



User Manual

QEC-RXXCXXL

EtherCAT Compound SubDevice with Digital I/O.

With Isolated 32-ch Digital Input/Output

(Revision 1.0)

REVISION

DATE	VERSION	DESCRIPTION
2025/06/06	Version1.0	New Release.

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For EtherCAT solution service, support or tutorials, 86Duino Coding IDE 500+ introduction, functions, languages, libraries, etc. Please visit the QEC website:

- QEC: <https://www.qec.tw/>

This Manual is for the QEC series.

SAFETY INFORMATION

- Read these safety instructions carefully.
- Please carry the unit with both hands and handle it with caution.
- Power Input voltage +19 to +50VDC Power Input (Typ. +24VDC)
- Make sure the voltage of the power source is appropriate before connecting the equipment to the power outlet.
- To prevent the QEC device from shock or fire hazards, please keep it dry and away from water and humidity.
- Operating temperature between -20 to +70°C/-40 to +85°C (Option).
- When using external storage as the main operating system storage, ensure the device's power is off before connecting and removing it.
- Never touch un-insulated terminals or wire unless your power adaptor is disconnected.
- Locate your QEC device as close as possible to the socket outline for easy access and avoid force caused by the entangling of your arms with surrounding cables from the QEC device.
- If your QEC device will not be used for a period of time, make sure it is disconnected from the power source to avoid transient overvoltage damage.

WARNING!



DO NOT ATTEMPT TO OPEN OR TO DISASSEMBLE THE CHASSIS (ENCASING) OF THIS PRODUCT. PLEASE CONTACT YOUR DEALER FOR SERVICING FROM QUALIFIED TECHNICIAN.

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Ch. 1

General Information

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1.1 Introduction

ICOP's QEC-RXXCXXL is a high-performance EtherCAT SubDevice offering up to 32 isolated digital input or output channels, designed for seamless integration with EtherCAT MDevice systems. Certified by the EtherCAT Conformance Test Tool (ET9400), it ensures reliable communication, precise timing, and broad compatibility with various industrial environments.

Advanced, Flexible, and Reliable Digital I/O

The QEC-RXXCXXL supports flexible configurations of 8, 16, or 32 isolated digital I/O channels, enabling tailored deployment in diverse industrial applications.

- Digital Input: Compatible with both NPN and PNP sink types; supports operating frequencies up to 3000 Hz.
- Digital Output: Rated for up to 60VDC, with a typical load current of 500mA and peak up to 1000mA.
- Isolation Protection: 2500 Vrms for inputs and 1500 Vrms for outputs, ensuring electrical safety and durability.

Precise Synchronization via Distributed Clock

With Distributed Clock (DC) support, the QEC-RXXCXXL achieves sub-millisecond synchronization across EtherCAT networks—crucial for time-sensitive automation processes. The minimum cycle time of 1 ms makes it suitable for high-speed, high-precision control systems.

Compact, Durable, and Easy to Install

Housed in a compact and rugged form factor (107.45 x 49 x 77.31 mm, 370g), the QEC-RXXCXXL features:

- DIN-rail mount for easy integration
- Euroblock terminals for secure, efficient wiring
- Wide operating temperature: -20°C to +70°C (optional -40°C to +85°C)
- Built-in diagnostics for temperature, voltage, current, and power-on timing

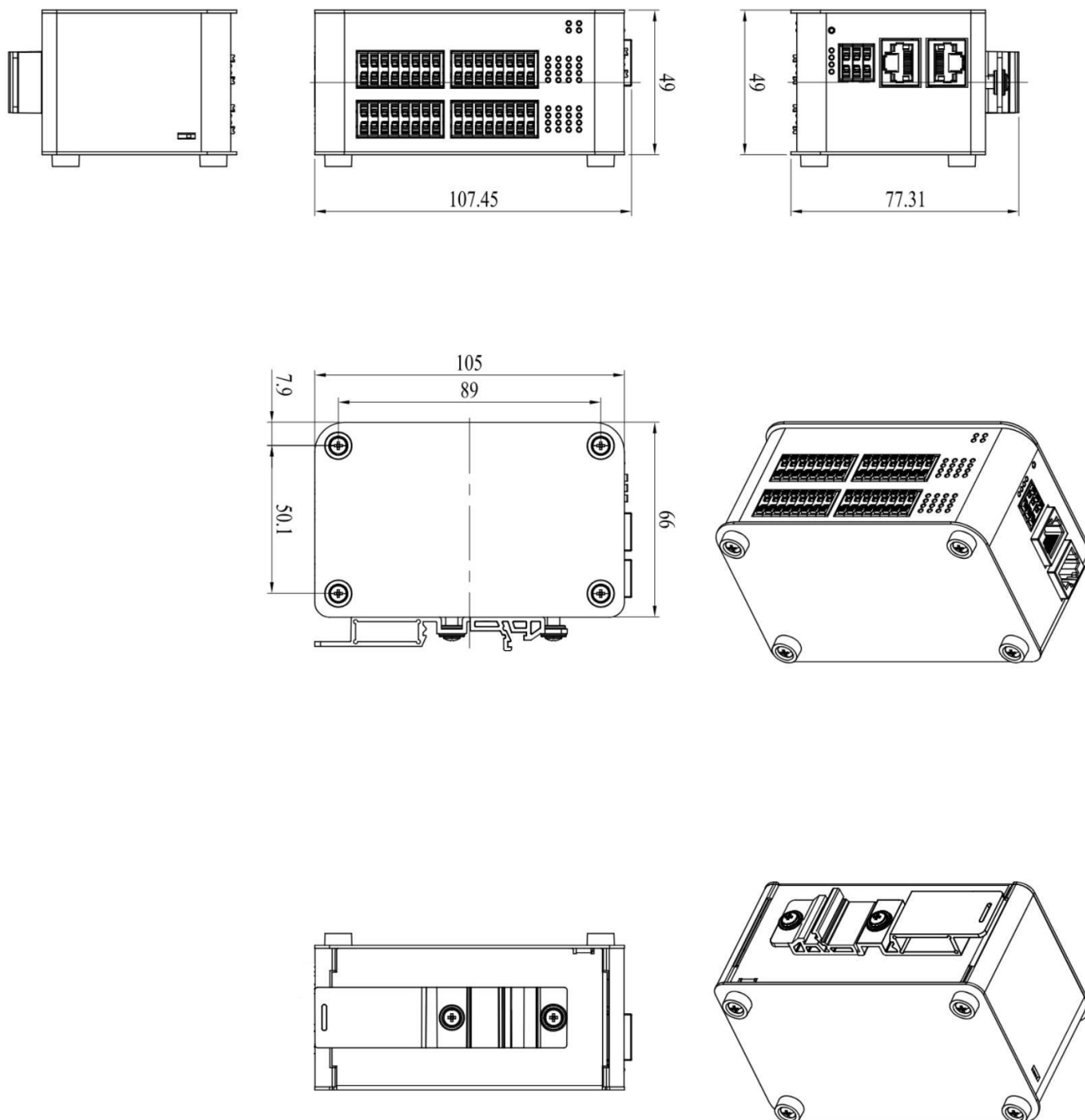
Whether for precise digital input acquisition, robust industrial output control, or synchronized operations, the QEC-RXXCXXL series offers a scalable, reliable solution for modern automation systems.

Contact ICOP today to learn how this advanced EtherCAT I/O module can elevate your control architecture.

1.2 Specifications

Digital I/O	Digital Input	Digital Output
Channels	16 (Isolated)	16 (Isolated)
Input Type	Sink (Supports both NPN and PNP configurations)	
Frequency	Safe Operating Frequency: ≤3000 Hz Rise Time (tr): 6us, Fall Time (tf): 6us	Operating Frequency: 1000Hz Turn-On Time: 0.25ms, Turn-Off Time: 20us
Load Voltage	+24V (Options: 24V or 48V)	+60Vdc
Load Current	-	Typ. 500mA (peak 1000mA)
Isolation Protection	2500 Vrms	1500 Vrms
EtherCAT		
Cable Type	Ethernet/EtherCAT Cable (Min. CAT 5), Shielded	
Cycle Time	1 ms	
Distributed Clock (DC)	Yes	
General		
Connector	Euroblock (Digital Input: Red, Digital Output: Orange)	
Power Connector	4-pin Power Input/Output & 2-pin FGND	
Power Requirement	+19 to +50VDC Power Input (Typ. +24VDC)	
Power Consumption	3W	
Operating Temperature	-20 to +70°C	
Dimension	107.45 x 49 x 77.31 mm	
Weight	370 g	
Mounting	DIN-Rail	
Internal Monitoring	Temperature, Voltage, Current, Start-up time	

1.3 Dimension

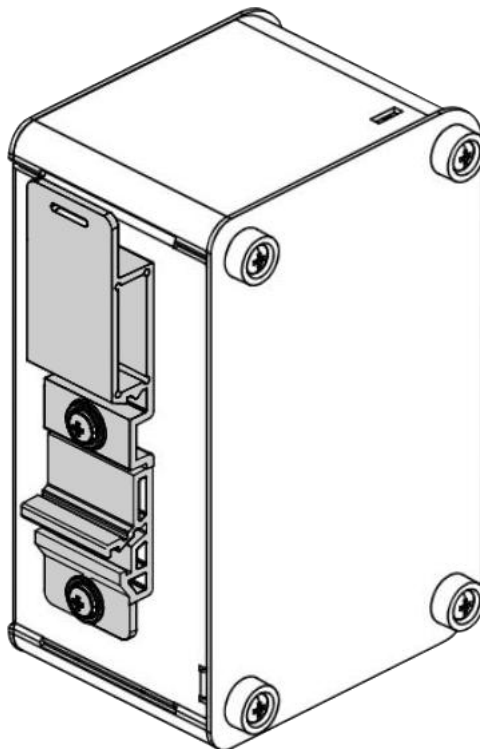
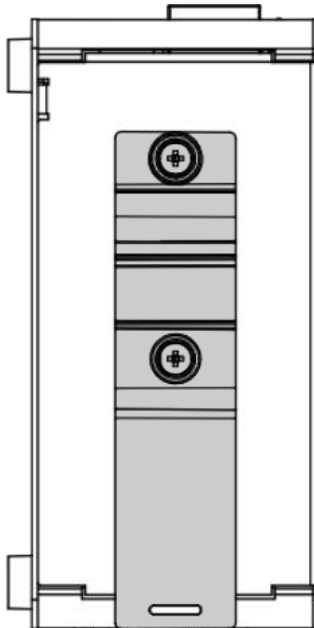


(Unit: mm)

1.4 Mounting Instruction

QEC-RXXCXXL is an easy-install design to help you set-up your modules easily. Please refer to [Ch.3.1 DIN-Rail installation](#).

- **DIN-Rail**



1.5 Ordering Information

Type	RJ45 power source		Functions			Feature	-	Coating
	Input	Output	Digital	Input	Output	Digital Type		
QEC-R	<u>X</u>	<u>X</u>	C	<u>X</u>	<u>X</u>	<u>X</u>		<u>X</u>

1. Type: Code 1~4

R: EtherCAT SubDevice.

2. RJ45 Power source: Code 5~6

0: RJ45 In/Out w/o power

1: RJ45 PoE Device, Red Plastic Housing

3. Functions: Code 7~9

C: Digital I/O

X: 0, 8, F (16), T (32) input channels

X: 0, 8, F (16), T (32) output channels

4. Feature: Code 10

G: AD*1 、 DA*1 、 UART

K: DA*2 、 UART

N: AD*2 、 UART

U: UART only

L: None

5. Coating: Code 11

C: Yes / N: Normal

Q E C - R X X C X X X - X

1.5.1 Reference Ordering Part Number:

Below are the standard Part Numbers:

- **QEC-R00CFLL-N**: EtherCAT Compound SubDevice/16 Digital Input/16 Digital Output
- **QEC-R11CFLL-N**: EtherCAT Compound SubDevice/16 Digital Input/16 Digital Output/PoE
- **QEC-R00CT0L-N**: EtherCAT Compound SubDevice/32 Digital Input
- **QEC-R00C0TL-N**: EtherCAT Compound SubDevice/32 Digital Output



Ch. 2

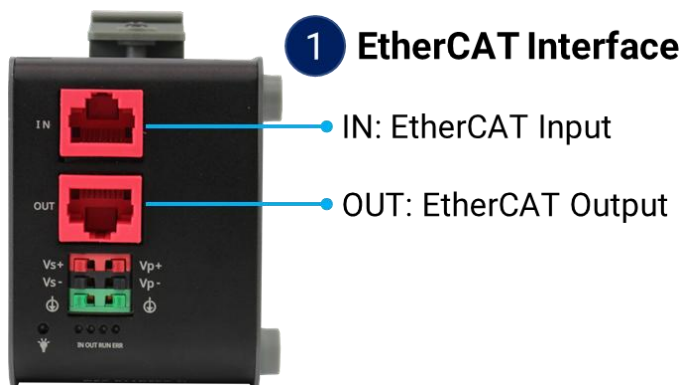
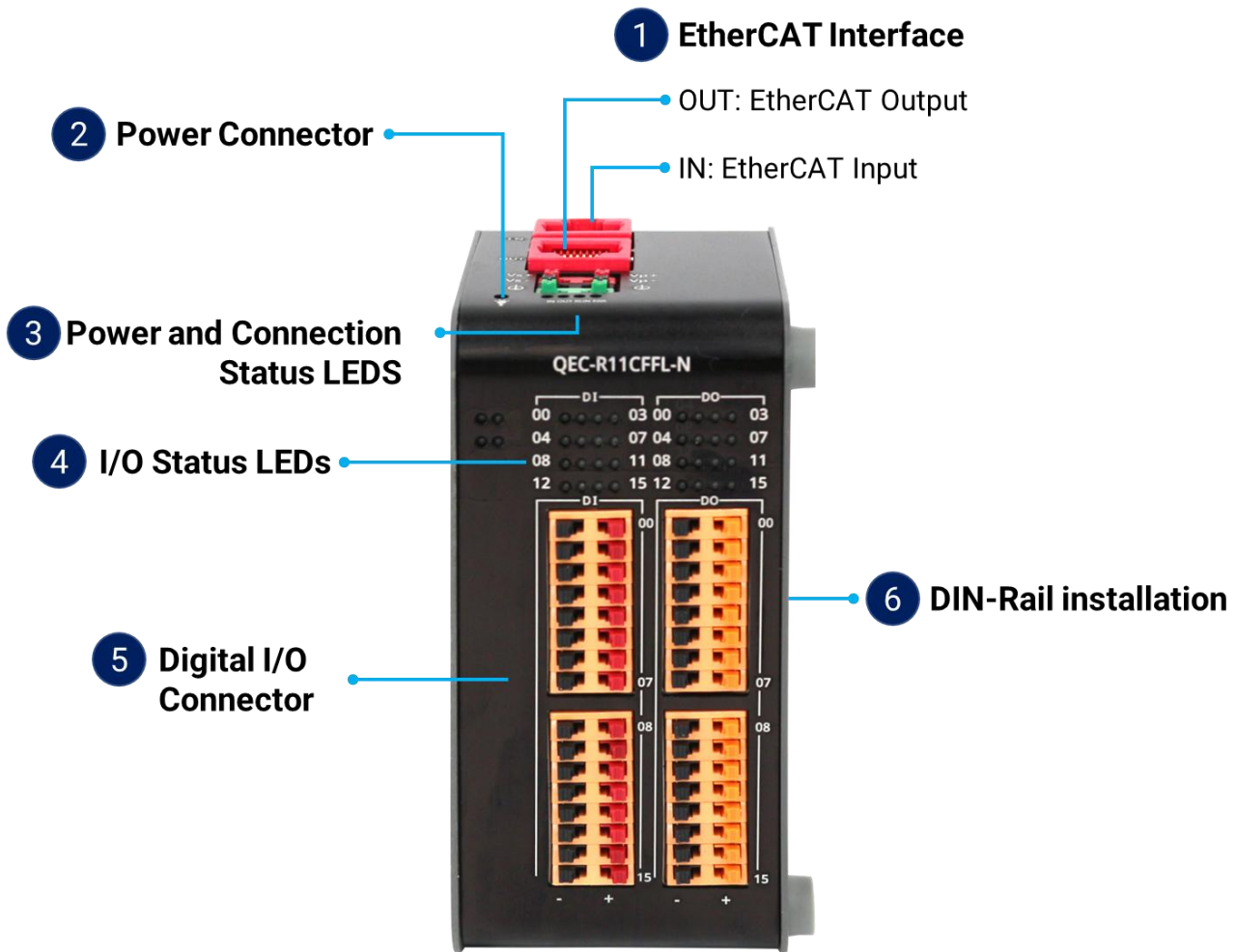
Hardware System

[2.1 General Technical Data](#)

[2.2 Connector Summary](#)

[2.3 Wiring to the Connector](#)

2.1 General Technical Data

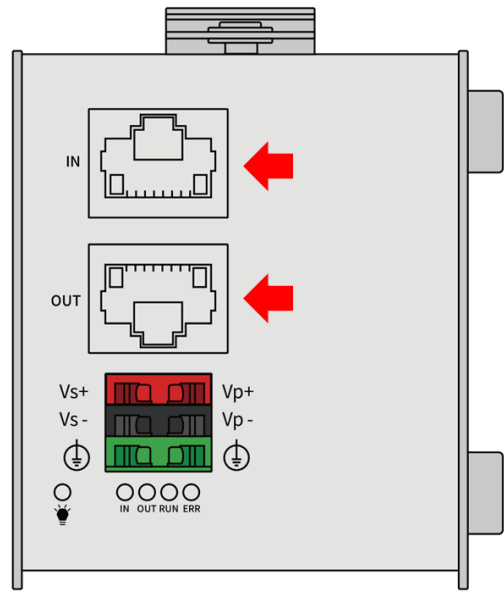


2.2 Connector Summary

No.	Description		Type Narrative	Pin #
1	EtherCAT Interface	OUT	External RJ45 Connector (Gold finger)	8-pin
		IN		8-pin
2	Power Connector		Terminal Block Interface	6-pin
3	Power and Connection Status LEDs		External Status LEDs	-
4	I/O Status LEDs		External Status LEDs	-
5	Digital I/O Connector		32 channels push-in Terminal (Euroblock)	32-ch
6	DIN-Rail installation		DIN-Rail	-

2.2.1 EtherCAT Interface

RJ45 Connectors.

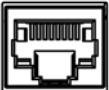


EC IN

	Pin #	Signal Name	Pin #	Signal Name
 8 2,1	1	LAN1_TX+	2	LAN1_TX-
	3	LAN1_RX+	4	VS+
	5	VP+	6	LAN1_RX-
	7	VS- (GND)	8	VP- (GND)

- * PoE LAN with the Red Housing; Regular LAN with Black Housing.
- * L4, L5, L7, L8 pins are option, for RJ45 Power IN/OUT.

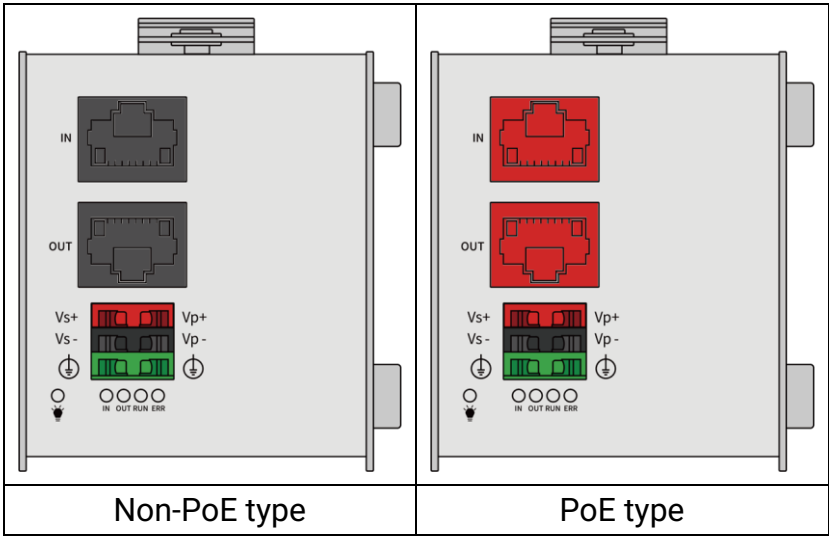
EC OUT

	Pin #	Signal Name	Pin #	Signal Name
 1,2 8	1	LAN2_TX+	2	LAN2_TX-
	3	LAN2_RX+	4	VS+
	5	VP+	6	LAN2_RX-
	7	VS- (GND)	8	VP- (GND)

- * PoE LAN with the Red Housing; Regular LAN with Black Housing.
- * L4, L5, L7, L8 pins are option, for RJ45 Power IN/OUT.

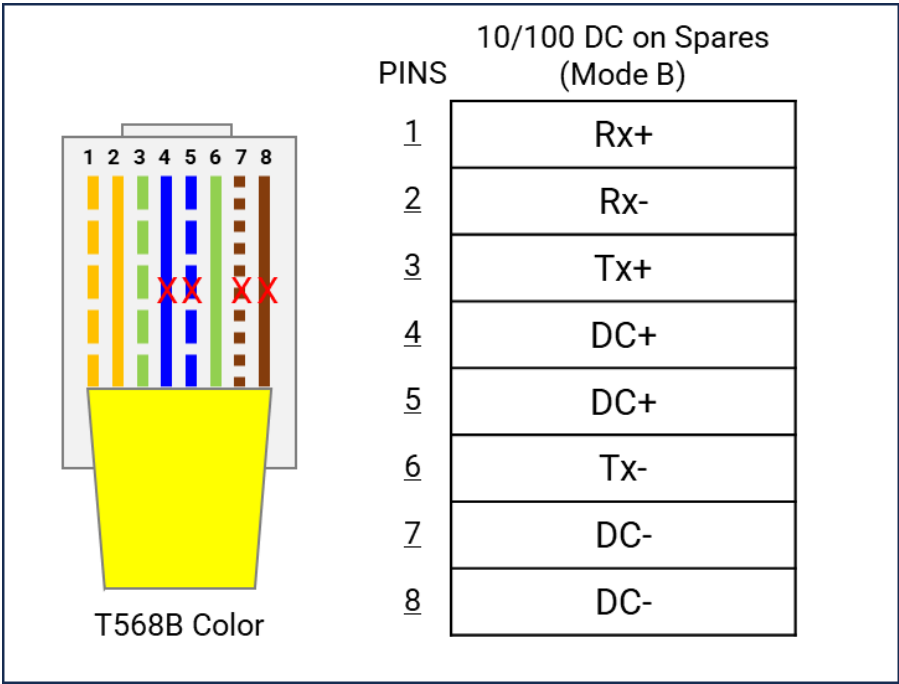
Note. QEC’s PoE (Power over Ethernet)

In QEC product installations, users can easily distinguish between PoE and non-PoE: if the RJ45 house is red, it is PoE type, and if the RJ45 house is black, it is non-PoE type.



PoE (Power over Ethernet) is a function that delivers power over the network. QEC can be equipped with an optional PoE function to reduce cabling. In practice, PoE is selected based on system equipment, so please pay attention to the following points while evaluating and testing:

- 1. When connecting PoE and non-PoE devices, make sure to disconnect Ethernet cables at pins 4, 5, 7, and 8 (e.g., when a PoE-supported QEC EtherCAT MDevice connects with a third-party EtherCAT SubDevice).
- 2. The PoE function of QEC is different and incompatible with EtherCAT P, and the PoE function of QEC is based on PoE Type B, and the pin functions are as follows:

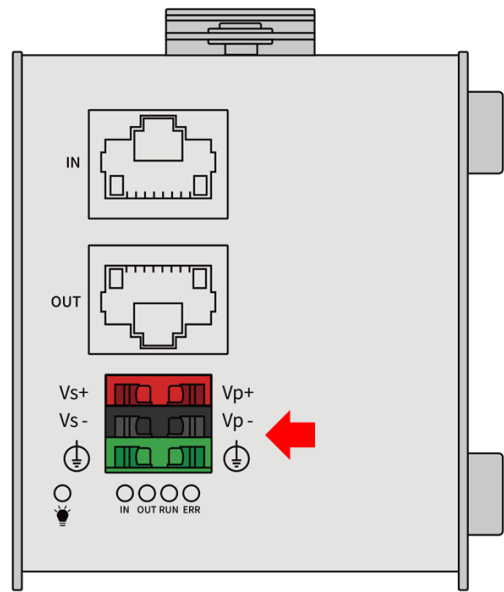


- 3. QEC’s PoE power supply is up to **24V/3A**.

2.2.2 Power Connector

Euroblock Connectors.

4-pins Power Input/Output & 2-pins FGND.



Vs for system power; Vp for peripheral power and backup power.

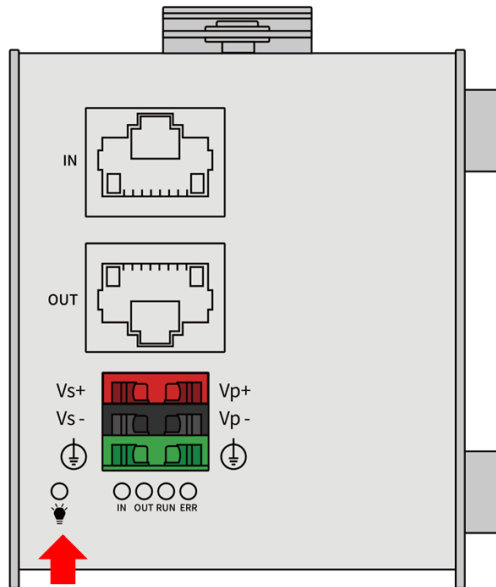
	Pin #	Signal Name	Pin #	Signal Name
	1	Vs+	2	Vp+
	3	Vs- (GND)	4	Vp- (GND)
	5	F.G	6	F.G

* Power Input voltage +19 to +50VDC Power Input (Typ. +24VDC)

2.2.3 Power and Connection Status LEDs

Power and connection status LEDs information.

Power Status LED



Power input is 24V (typical). The LED status provide high/low voltage warning.

Notation	States	Condition	Description
PWR 	Green LED On	Voltage $\leq 50V$ and $\geq 45V$ Voltage $\leq 26V$ and $\geq 19V$	When Vs and Vp voltages are confirmed to be normal, the Green LED will remain steady on.
	Green LED On Red LED On	Voltage $< 45V$ and $> 26V$ Voltage $< 19V$ and $> 12V$	LEDs will alternately flash (at 0.3-second intervals) until the Vs and Vp voltages are correct.
	Orange LED On	Voltage $> 50V$ or $< 12V$	Orange LED (Green + Red) will continuously flash (at 0.3-second intervals) until the Vs and Vp voltages are correct.

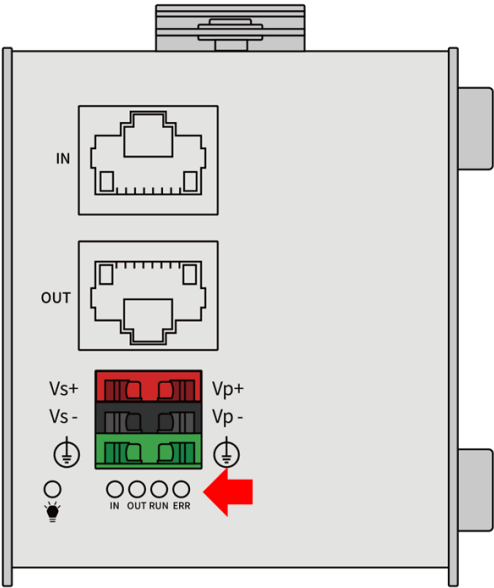
* Vs power status will be displayed first.

Power ERROR Code table (Red LED Flashing Display (2 seconds/cycle)) :

Long Light	Short Flash	Description
0 Long Light	After microchip completes the Bootloader test, it proceeds to the APP program stage.	
	1 short flash	Microchip communication with the EtherCAT chip failed.
	2 short flashes	EtherCAT chip internal RAM test failed.
	5 short flashes or 6 short flashes	Quartz oscillator on the board abnormality.
1 Long Light	Indicates the microchip Bootloader stage during startup, APP program not yet executed.	
	1 short flash	microchip internal SRAM failed.
	2 short flashes	APP software CHECKSUM failed.
2 Long Lights	Not yet defined.	

* Note: If you encounter any of the above abnormal states, please contact us.

Connection Status LEDs



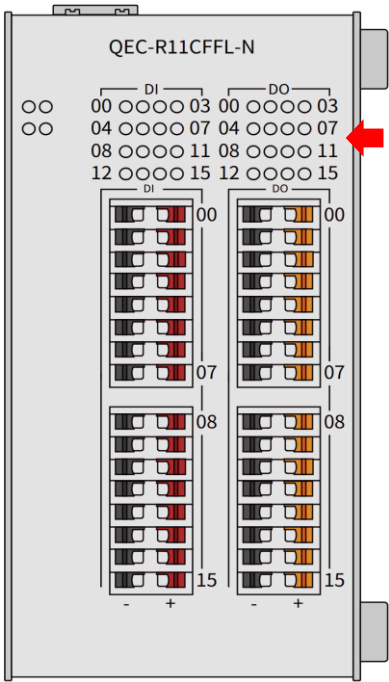
There are EtherCAT In, Out, Run, and Error Status LEDs.



Notation	Color	States	Description
In	Green	Off	No link
		Blinking	Link and activity
		On	Link without activity
Out	Green	Off	No link
		Blinking	Link and activity
		On	Link without activity
Run	Green	Off	The device is in state INIT
		Blinking	The device is in state Pre-Operation
		Single Flash	The device is in state Safe-Operation
		On	The device is in state Operation
Err	Red	Off	No error
		Blinking	Invalid Configuration
		Single Flash	Local Error
		Double Flash	Process Data Watchdog Timeout EtherCAT Watchdog Timeout
		On	The device is in state Error

2.2.4 I/O Status LEDs

The I/O status LEDs for the Digital I/O. We use QEC-R00CFFL-N in this case.



Digital Input

The LEDs of 16 digital inputs are 0 to 15, individually indicating the status of the 16 digital channels.

DI 00 ○○○○ 03 04 ○○○○ 07 08 ○○○○ 11 12 ○○○○ 15	Notation	Color	States	Description
	DI	-	Off	Digital input status is "Off"
		Green	On	Digital input status is "On"

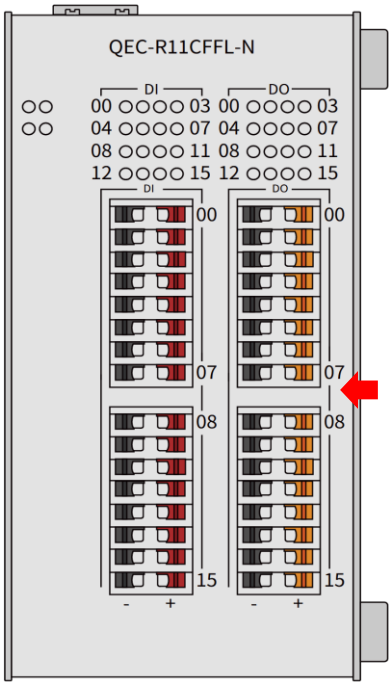
Digital Output

The LEDs of 16 digital outputs are 0 to 15, individually indicating the status of the 16 digital channels.

DO 00 ○○○○ 03 04 ○○○○ 07 08 ○○○○ 11 12 ○○○○ 15	Notation	Color	States	Description
	DO	-	Off	Digital output status is "Off"
		Green	On	Digital output status is "On"

2.2.5 Digital I/O Connector

The Digital I/O connector description. We use QEC-R00CFFL-N in this case.



For EtherCAT SubDevice index assignments, refer to [Ch. 5.2.3 Especial Objects \(0x6000-0xFFFF\)](#).

The Digital I/O specification table:

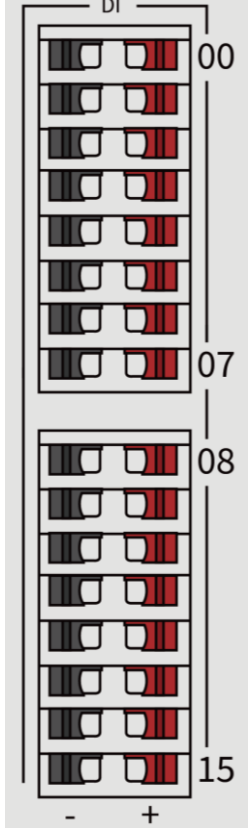
Digital I/O	Digital Input	Digital Output
Channels	16 (Isolated)	16 (Isolated)
Input Type	Sink (Supports both NPN and PNP configurations)	
Frequency	Safe Operating Frequency: ≤ 3000 Hz Rise Time (tr): 6us, Fall Time (tf): 6us	Operating Frequency: 1000Hz Turn-On Time: 0.25ms, Turn-Off Time: 20us
Load Voltage	+24V (Options: 24V or 48V)	+60Vdc
Load Current	-	Typ. 500mA (peak 1000mA)
Isolation Protection	2500 Vrms	1500 Vrms

Color Define:

- Digital Input: Positive (Red), Negative (Black).
- Digital Output: Positive (Orange), Negative (Black).

Digital Input

Digital Input: Positive (Red), Negative (Black).

Pin #	Signal Name		Pin #	Signal Name
00	DI_00-		00	DI_00+
01	DI_01-		01	DI_01+
02	DI_02-		02	DI_02+
03	DI_03-		03	DI_03+
04	DI_04-		04	DI_04+
05	DI_05-		05	DI_05+
06	DI_06-		06	DI_06+
07	DI_07-		07	DI_07+
08	DI_08-		08	DI_08+
09	DI_09-		09	DI_09+
10	DI_10-		10	DI_10+
11	DI_11-		11	DI_11+
12	DI_12-		12	DI_12+
13	DI_13-		13	DI_13+
14	DI_14-		14	DI_14+
15	DI_15-		15	DI_15+

Digital Input Load Voltage:

- Maximum Load Voltage: Load Voltage+24V (Options: 24V or 48V)

Channel Isolation:

- Isolated Channels: 16

Frequency

- Safe Operating Frequency: ≤ 3000 Hz (Rise Time (tr): 6 μ s, Fall Time (tf): 6 μ s)

I/O Type:

- Type: Sink (Supports both NPN and PNP configurations)

Isolation Protection

- 2500 Vrms

Digital Output

Digital Output: Positive (Orange), Negative (Black).

Pin #	Signal Name		Pin #	Signal Name
0+	DQ_00-		0-	DQ_00+
1+	DQ_01-		1-	DQ_01+
2+	DQ_02-		2-	DQ_02+
3+	DQ_03-		3-	DQ_03+
4+	DQ_04-		4-	DQ_04+
5+	DQ_05-		5-	DQ_05+
6+	DQ_06-		6-	DQ_06+
7+	DQ_07-		7-	DQ_07+
8+	DQ_08-		8-	DQ_08+
9+	DQ_09-		9-	DQ_09+
10+	DQ_10-		10-	DQ_10+
11+	DQ_11-		11-	DQ_11+
12+	DQ_12-		12-	DQ_12+
13+	DQ_13-		13-	DQ_13+
14+	DQ_14-		14-	DQ_14+
15+	DQ_15-		15-	DQ_15+

Digital Output Load Voltage:

- Maximum Load Voltage: +60Vdc

Digital Output Load Current:

- Typ. 500mA (peak 1000mA)

Channel Isolation:

- Isolated Channels: 16

Frequency

- Operating Frequency: 1000Hz (Turn-On Time: 0.25ms, Turn-Off Time: 20us)

I/O Type:

- Type: Sink (Supports both NPN and PNP configurations)

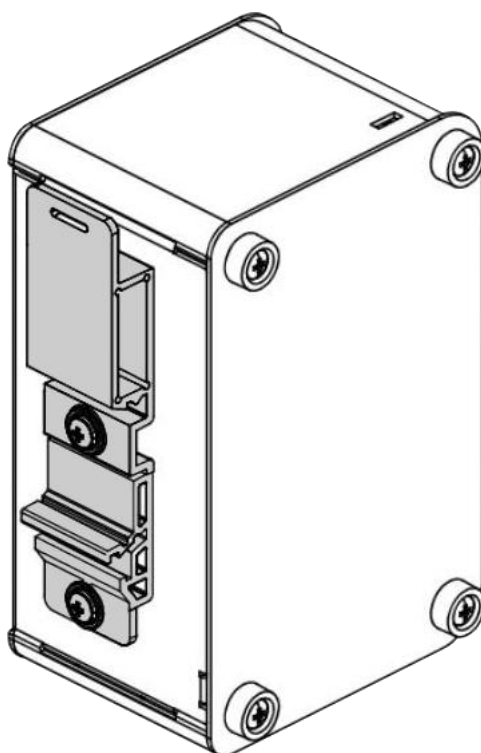
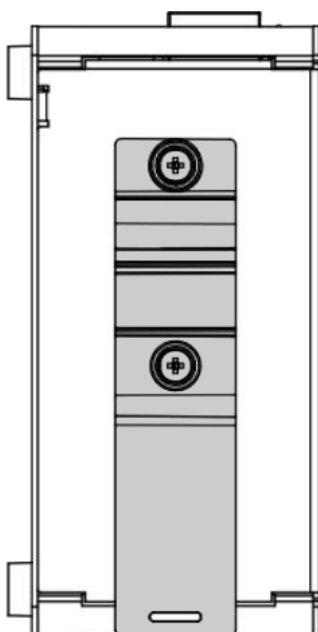
Isolation Protection

- 1500 Vrms

2.2.6 DIN-Rail

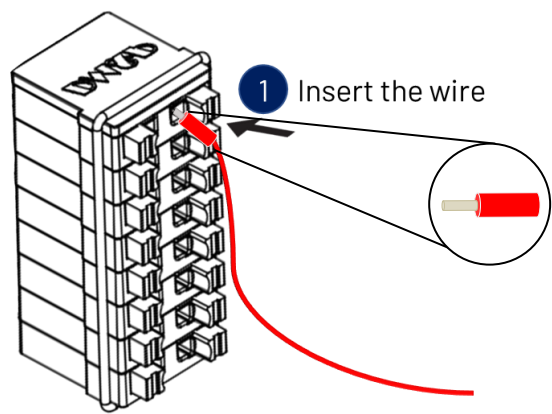
QEC-RXXCXXL is an easy-install design to help you set-up your modules easily. Please refer to [Ch.3.1 DIN-Rail installation](#).

- DIN-Rail

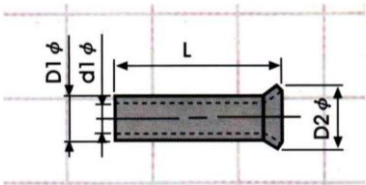


2.3 Wiring to the Connector

2.3.1 Connecting the wire to the connector



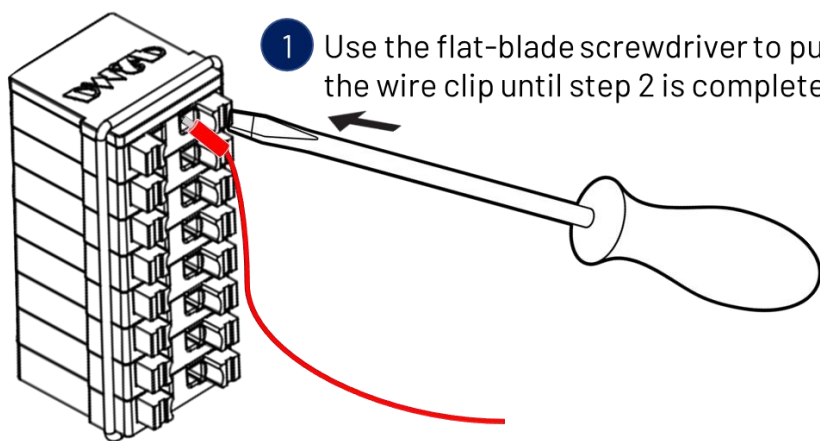
1 Insert the wire



Insulated Terminals Dimensions (mm)

Position	L	ØD1	Ød1	ØD2
CN 0.5-6	6.0	1.3	1.0	1.9
CN 0.5-8	8.0	1.3	1.0	1.9
CN 0.5-10	10.0	1.3	1.0	1.9

2.3.2 Removing the wire from the connector



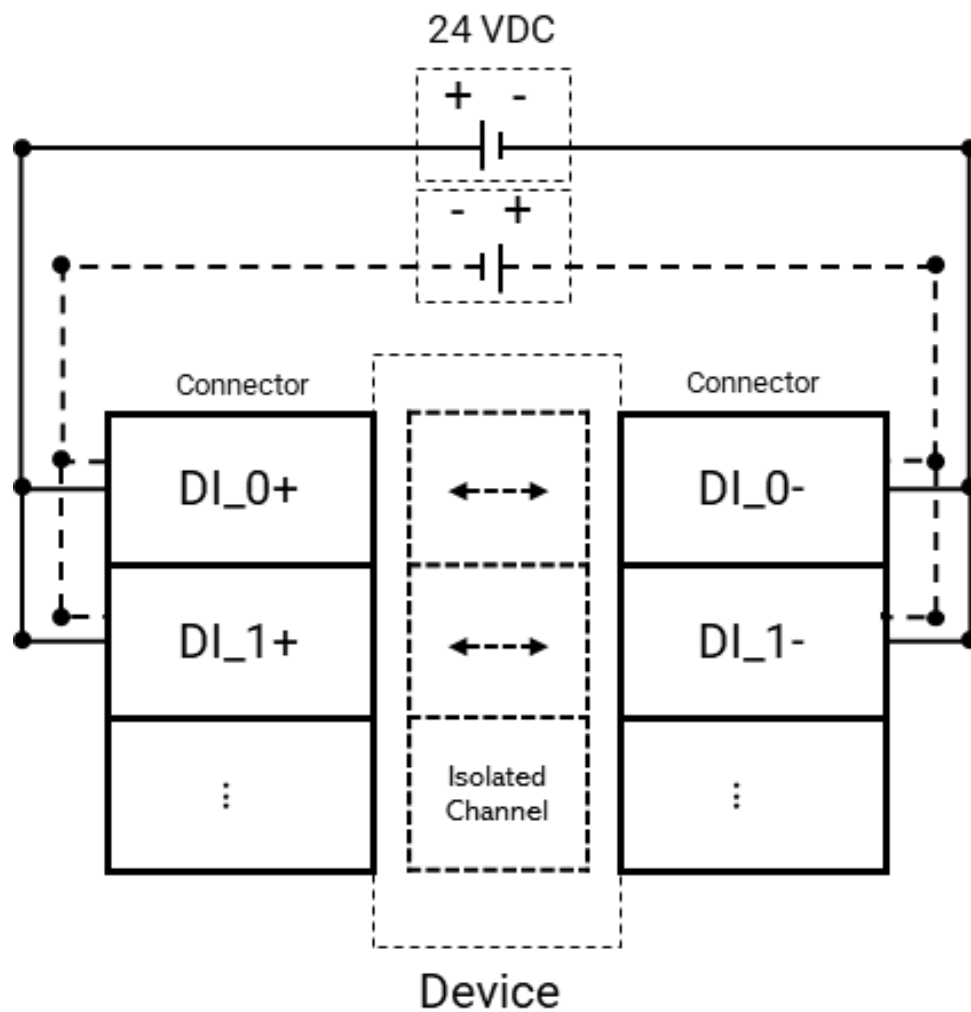
1 Use the flat-blade screwdriver to push the wire clip until step 2 is completed.

2 Remove the wire

2.3.3 Application Wiring

Digital Input

Example for Basic Digital Input Operation.

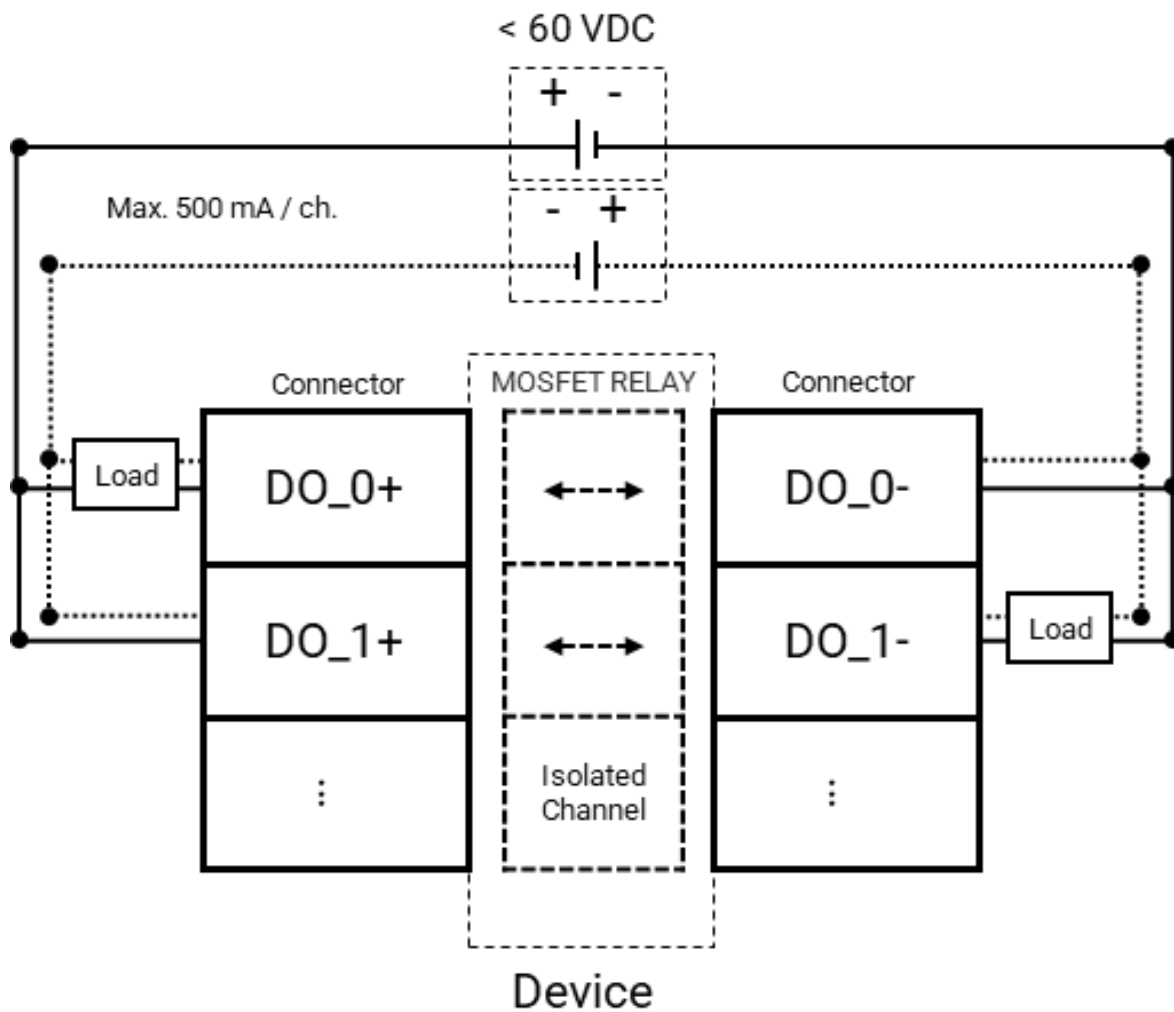


Digital Input Specification:

- Maximum Load Voltage: Load Voltage+24V (Options: 24V or 48V)
- Safe Operating Frequency: ≤ 3000 Hz (Rise Time (tr): 6 μ s, Fall Time (tf): 6 μ s)
- Type: Sink (Supports both NPN and PNP configurations)
- Isolation Protection: 2500 Vrms

Digital Output

Example for Basic Digital Output Operation.



Digital Output Specification:

- Maximum Load Voltage: +60Vdc
- Typ. 500mA (peak 1000mA)
- Operating Frequency: 1000Hz (Turn-On Time: 0.25ms, Turn-Off Time: 20us)
- Type: Sink (Supports both NPN and PNP configurations)
- Isolation Protection: 1500 Vrms



Ch. 3

Hardware Installation

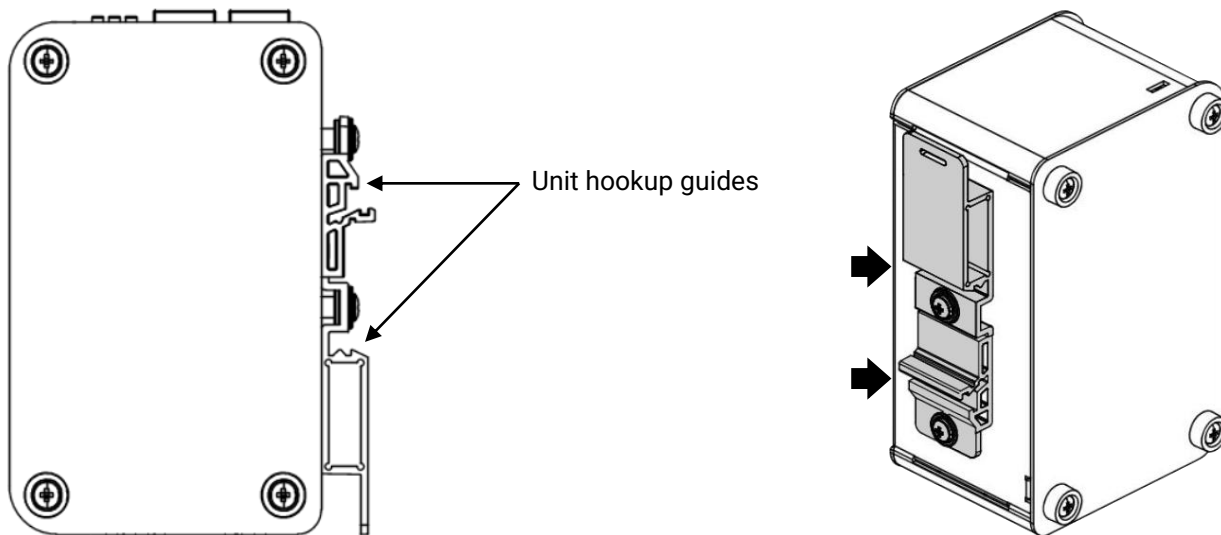
[3.1 DIN-Rail installation](#)

[3.2 Removing QEC-RXXCXXL Unit](#)

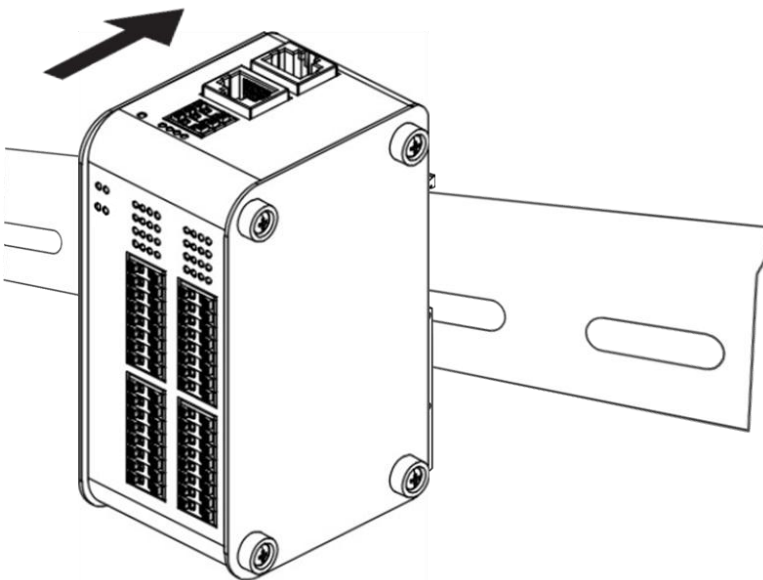
This section describes how to install QEC-RXXCXXL. Please turn OFF the power supply before you mount QEC-RXXCXXL. Always mount QEC-RXXCXXL one at a time.

3.1 DIN-Rail installation

Slide in the QEC-RXXCXXL on the hookup guides and press the QEC-RXXCXXL with a certain amount of force against the DIN track until the DIN Track mounting hook lock into place.



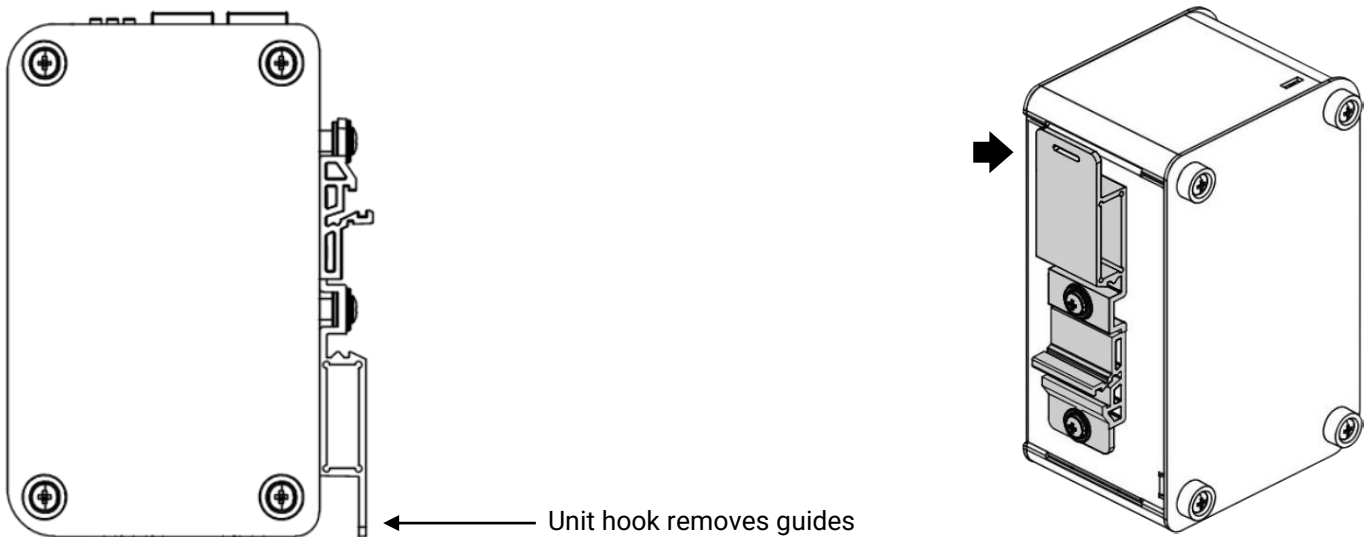
When you mount the QEC-RXXCXXL, releasing the DIN track mounting hook on the QEC-RXXCXXL is unnecessary. After you mount the QEC-RXXCXXL, make sure it is locked to the DIN Track.



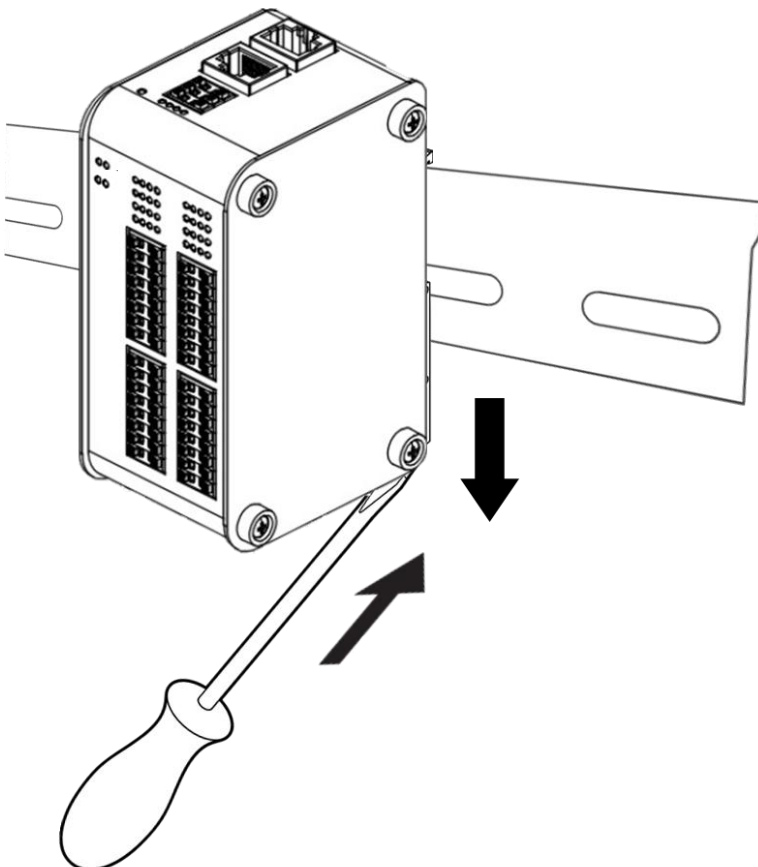
* Note: Always turn OFF the Unit power supply and I/O power supply before connecting and removing the QEC-RXXCXXL.

3.2 Removing QEC-RXXCXXL Unit

Use a flat-blade screwdriver to remove the DIN Track mounting hook on the unit.



Pull down and out the flat-blade screwdriver with force against the DIN track until you hear the DIN Track remove the hook.





Ch. 4

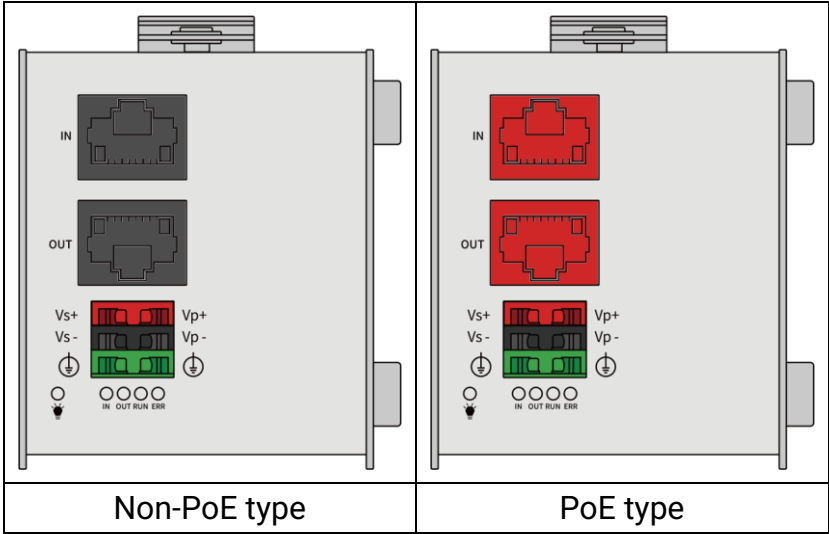
Getting Started

[4.1 Introduction](#)

[4.2 TwinCAT Operation](#)

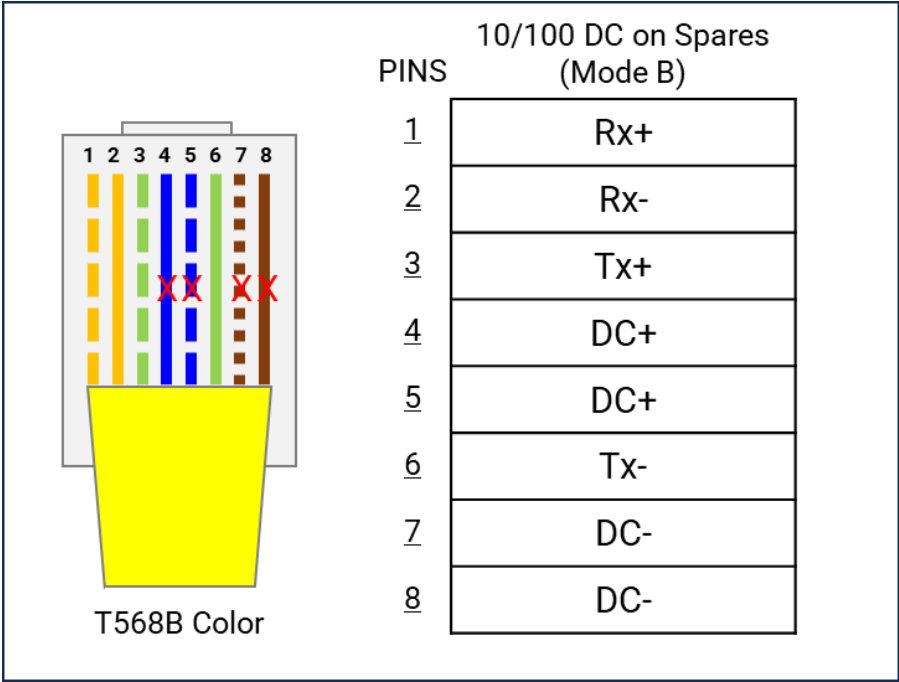
Note. QEC Device’s PoE (Power over Ethernet)

In QEC product installations, users can easily distinguish between PoE and non-PoE: if the RJ45 house is red, it is PoE type, and if the RJ45 house is black, it is non-PoE type.



PoE (Power over Ethernet) is a function that delivers power over the network. QEC can be equipped with an optional PoE function to reduce cabling. In practice, PoE is selected based on system equipment, so please pay attention to the following points while evaluating and testing:

- 1. When connecting PoE and non-PoE devices, make sure to disconnect Ethernet cables at pins 4, 5, 7, and 8 (e.g., when a PoE-supported QEC EtherCAT MDevice connects with a third-party EtherCAT SubDevice).
- 2. The PoE function of QEC is different and incompatible with EtherCAT P, and the PoE function of QEC is based on PoE Type B, and the pin functions are as follows:



- 3. QEC’s PoE power supply is up to 24V/3A.

4.1 Introduction

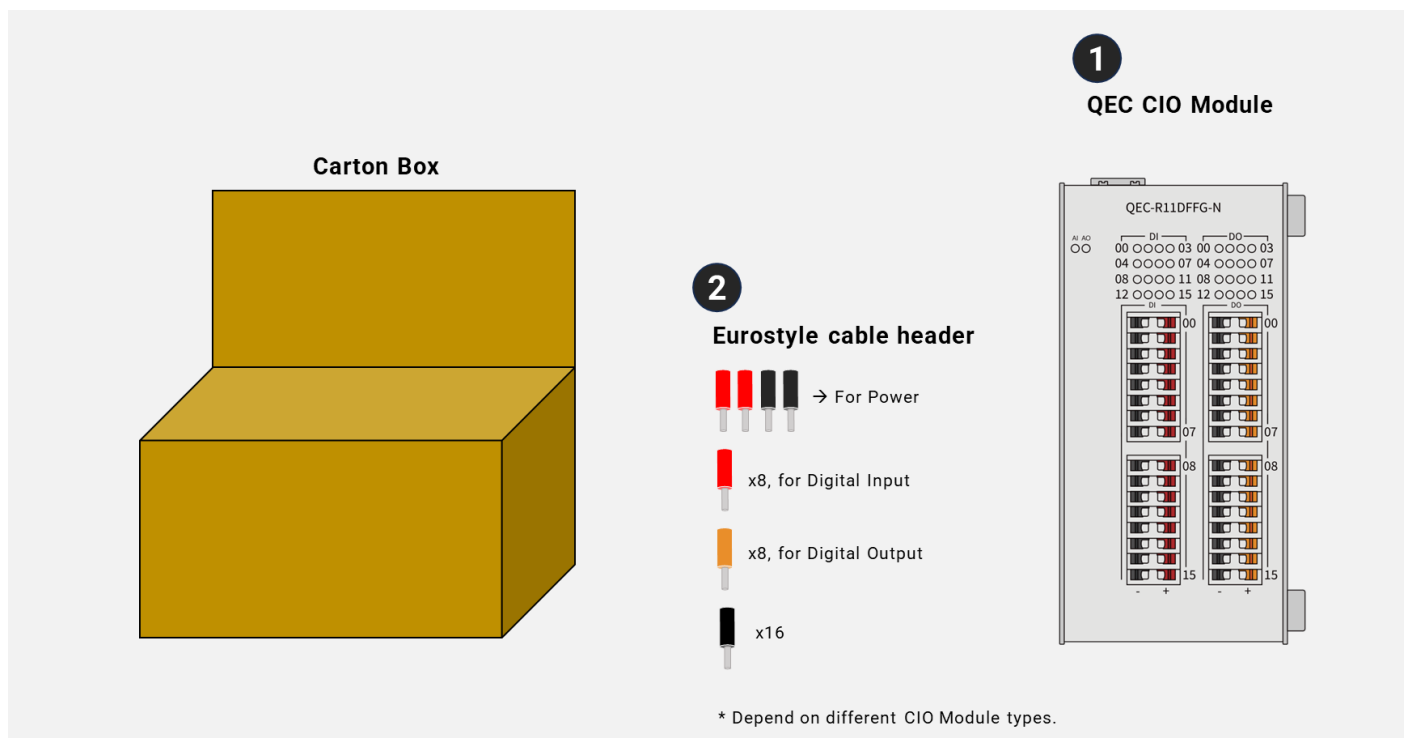
Welcome to the Getting Started Chapter for the QEC-RXXCXXL module. This section is designed to assist you in efficiently setting up and utilizing the QEC-RXXCXXL module. To facilitate this process, we will focus on TwinCAT by Beckhoff Automation, which operates on a PC.

In the following pages, since QEC-RXXCXXL modules are in the QEC CIO family, we will walk you through the steps for connecting one QEC-RXXCFFG, which has the same functionality, and initiating your journey toward fully integrating this EtherCAT SubDevice into your projects. We aim to simplify the initial setup so you can quickly explore your device's extensive capabilities.

4.1.1 Package Contents

The package includes the following items:

1. QEC CIO Series module
2. Cable-set (Euro-type connector)



Please get in touch with our sales channels if any of the package items are missing or damaged. Also, feel free to reuse the shipping materials and carton for further storing and shipping needs in the future.

4.2 TwinCAT Operation

This section is for you if you're ready to get your QEC-RXXCFFG module up and running with TwinCAT. We'll focus on using the Digital Input, Digital Output, Analog Input, and Analog Output.

4.2.1 Install the ESI file

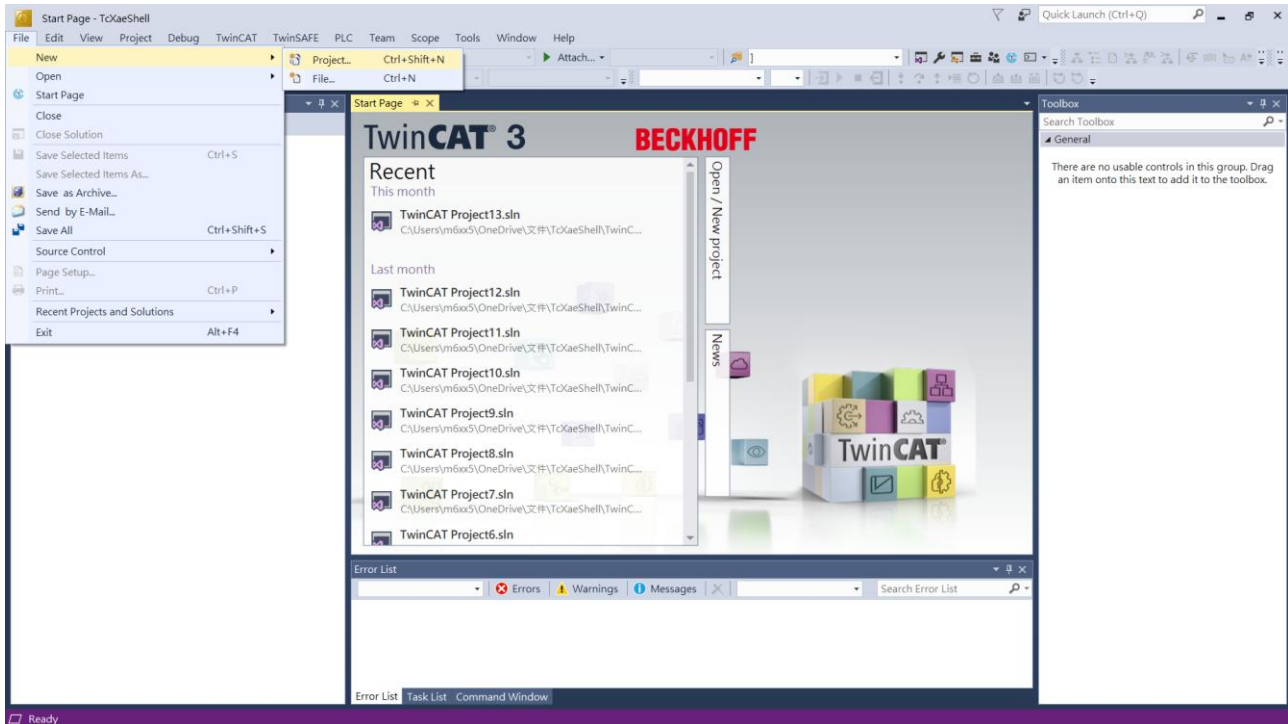
1. Obtain the ESI file: The ESI file for the QEC-R11CFFG module is located on our website at the following link: https://www.icop.com.tw/resource_entrance. Simply download the ZIP file and extract it.
2. Install the ESI file: Once extracted, the XML file must be copied or moved to the appropriate system directory.
3. Restart the Programming System If Needed: If the TwinCAT program was running when the ESI file was copied to the appropriate system directory, you may have to restart the TwinCAT program before it will recognize the new ESI file.

4.2.2 Add the QEC-R11CFFG to the Project

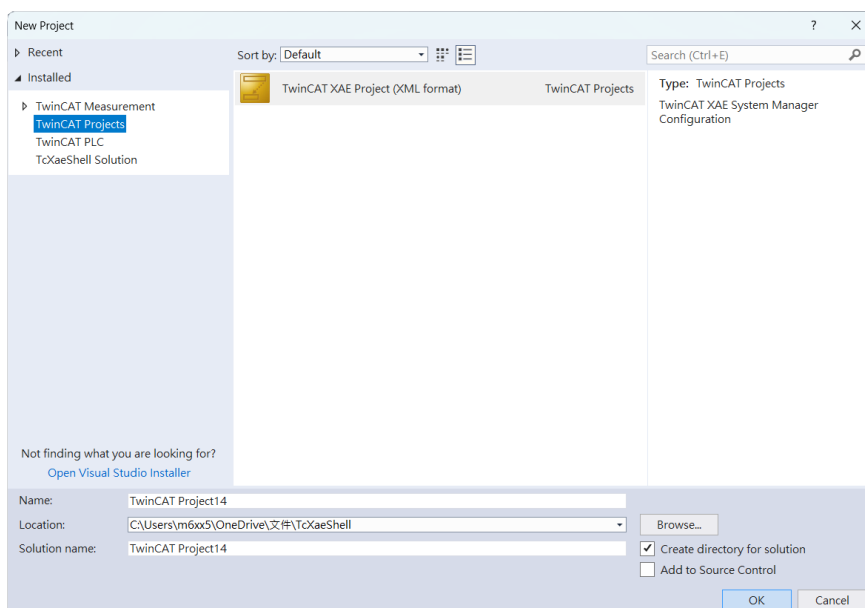
This section assumes that the TwinCAT software is in Config Mode.

For more information about TwinCAT, please refer to [TwinCAT | Automation software | Beckhoff Worldwide](#), or contact Beckhoff Automation.

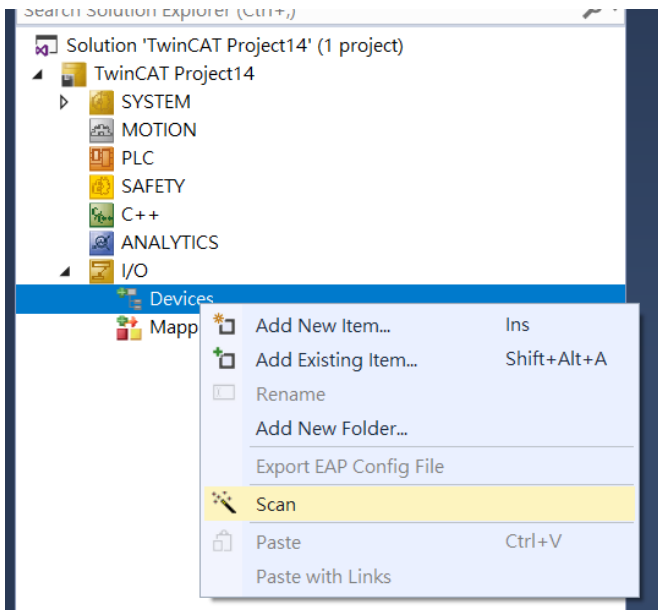
1. Click the New Project.



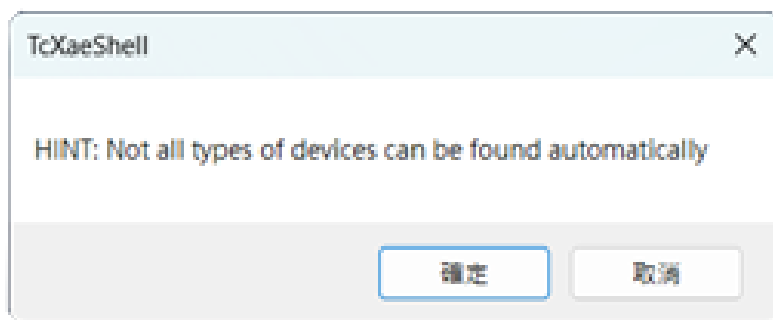
2. Select the “TwinCAT XAE Project (XML format)”, and change the project file name and location if you need. Then click “OK”.



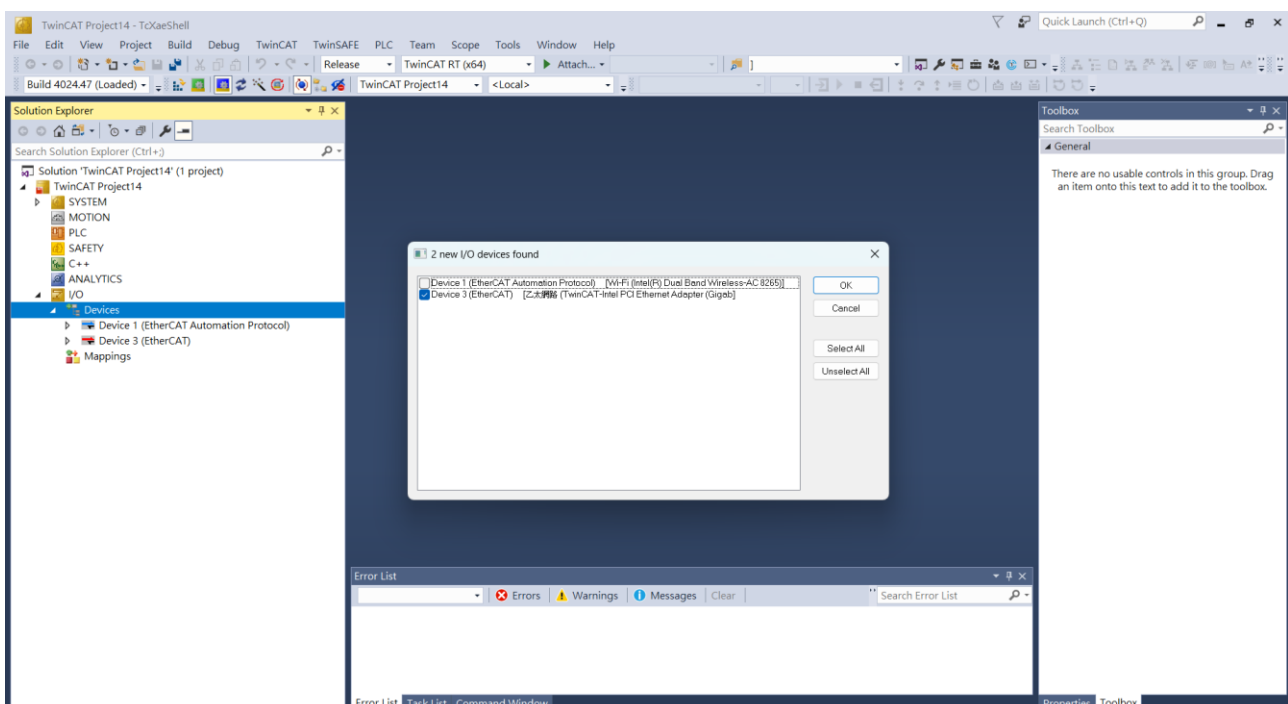
3. Right-click the **"Devices"** under the I/O node, and click the **"Scan"** button to start scanning. (If the **"Scan"** option is not available, the TwinCAT software is not in Config Mode.)



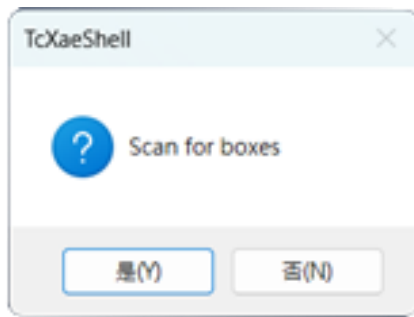
4. Click **"OK"** for the HINT message.



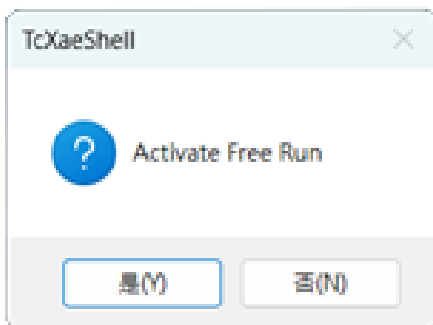
5. Choose the EtheCAT connection network.



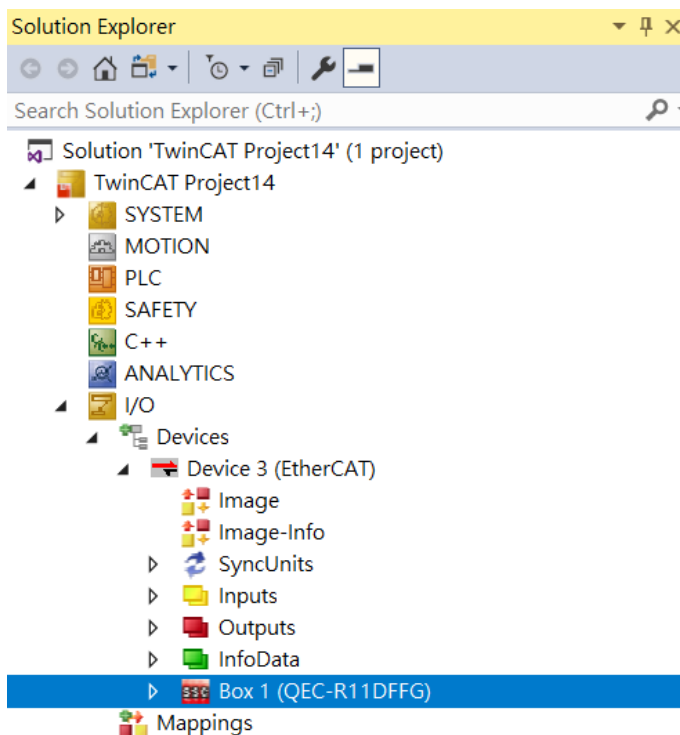
6. Confirm **“Yes”** to start the scan.



7. Choose **“Yes”** when TwinCAT asks you to activate Free Run. Then, EtherCAT Network will translate into OP state automatically.

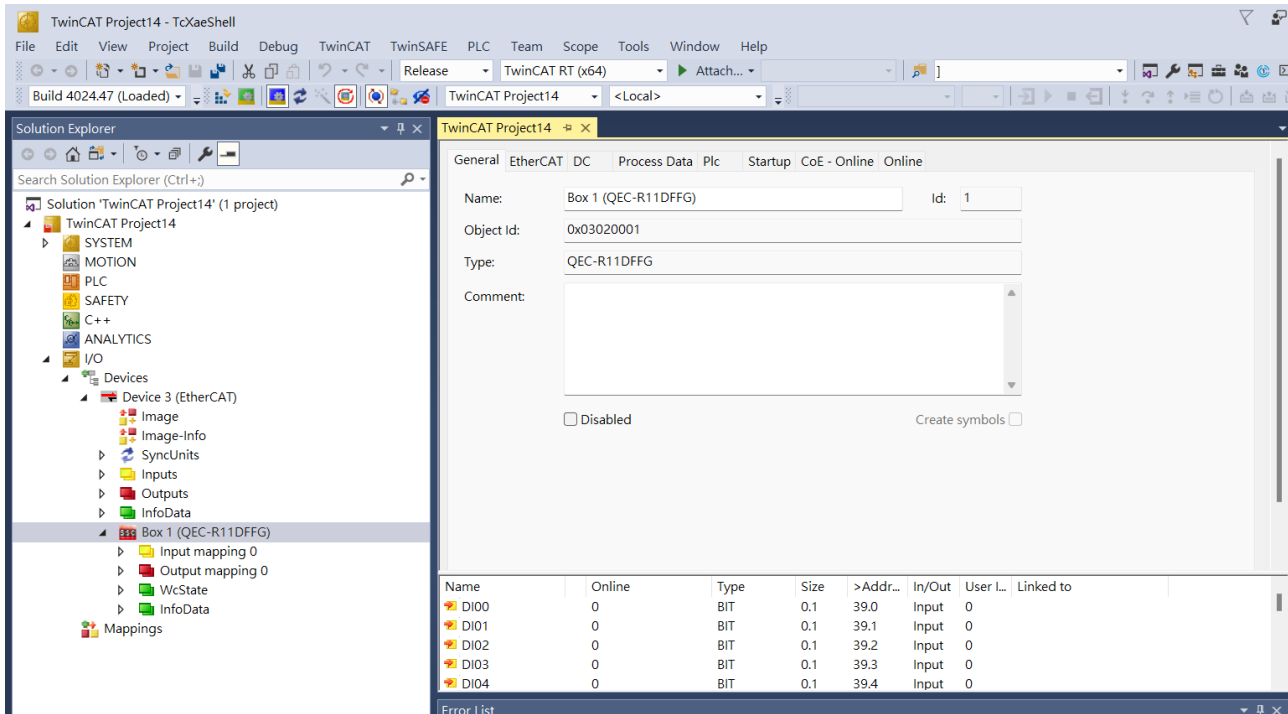


8. The QEC-R11CFFG will appear in the device tree and the name will typically begin with **“Box”**.

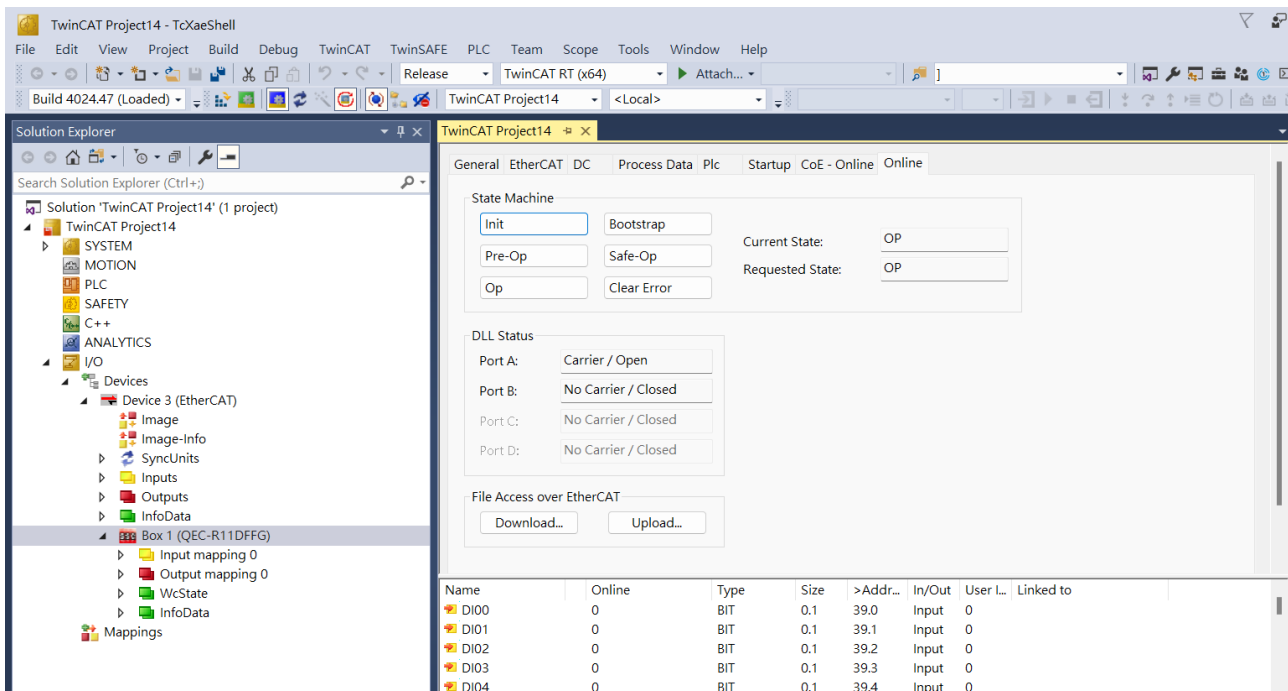


4.2.3 Start to Configure the QEC-R11CFFG

1. Click **"Box 1 (QEC-R11CFFG)"** and a dashboard for the EtherCAT SubDevice will appear in the right window. The default tab is "General", and you can see the SubDevice's Name, Object Id, Type, and Comment in this tab.



2. Click on the **"Online"** tab to check the EtherCAT SubDevice EtherCAT State Machine (ESM) is on OP status.



3. Click on the **"Process Data"** tab to check the PDO Assignment; the default PDO Output are Digital Output Index (0x7000) and Analog Output Index (0x7001), and PDO Input are Digital Input Index (0x6000) and Analog Input Index (0x6001).

The screenshot shows the TwinCAT Project14 - TcXaeShell interface. The Solution Explorer on the left shows the project structure, including the 'Box 1 (QEC-R11DFFG)' under 'Devices'. The 'Process Data' tab is selected, displaying the PDO Assignment (0x1C12) and PDO Content (0x1A00) sections.

Sync Manager:

SM	Size	Type	Flags
0	128	Mbx...	
1	128	Mbxin	
2	4	Outp...	
3	4	Inputs	

PDO List:

Index	Size	Name	Flags	SM	SU
0x1A00	4.0	Input mapping 0	MF	3	0
0x1600	4.0	Output mapping 0	MF	2	0

PDO Assignment (0x1C12):

☒ 0x1600

PDO Content (0x1A00):

Index	Size	Offs	Name	Type	Default (hex)
0x6000...	0.1	0.0	DI00	BIT	
0x6000...	0.1	0.1	DI01	BIT	
0x6000...	0.1	0.2	DI02	BIT	
0x6000...	0.1	0.3	DI03	BIT	

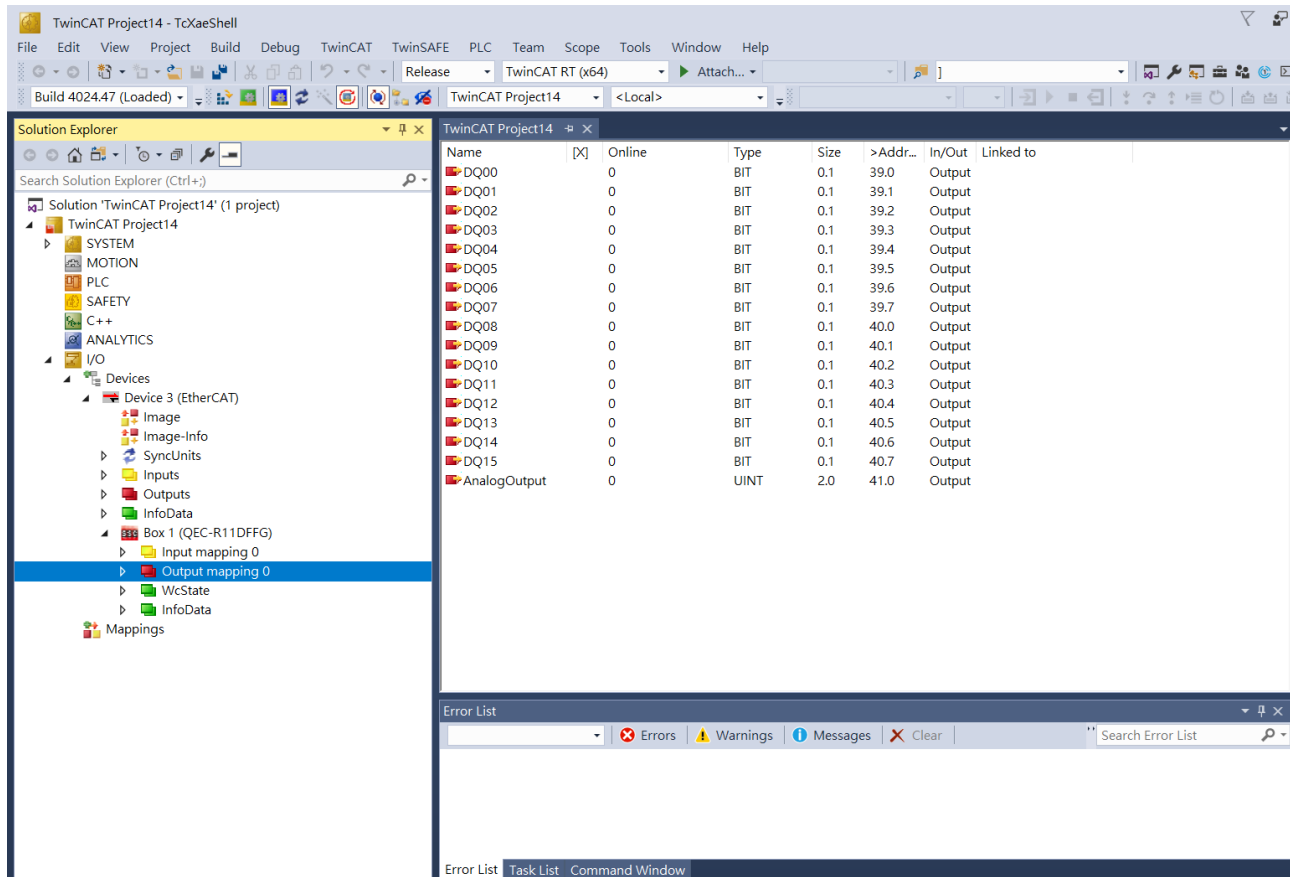
Download

Predefined PDO Assignment: (none)

Name	Online	Type	Size	>Addr...	In/Out	User I...	Linked to
DI00	0	BIT	0.1	39.0	Input	0	
DI01	0	BIT	0.1	39.1	Input	0	
DI02	0	BIT	0.1	39.2	Input	0	
DI03	0	BIT	0.1	39.3	Input	0	
DI04	0	BIT	0.1	39.4	Input	0	

4.2.4 Control the QEC-R11CFFG

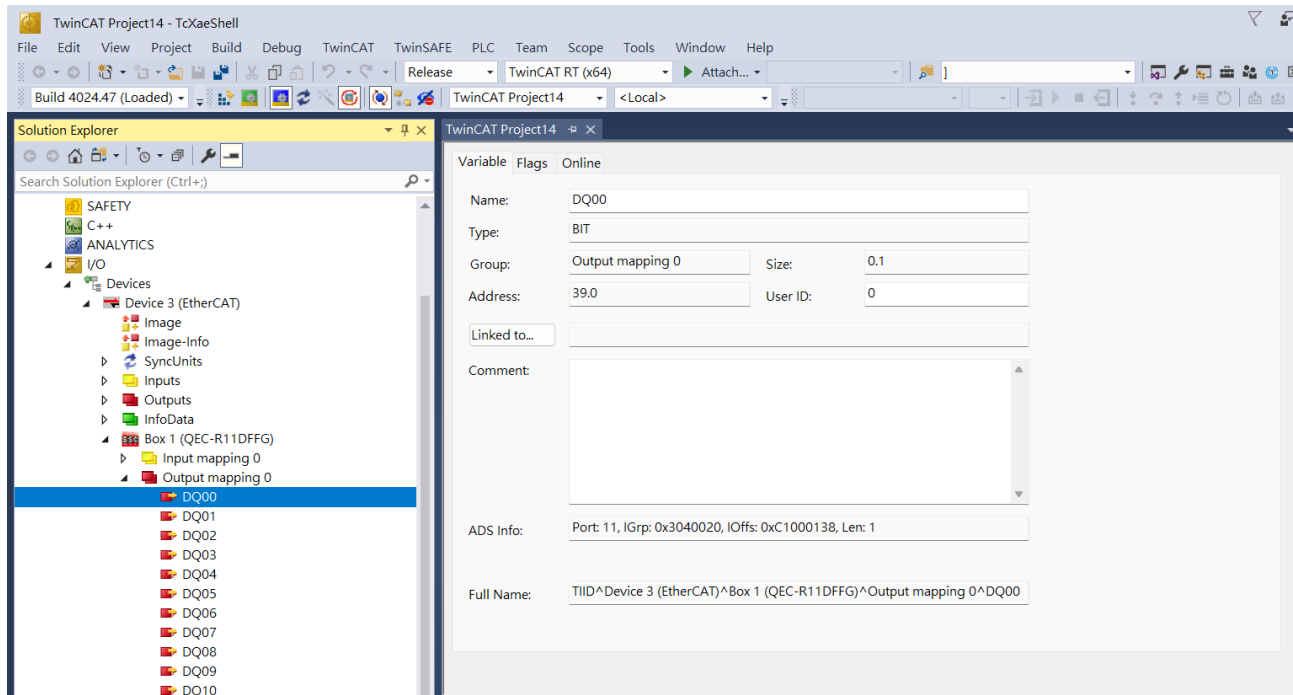
Next, we will set the Digital Output channel 0 "DQ00" to 1 to let it pull high.



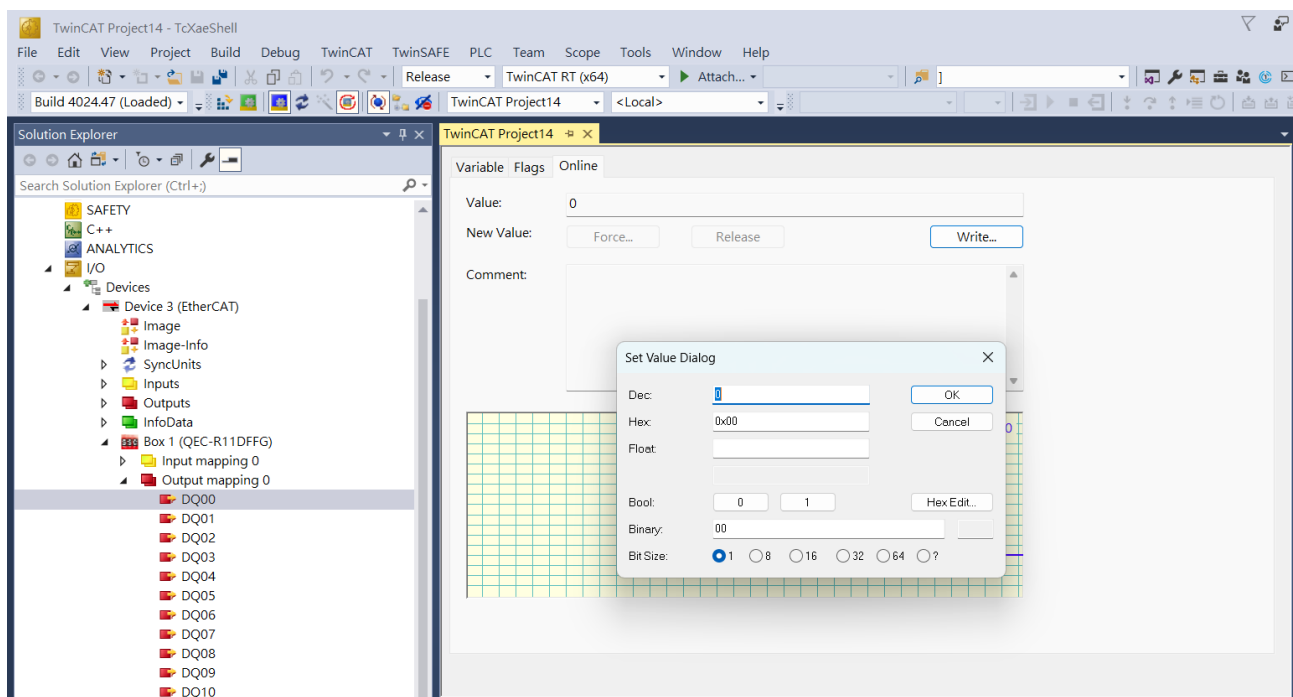
A. Digital Output

Configure the Digital Output.

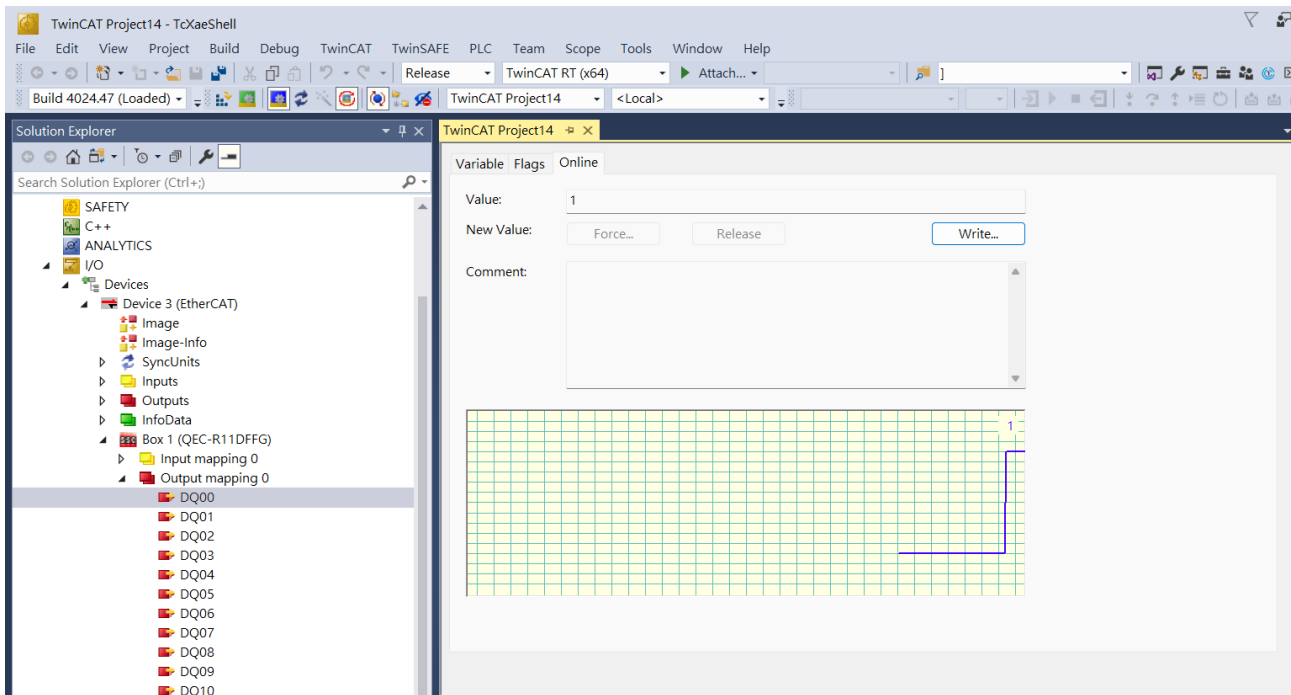
1. Select the drop-down list of the **"Output mapping 0"**. Click the **"DQ00"** and it'll appear control dashboard in the right windows.



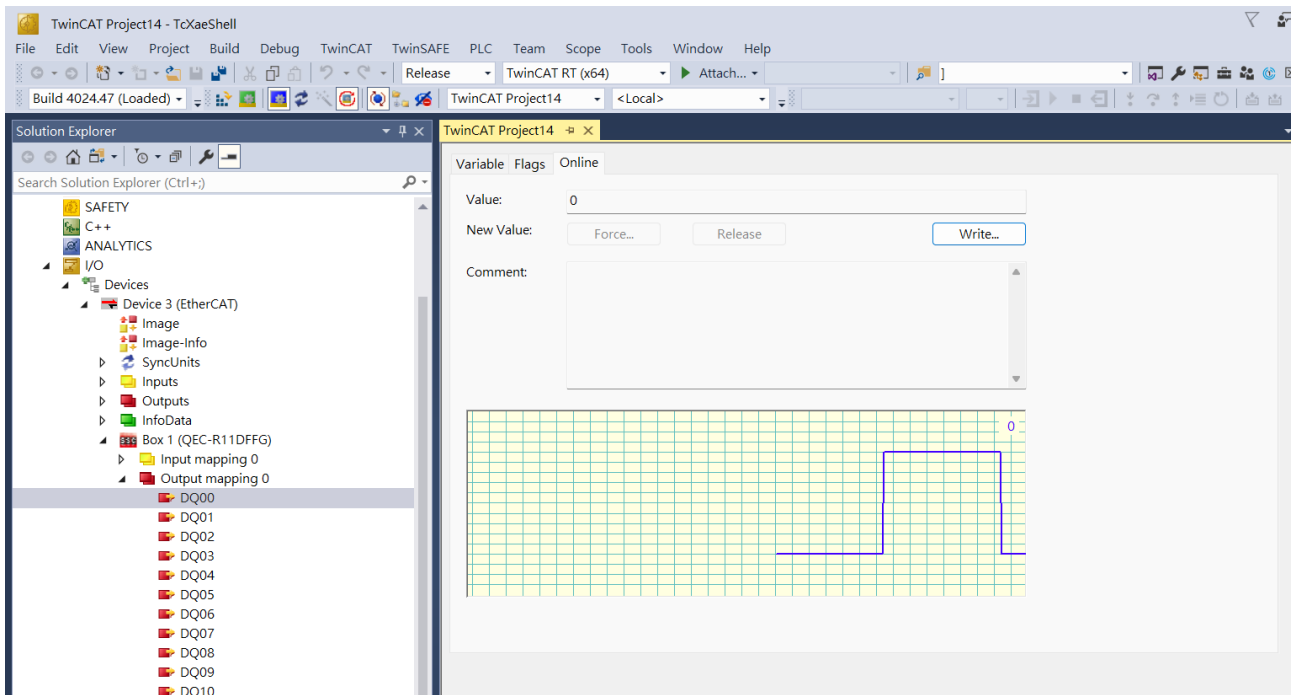
2. Click the **"Online"** tab, and click the **"Write..."** button. Enter **"1"** in the pop-up window to change the value of DQ00 to "1".



3. Then, the “DQ00” starts pull high (“Value” equals 1).



If you enter 0 to the Value, the “DQ00” starts pull low.





Ch. 5

SubDevice Information

[5.1 ESI \(EtherCAT SubDevice Information\) file](#)

[5.2 Object Dictionary](#)

5.1 ESI (EtherCAT SubDevice Information) file

The ESI files contain information unique to the EtherCAT SubDevice Terminals in XML format. You can load an ESI file into the Support Software to easily allocate SubDevice Terminal process data and other settings. The ESI files for QEC EtherCAT SubDevices are already installed in the Support Software.

Note. Ensuring Up-to-date Installation of the XML Device Description File (ESI)

To ensure smooth functioning, it is important to install the latest version of the XML device description file in the EtherCAT MDevice software. The latest version of the XML device description file can be downloaded from the QEC Website or ICOP Website.

<https://www.qec.tw/>

https://www.icop.com.tw/resource_entrance

5.2 Object Dictionary

The object dictionary defined here shall be used complementary with ETG.5001 and ETG.1000.

- Device Profile: 5001
- Modul Profile: 0
- Modular Device Profile

Usage Notes:

- The PDO mapping object and SyncManager assignment object doesn't need to be defined. In that case they are created automatically.
- The following objects are fixed included in the SSC and shall not be defined in the file: 0x1000, 0x1001, 0x1008, 0x1009, 0x100a, 0x1010, 0x1011, 0x1018, 0x10F0, 0x10F1, 0x10F3, 0x1c00, 0x1c32, 0x1c33
- Entries less or equal one 8Bit shall not overlap byte borders.
- Entries greater 8Bit shall always start at an exact word border

5.2.1 Standard Objects (0x1000-0x1FFF)

Index 1000 Device type

Index	Name	Data type	Flags	Default
1000	Device type	UINT32	RO	0x00001389 (5001)

Index 1001 Error register

Index	Name	Data type	Flags	Default
1001	Error register	UINT8	RO	0x00 (0)

Index 1008 Device name

Index	Name	Data type	Flags	Default
1008	Device name	STRING	RO	Refer to Table 4-1.

Table 4-1: Device Name

Type	Device Name
Digital I/O + Analog I/O + Serial Port	QEC-R00CFFG
	QEC-R11CFFG
Digital I/O + Serial Port	QEC-R00CFFU
	QEC-R11CFFU
Digital I/O	QEC-R00CFFL
	QEC-R11CFFL

Index 1009 Manufacturer Hardware version

Index	Name	Data type	Flags	Default
1009	Hardware version	STRING	RO	DM514

Index 100A Manufacturer Software version

Index	Name	Data type	Flags	Default
100A	Software version	STRING	RO	1.00

Index 1018 Identity Object

Index	Name	Data type	Flags	Default
1018:0	Identity	UINT8	RO	> 4 <
1018:01	Vendor ID	UINT32	RO	0x00000BC3 (3011)
1018:02	Product code	UINT32	RO	Refer to Table 4-2.
1018:03	Revision Number	UINT32	RO	Depending by model.
1018:04	Serial number	UINT32	RO	0x00000000 (0)

Table 4-2: Product code & Revision Number

Model Name	Product code
QEC-R00CFFG	0x0086D900
QEC-R11CFFG	0x0086D903
QEC-R00CFFU	0x0086D914
QEC-R11CFFU	0x0086D917
QEC-R00CFFL	0x0086D918
QEC-R11CFFL	0x0086D91B

Index 10F1 Error Settings

Index	Name	Data type	Flags	Default
10F1:0	Error Settings	UINT8	RO	> 2 <
10F1:01	Local Error Reaction	UINT32	RW	0x00000001 (1)
10F1:02	Sync Error Counter Limit	UINT32	RW	0x0004 (4)

Index 10F8 Timestamp Object

Index	Name	Data type	Flags	Default
10F8	Timestamp Object	UINT8	RW P	B5 36 21 E6 0D 00 00 00

Index 1600 Output mapping 0

Index	Name	Data type	Flags	Default
1600:0	Output mapping 0	UINT8	RO	> 17 <
1600:01	SubIndex 001	UINT32	RO	0x7000:01, 1
1600:02	SubIndex 002	UINT32	RO	0x7000:02, 1
1600:03	SubIndex 003	UINT32	RO	0x7000:03, 1
1600:04	SubIndex 004	UINT32	RO	0x7000:04, 1
1600:05	SubIndex 005	UINT32	RO	0x7000:05, 1
1600:06	SubIndex 006	UINT32	RO	0x7000:06, 1
1600:07	SubIndex 007	UINT32	RO	0x7000:07, 1
1600:08	SubIndex 008	UINT32	RO	0x7000:08, 1
1600:09	SubIndex 009	UINT32	RO	0x7000:09, 1
1600:0A	SubIndex 010	UINT32	RO	0x7000:0A, 1
1600:0B	SubIndex 011	UINT32	RO	0x7000:0B, 1
1600:0C	SubIndex 012	UINT32	RO	0x7000:0C, 1
1600:0D	SubIndex 013	UINT32	RO	0x7000:0D, 1
1600:0E	SubIndex 014	UINT32	RO	0x7000:0E, 1
1600:0F	SubIndex 015	UINT32	RO	0x7000:0F, 1
1600:10	SubIndex 016	UINT32	RO	0x7000:10, 1

Index 1A00 Input mapping 0

Index	Name	Data type	Flags	Default
1A00:0	Input mapping 0	UINT8	RO	> 17 <
1A00:01	SubIndex 001	UINT32	RO	0x6000:01, 1
1A00:02	SubIndex 002	UINT32	RO	0x6000:02, 1
1A00:03	SubIndex 003	UINT32	RO	0x6000:03, 1
1A00:04	SubIndex 004	UINT32	RO	0x6000:04, 1
1A00:05	SubIndex 005	UINT32	RO	0x6000:05, 1
1A00:06	SubIndex 006	UINT32	RO	0x6000:06, 1
1A00:07	SubIndex 007	UINT32	RO	0x6000:07, 1
1A00:08	SubIndex 008	UINT32	RO	0x6000:08, 1
1A00:09	SubIndex 009	UINT32	RO	0x6000:09, 1
1A00:0A	SubIndex 010	UINT32	RO	0x6000:0A, 1
1A00:0B	SubIndex 011	UINT32	RO	0x6000:0B, 1
1A00:0C	SubIndex 012	UINT32	RO	0x6000:0C, 1
1A00:0D	SubIndex 013	UINT32	RO	0x6000:0D, 1
1A00:0E	SubIndex 014	UINT32	RO	0x6000:0E, 1
1A00:0F	SubIndex 015	UINT32	RO	0x6000:0F, 1
1A00:10	SubIndex 016	UINT32	RO	0x6000:10, 1

Index 1C00 Sync manager type

Index	Name	Data type	Flags	Default
1C00:0	Sync manager type	UINT8	RO	> 4 <
1C00:01	SubIndex 001	UINT8	RO	0x01 (1)
1C00:02	SubIndex 002	UINT8	RO	0x02 (2)
1C00:03	SubIndex 003	UINT8	RO	0x03 (3)
1C00:04	SubIndex 004	UINT8	RO	0x04 (4)

Index 1C12 SyncManager 2 assignment

Index	Name	Data type	Flags	Default
1C12:0	SyncManager 2 assignment	UINT8	RO	> 1 <
1C12:01	SubIndex 001	UINT16	RO	0x1600 (5632)

* Note if this object is not defined it will be created automatically

Index 1C13 SyncManager 3 assignment

Index	Name	Data type	Flags	Default
1C13:0	SyncManager 3 assignment	UINT8	RO	> 1 <
1C13:01	SubIndex 001	UINT16	RO	0x1A00 (6656)

* Note if this object is not defined it will be created automatically

Index 1C32 SM output parameter

Index	Name	Data type	Flags	Default
1C32:0	SM output parameter	UINT8	RO	> 32 <
1C32:01	Synchronization Type	UINT16	RW	0x0001 (1)
1C32:02	Cycle Time	UINT32	RO	0x00000000 (0)
1C32:04	Synchronization Types supported	UINT16	RO	0x401F (16415)
1C32:05	Minimum Cycle Time	UINT32	RO	0x000186A0 (100000)
1C32:06	Calc and Copy Time	UINT32	RO	0x00000000 (0)
1C32:08	Get Cycle Time	UINT16	RW	0x0000 (0)
1C32:09	Delay Time	UINT32	RO	0x00000000 (0)
1C32:0A	Sync0 Cycle Time	UINT32	RW	0x00000000 (0)
1C32:0B	SM-Event Missed	UINT16	RO	0x0000 (0)
1C32:0C	Cycle Time Too Small	UINT16	RO	0x0029 (41)
1C32:0D	Shift Time too Short Counter	UINT16	RO	0x0000 (0)
1C32:20	Sync Error	BOOL	RO	TRUE

Index 1C33 SM input parameter

Index	Name	Data type	Flags	Default
1C33:0	SM input parameter	UINT8	RO	> 32 <
1C33:01	Synchronization Type	UINT16	RW	0x0022 (34)
1C33:02	Cycle Time	UINT32	RO	0x00000000 (0)
1C33:04	Synchronization Types supported	UINT16	RO	0x401F (16415)
1C33:05	Minimum Cycle Time	UINT32	RO	0x000186A0 (100000)
1C33:06	Calc and Copy Time	UINT32	RO	0x00000000 (0)
1C33:08	Get Cycle Time	UINT16	RW	0x0000 (0)
1C33:09	Delay Time	UINT32	RO	0x00000000 (0)
1C33:0A	Sync0 Cycle Time	UINT32	RW	0x00000000 (0)
1C33:0B	SM-Event Missed	UINT16	RO	0x0000 (0)
1C33:0C	Cycle Time Too Small	UINT16	RO	0x0029 (41)
1C33:0D	Shift Time too Short Counter	UINT16	RO	0x0000 (0)
1C33:20	Sync Error	BOOL	RO	TRUE

5.2.2 Manufacturer Objects (0x5000-0x5FFF)

Index 0x5000 to 0x5007 Manufacturer Object

Index	Object Code	Data Type	Name	Default	Description
5000	VARIABLE	UINT16	SP_Voltage	0	Read SP Voltage.
5001	VARIABLE	UINT16	SP_Current	0	Read SP Current.
5002	VARIABLE	UINT16	PP_Voltage	0	Read PP Voltage.
5003	VARIABLE	UINT16	PP_Current	0	Read PP Current.
5004	VARIABLE	INT16	Temperature	0	Read Temperature.
5005	VARIABLE	UINT8	BoxStatus	0	Read Box Status, refer to Table 4-4.
5006:0	RECORD		OrderInformation	> 4 <	Order Information.
5006:01		STRING(6)	Customer	0	Customer.
5006:02		STRING(8)	OrderNo	0	Order No.
5006:03		STRING(11)	InvNo	0	Inv No.
5006:04		STRING(4)	DelyDate	0	Dely Date.
5007:0	RECORD	UINT32	MTBF	> 2 <	-
5007:01		INT32	WorkingHours	0	If return -1, the mean is EEPROM have error.
5007:01		INT32	BootTimes	0	If return -1, the mean is EEPROM have error.

Table 4-4: Index 0x5005 BoxStatus Definitions

Value	Description
0	Normal Operation
3	ESC 3p3 Power NG
4	DIQ 3p3 Power NG
5	External XTgal Stop
6	External XTgal Over Range
0x10	Power Voltage Low or High
0x11	Power Voltage Too Low or Too High

5.2.3 Especial Objects (0x6000-0xFFFF)

Index 0x6nnx Input Data of the Module (0x6000 - 0x6FFF)

Index	Data Type	Name	Flags	Default	Description
6000:0	-	DigitalInput	TX	> 16 <	Digital Input
6000:01	BOOL	DI00	RO	FALSE	DI00
6000:02	BOOL	DI01	RO	FALSE	DI01
6000:03	BOOL	DI02	RO	FALSE	DI02
6000:04	BOOL	DI03	RO	FALSE	DI03
6000:05	BOOL	DI04	RO	FALSE	DI04
6000:06	BOOL	DI05	RO	FALSE	DI05
6000:07	BOOL	DI06	RO	FALSE	DI06
6000:08	BOOL	DI07	RO	FALSE	DI07
6000:09	BOOL	DI08	RO	FALSE	DI08
6000:10	BOOL	DI09	RO	FALSE	DI09
6000:11	BOOL	DI10	RO	FALSE	DI10
6000:12	BOOL	DI11	RO	FALSE	DI11
6000:13	BOOL	DI12	RO	FALSE	DI12
6000:14	BOOL	DI13	RO	FALSE	DI13
6000:15	BOOL	DI14	RO	FALSE	DI14
6000:16	BOOL	DI15	RO	FALSE	DI15

Index 0x7nnx Output Data of the Module (0x7000 - 0x7FFF)

Index	DataType	Name	Flags	Default	Description
7000:0	-	DigitalOutput	RX	> 16 <	Digital Output
7000:01	BOOL	DQ00	RW	FALSE	DQ00
7000:02	BOOL	DQ01	RW	FALSE	DQ01
7000:03	BOOL	DQ02	RW	FALSE	DQ02
7000:04	BOOL	DQ03	RW	FALSE	DQ03
7000:05	BOOL	DQ04	RW	FALSE	DQ04
7000:06	BOOL	DQ05	RW	FALSE	DQ05
7000:07	BOOL	DQ06	RW	FALSE	DQ06
7000:08	BOOL	DQ07	RW	FALSE	DQ07
7000:09	BOOL	DQ08	RW	FALSE	DQ08
7000:10	BOOL	DQ09	RW	FALSE	DQ09
7000:11	BOOL	DQ10	RW	FALSE	DQ10
7000:12	BOOL	DQ11	RW	FALSE	DQ11
7000:13	BOOL	DQ12	RW	FALSE	DQ12
7000:14	BOOL	DQ13	RW	FALSE	DQ13
7000:15	BOOL	DQ14	RW	FALSE	DQ14
7000:16	BOOL	DQ15	RW	FALSE	DQ15

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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