshooting to use the code readers listed below.

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.

Please make sure that the end users read this manual.

Available code readers

Product name	Model
CF26	CF26-SR, CF26-LR

CONTENTS

PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS	1
SAFETY PRECAUTIONS	3
PRECAUTIONS FOR USE	4
CONDITIONS OF USE FOR THE PRODUCT	5
INTRODUCTION	6
RELEVANT MANUALS	9
TERMS	10
CHAPTER 1 PRODUCT OVERVIEW	11
CHAPTER 2 PART NAMES	13
CHAPTER 3 SPECIFICATIONS	15
3.1 General Specifications	15
3.2 Performance Specifications	16
Working distance and field of view	17
3.3 Indicator Display Specifications	19
3.4 [TRIG] Button Operational Specifications	20
3.5 [TUNE] Button Operational Specifications	21
3.6 I/O Specifications	22
Image acquisition trigger	22
3.7 Cable Specifications	25
Ethernet cable (COGNEX product)	25
Breakout cable (COGNEX product)	26
CHAPTER 4 FUNCTIONS	27
4.1 Function List	27
CHAPTER 5 SYSTEM CONFIGURATION	29
5.1 Ethernet Connection	29
Ethernet	29
Ethernet + I/O	30
5.2 RS-232 Connection	31
RS-232	31
RS-232 + I/O	32
5.3 Hardware Components	33
5.4 Configurations and Optional Items of Code Reader CF26	34
Configuration of code reader CF26-SR	34
Configuration of code reader CF26-LR	34
Items to prepare as needed	34
5.5 Available Modules and Configuration Tools	35
Modules	35
Configuration tools	35
5.6 Items to Prepare	36
Breakout cable (COGNEX product)	36
Ethernet cable (COGNEX product)	36
CHAPTER 6 SYSTEM CONSTRUCTION	37

6.1	Installation Environment	37
6.2	Angle Change of a Code Reader CF26	37
6.3	Installation of a Code Reader CF26	40
	Installation in a straight configuration	40
	Installation in a right angle configuration	40
6.4	Connection of an Ethernet Cable (COGNEX Product)	41
6.5	Connection of a Breakout Cable (COGNEX Product)	42
	Connection example of RS-232	43
	Connection example of an I/O module	44
 CHAPTER 7 INSTALLATION		 46
7.1	Software Installation	46
7.2	Registration of a Profile	46
 CHAPTER 8 MAINTENANCE AND INSPECTION		 48
8.1	Cleaning a Code Reader CF26 Housing	48
8.2	Cleaning an Image Sensor Window	48
8.3	Cleaning a Lens Cover	48
 CHAPTER 9 TROUBLESHOOTING		 50
9.1	Error Checking Method	50
 APPENDIX		 52
Appendix 1 EMC and Low Voltage Directives		52
	Measures to comply with the EMC Directive	52
	Measures to comply with the Low Voltage Directive	53
	UL/cUL	53
Appendix 2 External Dimensions		54
REVISIONS		56
WARRANTY		57
INFORMATION AND SERVICES		58
TRADEMARKS		58

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Code Reader CF26 User's Manual [SH-082092ENG] (this manual)	Functions, installation methods, system configuration, required hardware components etc. of the code reader	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
Code Reader Setting Guide [BCN-P5999-1258]	Basic operations of DataMan Setup Tool for MELSENSOR	e-Manual PDF

Point

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.

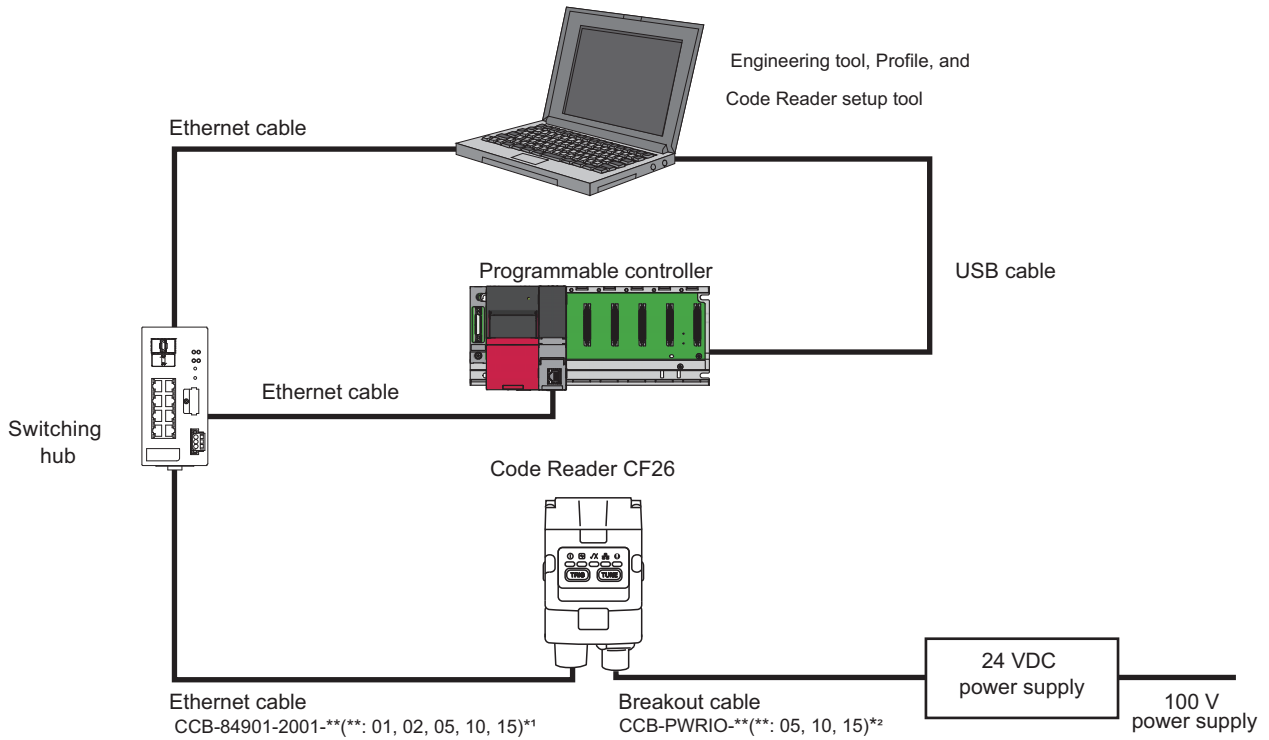
TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
1DMax™	A 1-D code reading algorithm optimized for omnidirectional code reading. It can handle variation in contrast, blur, damage, poor print quality, specularly, low resolution, quiet zone violation, and perspective distortion. By applying 1DMax, a reading failure is drastically reduced and that improves capacity utilization.
2DMax™	A 2-D code reading algorithm. 2DMax™ with PowerGrid™ technology reads severely damaged or poorly printed 2-D matrix codes, and can even decode 2-D codes with blurred perimeter or with no quiet zone.
Built-in Ethernet port LCPU	A generic term for L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, and L26CPU-PBT.
CC-Link IE Field Network Basic	CC-Link IE Field Network Basic is a factory automation network using standard Ethernet. Data is periodically exchanged between a master station and slave stations using link devices (cyclic transmission).
DataMan	The name of the industrial barcode reader from Cognex Corporation.
DMCC	An abbreviation for DataMan Control Commands. A method for setting and controlling a code reader directly by using custom applications or using a program from a COM port. A code reader with an RS-232 connector or a USB connector can be controlled in a COM port connection. On the other hand, a code reader which supports Ethernet can be controlled with a Telnet protocol.
Engineering tool	A tool for setting, programming, debugging, and maintenance of programmable controller. A generic term for GX Works2, GX Works3, and MELSOFT Navigator.
Exposure time	In photographing by a camera, the time that imager type being exposed to the light through the lens after the shutter is opened.
FTP	An abbreviation of File Transfer Protocol. The communication protocol to transfer files on the network.
FX3UCPU	A generic term for FX3UCPU and FX3UCCPU.
FX5CPU	A generic term for MELSEC iQ-F series CPU modules.
GX Works2	A generic product name for SWnDND-GXW2 and SWnDNC-GXW2. ('n' indicates its version.) GX Works2 corresponding to MELSOFT Navigator is the product later than GX Works2 Version 1.11M. A configuration tool used for setting of MELSEC-Q/L.
GX Works3	A generic product name for SWnDND-GXW3. ('n' indicates its version.) A configuration tool used for setting of MELSEC iQ-R/iQ-F.
High-speed Universal model QCPU	A generic term for Q03UDVCP, Q04UDVCP, Q06UDVCP, Q13UDVCP, and Q26UDVCP.
HotBars II™	One of the image processing algorithm which is used by Cognex® DataMan image processing barcode reader. 1-D linear barcodes being damaged or in low quality can be decoded rapidly by using the algorithm.
MELSOFT Navigator	A product name for the integrated development environment included in SWnDND-IQWK (MELSOFT iQ Works). ('n' indicates its version.)
One-dimensional code (1-D code)	A code containing information such as numbers, texts, and symbols. The information represents by varying the widths and spacing of parallel lines, and it is encoded in 1-D in accordance with the predefined rule.
PowerGrid™ technology	In PowerGrid technology, 2-D codes whose finder pattern, clocking pattern, or quiet zone are completely missing can be read.
QnUDE(H)CPU	A generic term for Q03UDEHCP, Q04UDEHCP, Q06UDEHCP, Q10UDEHCP, Q13UDEHCP, Q20UDEHCP, Q26UDEHCP, Q50UDEHCP, and Q100UDEHCP.
RnCPU	A generic term for R04CPU, R08CPU, R16CPU, R32CPU, and R120CPU.
RnENCPU	A generic term for R04ENCPU, R08ENCPU, R16ENCPU, R32ENCPU, and R120ENCPU.
SLMP	An abbreviation of SeamLess Message Protocol. The protocol to access the programmable controller connected from the external device to the SLMP corresponding device, or connected to the SLMP corresponding device.
Stacked code	A code display system which consists of 1-D codes being piled on top of one another, and contains information vertically and horizontally.
Two-dimensional code (2-D code)	A code containing information both horizontally and vertically. Compared to 1-D code, it can deal with large amounts of information despite that the print area is limited.
Universal model process CPU	A generic term for Q04UDPVCP, Q06UDPVCP, Q13UDPVCP, and Q26UDPVCP.

1 PRODUCT OVERVIEW

Code reader CF26 is a compact code reader for quality control in an inspection process and inventory control in a shipment process.



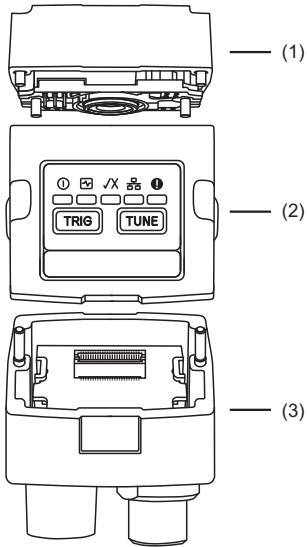
*1 Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight

*2 Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

2 PART NAMES

Standard components

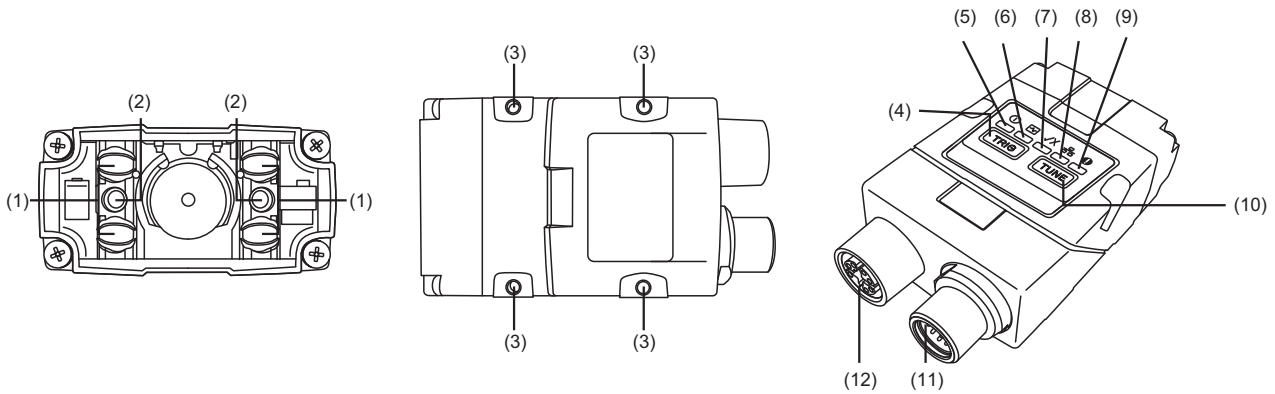
The following shows the three main modules of a code reader CF26.



No.	Name	Description
(1)	Optics module	Lens, lights, front cover
(2)	Main module	Sensor, CPU
(3)	I/O connector module	Power supply, I/O, RS-232 connector, Ethernet connector

Connectors and indicators

The following shows the built-in lighting system and other features of a code reader CF26.



No.	Name
(1)	Integrated lights
(2)	LED aimer guides
(3)	Mounting holes (M3×3.5 mm)
(4)	[TRIG] button
(5)	Power indicator
(6)	Registration status indicator
(7)	Read success/fail indicator
(8)	Network status indicator
(9)	Error indicator
(10)	[TUNE] button
(11)	Power, I/O and RS-232 connector
(12)	Ethernet connector

3 SPECIFICATIONS

This chapter shows the specifications of code reader CF26s.

3.1 General Specifications

The following shows the general specifications of code reader CF26s.

Item	Specifications
Ambient operating temperature	0 to 40°C
Ambient storage temperature	-10 to 60°C
Maximum humidity	Less than 95% RH, non-condensing
Vibration resistance	IEC 60068-2-6: A vibration of 10 G (10 to 500 Hz at 100 m/s ² with 15 mm width) was applied to each of the three main axes for 2 hours.
Shock resistance	IEC 60068-2-27: 1000 half sinusoidal shocks with 11 G (10 ms) were applied.
Protective structure	IP65 (when all the connectors are connected to cables or sealed with sealing caps)
Installation location ^{*1}	Outside a control panel

*1 Do not install it in the following places:

- Where the ambient temperature or humidity exceed the applicable ranges
- Where condensation occurs due to sudden temperature changes
- Where there is corrosive or flammable gas
- Where there are a lot of conductible dust, iron filings, or salt
- Where in danger of organic solvents, such as benzene, thinner, and alcohol or strong alkaline substances such as caustic soda to adhere
- Where subject to much vibration or shock
- Where in danger of liquid such as water, oil, or chemicals to adhere

3.2 Performance Specifications

The following shows the performance specifications of code reader CF26s.

Item		CF26-SR	CF26-LR
Supported codes	1-D code	Code 128, Code 25, Code 93, Code 39, PharmaCode, Codabar, Interleaved 2 of 5, UPC/EAN/JAN, MSI	
	2-D code	Data Matrix (ECC 0, 50, 80, 100, 140, 200), QR Code, Micro QR Code, MaxiCode, Aztec Code, VeriCode ^{*1}	
	Stacked code	PDF 417, EAN.UCC Composite, Micro PDF 417, DataBar	
Reading direction for 1-D code		All directions	
Reading algorithm		1DMax™ 2DMax™ (PowerGrid™ technology is available.) HotBars II™	
Image sensor		1/3 inch CMOS, 4.8 mm × 3.6 mm (W × H), 3.75 μm sq.pixels, global shutter	
Lens		S-mount/6.2 mm F: 5, liquid lens	S-mount/16 mm F: 7, liquid lens
Maximum image resolution (pixels)		1280 × 960	
Maximum scan speed ^{*2}		45 full frames per second	
Maximum decode rate		45/sec	
Power supply requirements		External power supply: 24 VDC ±10% LPS or NEC class 2 only	
Current consumption		Typ. 0.25 A, Max. 1.0 A ^{*3}	
Input 0 (trigger)	—	Opto-isolated image acquisition trigger input × 1	
	Voltage	• ON: 15 to 25 VDC (standard 24 VDC) • OFF: 0 to 5 VDC (standard 0 VDC)	
	Current	• 4.2 mA/24 VDC	
Input 1 (general-purpose input)	—	Opto-isolated general-purpose input × 1	
	Voltage	• ON: 15 to 25 VDC (standard 24 VDC) • OFF: 0 to 5 VDC (standard 0 VDC)	
	Current	• 4.2 mA/24 VDC	
Output 0 to 3	—	Opto-isolated general-purpose output × 4	
	Voltage	• 28 VDC maximum through external load	
	Current	• ON: Max. 50 mA (sink or source) • OFF: Leakage current Max. 100 μA • External load resistance: 150Ω/12 VDC, 470Ω/24 VDC	
Communication		RS-232 (RxD, TxD (TIA/EIA-232-F compliant)), Ethernet, CC-Link IE Field Network Basic, SLMP, FTP	
RS-232 communication method		Full-duplex communication or half-duplex communication	
Ethernet communication speed		10/100 Mbps	
Material		Aluminum	
Mounting		M3 screw hole × 4	
Dimensions		Straight configuration: 44.0 mm × 22.5 mm × 79.3 mm Right-angle configuration: 44.0 mm × 52.0 mm × 49.3 mm	Straight configuration: 44.0 mm × 22.5 mm × 94.5 mm Right-angle configuration: 44.0 mm × 52.0 mm × 64.5 mm
Weight		0.14kg	0.19kg

*1 A license needs to be purchased from Veritec Iconix Ventures Inc.

*2 Maximum frame rate at minimum exposure

*3 May be reached if the optics module operates while reading a code.

Working distance and field of view

The distance from a lens to an inspection target is referred to as 'working distance', and an area where a code reader can see at that distance is referred to as 'field of view.'

As the working distance increases, so does the field of view.

Code reader CF26-SR (6.2 mm lens)

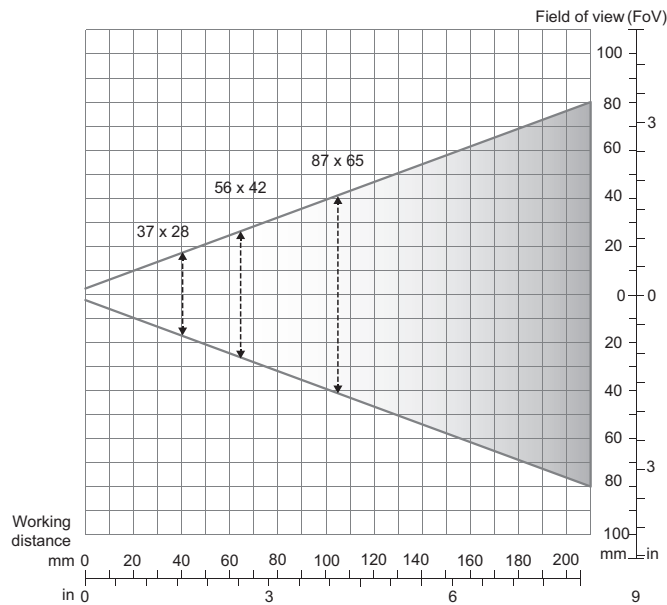
The following shows the minimum code sizes that can be read in each working distance.

Unit: mm

Working distance	Minimum size for 1-D code	Minimum size for 2-D code
40	0.0508 (2 mil)	0.0762 (3 mil)
65	0.0508 (2 mil)	0.1016 (4 mil)
105	0.127 (5 mil)	0.1778 (7 mil)

1 mil = 1/1000 inch = 0.0254 mm = 25.4 μm (Mil (milliinch) is the size of a single cell.)

The following figure shows the field of view in horizontal direction and vertical direction.



Code reader CF26-LR (16 mm lens)

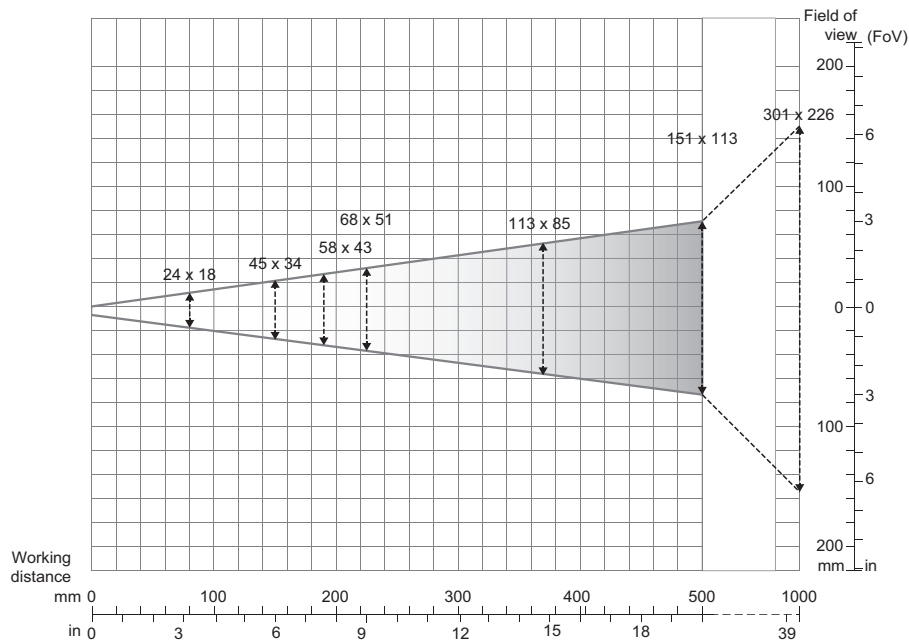
The following shows the minimum code sizes that can be read in each working distance.

Unit: mm

Working distance	Minimum size for 1-D code	Minimum size for 2-D code
80	0.0508 (2 mil)	0.0508 (2 mil)
150	0.0508 (2 mil)	0.0762 (3 mil)
190	0.0508 (2 mil)	0.1016 (4 mil)
225	0.0762 (3 mil)	0.1016 (4 mil)
375	0.1016 (4 mil)	0.1778 (7 mil)
500	0.1524 (6 mil)	0.254 (10 mil)
1000	0.381 (15 mil)	0.508 (20 mil)

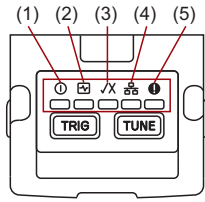
1 mil = 1/1000 inch = 0.0254 mm = 25.4 μm (Mil (milliinch) is the size of a single cell.)

The following figure shows the field of view in horizontal direction and vertical direction.



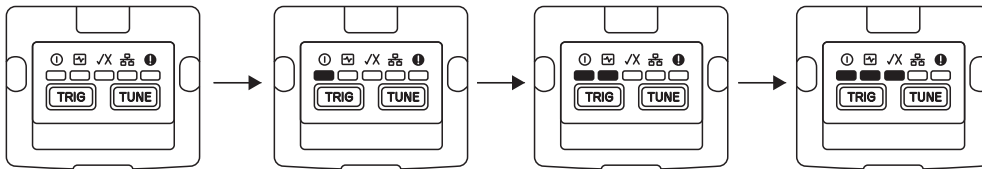
3.3 Indicator Display Specifications

The following shows the display specifications of indicators.



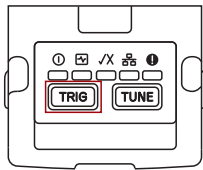
No.	Indicator name	Display specification
(1)	Power indicator	Green: Powered ON
(2)	Registration status indicator	<ul style="list-style-type: none"> Green: Code registered Yellow: Code not registered
(3)	Read success/fail indicator	<ul style="list-style-type: none"> Green: Read succeeded Red: Read failed
(4)	Network status indicator	<ul style="list-style-type: none"> Yellow (ON): Linking up Yellow (flashing): Transferring data
(5)	Error indicator	Red: Error

They indicate the stage of auto-tuning process: they turn ON in order from the left according to the stage of the process.




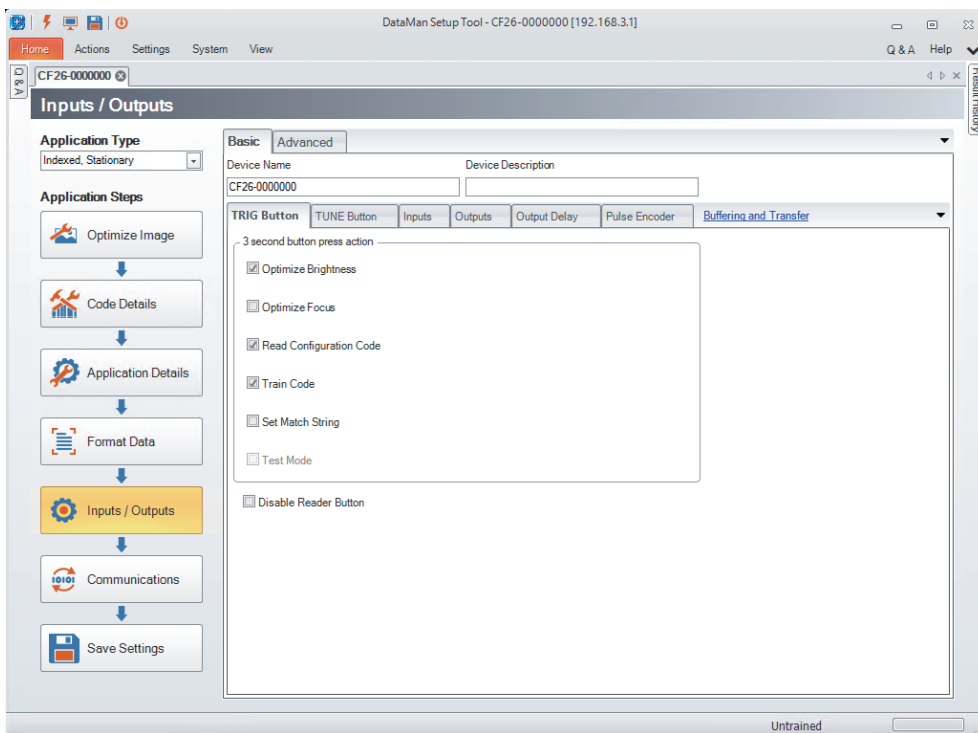
3.4 [TRIG] Button Operational Specifications

A code reader can capture images manually by setting the operation of the [TRIG] button.



The operation of the [TRIG] button can be set in DataMan Setup Tool.

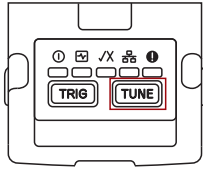
 The [Inputs/Outputs] button ⇒ the [Basic] tab ⇒ the [TRIG Button] tab



Item	Description
3 second button press action	To perform all the selected operations.
Disable Reader Button	To disable the [TRIG] button of a code reader CF26.

3.5 [TUNE] Button Operational Specifications

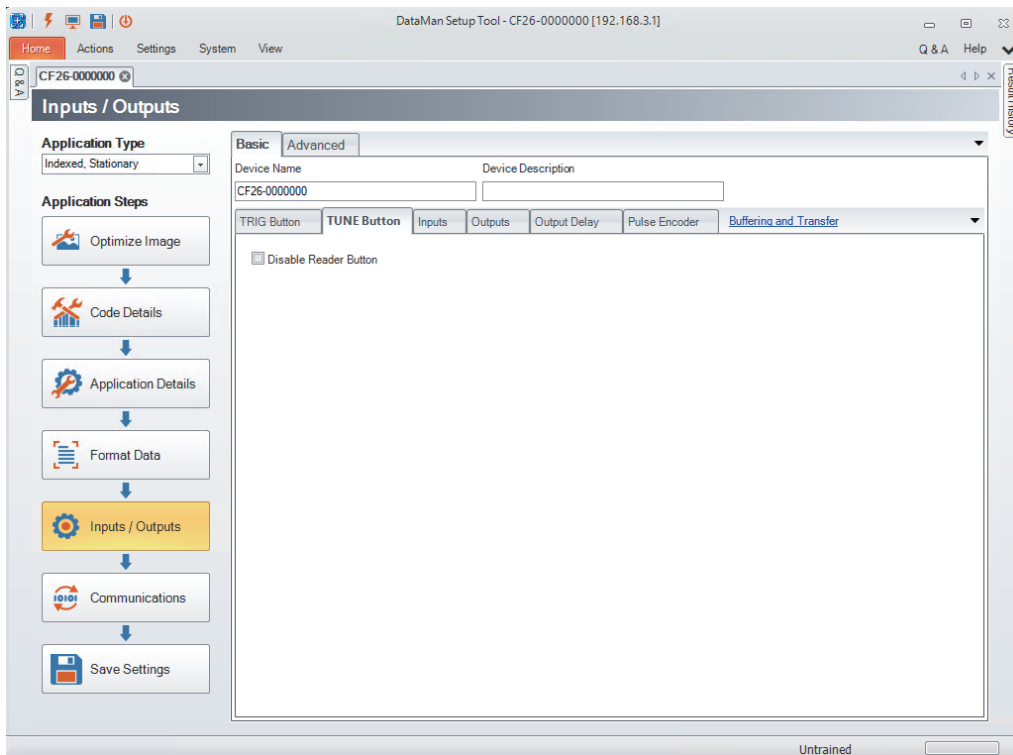
The operations of the [TUNE] button varies depending on the way to press.



How to press	Description
Press one time	The ON/OFF status of LED aimer guides is inverted.
Press one time for three seconds	The light and image acquisition of a code reader CF26 is adjusted.

The operation of a code reader when pressing the [TUNE] button can be set in DataMan Setup Tool.

🖱️ The [Inputs/Outputs] button ⇨ the [Basic] tab ⇨ the [TUNE Button] tab



Item	Description
Disable Reader Button	To disable the [TUNE] button of a code reader CF26.

3.6 I/O Specifications

This section shows the specifications of image acquisition trigger inputs and outputs.

Point

For details of breakout cables, refer to the following:

☞ Page 26 Breakout cable (COGNEX product)

For the connection example of a breakout cable, refer to the following:

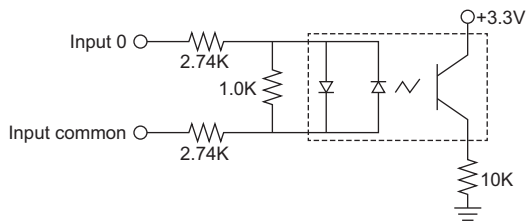
☞ Page 43 Connection example of RS-232

Image acquisition trigger

Input

An opto-isolated image acquisition trigger input (× 1) is integrated into a code reader.

By selecting "Single (external)" for "Trigger Type" in the "Application Details" step of DataMan Setup Tool, image acquisition can be started using a sink type device or source type device.



Maximum voltage between input pins: 28 VDC, minimum voltage transition: 12 VDC

■ Sink type

To trigger from the output of a sink type photodetector or programmable controller, connect 'Input 0' of a breakout cable to the output of the detector, and connect 'Input common' to 24 VDC.

When the output is turned ON, 'Input 0' is pulled down to 0 VDC and the opto-coupler is turned ON.

■ Source type

To trigger from the output of a source type photodetector or programmable controller, connect 'Input 0' of a breakout cable to the output of the detector, and connect 'Input common' to 0 VDC.

When the output is turned ON, 'Input 0' is pulled up to 24 VDC and the opto-coupler is turned ON.

Output

Outputs can be set for both sink type and source type.

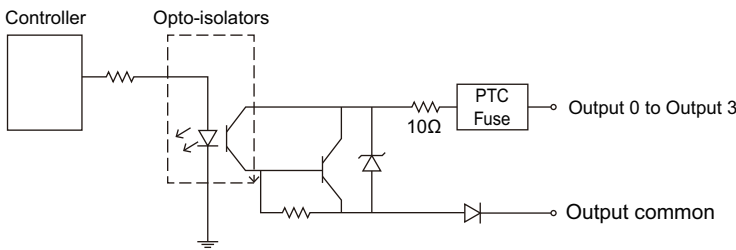
Specifications	Description
Voltage	28 VDC maximum through external load
Current	<ul style="list-style-type: none"> • Sink current: Max. 50 mA • Leakage current in OFF status: Max. 100 μA • External load resistance: 240 Ω to 10 kΩ Each line is rated at a maximum 50 mA and protected against over-current, short circuits, and transients from switching inductive loads. A protection diode is required for a high inductive load.

■ Sink type

For a sink type device, connect an external load between 'Output 0' to 'Output 3' of a breakout cable and the positive side (28 VDC or less).

When 'Output 0' to 'Output 3' are turned ON, the outputs are pulled down to 3 VDC or less, then a current flows to the external load.

When 'Output 0' to 'Output 3' are turned OFF, a current does not flow to the external load.

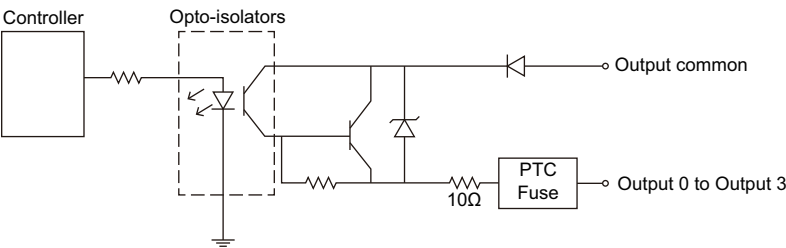


■ Source type

For a source type device, connect an external load between 'Output 0' to 'Output 3' of a breakout cable and the negative side (0 VDC).

For a connection to which a 24 VDC power supply is connected, when 'Output 0' to 'Output 3' are turned ON, the outputs are pulled up to 21 VDC or more, then a current flows to the external load.

When 'Output 0' to 'Output 3' are turned OFF, a current does not flow to the external load.

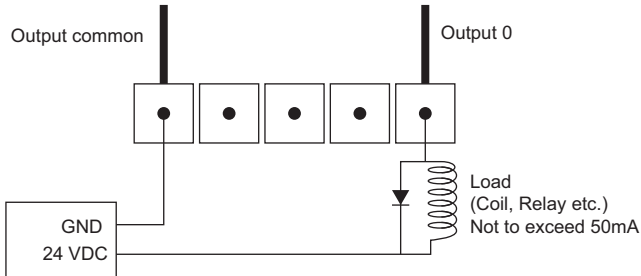


Output wiring

To connect 'Output 0' to 'Output 3' of a breakout cable to a relay, LED, or similar load, connect the negative side of the load to 'Output 0' to 'Output 3' and connect the positive side to 24 VDC.

When 'Output 0' to 'Output 3' are turned ON, the negative side of the load is pulled down to 3 VDC or less, then 24 VDC is applied to the load.

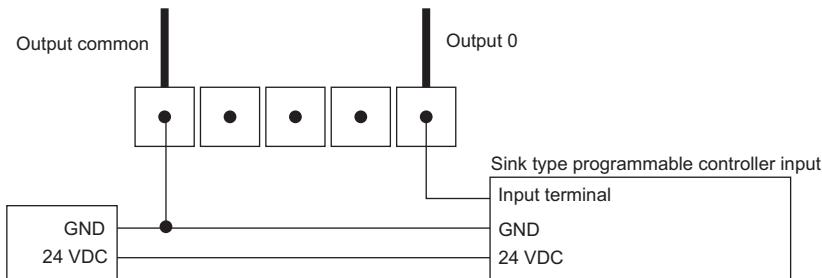
Use a protection diode for a high inductive load. Connect the anode to a output and connect the cathode to 24 VDC.



■ Sink type

To connect to the inputs of a sink type programmable controller, connect 'Output 0' to 'Output 3' of a breakout cable directly to the input terminals of the controller inputs.

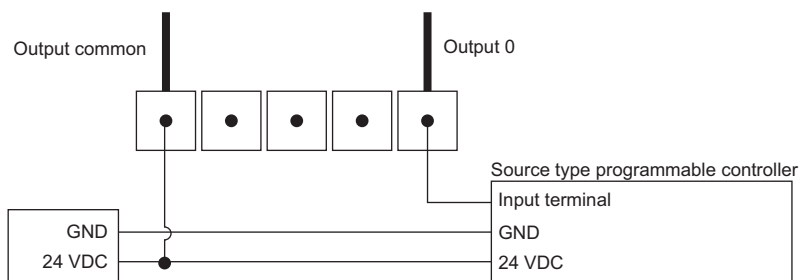
When 'Output 0' to 'Output 3' are turned ON, the input terminals are pulled down to 3 VDC or less.



■ Source type

To connect to the inputs of a source type programmable controller, connect 'Output 0' to 'Output 3' of a breakout cable directly to the input terminals of the controller inputs.

When 'Output 0' to 'Output 3' are turned ON, the input terminals are pulled up to 21 VDC or more.



3.7 Cable Specifications

This section shows the specifications of an Ethernet cable and breakout cable to be connected to a code reader CF26.

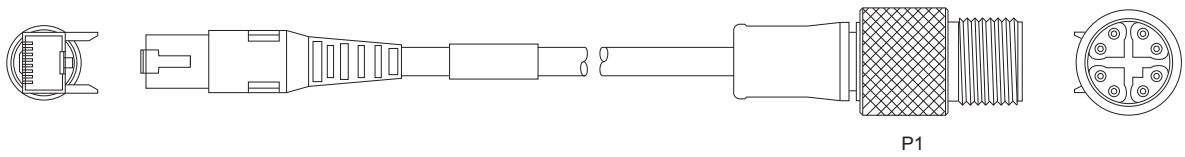


Ethernet cables and breakout cables are sold separately.

Ethernet cable (COGNEX product)

Ethernet cables are used for directly connecting a code reader CF26 to one device, or connecting a code reader to multiple devices via a switching hub or a router.

CCB-84901-2001-**



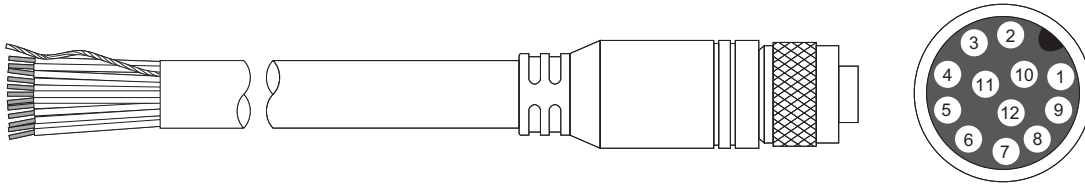
P1: To a code reader



If the bend radius or service loop is smaller than 10 times of the cable diameter, the Ethernet cable may cause cable shielding degradation, cable damage, or wear out in a short period.
The bend radius must be at least 152.4 mm from the connector.

Breakout cable (COGNEX product)

A breakout cable is used for supplying 24 VDC to a code reader CF26. It can also be used for RS-232 connection and I/O connection.



Precautions

- For RS-232 connection, use the power supply return path for the ground.
- Breakout cables are not terminated.
- Cut unused wires or protect them with insulating materials.
- Be careful not to short-circuit with 24 VDC wires.

Signal names and wire colors

For breakout cables, CCB-PWRIO-**, CCB-PWRIO-**R, and CCB-M12X12FS-05 have different signal names and wire colors respectively.

Pin Number	CCB-PWRIO-**, CCB-PWRIO-**R		CCB-M12X12FS-05	
	Signal name	Wire color	Signal name	Wire color
(1)	Output 2	Yellow	Output 2	White
(2)	TxD (RS-232)	White and Yellow	TxD (RS-232)	Green
(3)	RxD (RS-232)	Brown	RxD (RS-232)	Pink
(4)	Output 3	White and Brown	Output 3	Yellow
(5)	Input 1	Violet	Input 1	Gray
(6)	Input common	White and Violet	Input common	Black
(7)	24 VDC	Red	24 VDC	Brown
(8)	GND	Black	GND	Blue
(9)	Output common	Green	Output common	Violet
(10)	Input 0	Orange	Input 0	Red
(11)	Output 0	Blue	Output 0	Gray and Pink
(12)	Output 1	Gray	Output 1	Red and Blue

4 FUNCTIONS

This chapter explains the functions that can be used for a code reader CF26. Each function can be set in DataMan Setup Tool (code reader setup tool).

4.1 Function List

The main functions of a code reader CF26 are listed below.

Function name	Description
Application Type	To select an application type.
Application Steps	To display the setting steps in order from the top for using a code reader. The settings of a code reader can be made easily by simply setting it in order.
Optimize Image	To set, adjust, and test the connected code reader. The brightness can also be set.
Basic	To perform basic settings in a code reader.
Live	To make a code reader enter Live mode. In Live mode, monitoring of the image read by a code reader can be performed as well as decoding. The read image can be checked in DataMan Setup Tool.
Tune	To select the appropriate setting for reading image automatically.
Test	To test a code reader in the current settings without any disruption to the production process.
Advanced	To set the details.
Code Details	To set the code types and multi-codes that can be read in a code reader.
Basic	To select codes that can be read in a code reader. The codes can be detected automatically from the read image.
Advanced	To set the details.
Application Details	To perform trigger settings and exposure settings.
Basic	To set a trigger type, delay, time-out, an interval, and a burst-length. To set the items of a trigger, an interval, and exposure easily by using assistant functions.
Advanced	To set the details.
Format Data	To set the output data of a code reader.
Basic	To select the type of output data format to use.
Standard	To customize the output data by using the existing data format.
Perl Style	To create output data format using regular expressions.
Inputs/Outputs	To set the behavior of buttons and input and output lines.
Basic	To set the [TRIG] button, the [TUNE] button, inputs, outputs, output delay, and pulse encoder.
Advanced	To set the details.
Communication	To configure settings for communications.
Serial	To configure settings for RS-232 serial communication.
Ethernet	To configure settings for Ethernet communication.
Advanced	To set the details.
Save Settings	To save the settings which are set in the application steps in a code reader.

5 SYSTEM CONFIGURATION

5.1 Ethernet Connection

This section shows the system configuration when a code reader CF26 and a programmable controller are connected with an Ethernet.

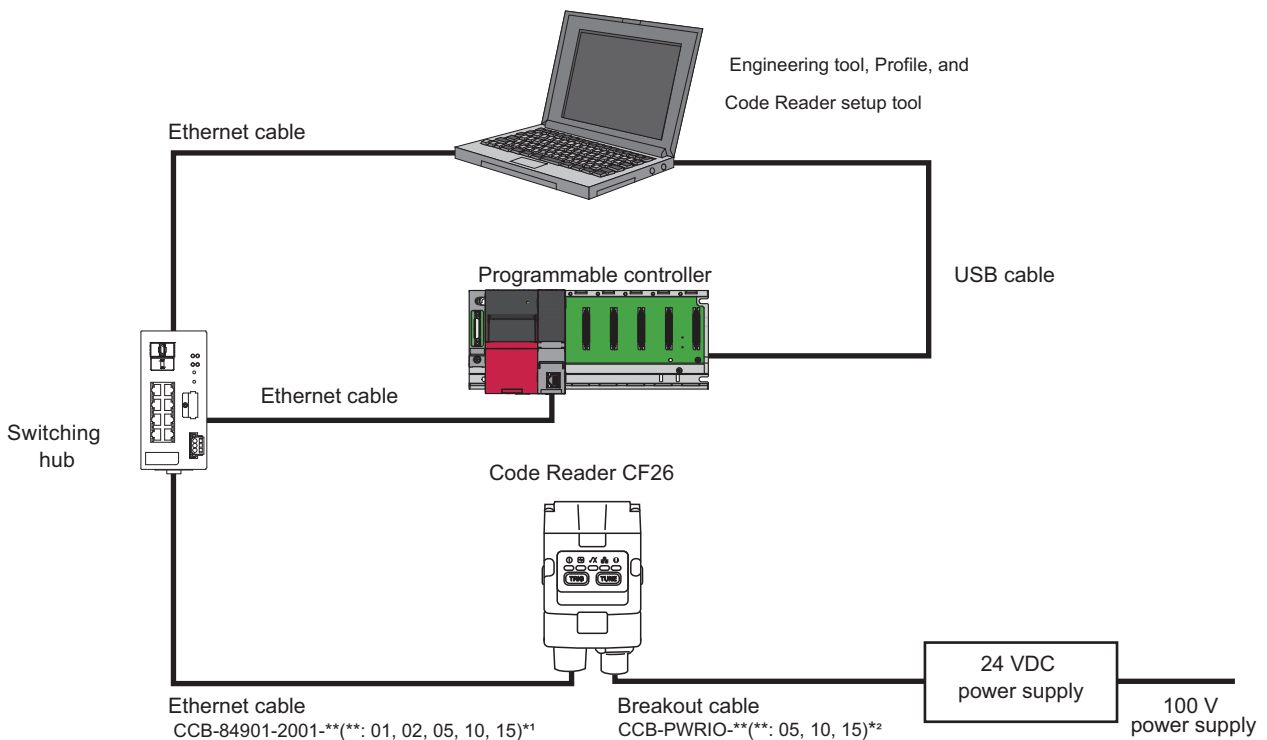


For the settings of CC-Link IE Field Network Basic connection and SLMP scanner connection, configure the system using Ethernet.

Ethernet

Triggers are sent to a code reader, and character strings read by the code reader are received in a programmable controller via Ethernet.

5

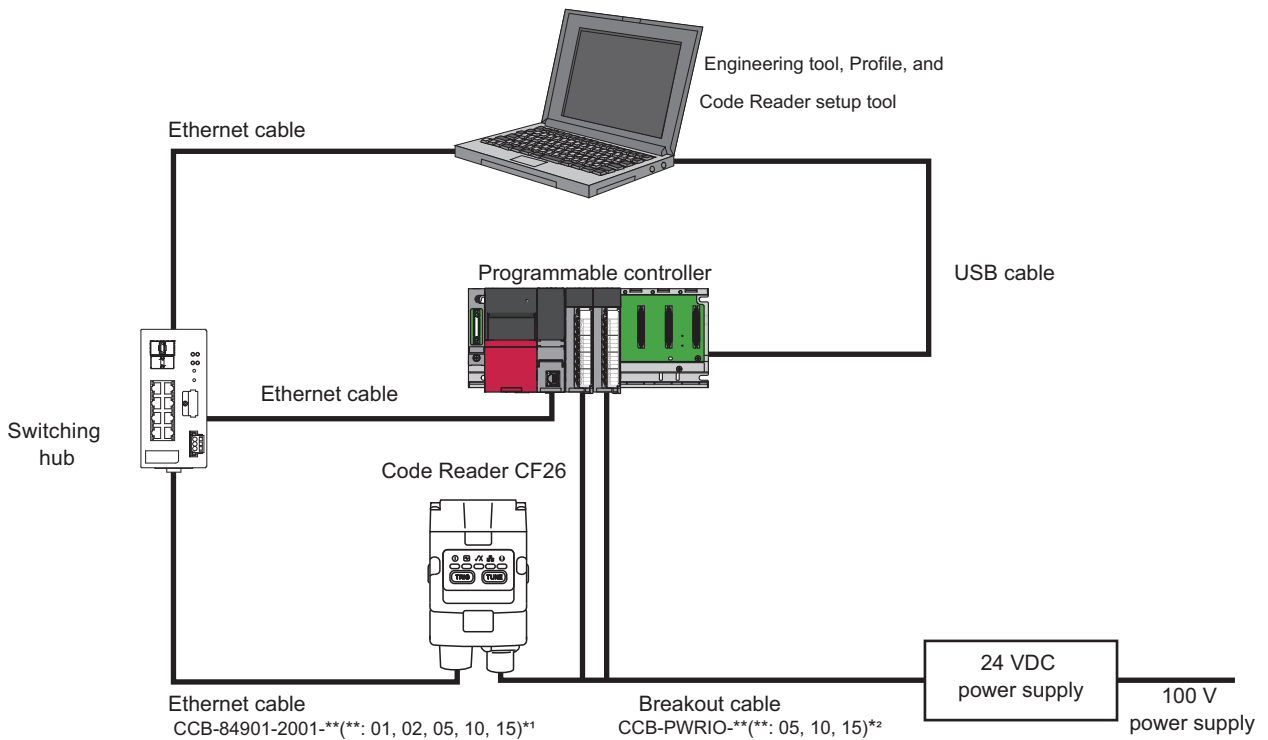


¹ Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight

² Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

Ethernet + I/O

Triggers are sent to a code reader with signals of an output module, and characters read by the code reader are received in a programmable controller via Ethernet.



^{*1} Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight

^{*2} Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

5.2 RS-232 Connection

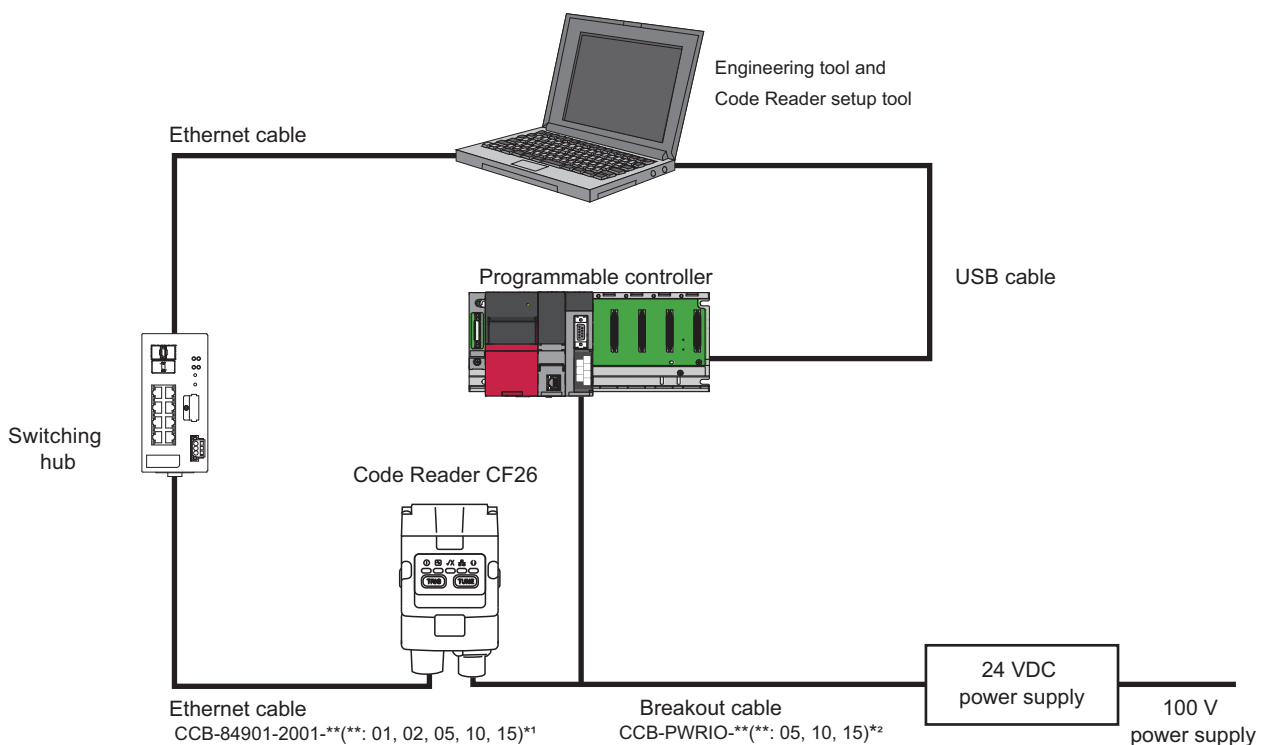
This section shows the system configuration when a code reader CF26 and a programmable controller are connected with an RS-232 connection.

RS-232

- Trigger commands are sent to a code reader from a serial communication module via RS-232 serial communication. Character strings read by the code reader are received in a programmable controller via RS-232 serial communication.
- DMCC commands are sent from a serial communication module via RS-232 serial communication, and the read character strings are registered in a code reader in advance.

The character strings of the read code are verified with the registered one. When they are matched, the read character strings are received in a programmable controller via RS-232 serial communication. If they are not matched, the character strings that represent a mismatch are also received in the programmable controller via RS-232 serial communication.

5



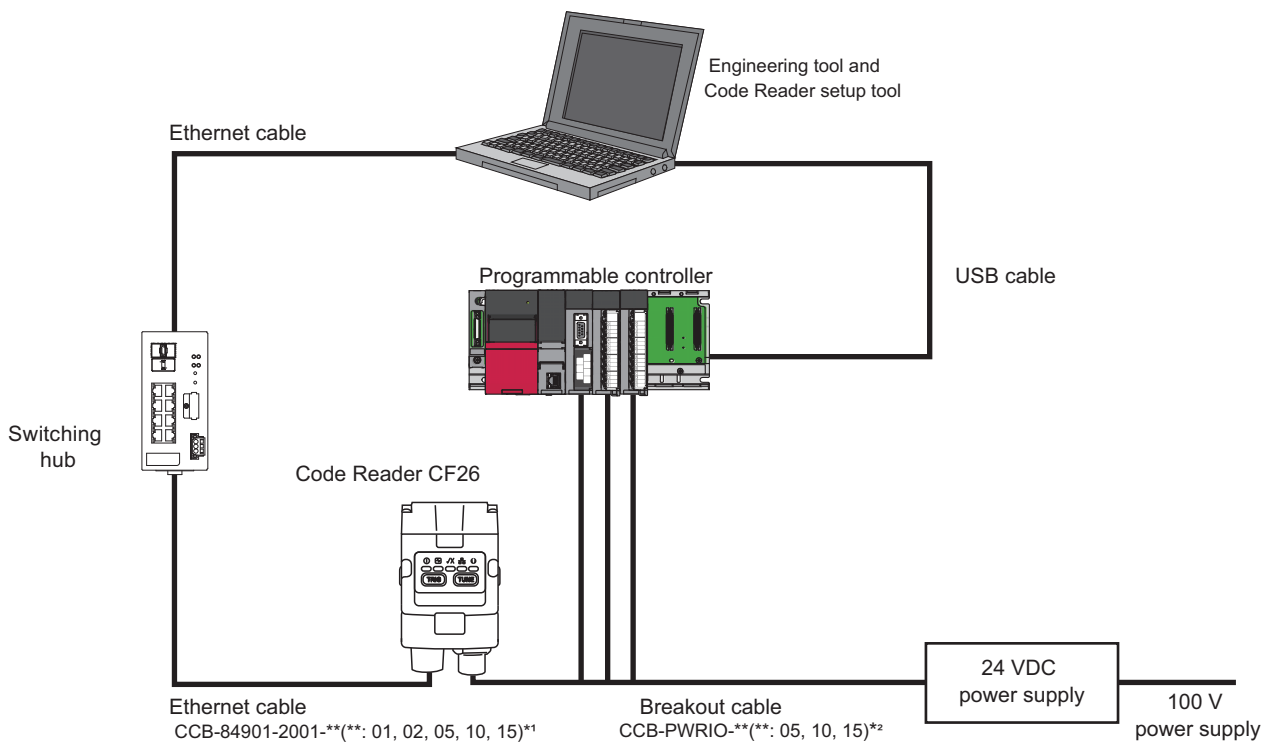
¹ Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight

² Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

RS-232 + I/O

- Trigger signals from an output module are sent to a code reader in I/Os, and the character strings read by the code reader are received in a programmable controller via RS-232 serial communication.
- The output signals which represent read success or fail sent from a code reader CF26 are received in a programmable controller via RS-232 serial communication.
- DMCC commands are sent from a serial communication module via RS-232 serial communication, and the read character strings are registered in a code reader in advance.

The character strings of the read code are verified with the registered one. When they are matched, the read character strings are received in a programmable controller via RS-232 serial communication. If they are not matched, the character strings that represent a mismatch are also received in the programmable controller via RS-232 serial communication.



*1 Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight

*2 Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

5.3 Hardware Components

The following shows the hardware components of the system configuration.

Component name	Remarks	Reference
Personal computer	Required for setting a programmable controller and a code reader	—
Code reader	Code reader CF26	Page 34 Configurations and Optional Items of Code Reader CF26
Programmable controller	Required for using code readers	Page 35 Modules
Engineering tool, profile	Required for setting a programmable controller	Page 35 Configuration tools
Code reader setup tool	Required for setting a code reader	
Breakout cable	Required for supplying power Available for RS-232 or I/O connection	Page 36 Breakout cable (COGNEX product)
Ethernet cable	Required for setting a code reader from a personal computer	Page 36 Ethernet cable (COGNEX product)
Ethernet cable	Commercial products	—
USB cable		
Switching hub (router)		
24 VDC power supply		

5.4 Configurations and Optional Items of Code Reader CF26

This section shows the configurations and optional items of a code reader CF26-SR or a code reader CF26-LR.

Configuration of code reader CF26-SR

The following shows the configuration of a code reader CF26-SR.

Product name	Remarks
Lens	6.2 mm liquid lens
Lens cover	Transparent

Configuration of code reader CF26-LR

The following shows the configuration of a code reader CF26-LR.

Product name	Remarks
Lens	16 mm liquid lens
Extended lens cover	Half-polarized

Items to prepare as needed

Optional items of code reader CF26-SR

Preparation of the products listed below is required as necessary.

Product name	Model (COGNEX model)	Remarks
Lens cover	DM150-CVR-CLR	Transparent
	DM150-CVR-ESD	Electrostatics protection, transparent
	DM260-LENS-62CVR-F	Polarized

Optional items of code reader CF26-LR

Preparation of the products listed below is required as necessary.

Product name	Model (COGNEX model)	Remarks
Liquid lens	DM260-KIT-16LL	16 mm liquid lens set
Extended lens cover	DM260-LENS-16CVR	Un-polarized
	DM260-LENS-16CVR-P	Half-polarized
	DM260-LENS-16CVR-F	Fully polarized

Mounting bracket (optional item)

Preparation of either of the brackets listed below is required according to the mount location.

Product name	Model (COGNEX model)	Remarks
Universal mounting bracket	DM100-UBRK-000	—
Pivot mounting bracket	DM100-PIVOTM-00	—

5.5 Available Modules and Configuration Tools

This section shows the configuration tools and modules that are available for connecting to a code reader CF26. The available version of configuration tools and modules varies depending on whether or not the automatic detection function of connected devices in GX Works3 is applied when setting a programmable controller. The automatic detection function of connected devices can be applied in the programmable controller setting when configuring settings for CC-Link IE Field Network Basic connection and SLMP scanner connection. For the method of setting a programmable controller, refer to the following:

 Code Reader Connection Guide

Modules

The following shows the modules and versions supported by a code reader CF26.

—: Not supported

Module	Version		
	With the automatic detection function of connected devices	Without the automatic detection function of connected devices	
RnCPU, RnENCPU	The firmware version is 28 or later.	No restrictions	
FX5CPU	The firmware version is 1.040 or later.		
High-speed Universal model QCPU, Universal model process CPU	The first five digits of the serial number are '19042' or higher.		
QnUDE(H)CPU*1	—		
Built-in Ethernet port LCPUCPU	The first five digits of the serial number are '18112' or higher.		
Serial communication module*2	—	No restrictions	
Ethernet module	QJ71E71-100*1		
	LJ71E71-100*1		
	RJ71EN71*1		
	FX5-ENET*3		

- *1 SLMP connection only
- *2 RS-232 serial communication only
- *3 CC-Link IE Field Network Basic connection only

Configuration tools

The following shows the configuration tools and versions supported by a code reader CF26.

—: the automatic detection function of connected devices is not supported.

Engineering tool	Version	
	With the automatic detection function of connected devices	Without the automatic detection function of connected devices
GX Works3*1	1.035M or later	No restrictions
GX Works2*2	1.565P or later	
Code reader setup tool		
DataMan Setup Tool	DataMan Setup Tool 6.1.5 or later Firmware 5.7.5 or later*3	

- *1 When using the predefined protocol support function or the sensor/device monitor function, use the version "1.055H" or later.
- *2 When using the predefined protocol support function, use the version "1.585K" or later.
- *3 The firmware of a code reader CF26 needs to be updated to the version that supports DataMan Setup Tool. For details on the firmware update, refer to the "How do I use the Update Firmware function?" on the "DataMan 260 Series: Questions and Answers" screen. Select [Help] ⇒ [CF26] ⇒ [CF26 Questions and Answers] in DataMan Setup Tool to display the screen.

5.6 Items to Prepare

This section shows the items required for the system configuration.

Cables

A breakout cable and an Ethernet cable are required to connect a code reader CF26 to a programmable controller.

Breakout cable (COGNEX product)

The following shows the breakout cables that can be connected to a code reader CF26.

COGNEX model	Remarks
CCB-PWRIO-** (** : 05, 10, or 15)	Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight
CCB-PWRIO-**R (**R : 05R, 10R, or 15R)	Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, right-angle
CCB-M12X12FS-05	Cable length 5 m, unshielded cable, straight

Ethernet cable (COGNEX product)

The following shows the Ethernet cables that can be connected to a code reader CF26.

COGNEX model	Remarks
CCB-84901-2001-** (** : 01, 02, 05, 10, or 15)	Cable length (0.6 m, 2 m, 5 m, 10 m, or 15 m), straight
CCB-84901-2002-** (** : 02, 05, 10)	Cable length (2 m, 5 m, 10 m), right-angle

6 SYSTEM CONSTRUCTION

This chapter shows how to install optional items to a code reader CF26.

6.1 Installation Environment

Before installing a code reader CF26, check that the installation environment complies with the precautions for use and general specifications.

☞ 2 PRECAUTIONS FOR USE

☞ Page 15 General Specifications

6.2 Angle Change of a Code Reader CF26

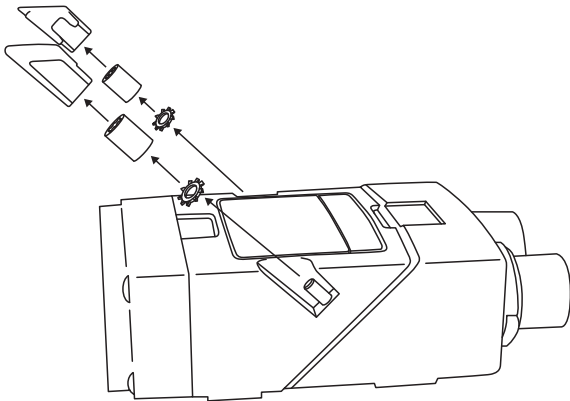
This section shows the precautions and procedure for changing an angle of a code reader CF26 from straight to a right angle configuration.

Precautions

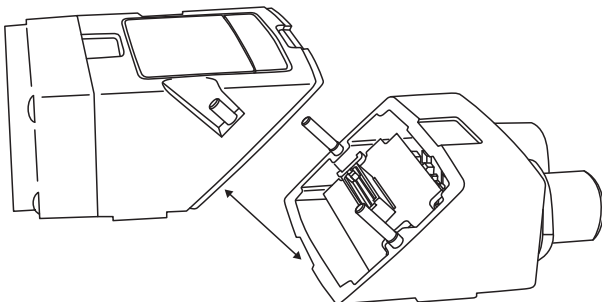
- Before handling a code reader CF26, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Wearing a grounded antistatic wrist strap is recommended. Failure to discharge the static electricity may cause the code reader CF26 to fail or malfunction.
- Be sure to install an I/O connector module to the main module without leaving any space between them. If not installed properly, dust or water-proof performance may not be obtained.
- Switching the code reader configuration to a straight or right angle should be limited up to 10 times. Exceeding the limit may cause malfunction.
- Disconnect the code reader CF26 from power before changing the angle.

Operating procedure

1. Remove the screw covers and unscrew the cap nuts and washers with a T10 torx driver.



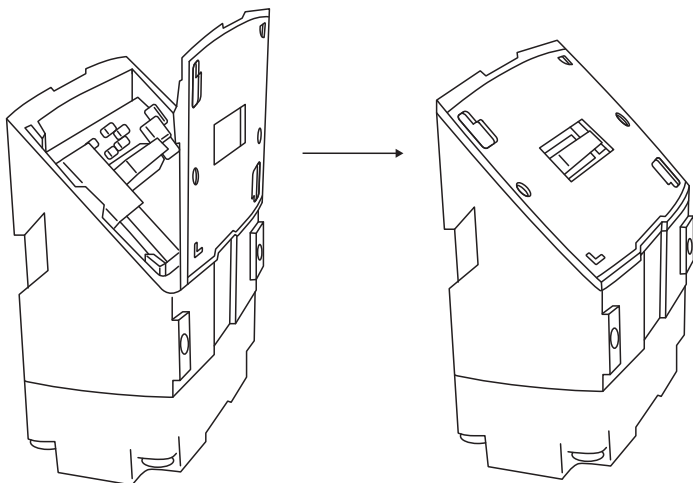
2. Detach the main module and the I/O connector module by pulling them apart.



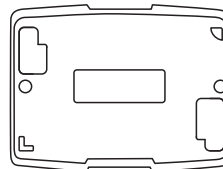
- Align the lower edge of a gasket onto the bottom surface of the main module, and then compress the upper edge of the gasket to fix the module.

Point

The surface of the gasket as shown below is the side where the I/O connector module is attached. Make sure that the gasket is properly fixed on the main module.

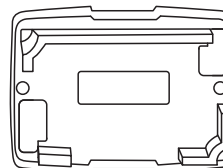


The surface of a gasket



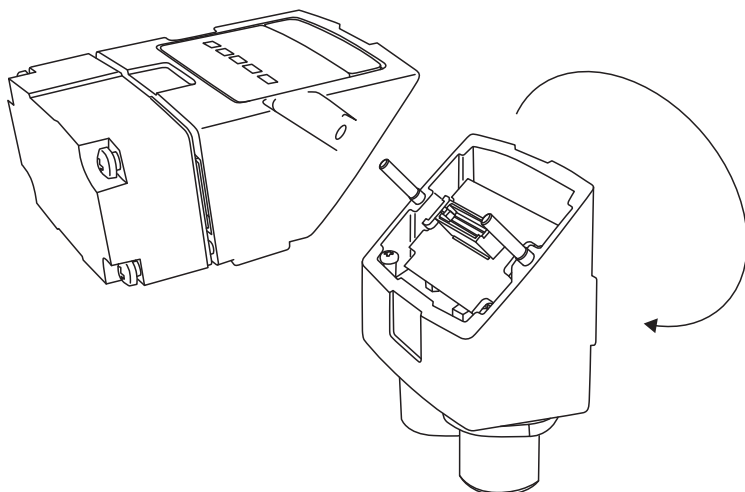
Bottom

The rear of a gasket

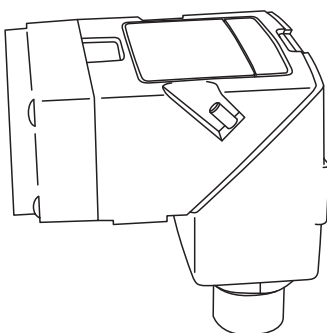


Bottom

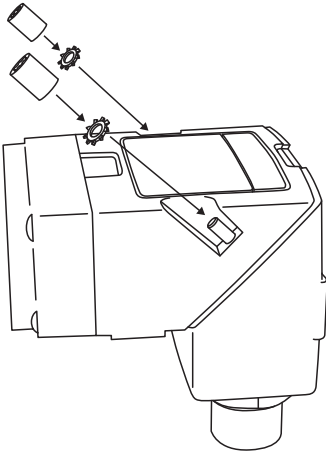
- Change the orientation.



- Reattach the I/O connector module to the main module.



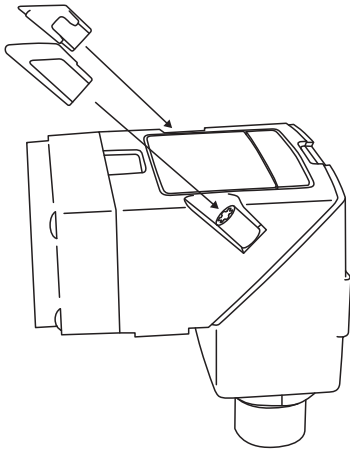
6. Attach the washers and fasten the module loosely with two cap nuts. In this case, be careful not to tighten the cap nuts firmly with a T10 torx driver.



7. When fastening the cap nut, fix it with a torque of 0.12 N·m. Then install the screw cover.

Point 

There are unique left and right screw covers. Take care to attach them correctly.



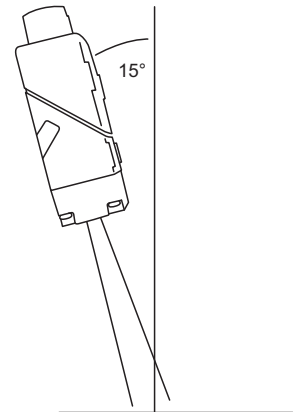
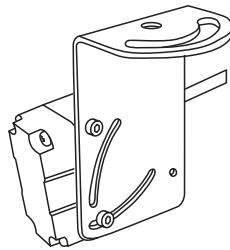
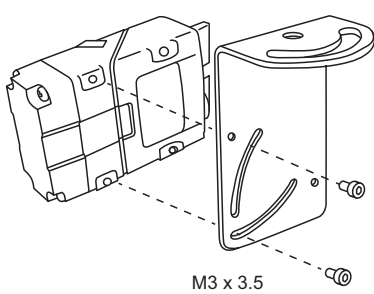
6.3 Installation of a Code Reader CF26

This section shows the examples of installing a universal mounting bracket to a code reader CF26.

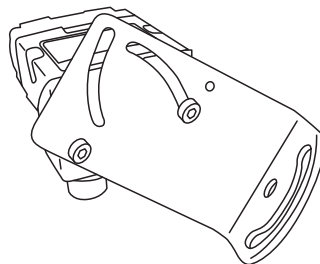
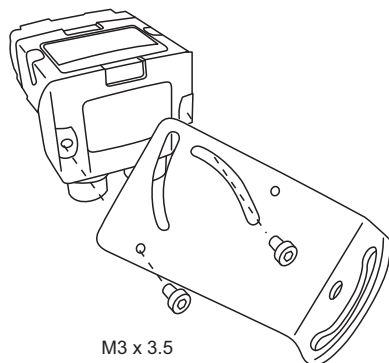
Point 

Installing a code reader at the angle (15°) can reduce reflections and improve performance.

Installation in a straight configuration



Installation in a right angle configuration

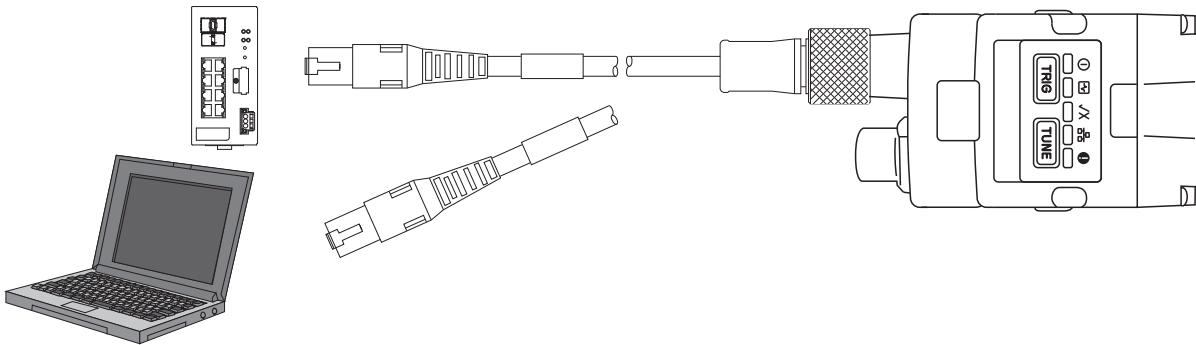


6.4 Connection of an Ethernet Cable (COGNEX Product)

This section shows the procedure for connecting an Ethernet cable.

Precautions

- The Ethernet cables are designed to connect with their key aligned with the keyway of the connector on a code reader. Do not force the connections or damage may occur.
- When powering ON the system, turn ON the power of the programmable controller first, or at the same time with the code reader CF26.



Operating procedure

1. Connect an Ethernet cable to an Ethernet connector of the code reader CF26.
2. Connect the Ethernet cable to the switching hub or personal computer as necessary.

6.5 Connection of a Breakout Cable (COGNEX Product)

This section shows the precautions and the procedure for connecting a breakout cable.

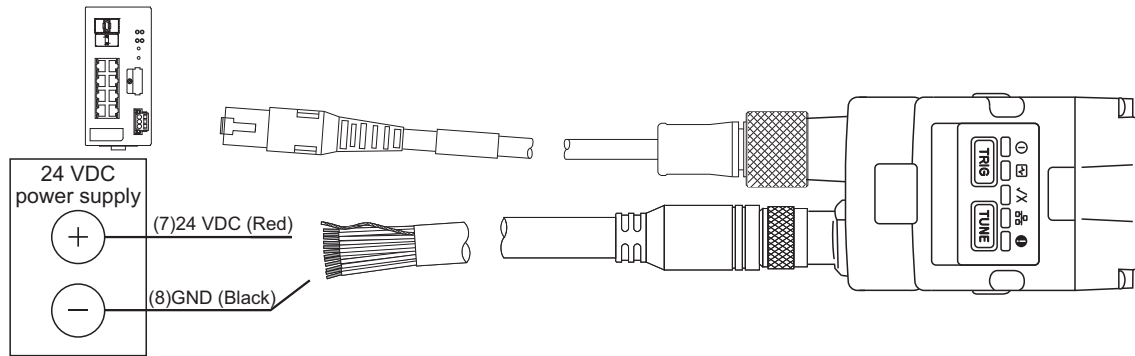
Ex.

Breakout cable: CCB-PWRIO-**(**: 05, 10, or 15)^{*1}

^{*1} Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

Precautions

- Check that the 24 VDC power supply is OFF when connecting to a breakout cable.
- Cut unused wires or protect them with insulating materials. Be careful not to contact with 24 VDC wires.
- The breakout cables are designed to connect with their key aligned with the keyway of the connector on a code reader. Do not force the connections or damage may occur.
- When powering ON the system, turn ON the power of the programmable controller first, or at the same time with the code reader CF26.



Point

For details of breakout cables, refer to the following:

➔ Page 26 Breakout cable (COGNEX product)

Operating procedure

- 1.** Connect the breakout cable to a 24 VDC power supply.
Connect the (7) 24 VDC (red) of the cable to the positive terminal of the power supply, and the (8) GND (black) to the negative terminal.
- 2.** Connect the breakout cable to the power supply, I/O, and RS-232 connector of the code reader CF26.

Connection example of RS-232

The following shows an example of connecting a breakout cable to an RS-232 connector (D-sub 9 Pin).

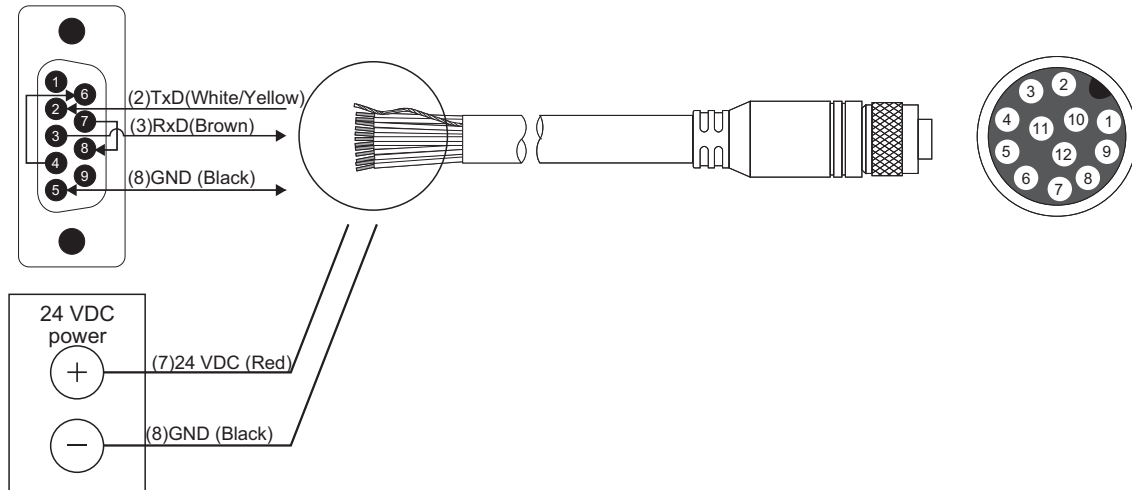
Ex.

Breakout cable: CCB-PWRIO-**(**: 05, 10, or 15)^{*1}

^{*1} Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

Precautions

- Cut unused wires or protect them with insulating materials. Be careful not to contact with 24 VDC wires.



RS-232 connector (D-sub 9 Pin)	Breakout cable	24 VDC power supply
② RD (RxD)	(2) TxD (White and Yellow)	—
③ SD (TxD)	(3) RxD (Brown)	—
⑤ SG	(8) GND (Black)	Negative terminal
④ ER (DTR) — ⑥ DR (DSR)	—	—
⑦ RS (RTS) — ⑧ CS (CTS)	—	—
—	(7) 24 VDC (Red)	Positive terminal

- Signal names of the RS-232 connector (D-sub 9 Pin) side

Pin Number	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Signal name	CD (DCD)	RD (RxD)	SD (TxD)	ER (DTR)	SG	DR (DSR)	RS (RTS)	CS (CTS)	CI (RI)

Point

For signal names of the breakout cable, refer to the following:

☞ Page 26 Breakout cable (COGNEX product)

Operating procedure

1. Connect a breakout cable to an RS-232 connector (D-sub 9 Pin).

Connect a breakout cable and an RS-232 connector (D-sub 9 Pin) as follows: (2) TxD (white and yellow) to ② RD (RxD), (3) RxD (brown) to ③ SD (TxD), (8) GND (black) to ⑤ SG.

In addition, connect the RS-232 connector as follows: ④ ER (DTR) to ⑥ DR (DSR), ⑦ RS (RTS) to ⑧ CS (CTS).

2. Connect the breakout cable to a 24 VDC power supply.

Connect the (7) 24 VDC (red) of the cable to the positive terminal of the power supply, and the (8) GND (black) to the negative terminal.

Connection example of an I/O module

The following shows examples of connecting a breakout cable to input/output modules.

Sink type

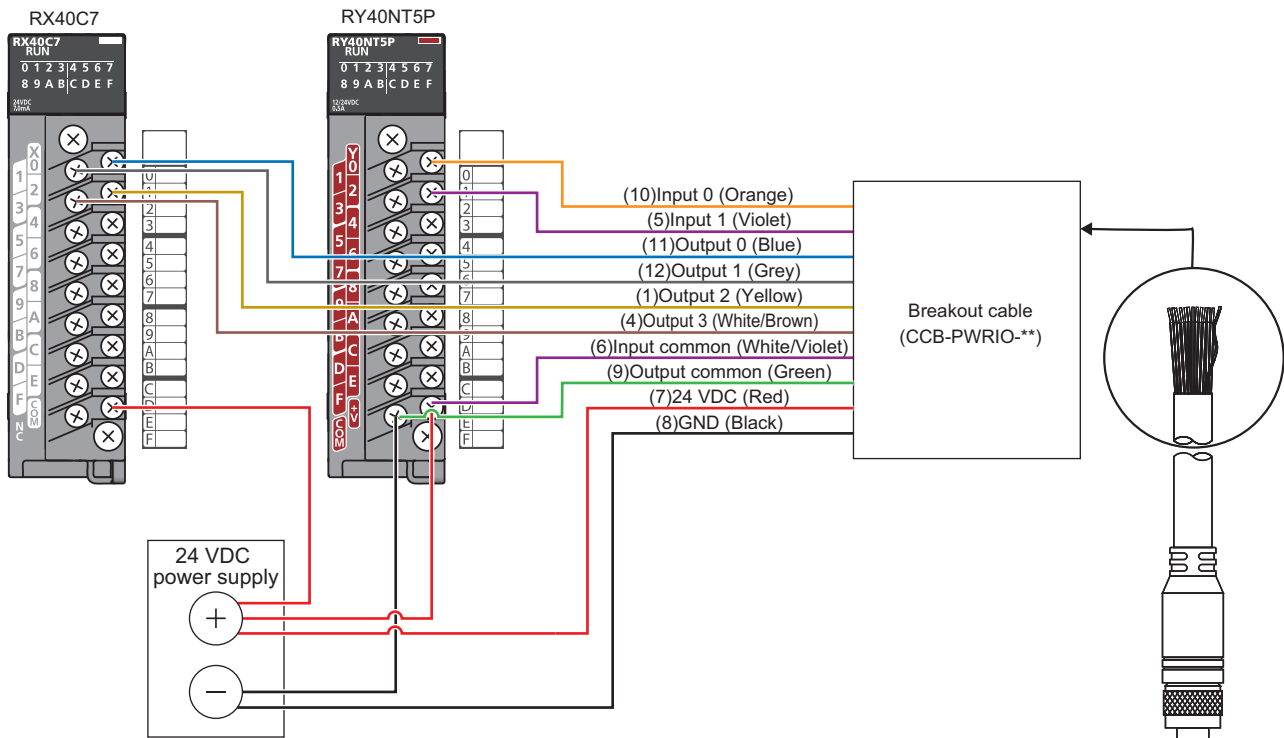
Ex.

Breakout cable: CCB-PWRIO-**(**: 05, 10, or 15)^{*1}

^{*1} Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

Input module (positive/negative common shared type): RX40C7

Output module (sink type): RY40NT5P



■RX40C7

Terminal name	Breakout cable	24 VDC power supply
X00	(11) Output 0 (Blue)	—
X01	(12) Output 1 (Gray)	—
X02	(1) Output 2 (Yellow)	—
X03	(4) Output 3 (White and Brown)	—
COM	—	Positive terminal

■RY40NT5P

Terminal name	Breakout cable	24 VDC power supply
Y00	(10) Input 0 (Orange)	—
Y02	(5) Input 1 (Violet)	—
+V	(6) Input common (White and Violet)	Positive terminal
COM	(9) Output common (Green)	Negative terminal

1. Connect a breakout cable to input/output modules.

2. Connect the breakout cable to a 24 VDC power supply.

Connect the (7) 24 VDC (red) of the cable to the positive terminal of the power supply, and the (8) GND (black) to the negative terminal.

Source type

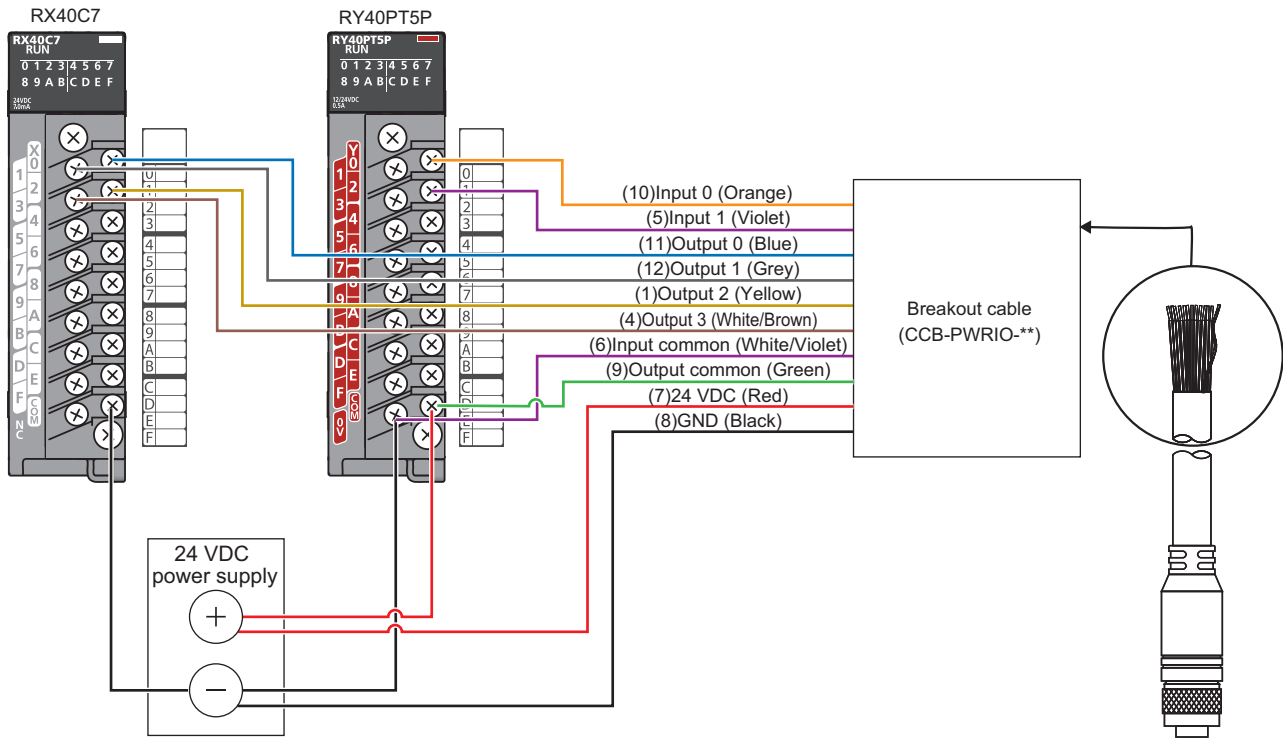
Ex.

Breakout cable: CCB-PWRIO-**(**: 05, 10, or 15)^{*1}

^{*1} Cable length (5 m, 10 m, or 15 m), shielded twisted-pair cable, straight

Input module (positive/negative common shared type): RX40C7

Output module (source type): RY40PT5P



■RX40C7

Terminal name	Breakout cable	24 VDC power supply
X00	(11) Output 0 (Blue)	—
X01	(12) Output 1 (Gray)	—
X02	(1) Output 2 (Yellow)	—
X03	(4) Output 3 (White and Brown)	—
COM	—	Negative terminal

■RY40PT5P

Terminal name	Breakout cable	24 VDC power supply
Y00	(10) Input 0 (Orange)	—
Y02	(5) Input 1 (Violet)	—
COM	(9) Output common (Green)	Positive terminal
0V	(6) Input common (White and Violet)	Negative terminal

1. Connect a breakout cable to input/output modules.
2. Connect the breakout cable to a 24 VDC power supply.
Connect the (7) 24 VDC (red) of the cable to the positive terminal of the power supply, and the (8) GND (black) to the negative terminal.

7 INSTALLATION

7.1 Software Installation

To configure a code reader CF26, DataMan Setup Tool must be installed on a networked personal computer. For information on how to obtain DataMan Setup Tool, please contact your local Mitsubishi Electric sales office or representative.

Precautions

There are combinations between versions of DataMan Setup Tool and versions of the firmware. For the combinations, check the DataMan Setup Tool release history.

7.2 Registration of a Profile

To establish communication between a programmable controller and a code reader CF26 by configuring communication settings, registering a profile to an engineering tool is required.

A profile is data that stores information of a connected device (such as a model name.)

By registering the profile to an engineering tool, the code reader CF26 is added in the "Ethernet Configuration" window or the "CC-Link IEF Basic Configuration" window.

For details on how to register profiles, refer to the following:

 GX Works2 Version 1 Operating Manual (Common)

 GX Works3 Operating Manual

For information on how to obtain a profile, please contact your local Mitsubishi Electric sales office or representative.

8 MAINTENANCE AND INSPECTION

8.1 Cleaning a Code Reader CF26 Housing

- To clean the outside of the code reader CF26 housing, apply a small amount of mild detergent cleaner or isopropyl alcohol on a cleaning cloth.
- Do not attempt to clean the code reader with harsh or corrosive solvents, including lye, methyl ethyl ketone (MEK) or gasoline. It may cause a failure.

8.2 Cleaning an Image Sensor Window

- To remove dust from the outside of the image sensor window, use a pressurized air duster. The air must be free of oil, moisture, or other contaminants that could remain on the lens cover. These substances could remain on the glass and possibly degrade the image.
- Do not touch the glass part of the image sensor window.
- If oil/smudges still remain, clean the image sensor window with a cotton bud soaked in alcohol (ethyl, methyl or isopropyl).


8.3 Cleaning a Lens Cover

- To remove dust from the lens cover, use a pressurized air duster. The air must be free of oil, moisture, or other contaminants that could remain on the lens cover. These substances could remain on the lens and possibly degrade the image.
- To clean the plastic window of the lens cover, apply a small amount of isopropyl alcohol on a cleaning cloth. Do not scratch the plastic window.

9 TROUBLESHOOTING

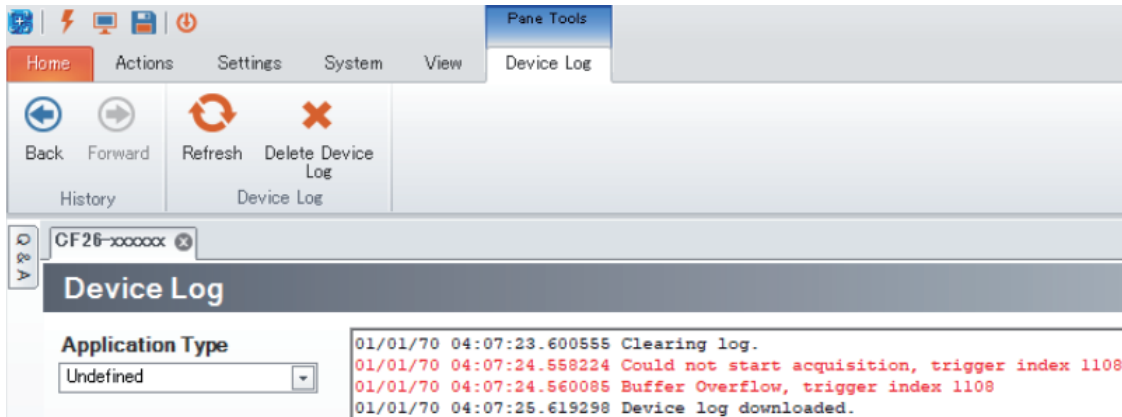
9.1 Error Checking Method

If an error indicator turns ON or the code reader CF26 does not work properly, check the error in the "Device Log" screen of DataMan Setup Tool.

 [System] in the menu ⇒ [Device Log]

Ex.

"Buffer Overflow" error occurred.



An error is displayed in red.

APPENDIX

Appendix 1 EMC and Low Voltage Directives

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.

For products compliant to the EMC and Low Voltage Directives, their manufacturers are required to declare compliance and affix the CE marking.

The sales representative in EU member states is:

Company: MITSUBISHI ELECTRIC EUROPE B.V.

Address: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

Measures to comply with the EMC Directive

The EMC Directive sets requirements for emission (conducted and radiated electromagnetic interference emitted by a product) and immunity (the ability of a product not to be influenced by externally generated electromagnetic interference). This section describes the precautions for machinery constructed with the MELSENSOR CF26 models to comply with the EMC Directive.

These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.

The manufacturer of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

EMC Directive related standards

■ Emission requirements

Standard: EN61131-2:2007

Test item	Test description	Value specified in standard
CISPR16-2-3 Radiated emission	The electromagnetic wave emitted by the product to the external space is measured.	<ul style="list-style-type: none">• 30 to 230 MHzQP: 40 dBμV/m (measured at 10 m distance)^{*1}• 230 to 1000 MHzQP: 47 dBμV/m (measured at 10 m distance)
CISPR16-2-1, CISPR16-1-2 Conducted emission	The noise level which the product emits to the power line is measured.	<ul style="list-style-type: none">• 0.15 to 0.5 MHzQP: 79 dB, Mean: 66 dB^{*1}• 0.5 to 30 MHzQP: 73 dB, Mean: 60 dB

*1 QP: Quasi-Peak value, Mean: Average value

■ Immunity requirements

Standard: EN61131-2:2007

Test item	Test description	Value specified in standard
EN61000-4-2 Electrostatic discharge immunity	An electrostatic discharge is applied to the enclosure of the equipment.	<ul style="list-style-type: none"> • 8 kV: Air discharge • 4 kV: Contact discharge
EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity	An electric field is radiated to the product.	80% AM modulation @1 kHz <ul style="list-style-type: none"> • 80 to 1000 MHz: 10 V/m • 1.4 to 2.0 GHz: 3 V/m • 2.0 to 2.7 GHz: 1 V/m
EN61000-4-4 Fast transient burst immunity	Burst noise is applied to power lines and signal lines.	<ul style="list-style-type: none"> • AC/DC power, I/O power, and AC I/O (unshielded) lines: 2 kV • DC I/O, analog, and communication lines: 1 kV
EN61000-4-5 Surge immunity	Lightning surge is applied to power lines and signal lines.	<ul style="list-style-type: none"> • AC power, AC I/O power, and AC I/O (unshielded) lines: 2 kV CM, 1 kV DM • DC power and DC I/O power lines: 0.5 kV CM, 0.5 kV DM • DC I/O, AC I/O (shielded), analog, and communication lines: 1 kV CM
EN61000-4-6 Conducted RF immunity	High-frequency noise is applied to power lines and signal lines.	0.15 to 80 MHz, 80% AM modulation @1 kHz, 10 Vrms
EN61000-4-8 Power-frequency magnetic field immunity	The product is immersed in the magnetic field of an induction coil.	50 Hz/60 Hz, 30 A/m
EN61000-4-11 Voltage dips and interruptions immunity	Power voltage is momentarily interrupted.	<ul style="list-style-type: none"> • 0%, 0.5 periods, starting at zerocrossing • 0%, 250/300 periods (50/60 Hz) • 40%, 10/12 periods (50/60 Hz) • 70%, 25/30 periods (50/60 Hz)

Measures to comply with the Low Voltage Directive

The MELSENSOR CF26 models are out of the requirement for conformance to the Low Voltage Directive.

UL/cUL

This section shows the standards that comply with UL.

- UL/cUL application

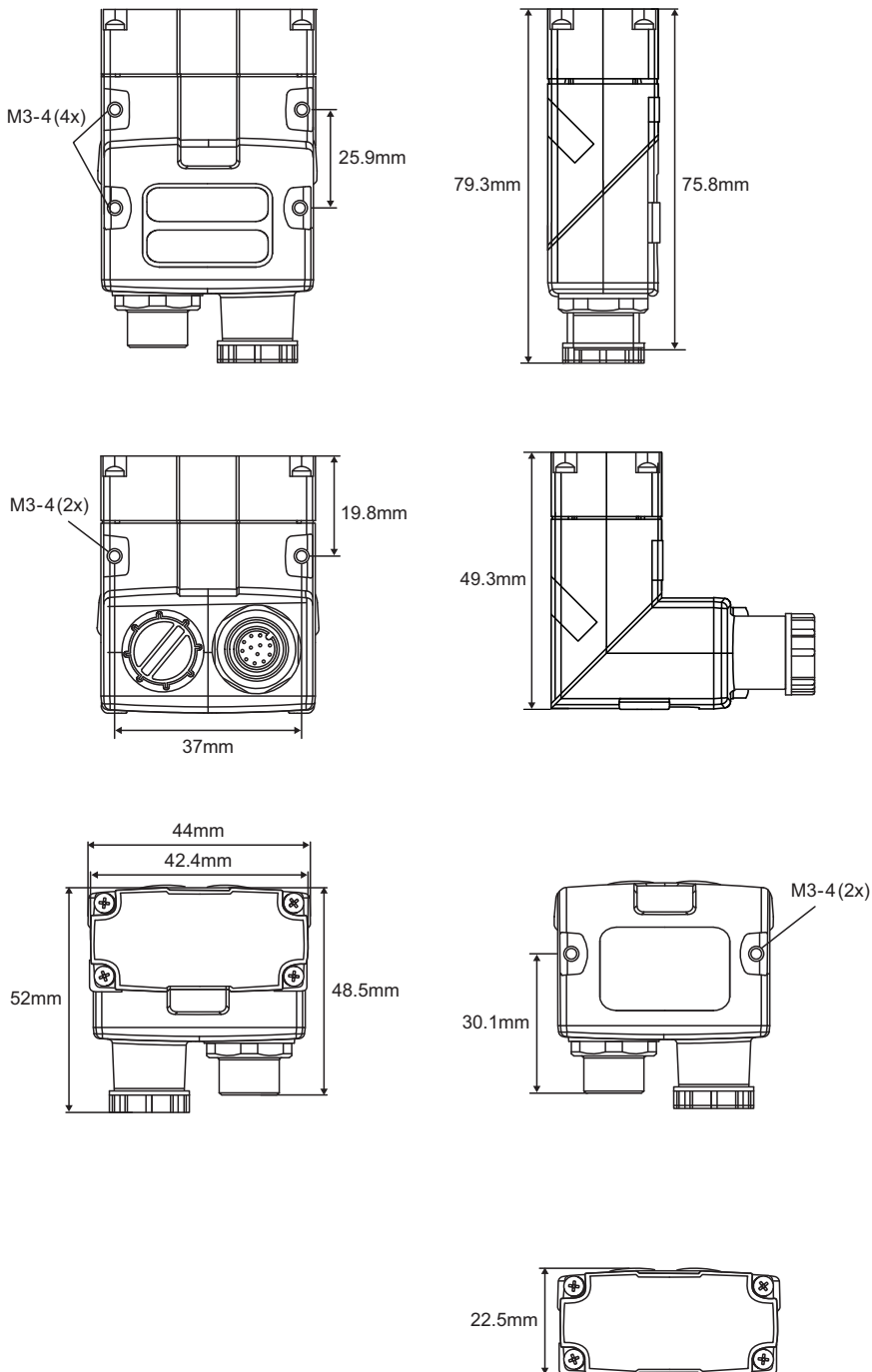
Item	Description
UL/cUL applicable standard	IEC 60950-1: 2005 Am 1: 2009 + Am 2: 2013

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Appendix 2 External Dimensions

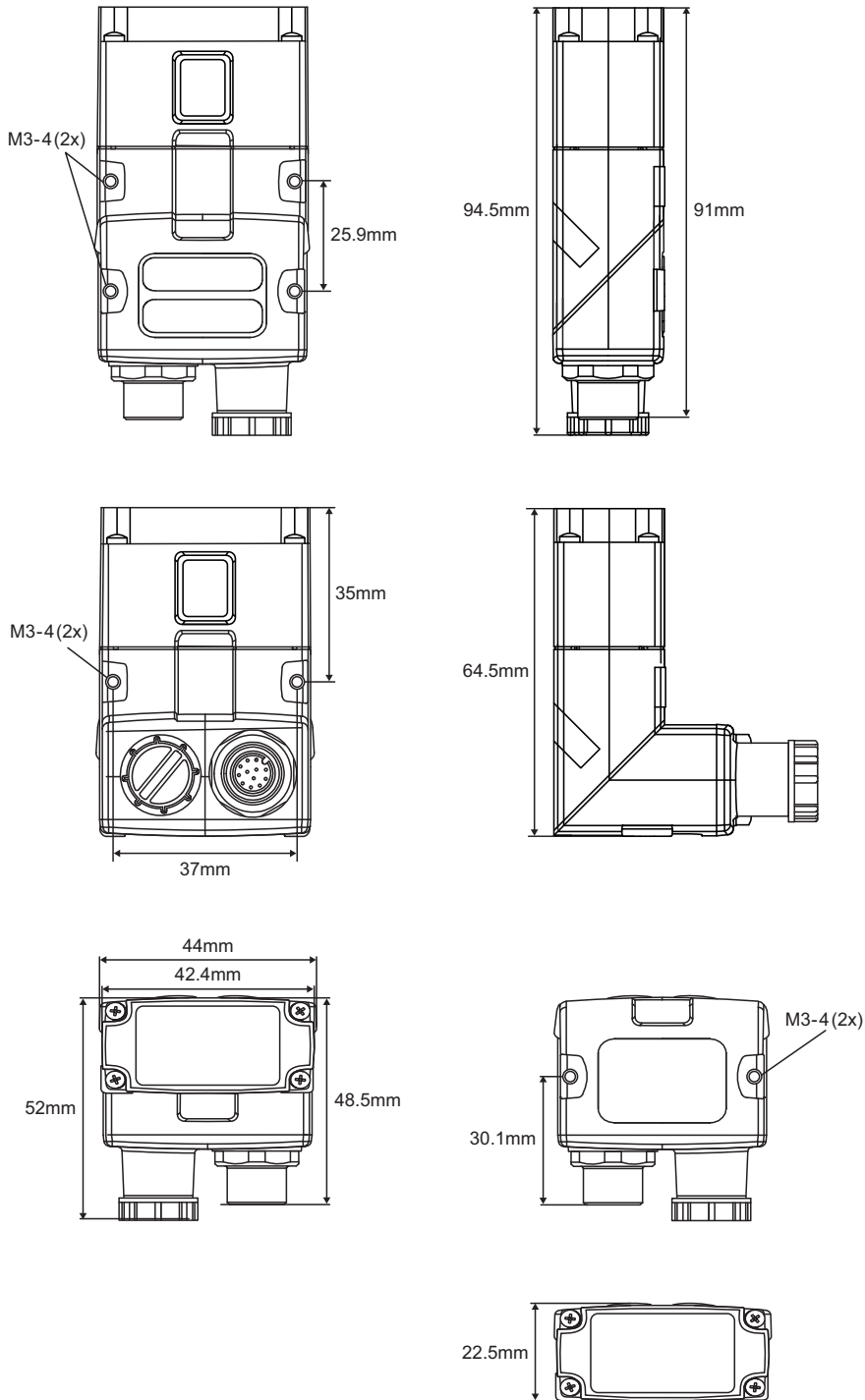
CF26-SR

The following figures show the dimensions of a code reader CF26-SR.



CF26-LR

The following figures show the dimensions of a code reader CF26-LR.



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REVISIONS

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

Revision date	*Manual number	Description
June 2019	SH(NA)-082092ENG-A	First edition
June 2020	SH(NA)-082092ENG-B	■Added or modified parts Section 3.2, Section 4.1, Section 5.5, Section 5.6
February 2021	SH(NA)-082092ENG-C	■Added or modified parts SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, Section 3.2
March 2024	SH(NA)-082092ENG-D	■Added or modified parts PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS, SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, RELEVANT MANUALS, TERMS, Section 3.1, Section 5.5, Section 5.6, Section 6.2, Section 6.5, Section 7.1, Appendix 1

Japanese manual number: SH-082091-D

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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COGNEX Cognex Corporation www.cognex.com

SH(NA)-082092ENG-D(2403)KWIX

MODEL:CF26-U-E

MODEL CODE: 13JX0C

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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