

EX Series Adapter

User Manual

DECOWELL Industrial Intelligence makes reliable partners



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Preface

■ Document Overview

Thank you for purchasing the DECOWELL EX Series slice I/O modules.

The EX Series slice I/O modules are distributed expansion modules developed by DECOWELL. This series consists of adapters, I/O modules, power modules, and end modules. The adapters support multiple communication buses, such as PROFINET, EtherCAT, DeviceNet, Modbus RTU, and PROFIBUS-DP. The I/O modules include digital input modules, digital output modules, analog input modules, analog output modules, and function modules. Users can configure these modules according to specific application requirements.

EX-1040 is CC-Link Bus adapter, each module can be expanded to have up to 32 input/output modules.

This manual mainly describes the specifications, features, and usage methods of this module. Please read it carefully before use to use this product more clearly and safely.

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Safety Precautions

■ Security Statement

1. Before installing, operating, or maintaining the product, please read and comply with these safety precautions.
2. To ensure personal and equipment safety, follow all safety labels on the product and all safety instructions contained in this manual during installation, operation, and maintenance.
3. The “Note”, “Caution”, “Warning”, and “Danger” statements in this manual do not represent all safety precautions that should be observed; they are supplementary to the overall safety requirements.
4. This product must be used under conditions that meet the specified design requirements. Failure to meet these conditions may result in malfunction. Functional abnormalities or component damage caused by non-compliance are not covered by the product warranty.
5. DECOWELL assumes no legal liability for personal injury, property damage, or other losses caused by improper or unauthorized operation of the product.

■ Security level definition



Note

Indicates additional information or explanations that supplement the operating instructions.



Caution

Indicates a hazardous situation that may result in minor to moderate personal injury or equipment damage if not operated as instructed.



Warning

Indicates a hazardous situation that may result in serious personal injury or death if not operated as instructed.

Warning — During Control System Design

01. When applying this system, please be sure to design a safety circuit to ensure that the control system can still operate safely when the external power supply fails or the expansion module malfunctions.
02. If the output circuit experiences prolonged overcurrent due to exceeding the rated load current or a load short circuit, the module may smoke or catch fire. External safety devices such as fuses or circuit breakers should be installed.

Caution — During Control System Design

01. It is essential to install an emergency braking circuit, a protection circuit, an interlock circuit for forward and reverse operation, and upper and lower limit interlock switches to prevent machine damage in the external circuit of the expansion module;
02. To ensure the safe operation of the equipment, please design external protection circuits and safety mechanisms for output signals related to major accidents;
03. When the output units of the expansion module, such as relays and transistors, are damaged, their outputs cannot be controlled to be in the ON or OFF state;

Caution — During Installation

01. During installation, prevent metal shavings and wire ends from falling into the module's ventilation holes, as this may cause fire, malfunction, or misoperation;
02. After installation, ensure that there are no foreign objects on its ventilation surface, otherwise it may cause poor heat dissipation, resulting in fire, malfunction, or misoperation;
03. During installation, ensure that the module is securely connected to its respective connector and that the module connection hooks are firmly locked. Improper module installation may lead to malfunctions, failures, or detachment.

Warning — During Installation

01. Only professional maintenance personnel who have received relevant electrical equipment training and possess sufficient electrical knowledge can install this product;

02. When installing or removing modules, all external power supplies to the system must be completely disconnected before proceeding. Failure to disconnect the power supply may result in electric shock, module malfunction, or accidental operation.

03. Do not use the module in the following locations: places with dust, fumes, conductive dust, corrosive gases, or flammable gases; places exposed to high temperatures, condensation, or wind and rain; places subject to vibration or impact. Electric shock, fire, or misoperation may also cause product damage and deterioration.

1. Product Information

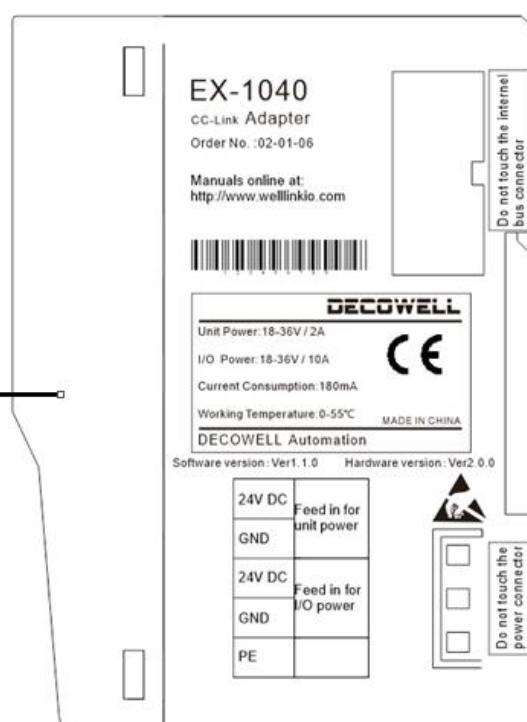
1.1 Product naming and nameplate

EX-1040

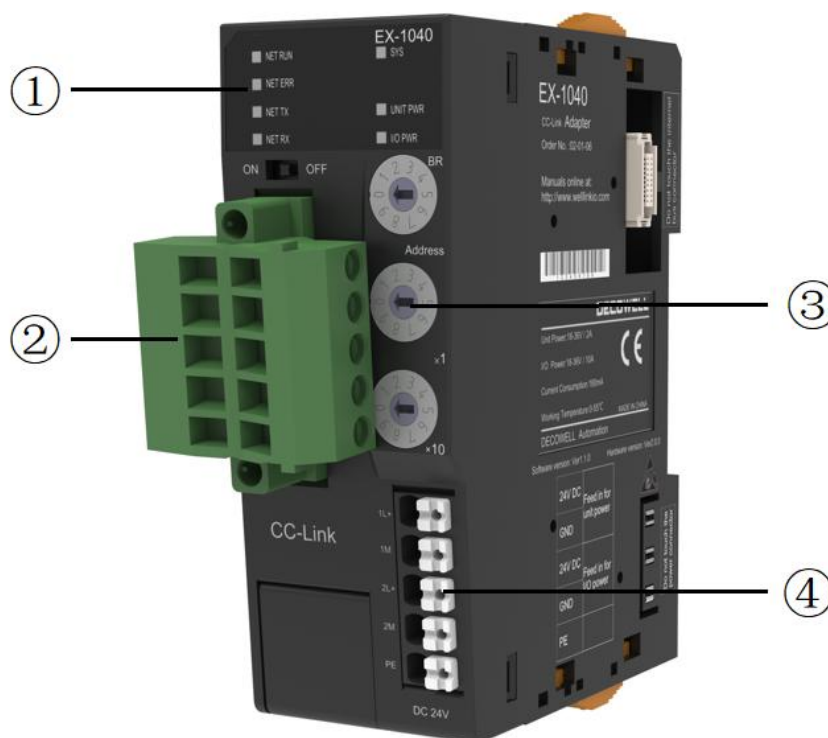
①

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NO.	Name	Explanation and definition
①	EX series	Card type IO
②	Bus protocol	CC Link bus adapter



1.2 Component Description

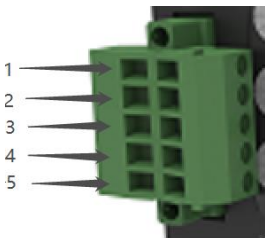


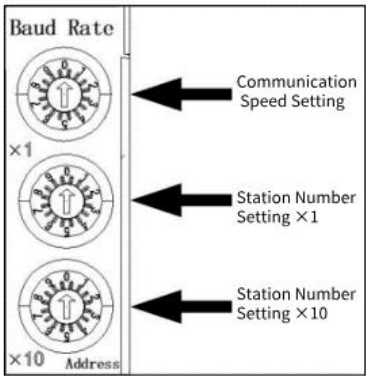
NO.	Describe	Illustrate	Color	State	Meaning
1	SYS	System indicator	green	1Hz Flashing	Communication Normal
				5Hz Flashing	I/O Slave Station Lost
				1 blink + 1 off	I/O Module Station Number Assignment Failed
				2 blink + 1 off	I/O Module Configuration Failed
				OFF	I/O Module Not Running
	UNIT PWR	System power indicator	green	ON	System Power Supply Normal
				OFF	System Power Supply Not Connected or Faulty
	IO PWR	IO Power indicator	green	ON	I/O Power Supply Normal
				OFF	I/O Power Supply Not Connected or Faulty
	NET-RUN	Operation indicator	green	ON	Communication Normal, Data Transmission Normal

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				OFF	Communication Stopped, Data Transmission
	NET-ERR	System fault indicator	red	ON	CC-Link Communication Error
				OFF	CC-Link Communication Normal
	NETTX	Data transmission indicator	green	Flashing	Data Transmitting
				OFF	Data Transmission Stopped or Abnormal
	NETRX	Data receiving indicator	green	Flashing	Data Receiving
				OFF	Data Reception Stopped or Abnormal

NO.	CC-LinkCommunication interface	Position	Signal	Signal definition
2		1	DA	Communication Line A
		2	DB	Communication Line B
		3	DG	Communication public terminal
		4	SLD	Shielded wire
		5	FG	chassis grounding

NO.	DIP switch settings	CC-Link Communication Rate Settings			
3		DIP switch		Communicati	Correspondi
		0	5	156kbps	1200m
		1	6	625kbps	600m
		2	7	2.5Mbps	200m
		3	8	5Mbps	150m
		4	9	10Mbps	100m
4	Power port	IO Module input power (2)L+2M) Adapter input power (1)L+1M)			

CC-Link DIP switch corresponding station number setting					
Fixed logic station	DIP code: 0	DIP code:1	DIP code:2	DIP code:3	DIP code:4
Variable Logic Station	DIP code:5	DIP code:6	DIP code:7	DIP code:8	DIP code:9
Communication Distance for Each Baud Rate Setting	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
	1200m	600m	200m	150m	100m

CC-Link Ver.1 Slave Station I/O and Register Capacity				
	1 station	2 station	3 station	4 station
Remote Input/Output RX/Ry	32 bits each	64 bits each	96 bits each	128 bits each
Remote register RWw/RWr	4 words each	8 words each	12 words each	16 words each
Number of connection points per site				
Remote IO points	32 Point DI/32 Point DO			
Remote register RWw	4 AO(Main site -> Remote site, Local site)			
Remote register RWr	4 AI(Main site -> Remote site, Local site)			
CC-Link Number of bus stations/points				
Max:4 station	Max: 128 DI, 128 DO, 16 AI, 16 AO			
Maximum Expandable I/O Modules	4×(32DI+32DO+4AI+4AO)			

1.3 Technical Specifications

Basic parameters	
External dimensions	90mm×67mm×34mm
Operating temperature	-20~55℃
Storage temperature	-40~85℃
relative humidity	95% No condensation

Protection level	IP20
Wiring specifications	0.2~1.5mm ²
Wiring method	Straight-through spring connector
Power parameters	
System-side power input	24VDC (±25%)
Current is supplied on the system side	2A(Max)
IOPort-side power input	24VDC (±20%)
IOPort-side output current	10A (Max) 5A at High Temperature
System electrical isolation test	AC500V
Power protection	Overcurrent protection, overvoltage protection, reverse connection protection
Software parameters	
Bus protocol	CC-Link
Communication rate	156kpbs, 625kpbs, 2.5Mbps, 5Mbps, 10Mbps
Transmission distance	1200m(Max)
Maximum input bytes	48 bytes
Maximum output bytes	48 bytes

1.4 Environmental Specifications

Environmental parameters	
Operating temperature	-20~55℃
Operating humidity	95% non-condensing
atmosphere	≥795 hPa (altitude ≤ 2000 m) as per IEC 61131-2
Storage temperature	-40~85℃
Overvoltage category	I

2. Electrical installation

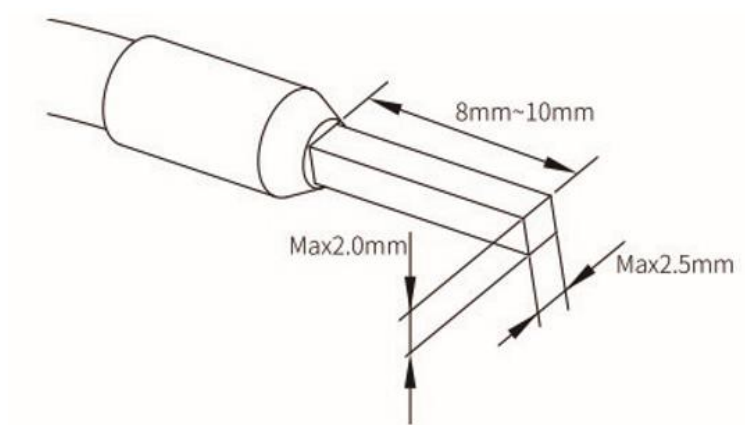
2.1 Cable selection

Power-related cables The wire diameter in the table below is for reference only.

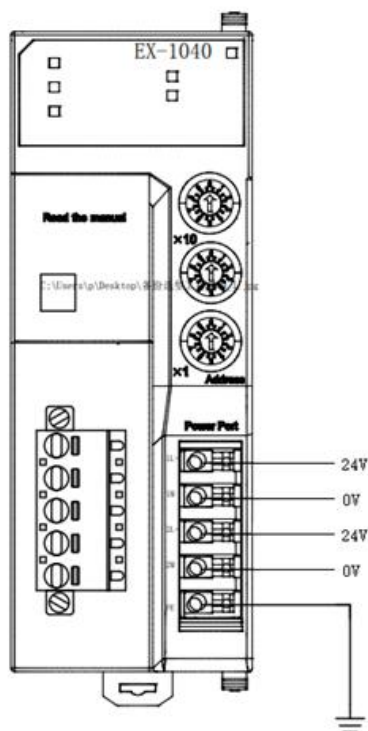
Adjustments should be made based on actual usage and calculations.

Name	Compatible wire diameter	
tubular wire lug	GB/mm ²	American Standard/AWG
	0.75	18
	1.0	18
	1.5	16

The shape and size requirements for the crimped terminals are shown in the following figure:



2.2 Terminal wiring



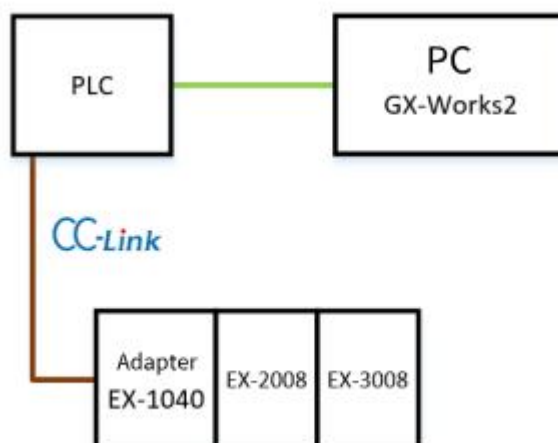
Notice

- The adapter module's grounding terminal needs to be directly grounded to prevent interference with the I/O module signals.
- The EX series adapter power supplies are divided into system power and I/O power. To avoid interference with the system, it is recommended to connect two sets of power lines from the same DC24V power module to the adapter's system power and I/O power respectively.

3. Adapter configuration case

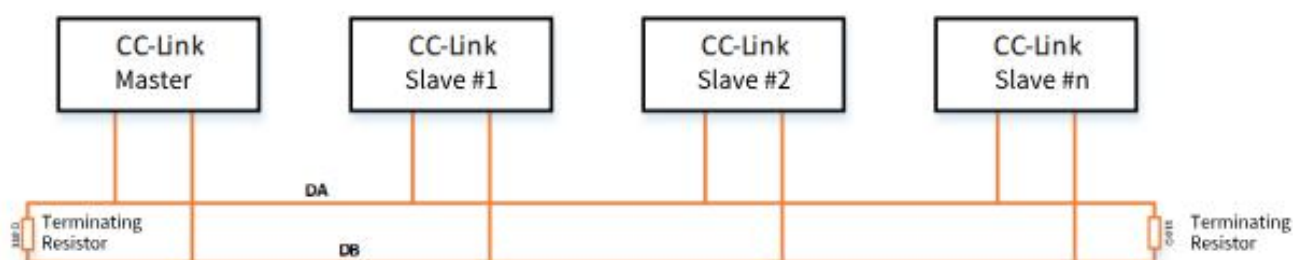
3.1 GX Works2 Connection with EX-1040 and Configuration

3.1.1 Communication connection diagram



Communication connection diagram

Notice: A terminating resistor (110 Ω) is added between the two terminals in the network. The connection method of the terminating resistor is shown in the figure below.



Terminal resistor wiring

3.1.2 Hardware configuration

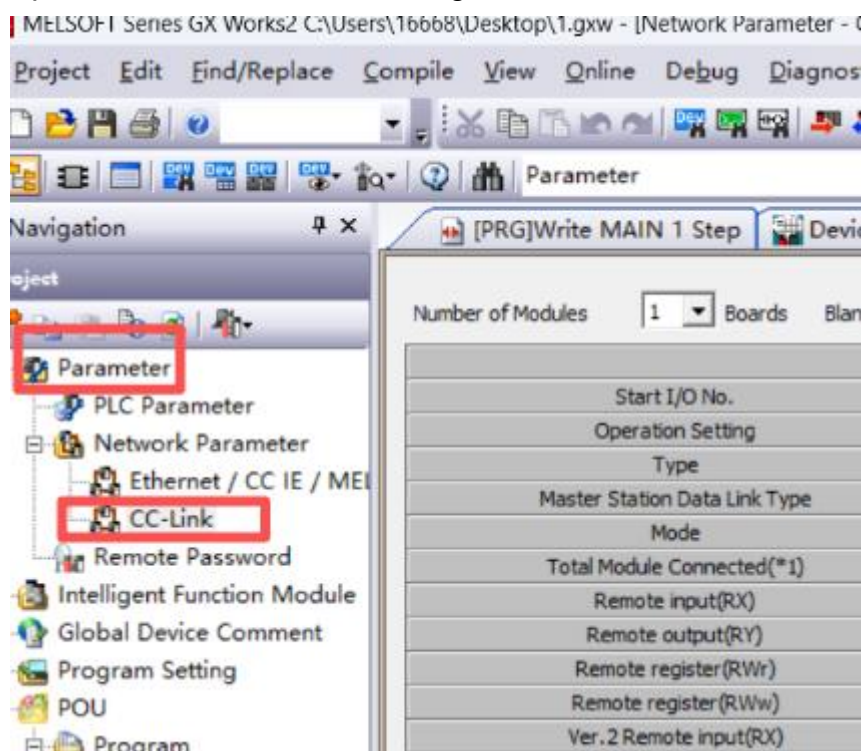
Hardware Configuration Table

Hardware	Quantity	Remark
Programming computer	1	Install GXWorks2
controller	1	Support CC-Link protocol
EX-1040	1	CC-Link adapter
EX-2008	1	Digital input module
EX-3008	1	Digital output module
Communication cable	several	

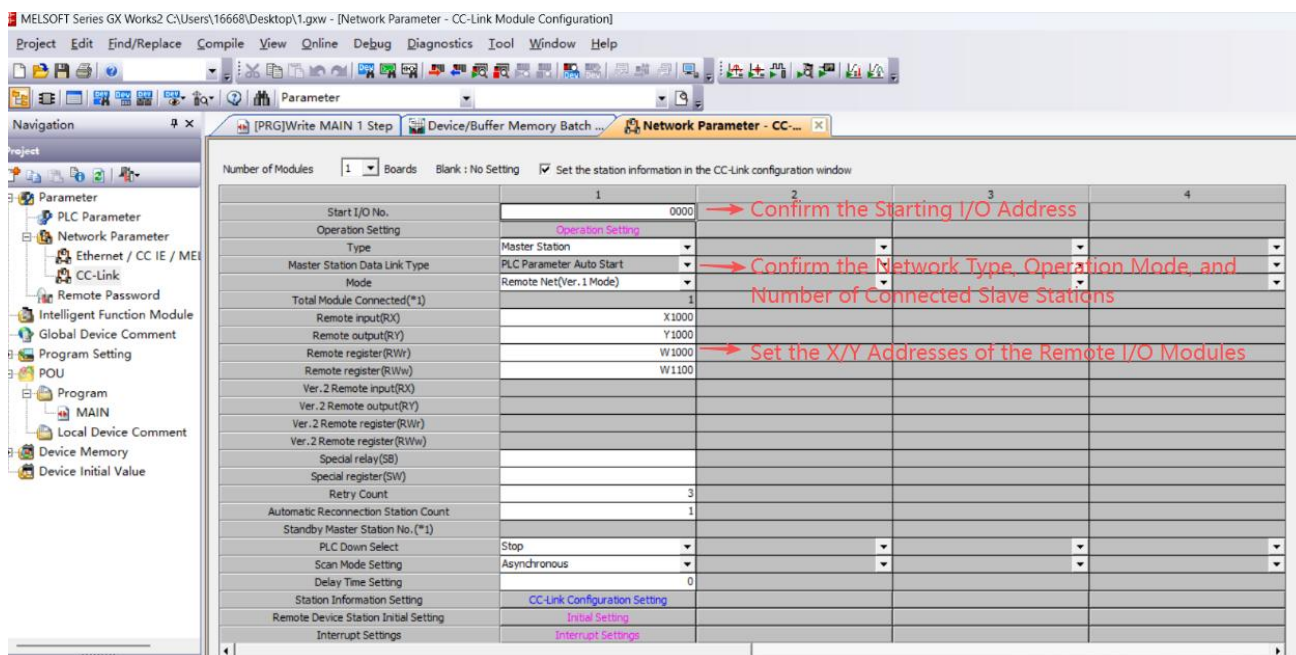
3.1.3 New Project and Communication Parameter Configuration

Open GX Works2 and select the actual CPU model used on site. Then, in the project navigation tree on the left, go to Parameters > Network Parameters > CC-Link.

In the CC-Link Parameter Setting window, configure the CC-Link slave station settings and CC-Link network parameters as shown in the figure below.

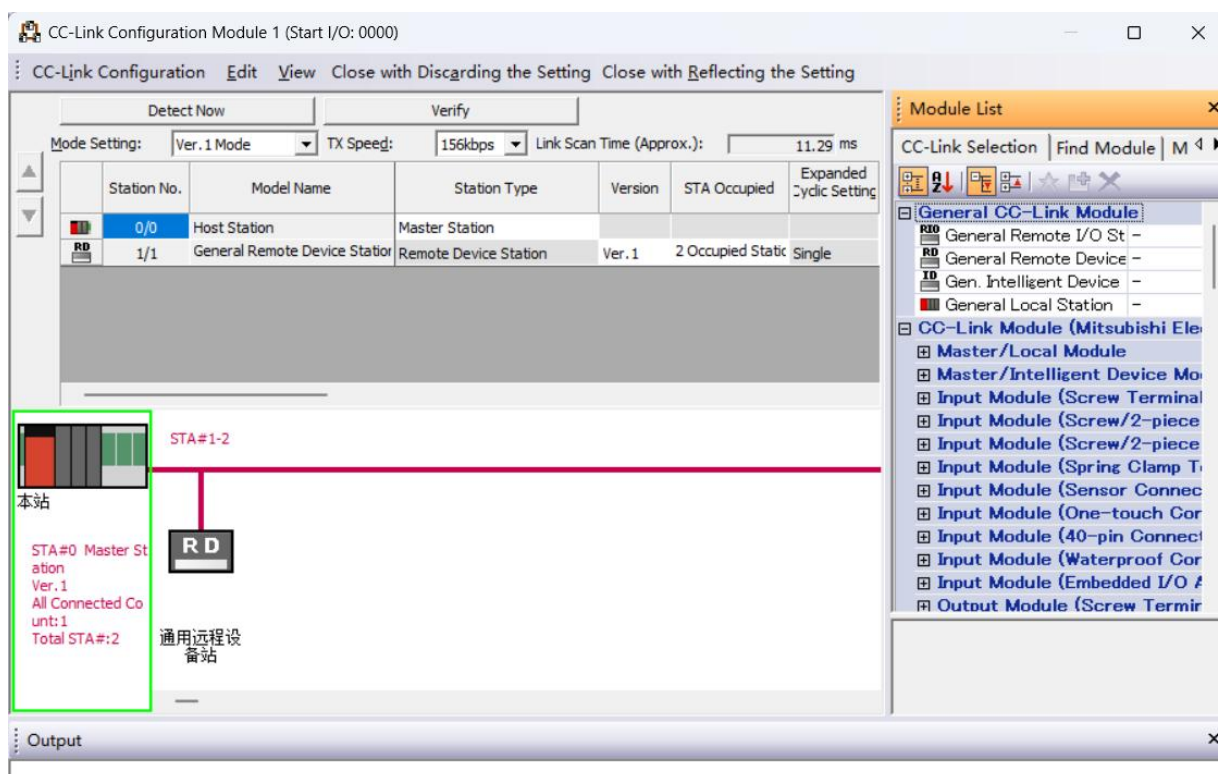


Open CC-Link parameter setting window



CC-Link Parameter settings

Configure the slave station information. In the CC-Link Parameter Setting window, select "CC-Link Configuration Setting" to configure parameters such as the station type, as shown in the figure below.



Configure slave parameters

For detailed slave station parameter configuration, please refer to the following EX-1040 remote device station setting rules:

The **EX-1040 CC-Link adapter** is configured as a **Remote Device Station** in Mitsubishi GX Works software. One logical station occupies **32 points**. The number of occupied stations can be configured according to the actual I/O modules connected to the EX-1040. A maximum of **4 logical stations** can be configured, with each logical station containing **32 points**. Therefore, the maximum expansion capacity is:

$$4 \times (32DI + 32DO + 4AI + 4AO)$$

The CC-Link remote I/O adapter supports two logical station configuration modes, determined by the first five and last five positions of the baud rate DIP switch settings.

- When the DIP switch is set to one of the **first five positions**, the communication speed is selected and the adapter is fixed at **4 logical stations**. The number of logical stations cannot be changed.
- When the DIP switch is set to one of the **last five positions**, the communication speed remains the same as the corresponding first five positions, but the number of logical stations can be adjusted according to the application requirements.

For logical station allocation:

- One group of **16-point digital input/output modules** occupies **one logical station**.
- One group of **4-channel analog modules** occupies **one logical station**.

Example:

If five EX-1040 adapters are connected to the PLC, and each EX-1040 is configured with an EX-200H, EX-300H, EX-4414, and EX-5414, while the other adapters use the same configuration, the communication speed should be configured according to the master station settings. Please refer to the table below for details.

Communication parameter settings

CC-Link DIP switch corresponding station number setting					
Fixed logic station	DIP code: 0	DIP code:1	DIP code:2	DIP code:3	DIP code:4

Variable Logic Station	DIP code:5	DIP code:6	DIP code:7	DIP code:8	DIP code:9
Communication Distance for Each Baud Rate Setting	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
	1200m	600m	200m	150m	100m

After the DIP switch settings are completed, based on the connected modules (EX-200H, EX-300H, EX-4414, and EX-5414), each EX-1040 contains one group of 32-point digital I/O, one group of 4-channel analog inputs, and one group of 4-channel analog outputs.

Therefore, the maximum logical station allocation is 1 logical station.

After the configuration is complete, transfer the settings to the PLC. You can then perform input/output (I/O) testing.

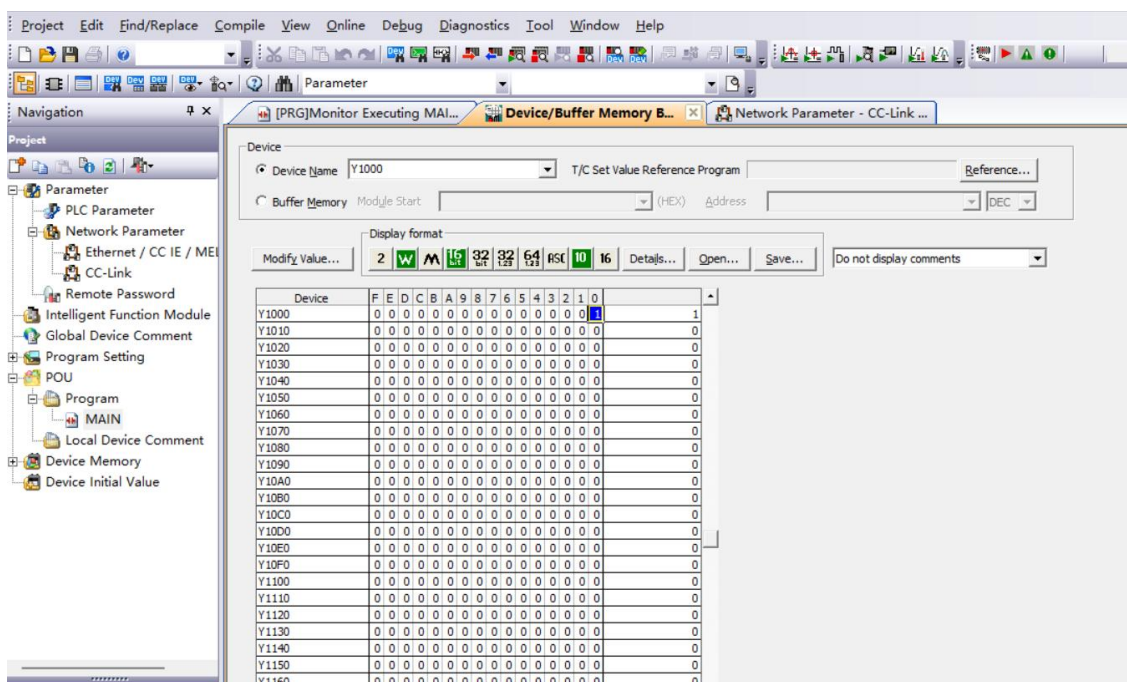
In this example, the start addresses are configured as follows:

Remote Input (RX): X1000

Remote Output (RY): Y1000

Remote Register (RWr): W1000

Remote Register (RWw): W1100



DO Module

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4. Appendix

Model	EX-1040
Adapter power consumption	190mA
Order number	02-01-06
Maximum number of I/Os	32/piece
Maximum number of input bytes	48
Maximum number of output bytes	48
Does it support digital modules?	yes
Does it support analog input modules?	yes
Does it support functional modules?	Yes (≤ 1 piece)
Does it support a communication module?	Yes (≤ 1 piece)



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