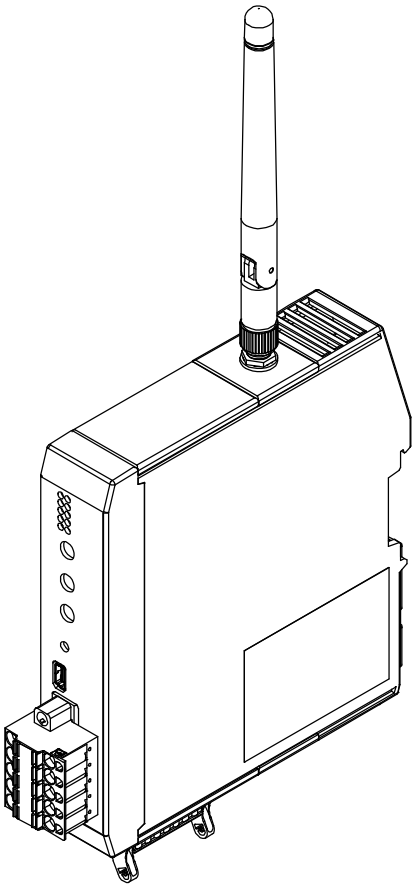
Transceivers for Wireless Positioning Units

EPC-200-CC

Instruction Manual



NBK®

Couplings, Screws, Clampers

Introduction

Thank you for purchasing **"Transceiver for Wireless Positioning Units (EPC-200-CC)"** from Nabeya Bi-tech Kaisha.

Before using this product, read the "Transceivers for Wireless Positioning Units (EPC-200-CC) Instruction Manual" (this manual) thoroughly.
The contents of **"1 Cautionary Notes Regarding Safety"** in particular, must be read and understood prior to use.
This manual should be stored in a manner that enables it to be viewed whenever a user may require it.

■About Applications of this Product

This product is designed for general industrial applications.
Do not use in applications where incorrect operation or failure may lead to death or personal injury, or in applications where failure could cause serious social damage or adverse impact.

- **Contact us when considering use for special applications.**
- **Always install the fail-safe function if using for applications involving equipment that may cause serious accident or loss.**

■About Disposal

When disposing this product, follow the rules and regulations of each local government and dispose of it as industrial waste.

Due to product improvements, some of the specifications described in this document are subject to change without notice.

Contents

1 Cautionary Notes Regarding Safety

Take care to understand the following precautions before using the product in order to ensure safe operation.
Improper handling or use may cause an unexpected accident or shorten the life of the product.
We do not take any responsibility in the case of failure due to improper use, modification, of for not following the precautions.

In this manual, safety precautions are classified as either a "Warning" or "Caution".

■Description of Markers

The specific contents will be indicated in sentences near the Warning/Caution marker.

 Warning	This indicates a situation where improper handling could result in a dangerous situation that could cause death or serious injury.
 Caution	This indicates that incorrect handling may cause minor injury or damage to the product and surrounding equipment.

■Explanation of Figure Marker

The specific contents will be indicated in sentences near the figure marker.

Figure Marker	Description
	Indicates something is prohibited. Never perform any prohibited work.
	Indicates something is mandatory. Always perform any mandatory work as instructed.

1.1 Cautionary Notes Regarding Installation and Wiring

Warning

- Be sure to perform wiring after installation is complete. **Not doing so may result in an electric shock.**
- Install in a place that is free from dust and water or oil. **Not doing so may result in an electric shock, fire, or a fault.**

- Do not allow conductive foreign matter, such as screws and metal pieces, or flammable foreign substances, such as oil, to enter the internals. **This may result in an electric shock, fire, or a fault.**
- Be sure to install the unit in such a way that fire or personal injury does not occur during an earthquake.
- Insulate the power supply terminals connections. **Not doing so may result in an electric shock.**

Warning

- Do not wire or operate with wet hands. **It may result in electric shock or failure.**
- Do not use this product near water, corrosive atmosphere, flammable gas or harmful gas, or near combustible materials. **This may result in an electric shock, fire, or a fault.**

- Do not damage, apply excessive stress, place heavy objects on, pinch, or bend the cables repeatedly. **This may result in an electric shock, fire, or a fault.**
- Do not use in locations subject to severe vibration or impacts. **This may result in an electric shock, injury, fire, or a fault.**

Caution

- Perform wiring correctly and securely. **Not doing so may result in an electric shock, fire, or a fault.**
- Install according to the specified mounting method and mounting direction. **Not doing so may result in injury or a fault.**

- Install the unit where the ambient temperature is -5˚C to 55˚C (non-freezing) and the ambient humidity is 20%RH to 85%RH (non-condensing). **Not doing so may result in a fire or a fault.**
- Check and adjust each setting before operation to avoid unexpected operation. **Not doing so may result in injury or a fault.**

- Do not apply any voltage other than the specified voltage. **This may result in a fault.**
- Do not stack the units. **This may result in a fault.**
- Do not step on the unit or place heavy objects on it. **This may result in a fault.**
- Do not subject the unit to strong impacts such as those caused by dropping or falling from something. **This may result in a fault.**
- Do not use outdoors or under exposure to direct sunlight. **This may result in a fire or a fault.**
- Do not use in places where static electricity is generated. **This may result in a fire or a fault.**
- Do not connect directly to AC power. **This may result in a fire or a fault.**

1.2 Cautionary Notes Regarding Operation and Maintenance

Warning

- Wiring, maintenance and inspection should be performed by a specialized technician. **This may result in an electric shock, injury, or a fault.**
- If an error occurs, stop operation immediately and install an external emergency stop circuit so that the power can be shut off. **This may result in an electric shock, injury, fire, or a fault.**

Warning

- Do not move, connect wiring, or inspect while the power is on. **It may result in electric shock or failure.**
- In case of a fault, shut off the power immediately at the power supply and do not reapply power. **Not doing so may result in a fire or a fault.**
- Do not disassemble, repair or modify. **This may result in an electric shock, injury, fire, or a fault.**

Caution

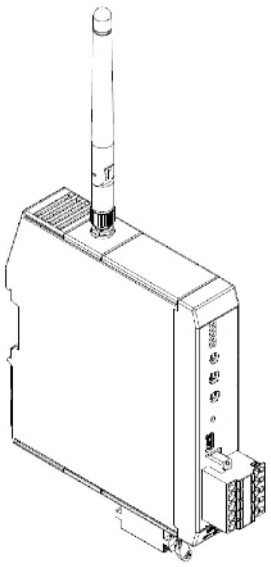
- Securely fix to the device so that it will not come loose during operation. **Not doing so may result in injury or a fault.**
- If an error occurs, fix the cause and ensure safety before restarting operation. **Not doing so may result in a fault.**
- Turn off the power if not using the product for extended periods of time. **Not doing so may result in a fault.**

Caution

- Do not make extreme adjustments or changes. **Such changes may cause unstable operation.**
- After power is restored in the event of a power outage, do not approach the equipment because operation may restart all of a sudden. **This may result in injury.**
- Do not turn the power on or off excessively frequently. **This may result in injury, fire, or a fault.**

2 Overview

2.1 Product Overview

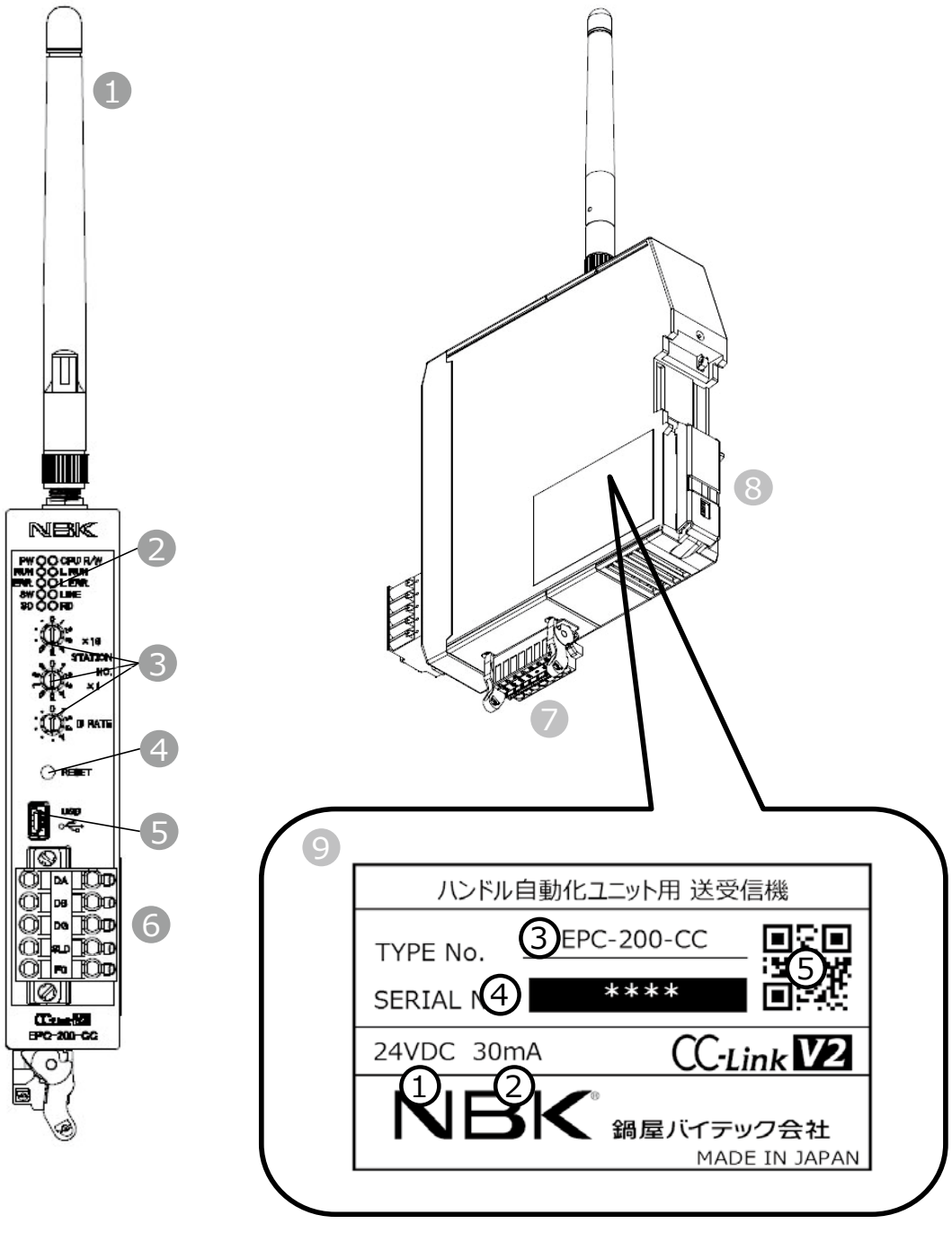


Transceivers for Wireless Positioning Units (EPC-200-CC)

- Transceivers dedicated for use with Wireless Positioning Units.
- With a PLC and CC-Link connection, Up to 32 Wireless Positioning Units can be used with simultaneous automated control.
- Configuration of transceivers can be easily performed with a PC and dedicated EPU-COM software.
- Use a DIN rail foot to enable mounting to DIN rails with one touch.

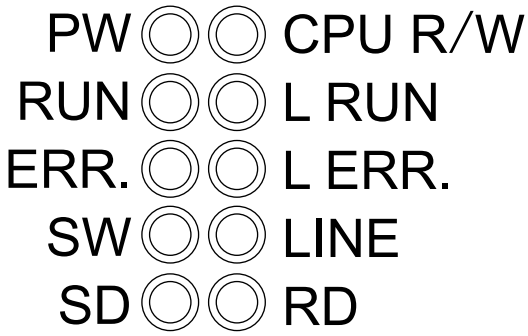
Caution
EPC-200-CC is a remote station device that supports CC-Link Ver. 2.00.
CC-Link Ver. 1.10 is not supported.
CC-Link is a registered trademark of Mitsubishi Electric Corporation.

2.2 Part Names and Functions



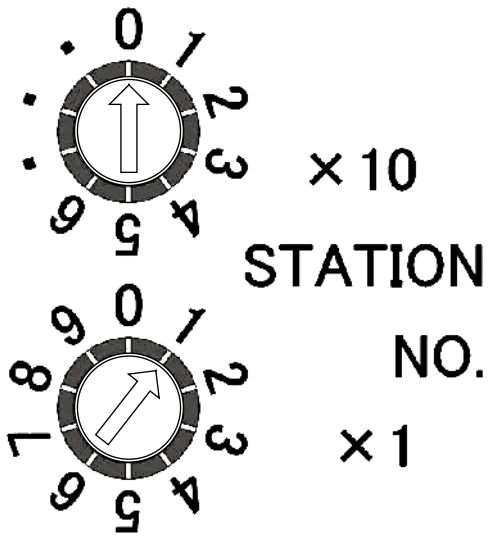
No.	Name	Function		Reference
1	Antenna	Antenna for wireless communication.		> P.17
2	Monitor LED	Displays the current status of the transceiver.		> P.10
3	CC-Link settings switch	Configures the CC-Link communication station number and communication speed.		> P.11, > P.12
4	Reset switch	Resets the hardware.		-
5	USB Connector	Connect to a PC with EPU-COM installed using the supplied USB cable.		-
6	CC-Link connector	Connects the CC-Link communication cable.		-
7	Power supply/ wired unit Connector	Connects the 24 VDC power supply or wired unit.		-
8	DIN rail foot	Used to mount to a DIN rail.		> P.16
9	Nameplate	(1) Rated Voltage	(5) QR Code	-
		(2) Rated Current		
		(3) Part No.		
		(4) Serial No.		

2.3 Monitor LED lighting pattern



LED name	LED color	Content
PW	Red	ON: Power on
		Off: Power off
CPU R/W	Red	ON: An error has occurred
		Flashing: A hardware error has occurred
		OFF: No error
RUN	Green	ON: Transceiver is normal
		OFF: Watchdog timer error
L RUN	Green	ON: Data link is running
ERR.	Red	ON: All stations communication error
		Flashing: Abnormal communication station
L ERR.	Red	ON: Update error (local station)
		Flashing: Switch settings changed while the power is on
SW	Green	ON: Switch settings are abnormal.
LINE	Green	ON: Communication is not possible, disconnected
SD	Green	ON: CC-Link communication data is being transmitted
RD	Green	ON: CC-Link communication data is being received

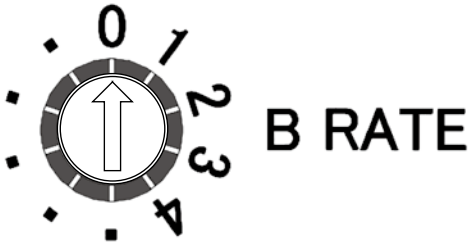
2.4 CC-Link Station Number Setting Switch



Set the station number of the transceiver.
Set with the CC-Link station number setting switch (STATION NO.).
x10 is the tens place, x1 is the ones place.

Setting range: 01 to 64 (00 cannot be used)
Default setting: 01 (x10:0, x1:1)

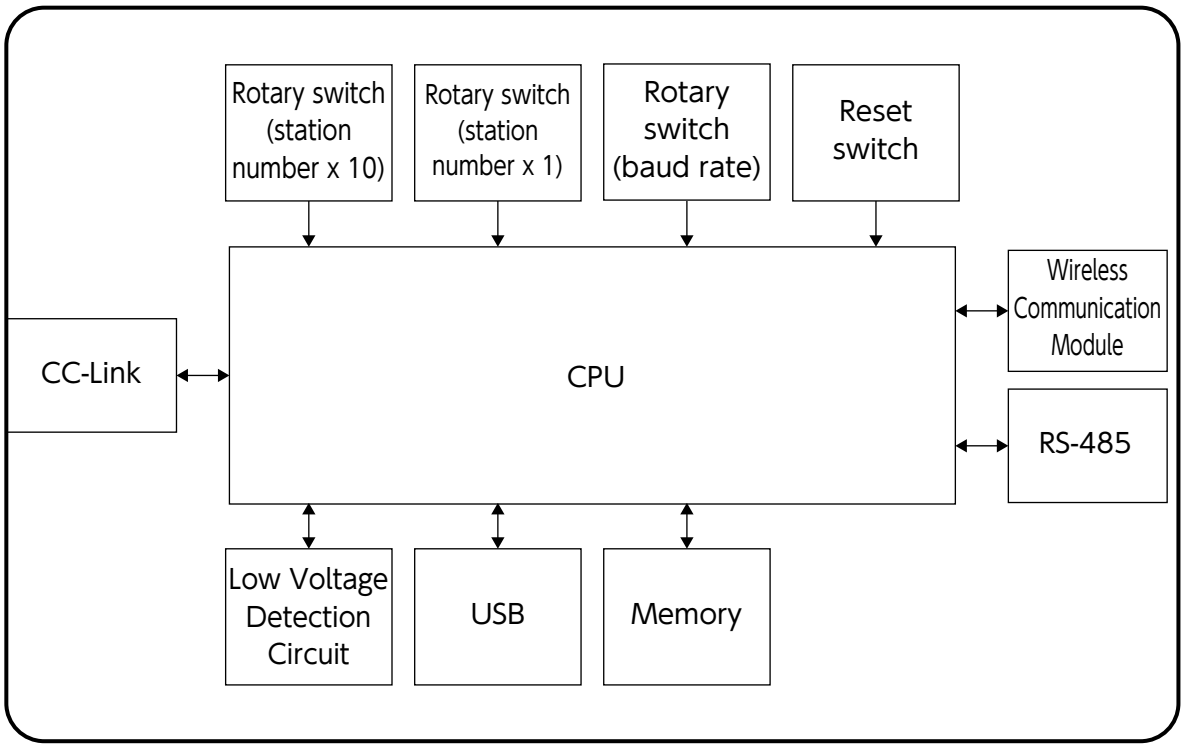
2.5 CC-Link transmission speed setting switch



Set the transmission speed of CC-Link communication.
Set with the CC-Link transmission speed setting switch (B RATE).
Default setting: 0 (156 kbps)

B RATE	Communication speed
0	156 kbps
1	625 kbps
2	2.5 Mbps
3	5 Mbps
4	10 Mbps
Others	Cannot be used

2.6 Block Diagram



3 Specifications

■Operating Environment

Operating Environment	**Temperature**	-5˚C to 55˚C (non-freezing)
	Humidity	20%RH to 85%RH (non-condensing)

■Transceivers for Wireless Positioning Units (EPC-200-CC)

Input Voltage		24 VDC ±10% (External Power Supply) 5 VDC ±5% (USB Power Supply)
Current Consumption		30 mA
Host Connection Method		PLC: CC-Link Ver.2.00 PC: USB 2.0
Maximum No. of Connected Units		32 Units
Unit Connection Method	**Wireless**	2.4 GHz Band Wireless Communication
	Wired	RS-485
Wireless Reach Distance (Reference Value)	**Indoors**	60 m
	Outdoors	1200 m
External Size (Not including connector/ antenna)		25 mm x 122.5 mm x 117 mm
Mass (Not including connector/ antenna)		131 g

4 Installation and Connection

4.1 Installation

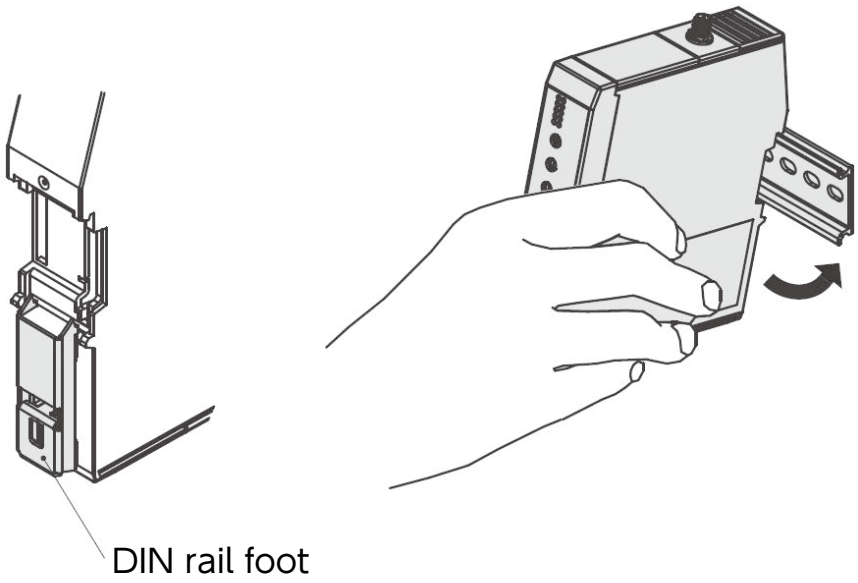
The following environmental conditions are required for installation.
Install in an appropriate environment.

- **Install indoors.**
- **Install in a place that is not exposed to direct sunlight.**
- **Install where there is no continuous vibration.**
- **Install in a place that is free from dust and water or oil.**
- **Install in an environment where heat is easily dissipated.**
- **Install in a place where inspection and cleaning are easy.**
- **Install the unit where the ambient temperature is -5˚C to 55˚C (non-freezing) and the ambient humidity is 20%RH to 85%RH (non-condensing).**
- **Be sure to install the unit in such a way that fire or personal injury does not occur during an earthquake.**
- **Do not install this product near water, corrosive atmosphere, flammable gas or harmful gas, or near combustible materials.**
- **Take measures regarding peripheral devices that are affected by noise as noise may be generated by the PWM switching control. Also consider the installation environment as the unit itself may be affected by external noise.**
- **If operating a Wireless Positioning Unit wirelessly, avoid installing the control panel inside a metal housing as the wireless performance will be degraded.**

※ **Contact us individually if installing in a special environment.**
> P.24

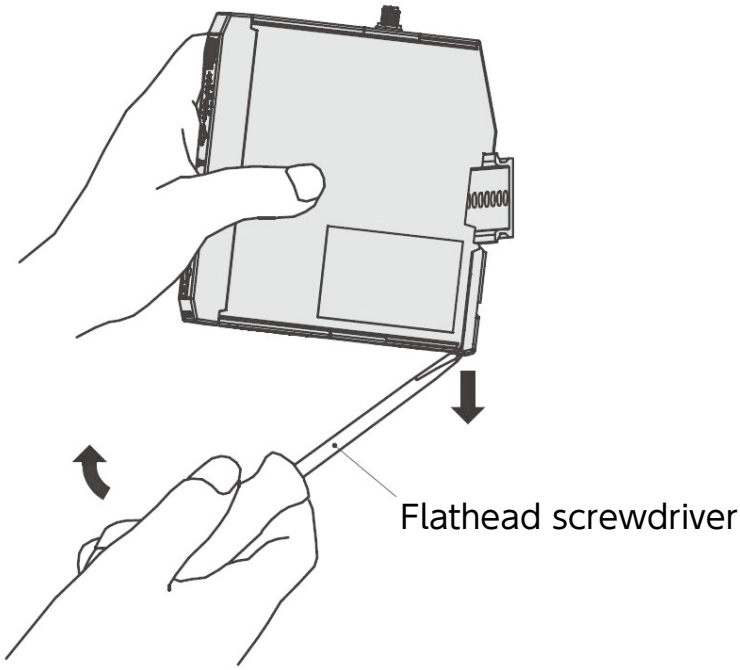
■ Mounting on DIN rail

Hook on a transceiver unit to one side of the DIN rail (width 35 mm) and press the rail onto the DIN rail foot.



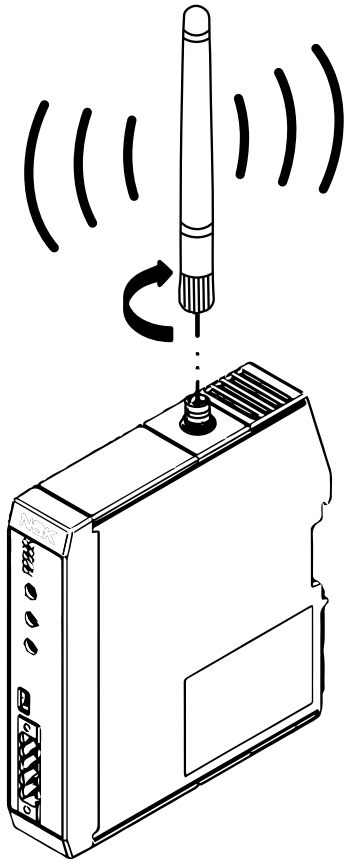
■ Removing from DIN rail

Pull down the DIN rail foot with a flathead screwdriver, then lift the transceiver up or remove by sliding along the rail.



■ Performing wireless communication

Remove the screw cover and attach the included antenna.
Radio waves are radiated vertically from the antenna axis as shown below.
After connecting the antenna, adjust the angle of the antenna while considering the directivity of the radio waves.

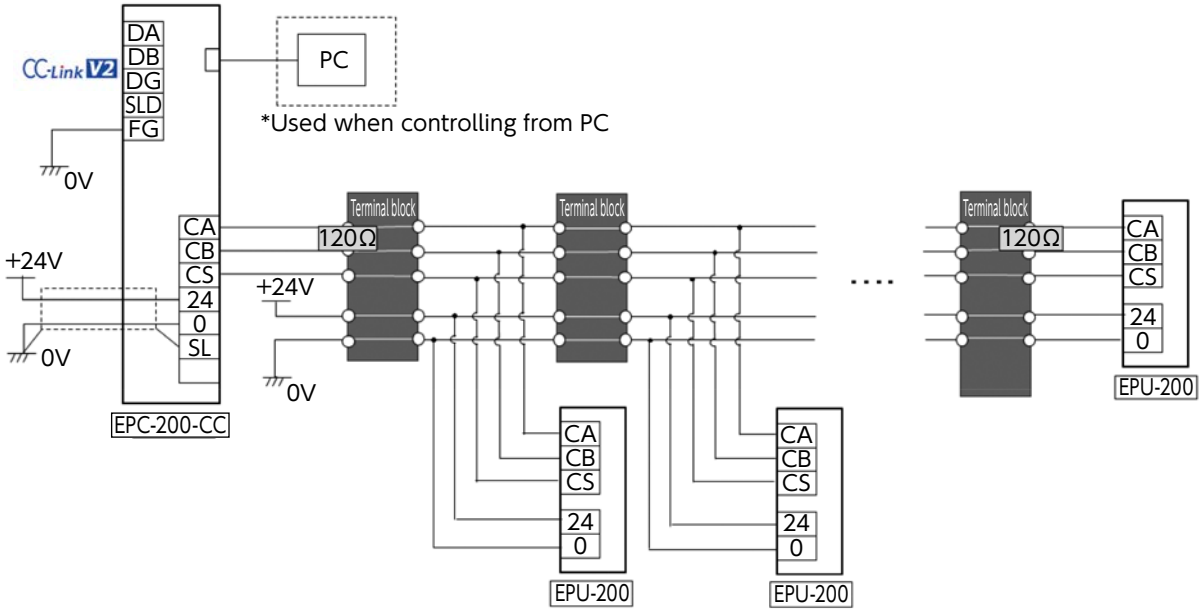


Wireless communication distance varies depending on the installation·connection conditions.
The communication distance may be shorter under the following conditions, and should be considered when determining the installation location and connection method.

- **There is an obstacle in the transmission path. (Rebar, reinforced concrete, etc.)**
- **There is a height difference in the transmission path.**
- **The installed position is close to the ground.**
- **There is metal around.**
- **There is a lot of radio noise in the vicinity.**

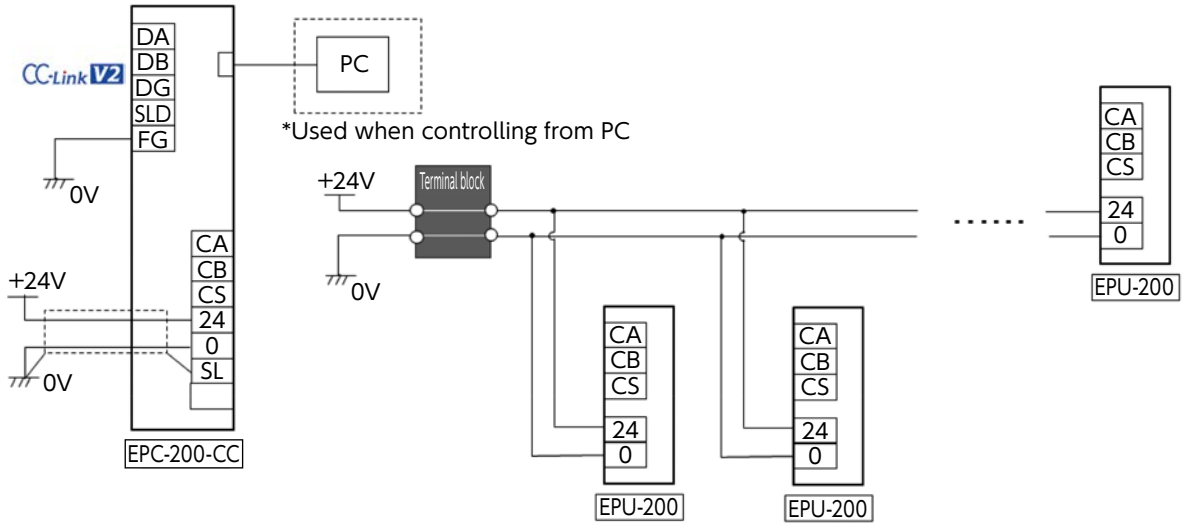
4.2 Connection

■Connection example 1　Wired connection (RS-485)



* Attach the included terminating resistor (120 Ω) to both ends of the communication line "CA"-"CB".

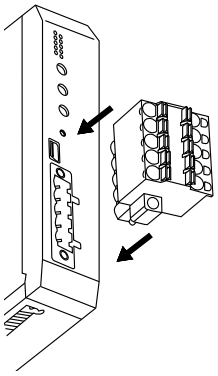
■Connection example 2　Wireless connection (2.4 GHz band wireless communication)



■CC-Link connector

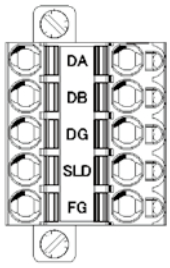
Specifications

Connector	Manufacturer	PHOENIX CONTACT
	Model	TFKC 2,5/ 5-STF-5,08
No. of Poles		5
Compatible Wire Size		AWG12-26



Connector array

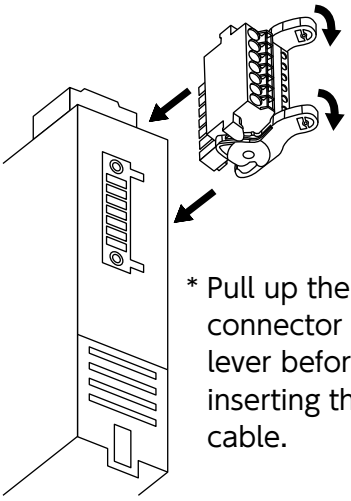
Signal Name	Content
DA	CC-Link Communication Signal
DB	CC-Link Communication Signal
DG	CC-Link Digital GND
SLD	CC-Link Shield
FG	Frame GND



CC-Link connector

■Power supply/wired unit connector specifications

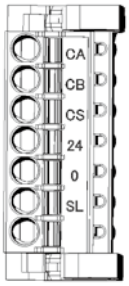
Connector	Manufacturer	PHOENIX CONTACT
	Model	FK-MCP 1,5/ 7-ST-3,5-LR
No. of Poles		7
Compatible Wire Size		AWG16-26



* Pull up the connector lever before inserting the cable.

Connector array

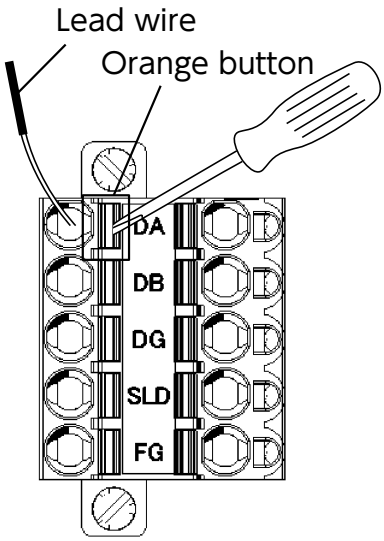
Signal Name	Content
CA	RS-485 Communication Signal (A)
CB	RS-485 Communication Signal (B)
CS	RS-485 GND/Shield
24	24VDC
0	0 V
SL	GND
Reserved	-



Power supply/ wired unit connector

■Connection method between connector and lead wire

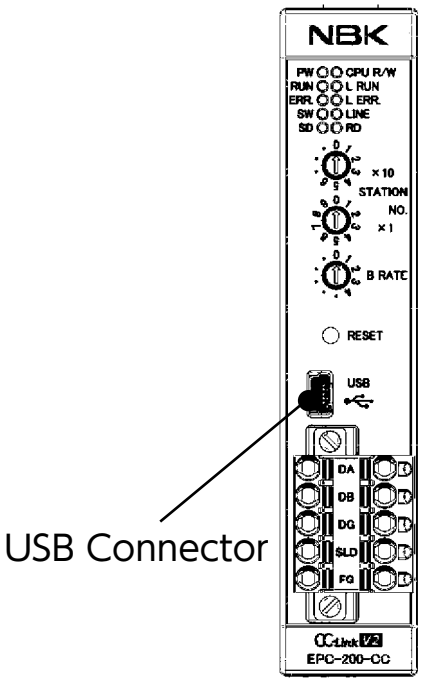
1. Remove 10 mm of insulation coating from the lead wire.
2. While pressing the orange button with a flathead screwdriver, insert the lead wire.
3. After the lead wire is inserted, release the button to secure the wire.



■USB Connector

Specifications	USB2.0
Shape	Mini USB Type-B

When connecting to a PC, connect the included USB cable to the USB connector.



5 Maintenance

Perform maintenance periodically in order to ensure safe use.
If any abnormality is found, stop using the unit immediately and take measures to eliminate the root cause of the abnormality.

5.1 Requests for Inspections

- **The technicians must turn on and off the power themselves.**
- **Be sure to carry out inspections regularly to prevent accidents.**

5.2 Inspection Items

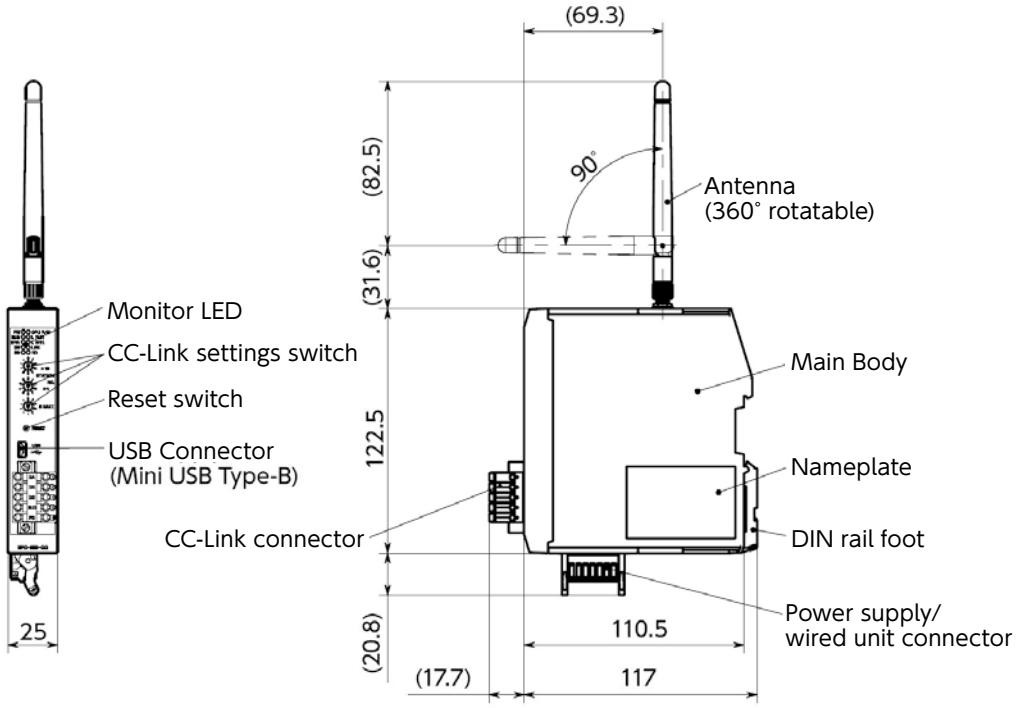
- **Is the power supply voltage within the specified values?**
- **Is the operating environment within the specified values?**
- **Is there a strange smell or abnormality?**
- **Is there any dust, debris, or foreign matter adhering?**
- **Is the DIN rail mounting location loose?**
- **Is the connector loose?**
- **Are any of the cables damaged or stressed?**

6 Troubleshooting

Symptom	Verification	Countermeasure	Explanation Page
Monitor LED does not light up	Is the power supply voltage correct?	Make sure the voltage level is as follows: external power supply: within 24V ± 10%, USB power supply: 5V ± 5%	> P.18
	Is the power supply cable connected correctly?	Wire correctly	
CC-Link communication is not possible	Is the station number setting correct?	Set the station number correctly	> P.11
	Is the communication speed setting correct?	Set the communication speed correctly	> P.12
	Is the connection of the CC-Link communication cable correct?	Wire correctly	> P.18
	Is the terminating resistor connected?	Connect it correctly	> P.18
Unit wired communication is not possible	Is the connection of the wired communication cable correct?	Wire correctly	> P.18
	Is the terminating resistor connected?	Connect it correctly	> P.18
Unit wireless communication is not possible	Is the antenna connection correct?	Connect it correctly	> P.17

7 Dimension Figure

■EPC-200-CC (unit: mm)



8 Warranty

Warranty period: One year after delivery.
Warranty contents: If a failure occurs during the warranty period under normal operating conditions as per this instruction manual, repair or replacement will be performed free of charge.

However, there may be a charge in the following cases even within the warranty period.

(1) If the unit is used incorrectly, has been repaired improperly, or modified.
(2) If the problem is caused by dropping the unit after purchase or due to damage during transportation.
(3) When the cause is a result of using the product outside of the specification range.
(4) Fire, earthquake, lightning, storm and flood damage, salt damage, abnormal voltages, or natural disasters.
(5) When the cause is intrusion of water, oil, metal chips, or other foreign matter.

The warranty covers only the product itself. Damage resulting from failure of the product will not be compensated.

■Contact

Customer Service Business Hours: 8:00 to 17:00 on weekdays, Eastern Standard Time
Phone: +1 (484) 685-7500
Fax: +1 (484) 685-7600
https://www.nbk1560.com/en-US/
e-mail: info.us@nbk1560.com
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9 Notes About Electromagnetic Radiation

Contains FCC ID : MCQ-S2CTH / IC : 1846A-S2CTH.

The wireless module built into the Transceiver for Wireless Positioning Units (EPC-200-CC) uses frequencies in the 2.4GHz band.
For this reason, read the following precautions regarding electromagnetic radiation carefully as use correctly.

We shall not be liable for any improper use, faults caused during use, malfunctions, and damages caused by use of this machine by our customers or third parties, unless legal liability is determined.

■Notes About Electromagnetic Radiation

- This device complies with part 15 of FCC Rules and Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
- This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
- Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Revision History

Date	Identification Number	Revision Contents
February 2020	UM-EPC200CC-SU-01E	Initial Release

NBK®

Couplings, Screws, Clampers

Initial Release February 2020
UM-EPC200CC-SU-01E