**Doc Num:** N18001MGM01

Published Date: 25th July 2018

# Interfacing Modular IO Header M-CCB-H with Mitsubishi PLCs on CC-Link IE Field Basic Network



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Quick Start Guide: Interfacing Modular IO Header M-CCB-H with Mitsubishi PLCs on CC-Link IE Field Basic networ			
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# **1** Scope of Document

This is a Quick Start Guide to interface Mitsubishi Electric India make Modular IO with Mitsubishi PLCs (iQ-R, iQ-F, Q and L) on CC-Link IE Field Basic network.

### Prerequisites

1. Engineering Tool [GX Works3/GX Works2]

Following updated firmware versions/serial numbers (first five digits) of the CPU module and software versions of GX Works3/GX Works2.

• MELSEC iQ-R

Function	CPU module Firmware Version	GX Works3 software version
CC Link IE Field Network Basic	"25" or Later	"1.030G"or later

MELSEC iQ-F

Function	CPU module Firmware Version	GX Works3 software version
CC Link IE Field Network Basic	"1.040" or Later	"1.030G"or later

• MELSEC -Q/L

Function	CPU module serial number (first five digits)	GX Works2 software version
CC Link IE Field Network Basic	"18112" or Later	"1.555D"or later

- 2. Modular IO setup
  - a. Modular IO Configurator Tool V1.2.0.0 or Onwards.
  - b. Modular IO Profile file "0x2071\_M-CCB-H\_0x0001\_en.CSPP.zip".

Download above files from Mitsubishi Electric India website.

### References

- a. Modular IO User Manual [Manual Number : N16001AAMH]
- b. CC-Link IE Field Network Basic [Manual Number: SH (NA)-081684ENG-D] and onwards.

Follow the steps below to interface Modular IO with Mitsubishi PLC.

- 1. <u>Prepare Hardware Setup</u>
- 2. <u>Register Modular IO Profile in Engineering Tool</u>
- 3. Install Modular IO Configurator Tool
- 4. Configure Modular IO Station using Modular IO Configurator Tool
- 5. <u>Set Parameters in CC-Link IE Field Basic Network Setting in Engineering Tool</u>
- 6. Monitor Status and Diagnostics

Subsequent sections explain necessary steps in detail.

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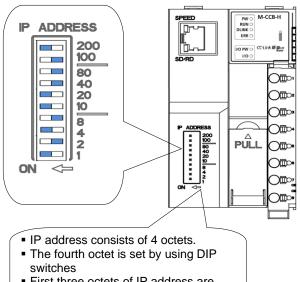
# 2 Hardware Setup

Setup diagram below shows setup with iQ-R PLC as a Master and Modular IO as a Slave device.
IQ-R PLC
Install Modular IO Configurator Tool as explained in section 4.
Register Modular IO Profile to Engineering Tool as explained in Section 3
PC with Engineering Tool Wini USB B Upto 63 I/O modules

### Setting of Station IP Address

Example shows DIP switch setting for value of 235

235= 200 + 20+10 +4+1



 First three octets of IP address are assigned by network master station.

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# **3** Register Modular IO Profile in Engineering Tool

This section explains how to register Modular IO profile in Engineering Tool so that Modular IO (M-CCB-H) appears in the Module List of Network Configuration Setting  $\rightarrow$  CC-Link IEF Basic Configuration

1. Start GX Works3 and execute command "Tool"  $\rightarrow$  "Profile Management"  $\rightarrow$  "Register".

MELSOFT GX Works3					
Project Edit Find/Replace Convert	View Online Debug Diagnostics To	ol Window Help			
i 🗅 📂 💾 🎒 🥥 💿 📮	X 🗅 🖬 🗠 🛪 🖼 🖼 🛤 💷	Memory Card	🔜 🕀 🕀 🕂 🔤	💷 📀 🚱 Max.: 🔹	**
Navigation $ au imes$		Check Program			
□ੁਸ਼ੂ <sub>*</sub>   □⊏   <u>O</u> ptions		Check Parameter			
		Confirm Memory Size (Offline)			
		Module Tool List			
		Drive Tool List			
		Profile Management	Register		
		Register Sample Library	Delete		
		Shortcut Key			
		Predefined Protocol Support Function			
		Circuit Trace			
		Options			
	Device Assignment Confirmation				ų×
	Start I/O No: 🗸 🗸 🗸	Display Option			
Ravigation Sonnection Destination	🚟 Device Assignment Confirmation 📴	Cross Reference 1 📲 Watch 1			
					CAP NUM

This will invoke "Register Profile" dialogue. Browse Modular IO profile file "0x2071\_M-CCB-H\_0x0001\_en.CSPP.zip" and click on "Register" button. You will get message "Registration of the profile is completed "on successful completion.

2. After registration, M-CCB-H can be seen in the Module List of "CC-Link IEF Basic Configuration" as shown below.

To view the CC-Link IEF Basic Configuration window,

 $[Navigation window] \Rightarrow [Parameter] \Rightarrow [CPU module model name] \Rightarrow [Module Parameter] \Rightarrow [Basic Settings] \Rightarrow [CC Link IEF Basic Setting] \Rightarrow [Network Configuration Setting] and then click on<Detailed Setting>$ 

2	🖞 CC-Link IEF Basic Configuration																			
:	CC-Link IEF Basic Configuration Edit View Close with Discarding the Setting Close with Reflecting the Setting																			
Γ	Detect Now Link Scan Setting										Module List ×									
	_	Conne	cted C	ount		0											Select CC-Link IEF Basic   Find Module   My ◀ ▶			
			No. Model Name		INeres CTA	ta dal Nama	Madel News	Madel News	STA#	Station Type	RX/R	Y Setting		RWv	v/RWr Se	etting	Group No.	RSVD	IP Address	🏦 🎗 🔚 🎫 🗶 🖻 🗙
F	<b>V</b>							Points	Start	End	Points	Start	End	Group no.	STA		CC-Link IEF Basic Module (General)			
5	-	-	0	Host Statio	m	0	Master Station						_			192.168.3.39	CC-Link IEF Basic Module (Mitsubishi Elec			
																	Input Module			
1.																	Output Module     I/O Combined Module			
																	IV I Inverter(FR-A800 Series)			
																	Inverter(FR-E700-NE)			
																	Inverter(FR-F800 Series)			
																	Servo Amplifier(MELSERVO-JE Series)			
																	CCIEF Basic Module (Mitsubishi Electric In			
																	Modular IO			
		•													M-CCB-H Modular IO					
										F										
10																				
																	To the 1			
				1													[Outline] Modular IO			
II H	lost Si	tation															[Specification]			
																	Input voltage: 24 VDC, 22 Watt			
	STA																Number of Occupied Stations: 1-4 stations (user configurable)			
	All Connected Co Unit 0 Unit 0							Number of IO Modules: 63 maximum												
		, I STA	#:0														[Manufacturer Name] Mitsubishi Electric Inidia			
																	[Station Type]			
																	Slave Station			
				•												4				
-																	1			

### NOTE:

Follow the same procedure to register Modular IO profile in GX Works 2.

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# 4 Install Modular IO Configurator Tool

You should have following installer files stored at the same location.

- a. ModularIOConfiguratorSetupx.x.x.exe
- b. ModularIOCommunicationComponentx.x.x.x.exe
  - x.x.x.x is a version of the software.

#### Software setup requirement:

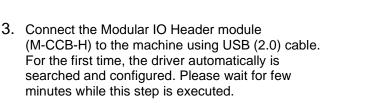
Processor	Intel core i3 or Higher version
Disk space	200 MB
RAM memory	2GB or Higher
Screen resolution	1280 x 768 or Higher
Platform	Windows 7 (64 bit/ 32 bit)/ Windows 8 (64 bit)/ Windows 8.1 (64 bit)/ Windows 10 (64 bit)
USB interface	USB 2.0

### Following steps explain how to install Modular IO Configuration Tool

1. Run ModularIOConfiguratorSetupx.x.x.exe. It will open Modular IO Configuration Tool Setup wizard.

Clc on Next button to complete installation of Modular IO Configuration Tool Setup, Communication Component Setup and Device Driver

2. Click on Finish button to complete Modular IO Configuration Tool Setup.



4. Once the driver is successfully installed, following message will appear.



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# 5 Configure Modular IO Station

This section explains configuration and special features of Modular IO Configurator Tool.

# 5.1 Configuration of Modular IO Station

Example here shows configuration of following modules.

Description	Ordering Code	Quantity
CC Link IE Field Basic Header Module	М-ССВ-Н	1
16 Digital Input, 24 VDC, Sink Type (Negative Common) Module	M-16D	1
16 Digital Output, 24 VDC, Source Type Module	M-16TE	1
2 Channel Universal Analog Input Module	M-UAD2	1
2 Channel Analog Output Voltage/ Current Module	M-DA2	1

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Following steps explain how to configure modular IO station in a Modular IO Configurator Tool.

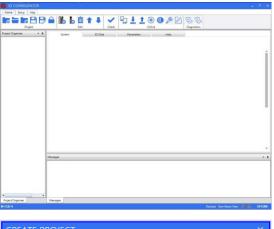
1. Open Modular IO Configurator Tool and view screen layout as beside

Click on create new project. This operation opens "Create Project" window.

Enter project name, browse path where project file will be saved. Select Bus type as CC-Link IE Field Basic.

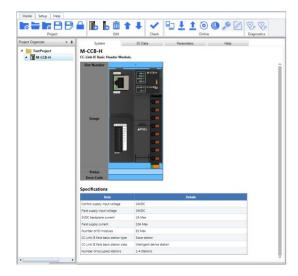
3. Add and configure Header module. Click on function this opens Add Header dialogue box and shows list of Header modules of selected Bus Type. Select Header module M-CCB-H and click on Add button.

Added Header module is displayed in tree view as well as in System tab of working area as beside.



CREATE PROJECT		×
Project Name		
Path		
		Browse
Bus Type		
	•	
	Crush	Cancel
	Create	Caricel





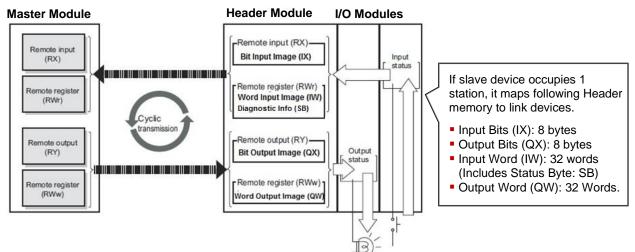
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4. Select Header module from Project Organiser window and click on "Parameters" tab to set Header configuration parameters. User can modify Project Values for individual parameter.

Parameter Name	Parameter Name Project Value		Comment		
General parameters					
Number of stations occupied	1		Defines number of stations occupied.		
Share diagnostics	Enable *		Enables diagnostic data (SB) updation.		
Action on fatal error	Continue N/W communication •	V/W communication 🔹 Defines action on fatal error to any slot including header. Stop or continue communication with N/W			
Share SB to RWr	Disable •		Enables diagnostic data (SB) sharing with N/W master.		
Output hold / clear	Clear •		Defines output state of IO modules when disconnected from network or master CPU is not in RUN mod		

Number of stations occupied can be configured as 1 to 4. The same number should be configured in Network Configuration Settings in CC-Link IEF Basic Configuration in Engineering Tool.

The figure below shows memory mapping of Header module memory (IX, QX, IW, QW and SB) to link devices (RX, RY, RWr and RWw).



So user can configure following IO modules, if number of stations occupied is 1.

Header memory	Number of Points	IO module	Max. Number of M Share diagnostics	odules if
			Disable	Enable
Input Bits (IX)	64 bits	16-Pt digital input		4
		8-Pt /4-Pt digital input		8
Output Bits (QX)	64 bits	16-Pt digital output		4
		8-Pt /4-Pt digital output		8
Input Word (IW)	32 words	2-Ch analog input	16	5
		4-Ch analog input	8	3
Output Word (QW)	32 words	2-Ch analog output	16	10
		4-Ch analog output	8	6

## NOTE:

- 1. SB memory is shared with network master if "Share SB to RWr" parmeter is set as 'Enable'.
- 2. IW memory is mapped to RWr memory and then SB memory is mapped to RWr memory consecutively

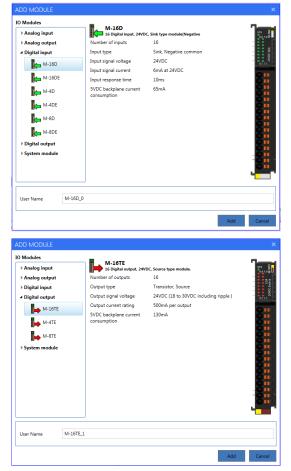
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5. Add and configure IO module to modular IO station, as below.

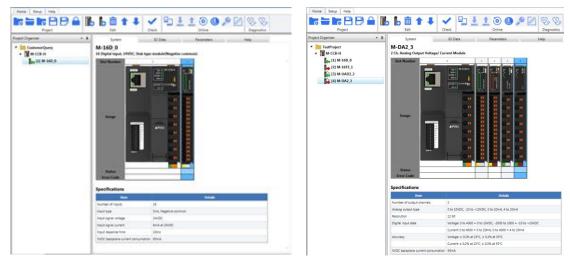
Click on function to open dialog box of "Add Module" which shows list of IO modules grouped as per IO module type.

Select M-16D Digital Input module and click on Add button.



Select M-16TE Digital output module and click on Add button.

Follow the same procedure to Add M-UAD2 and M-DA2. Then configure analog IO channels as per the application requirement. User can configure IO type and engineering scaling. Added IO modules are displayed in tree view and in System tab in working area as shown as below.



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- 6. User should attach Bus End module (M-BE) at the last slot position if there are 16 or more IO modules.
- 7. Connect Header module to your machine via standard USB cable.

Click on  $\frac{1}{2}$  to download the configuration to connected Header module. This pop ups progress window as shown below. After successful downloading, click Ok.

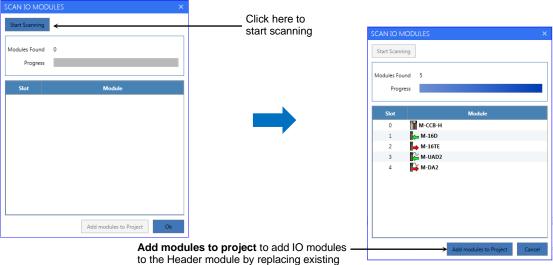
DOWNLOAD ×	DOWNLOAD ×
Starting Download	Download complete!
<b>5</b> 0	100 Bytes sent 651 of 651
Close on Completion Ok Cancel	Close on Completion Ok Cancel

# 5.2 Special Features of Modular IO Configurator Tool

1. Scan IO modules connected to Header module:

Tool facilitates quick configuration of a modular IO station if setup is available with IO modules actually attached to the Header module. Using "Scan IO Module" function, tool can read the list of IO modules (other than system modules) physically attached to the Header module.

Select Header module and click on Online function ( This opens following window of Scan IO Modules.



IO modules if any.

## NOTE:

System modules are passive modules. Hence, Header module cannot detect presence of System modules in a modular IO station. So System modules do not appear in the list after scan.

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2. Output test in online monitoring mode:

This is online feature and useful to test output module locally even when Header module is not connected to the fieldbus/ network. User can write individual output (True/ False to digital output module and channel data to analog output module) and test individual output.

Follow the steps as below, to write outputs for test purpose.

- 1. Click on function to connect to Header module. Icon changes to and Status bar is updated as ONLINE.
- 2. Enable output test by clicking on function  $\checkmark$  .Icon changes color to red  $\checkmark$  and also updates status on status bar. This allows user to write force output values to actual output values. When Output test is enabled, IO LED on Header module turns yellow.
- 3. Select output module to test output and then select "IO Data" tab.
- 4. Select individual output DO nn (for Digital output) or CHn (for Analog output).
- 5. Select option as
  - Force to true/ Force to False/ No Force for Digital output and
  - Enter value between -32768 and 32767 for Analog output.

Colour of Forced values change to red.

- 6. Repeat step 5 for other output module as required.
- 7. Click on Online function it to write Forced values to Actual values. Forced value overwrites Field bus values.

After writing output values to actual values, color of Forced values change to blue.

8. Change in digital output is indicated by output LED indication on the digital output module. User can measure actual output signal to test digital output and analog output.

For digital output, function "Enable/ Disable output test"  $\checkmark$  and "Write values"  $\checkmark$  are used as shown below.

In online monitoring mode, select digital output module, here M-16TE is selected as an example. By default, forcing of output is disable.

Project	) 🗕 🗈 b 🏾	dit Ch				agnostics
oject Organiser 👻 🖡	System	IO Data	Parameters	He		agnosaes j
TestProj	Channel Digital output	Data Type	Local Address	Field Bus Value	Forced Value	Actual Value
[1] M-16D_0	Digital output     Digital output	BYTE	QX 0	0		0
[2] M-16D_1	DO 00	BOOL	QX 0.0	False	No Force 🔻	False
(3] M-8D_2	DO 01	BOOL	QX 0.1	False	No Force 🔻	False
S [x] M-FPI_6	DO 02	BOOL	QX 0.2	False	No Force 🔻	False
S [x] M-FPD_10	DO 03	BOOL	QX 0.3	False	No Force 💌	False
[4] M-16TE_3	DO 04	BOOL	QX 0.4	False	No Force 🔻	False
[5] M-16TE_4 [6] M-UAD2_7	DO 05	BOOL	QX 0.5	False	No Force 🔻	False
[6] M-0AD2_7	DO 06	BOOL	QX 0.6	False	No Force 🔻	False
[7] M-DA2_8	DO 07	BOOL	QX 0.7	False	No Force 🔻	False
[9] M-16TE_5	Digital output 10-17	BYTE	QX 1	0		0
						Clear Forced Valu

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Click on function 2 lcon changes color to red 2 This enables output test feature and allows forcing of individual output as shown.

Project			Ec	l 1 it		Check		1 💿 d Online	) 🎤 🖉		2 😒 Diagnostics		Forced Valu	e
ect Organiser 🛛 👻 🖡		System			IO Data		Parameters	н	lelp			]		
TestProj		Ch	annel		Data Typ	e	Local Address	Field Bus Value	Forced Valu	Je	Actual Value		1	
4 🎬 M-CCB-H		Digital outp	ut										1.00	
(1] M-16D_0	^	Digital outp	ut 00-07		BYTE		QX 0	0			0		Force to TRUE	
(2] M-16D_1		DO 00			BOOL		QX 0.0	False	No Force	Ψ.	False		No Force	
[3] M-8D_2		DO 01			BOOL		QX 0.1	False	No Force		Faise		No Torce	
S [x] M-FPI_6		DO 02			BOOL		QX 0.2	False	Force to TRUE	_	False		No Force	
S [x] M-FPD_10		DO 03			BOOL		QX 0.3	False	Force to FALSE		False			
[4] M-16TE_3		DO 04			BOOL		QX 0.4	False	No Force	•	False		No Force	
5] M-16TE_4		DO 05			BOOL		QX 0.5	False	No Force	*	False		No Force	
6] M-UAD2_7		DO 06			BOOL		QX 0.6	False	No Force	•	False			
[7] M-DA2_8 [8] M-8TE_9		DO 07			BOOL		QX 0.7	False	No Force	•	False		No Force	
[9] M-16TE_5	*	Digital outp	ut 10-17		BYTE		QX 1	0			0		No Force	
											Clear Forced Values		No Force	
												] L		

After selection of either Force to TRUE or Force to FALSE, online changed force value for output turns red as shown above.

Clicking on function *writes* online changed force value to actual value and force value changes colour as blue as below.

	System	IO Data	Parameters	He		
			r drameters		eip	
	Channel	Data Type	Local Address	Field Bus Value	Forced Value	Actual Value
1	<ul> <li>Digital output</li> </ul>					
^	Digital output 00-07	BYTE	QX 0	0	1	1
	DO 00	BOOL	QX 0.0	False	Force to TRUE 🔹	True
	DO 01	BOOL	QX 0.1	False	No Force 🔹	False
	DO 02	BOOL	QX 0.2	False	No Force 🔹	False
	DO 03	BOOL	QX 0.3	False	No Force 🔹	False
	DO 04	BOOL	QX 0.4	False	No Force 🔹	False
	DO 05	BOOL	QX 0.5	False	No Force 🔹	False
	DO 06	BOOL	QX 0.6	False	No Force 🔹	False
	DO 07	BOOL	QX 0.7	False	No Force 👻	False
*	Digital output 10-17	BYTE	QX 1	0		0
	~	DO 00 DO 01 DO 02 DO 03 DO 04 DO 05 DO 06 DO 06	Digital output 00-07         BYTE           DO 00         BOOL           DO 01         BOOL           DO 02         BOOL           DO 03         BOOL           DO 04         BOOL           DO 05         BOOL           DO 06         BOOL           DO 07         BOOL	Digital output 00-07         BYTE         QX 0           DO 00         BOOL         QX 0.0           DO 01         BOOL         QX 0.1           DO 02         BOOL         QX 0.2           DO 03         BOOL         QX 0.3           DO 04         BOOL         QX 0.4           DO 05         BOOL         QX 0.5           DO 06         BOOL         QX 0.7	Digital output 00-07         BYTE         QX 0         0           DO 00         BOOL         QX 0.0         False           DO 01         BOOL         QX 0.1         False           DO 02         BOOL         QX 0.2         False           DO 03         BOOL         QX 0.3         False           DO 04         BOOL         QX 0.4         False           DO 05         BOOL         QX 0.5         False           DO 06         BOOL         QX 0.6         False           DO 07         BOOL         QX 0.7         False	Digital output 00-07         BYTE         QX 0         0         1           D0 00         BOOL         QX 0.0         False         Force to TRUE •           D0 01         BOOL         QX 0.1         False         No Force •           D0 02         BOOL         QX 0.2         False         No Force •           D0 03         BOOL         QX 0.4         False         No Force •           D0 04         BOOL         QX 0.4         False         No Force •           D0 05         BOOL         QX 0.5         False         No Force •           D0 06         BOOL         QX 0.5         False         No Force •           D0 07         BOOL         QX 0.7         False         No Force •

## NOTE

Output test is possible only if modular IO station is healthy. Confirm status of modular IO station using LED indications on Header module

Forcing of output continues as long as modular IO station is powered on and in ONLINE monitoring mode. When user tries to go OFFLINE, tool prompt user to clear forced values.

# 6 Set Network Configuration Setting in Engineering Tool

# 6.1 MELSEC iQ-R/ iQ-F Settings for the Master Station

Settings for the master station in MELSEC iQ-R/ MELSEC iQ-F are set in GX Works 3.

### **CC-Link IEF Basic Setting**

This section describes how to configure the basic settings such as whether to use CC-Link IE Field Network Basic.

MELSEC iQ-R

[Navigation window] ⇒ [Parameter] ⇒ [CPU module model name] ⇒ [Module Parameter] ⇒ [Basic Settings]

• MELSEC iQ-F

[Navigation window] ⇔ [Parameter] ⇔ [CPU module model name] ⇔ [Module Parameter] ⇔ [Ethernet Port] ⇔ [Basic Settings]

Set "IP Address", "Subnet Mask Pattern", and "Default Router IP Address" in the "IP Address Setting" window.

IP Address	
····· IP Address	192.168.3.39
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.100

After the IP address setting above, then set "CC-Link IEF Basic Setting "

#### Window

📮 CC-Link IEF Basic Setting	
To Use or Notto Use CC-Link IEF Basic Setting	Disable 🔹
Network Configuration Settings	<detailed setting=""></detailed>
Refresh Settings	<detailed setting=""></detailed>

### **Displayed** items

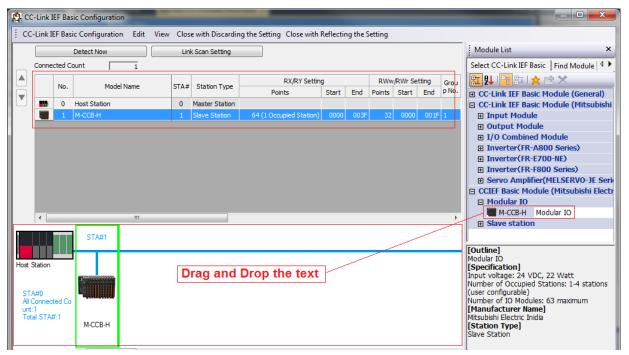
Item	Description	Setting Range	Default
To Use or Not to Use CC-Link IEF Basic Setting	Set whether to use CC-Link IE Field Network Basic.	• Enable • Disable	Disable
Network Configuration Settings	Set the information of the slave station to the master station. Moreover, configure link scan settings (timeout time and number of retries for slave station disconnection detection).		
Refresh Settings	Configure the settings to automatically link refresh RX/RY/ RWr/ RWw data to the devices.		

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### **Network Configuration Settings**

Set the network configuration.

### Window



### **Refresh Settings**

Set refresh parameters.

#### Window

Link Side				Link Side						CPU	Side		
Device Name	Points	Start	End	]	Targe	et	Device Name	Points	Start	End			
RX				+		•							
RY				+		•							
RWr				+		•							
RWw				+		•							

### **Displayed items**

ltem		Description	Setting Range	Default
Link S	Side	The number of points for the link devices (RX/RY, RWr/RWw) for the number of occupied stations and start/end device number set in the network configuration settings are displayed.		
CPU Side	Target	The target destination to be link refreshed is displayed.	Specify Device	(Empty)
	Device Name	Set the device of the link refresh target.	X, Y, M, L, B, D, W, R	(Empty)
	Points	The number of device points for the link refresh target is displayed. (The same value as the number of points on the link side is displayed.)		
	Start	Set the start device number within the link refresh range.	Follow the device settings of the CPU parameters	
	End	The end device number within the link refresh range is displayed.		

The below screen shot shows Device Names and Start and end addresses for an example.

Link Side					CPU Side						
Device Name	Points	Start	End		Target		Target Device Name		Points	Start	End
RX	64	00000	0003F	+	Specify Device	•	X	•	64	00100	0013F
RY	64	00000	0003F	+	Specify Device	•	Y	Ŧ	64	00100	0013F
RWr	32	00000	0001F	- 🖶 -	Specify Device	•	D	•	32	0	31
R₩w	32	00000	0001F	+	Specify Device	Ŧ	D	•	32	32	63

The following table shows mapping of Header module memory to link devices.

Link Side	CPU Side Address	Header Side Address	IO Modules
RX : 64bits	X00100 - X0010F	IX0-IX1 M-16D	
	X00110-X0013F	Unused	
RY : 64 bits	Y00100 - Y0010F	QX0-QX1	M-16TE
	Y00110-Y0013F	Unused	
RWr : 32 Words	D0- D1	IW0-IW1	M-UAD2
	D2-D31	D2-D31 Unused	
RWw : 32 words	D32-D33	QW0-QW1 M-DA2	
	D34-D63	Unused	

The number of link points per slave station is 64 points for RX/RY and 32 points for RWr/RWw.

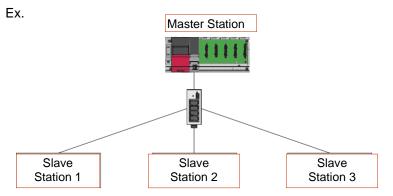
However, by changing the number of occupied stations, RX/RY can be set to a maximum of 256 points in increments of 64 points and RWr/RWw can be set to a maximum of 128 points in increments of 32 points.

Number of occupied stations configured decides size of memory to be shared with master during cyclic transmission as shown below

No. of occupied stations	RX	RY	RWr	RWw
1	64 bit	64 bit	32 word	32 word
2	128 bit	128 bit	64 word	64 word
3	192 bit	192 bit	96 word	96 word
4	256 bit	256 bit	128 word	128 word

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If the number of link points for the slave station is changed, the assignment range and station number are changed



- Slave station 1: 1 station occupied
- Slave station 2: 2 stations occupied
- Slave station 3: 4 stations occupied

The following table lists the number of link points.

Slave	Number of ecoupied		RX/RY Settii	ng	RWr/ RWw Setting			
Station	Number of occupied station	No of Points	Start	End	No of Points	Start	End	
1	1	64	0	3F	32	0	1F	
2	2 stations occupied	128	40	BF	64	32	5F	
3	4 stations occupied	256	C0	1BF	128	96	DF	

### NOTE:

Setting the number of link points for a slave station to 2 stations occupied means that two slave stations are connected. Thus, if the number of link points is increased, the number of connectable slave stations per network is decreased.

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# 6.2 MELSEC-Q/L Settings for the Master Station

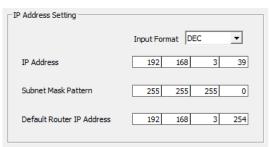
Settings for the master station in MELSEC-Q are set in GX Works2.

#### CC-Link IEF Basic Setting

This section describes how to configure whether to use CC-Link IE Field Network Basic and the settings of the refresh parameters.

 $[Project window] \Rightarrow [Parameter] \Rightarrow [PLC Parameter] \Rightarrow [Built-in Ethernet Port Setting] tab \Rightarrow [CC-Link IEF Basic Setting] button.$ 

To display the "CC-Link IEF Basic Setting" window, set "IP Address", "Subnet Mask Pattern", and "Default Router IP Address" in the "IP Address Setting" window.



After the setting above, the "CC-Link IEF Basic Setting window" displays when [CC-Link IEF Basic Setting] button is pressed.

#### Window

CC-Link IEF Basi	c Setting							×
Use the CC-	guration Set	ting						
	Link S	ide			PLC Side			
Dev. Name	Points	Start	End		Dev. Name Points Start			End
RX	0	0000	0000		-			
RY	0	0000	0000	+	-			
RWr	0	0000	0000	+	-			
RWw	0	0000	0000	+	-			
Please set the slave station first in Network Configuration Setting. Please check the content if it is changed because the Points is changed based on the number of occupied points of slave station.								
					Required Set	tangs ( No	ot Set /	Already Set )
			Defau	it	Check	Er	nd	Cancel

#### **Displayed** items

Item		Description	Setting Range	Default
Use the CC-Link IE	EF Basic	Set whether to use CC-Link IE Field Network Basic.	Checked Unchecked	Unchecked
Network Configuration Settings	[Network Configuration Settings] button	Set the information of the slave station to the master station.		
Refresh Setting	Link Side	The number of points for the link devices (RX/RY, RWr/ RWw) for the number of occupied stations and start/end device number set in the network configuration settings are displayed.		

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ltem			Description	Setting Range	Default
Refresh Setting	CPU Side	Device Name	Set the device of the link refresh target.	X, Y, M, L, D, W, R, ZR	(Empty)
		Points	The number of device points for the link refresh target is displayed. (The same value as the number of points on the link side is displayed.)		
		Start	Set the start device number within the link refresh range.	Follow the device settings of the CPU parameters.	(Empty)
		End	The end device number within the link refresh range is displayed.		

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# 7 Monitor Status and Diagnostics

After Network Configuration Setting, develop application program as per application requirement and download to MELSEC PLC.

Monitor individual Modular IO station status and diagnostics locally using Modular IO Configurator Tool as explained in section 7.1.

Monitor CC-Link IE Field Network Basic diagnostics using Engineering Tool as explained in section 7.2.

# 7.1 Modular IO Diagnostics

Following steps explain how to monitor IO data and diagnostics of a modular IO station in online mode,

- 1. Click on function To connect to Header module. Icon changes to and Status bar is updated as ONLINE.
- 2. Select Header module in Project Organiser window and click on tab "IO data" to monitor diagnostics (SB memory) of Header module.

Project				III Edit	1 4	Check		1 💿 🕑 Online		Diagnostics
roject Organiser 🛛 👻 🖡			System		IO Data		Parameters	He	lp	
<ul> <li>TestProj</li> <li>M-CCB-H</li> </ul>			Channel Diagnostic summa	D/	Data Type	2	Local Address	Field Bus Value	Forced Value	Actual Value
[1] M-16D_0	-		Diagnostic summa		WORD		SB 0 - SB 1	68		68
[2] M-16TE_1		- 9	Slot status							
	*		Slot status 07		BYTE		SB 2	128		128
	*	4	Slot status 815		BYTE		SB 3	0		0
	*		Slot status 1623		BYTE		SB 4	0		0
	*	4	Slot status 2432		BYTE		SB 5	0		0
	*		Slot status 3239		BYTE		SB 6	0		0
	*		Slot status 4047		BYTE		SB 7	0		0
	*		Slot status 4855		BYTE		SB 8	0		0
	*		Slot status 5663		BYTE		SB 9	0		0
										Clear Forced Value
Project Organiser	Messa	qes								•

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Select IO module in Project Organiser window and click on tab "IO data" to monitor IX of selected M-16D module.

Project		Edit Check		Diagnostic			
: Organiser 🔹 🖣		System IO Data	Parameters	Help			
TestProject		Channel	Data Type	Local Address	Field Bus Value	Forced Value	Actual Value
📔 М-ССВ-Н	E	Digital input					
(1) M-16D_0	-	Digital input 00-07	BYTE	IX 0	0		0
[2] M-16TE_1		DI 00	BOOL	IX 0.0	False	v	False
		DI 01	BOOL	IX 0.1	False	*	False
		DI 02	BOOL	IX 0.2	False	*	False
		DI 03	BOOL	IX 0.3	False	*	False
		DI 04	BOOL	IX 0.4	False	*	False
		DI 05	BOOL	IX 0.5	False	*	False
		DI 06	BOOL	IX 0.6	False	*	False
		DI 07	BOOL	IX 0.7	False	*	False
	-	Digital input 10-17	BYTE	IX 1	0		0
		DI 10	BOOL	IX 1.0	False	Ψ	False
		DI 11	BOOL	IX 1.1	False	*	False
		DI 12	BOOL	IX 1.2	False	*	False
		DI 13	BOOL	IX 1.3	False	*	False
		DI 14	BOOL	IX 1.4	False	*	False
		DI 15	BOOL	IX 1.5	False	*	False
		DI 16	BOOL	IX 1.6	False	*	False
		DI 17	BOOL	IX 1.7	False	v	False
							Clear Forced \

3. Select IO module in Project Organiser window and click on tab "IO data" to monitor QX of selected M-16TE module.

Project		D D D D D D D D D D D D D D D D D D D	<b>T ↓</b>	✓ Check	Online	0 🔎 🖉	Diagnostics				
ect Organiser 👻 🕈		System	IO D	ita	Parameters	Help					
TestProject M-CCB-H			Channel		Data Type	Local Add	ress	Field Bus Value	Forced Value		Actual Value
[1] M-16D_0	(	<ul> <li>Digital output</li> </ul>									
[2] M-16TE_1	^	Digital output 0	0-07		BYTE	QX 0		0			0
		DO 00			BOOL	QX 0.0		False	No Force	Ŧ	False
		DO 01			BOOL	QX 0.1		False	No Force	*	False
		DO 02			BOOL	QX 0.2		False	No Force	*	False
		DO 03			BOOL	QX 0.3		False	No Force	*	False
		DO 04			BOOL	QX 0.4		False	No Force	-	False
		DO 05			BOOL	QX 0.5		False	No Force	-	False
		DO 06			BOOL	QX 0.6	i	False	No Force	-	False
		DO 07			BOOL	QX 0.7		False	No Force	*	False
	^	Digital output 1	0-17		BYTE	QX 1		0			0
		DO 10			BOOL	QX 1.0	I	False	No Force	-	False
		DO 11			BOOL	QX 1.1		False	No Force	-	False
		DO 12			BOOL	QX 1.2		False	No Force	-	False
		DO 13			BOOL	QX 1.3		False	No Force	-	False
		DO 14			BOOL	QX 1.4		False	No Force	Ŧ	False
		DO 15			BOOL	QX 1.5		False	No Force	Ŧ	False
		DO 16			BOOL	QX 1.6		False	No Force	-	False
		DO 17			BOOL	QX 1.7		False	No Force	-	False
											Clear Forced
ect Organiser	Messag										

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4. Header diagnostic information covers modular IO station specific as well as Header module specific diagnostic information.

Click on diagnostic function "Header Diagnostics" b for monitoring diagnostic information of connected Header module.

This pops up following window of "HEADER DIAGNOSTIC INFORMATION".

DER DIAGNOSTIC IN	IFORMATION : [M-CCB-H		
			Collapse All Expand
	Diagnostics	Value	Description
Identification			
+ Version Info			
+ Hardware			
<ul> <li>Memory size</li> </ul>			
+ Header scan time			
+ Diagnostic Summary			
+ Slots 0-15			
+ Slots 16-31			
<ul> <li>Slots 32-47</li> </ul>			
+ Slots 48-63			
CC-Link IE Field Basic	diagnostics		

Header diagnostics are categorized for easy monitoring. User can monitor individual parameter by expanding individual diagnostic.as shown below

					Collapse All Expand
ation			Diagnostics	Value	Description
agnostics	$\geq$		Diagnostic Summary		
nmary	Ŧ		No. of configured slots	3	No. of configured slots.
	*	1	No. of detected slots	3	No. of detected slots.
	Ŧ		Status	64	Bitwise status of header module.
otwise Status		1-	Slots 0-15		1
IO modules	Ψ		Detected	000000000000111	Bitwise module detection status.
	Ŧ	1	Healthy	000000000000110	Bitwise module health status.
	Ŧ	- H	O error	000000000000000000000000000000000000000	Bitwise status of module mismatch or absent.
	Ŧ	- H	COM error	0000000000000000	Bitwise status of module COM error after power ON.
	Ŧ	H	Fatal error	000000000000000000000000000000000000000	Bitwise status of module fatal error.
	Ŧ	H	Non-fatal error	000000000000000000000000000000000000000	Bitwise status of module non-fatal error.
Link IE Field		Ľ	Slots 16-31	000000000000000000000000000000000000000	bitwise status of module non-ratal error.
ic Diagnostics	_				
ta transmission ON tation ID			Slots 32-47		
e station ID			Slots 48-63		
connects due to time-out		1.1	CC-Link IE Field Basic diagnostics	1	1
tion disconnection request issued of occupied station mismatch	1	(	CC-Link IE Field Basic diagnostics	256	Bitwise CC-Link IE Field diagnostics.
naster detected	/ •	1	Time between cyclic transmission requests (ms)	0	Time between last two transmission request received from master (ms).
is setting switch changed	*	1	Maximum time between cyclic transmission requests (ms)	0	Maximum time between cyclic transmission requests (ms).
	*	1	Minimum time between cyclic transmission requests (ms)	0	Minimum time between cyclic transmission requests (ms).
	Ŧ	1	Time since last cyclic transmission request (ms)	0	Time since last cyclic transmission request (ms).
	Ŧ	1	No. of cyclic transmission requests received	0	No. of cyclic transmission requests received.
	*	- H	No. of cyclic transmission responses sent	0	No. of cyclic transmission responses sent.
	Ŧ	- H	No. of receive frame error	0	No. of receive frame error.

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5. Slot diagnostic information provides configured modules and present modules, hardware versions and firmware versions of present modules, slot level error code, etc.

Similarly, click on function "Slot diagnostics" 🍪 to monitor slot diagnostics. This pops up following window of "SLOT DIAGNOSTIC INFORMATION".

LOT DIAG	NOSTIC IN	IFORMATION : [N	И-ССВ-Н]							×
Slot	Vendor	Configured	Present Module	Ver. Configured Module	Ver. Present Module	HW Ver.	FW Ver.	Backplane Ver.	Error	
0	1	M-CCB-H	M-CCB-H	0.0.0.4	0.0.0.11	1.0.0.0	0.0.0.11	0.0.0.8	0000	
1	1	M-16D	M-16D	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
2	1	M-16D	M-16D	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
3	1	M-8D	M-8D	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
4	1	M-16TE	M-16TE	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
5	1	M-16TE	M-16TE	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
6	1	M-UAD2	M-UAD2	1.0.0.0	1.0.0.0	1.0.0.0	1.0.0.0	0.0.0.2	0000	
7	0	M-DA2	M-DA2	1.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0000	
8	0	M-8TE	M-8TE	1.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0000	
9	0	M-16TE	M-16TE	1.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	0000	
		$\uparrow$	1			$\uparrow$	$\uparrow$			Ok
List of user names of Header module and IO modules configured						e version o modules.	of		indivi along	code idual m g with e

List of user names of connected Header module and IO modules physically attached to the Header. Firmware version of present modules

e along with error description in tool tip

### Important Error Codes of the Modular IO Station

The following table lists the error codes detected by the Modular IO

Error Code	Classification	Error Name
1000H	Fatal	Hardware failure
1001H	Fatal	Firmware watchdog error
1002H	Fatal	Configuration error
1003H	Fatal	Module absent or mismatch error
1004H	Fatal	IO module COM error
1009H	Fatal	Invalid parameter
1FFFH	Fatal	Fatal fieldbus error
2000H	Non-Fatal	Field power absent
2003H	Non-Fatal	Additional IO modules detected
2FFFH	Non-Fatal	Non-fatal fieldbus error

# 7.2 CC-Link IE Field Network Basic Diagnostics

Following steps explain how to monitor CC Link IE Field Basic Diagnostics

1.Connect GX Works3/GX Works2 to the CPU module on the master station.

2.Click on GX Works 3 menu command. [Diagnostics] ⇔ [CC-Link IEF Basic Diagnostics] Window

The network status including slave stations is checked in "Network Status".

.C-L	línk	E Field Basic		Change I	P Address Displ	ау	Monitor Statu		itoring	Start Monitoring	Stop Monitori
Master S	Station Status										
Fotal Slav Paramet	ve Stations ter)	1	IP Address	192.168.3.39	) Err	or Cod	e No Error				Error Details.
Vetwork	k Status										
Rough	Diagnostics										
Link Sc	an Time/Error	Stations									
Gr	oup No.1	Present	7 ms	Maximum	8	ms	Minimum	7	ms	Error Stns: 0 U	nfixed Stns: 0
Gr	oup No.2	Present	ms	Maximum		ms	Minimum		ms		
Gr	oup No.3	Present	ms	Maximum		ms	Minimum		ms		-
Gn	oup No.4	Present	ms	Maximum		ms	Minimum		ms		
Diagnos	ed Diagnostics stics Target Gr	Group No.		ress	Transmission 9	Status	Disconnections	Time	out Count	The Latest Frror	Error Details
Diagnos	tics Target Gr			ress	Transmission S	Status	Disconnections	Time	out Count	The Latest Error	Error Details
Diagnos Station N	vtics Target Gr	roup Group No. ns Reserved Static No Setting	on IP Add 192.16		Transmitting	Status	0	0	out Count	No Error	Error Details
Diagnos Station N	No. Occpd Str 1	roup Group No. ns Reserved Statio No Setting 	on IP Add 192.16		Transmitting	Status	0	0	out Count	No Error	Error Details
Diagnos Station N	vtics Target Gr	roup Group No. ns Reserved Static No Setting	on IP Add 192.16		Transmitting	Status	0	0	out Count	No Error	Error Details
Diagnos Station N  	No. Occpd Str 1 	Reserved Station	on IP Add 192.16		Transmitting 	Status	0 	0	out Count	No Error 	Error Details 
Diagnos Station N  	No. Occpd Str 1  	Reserved Static No Setting	on IP Add 192.16  		Transmitting  	Status	0  	0	out Count	No Error  	Error Details
Diagnos Station N	No. Occpd Str 1   	Reserved Station	on IP Add 192.16  		Transmitting  	Status	0  	0	out Count	No Error   	Error Details   
Diagnos <sup>4</sup> Station N    	Alo.         Occpd Str           1	Reserved Station	on IP Add 192.16      		Transmitting      	Status	0  	0    	out Count	No Error      	Error Details
Diagnosi	Stics Target Gr           1	Group No. Group No. Group No. Setting	on IP Add 192.16     		Transmitting	Status	0    	0    	out Count	No Error      	Error Details
Diagnos	Autor         Occpd Str           1	Reserved Station	on IP Add 192.16      		Transmitting      	Status	0  	0    	out Count	No Error       	Error Details
Diagnos <sup>i</sup> Station N     	Au.         Occpd Str           1	Group No. Group No. Group No. Setting	on IP Add 192.16       		Transmitting	Status	0     	0      	out Count	No Error       	Error Details
Diagnosi Station N        -	Abs.         Occept Str           1	Group No. Seenved Static No Setting	on IP Add 192.16        -		Transmitting	Status	0        -	0        -	out Count	No Error	Error Details
Diagnosi Station N  	and the second	Group No. Group No. Second Statu	on IP Add 192.16        -		Transmitting	Status	0       	0        -	out Count	No Error       	Error Details
Diagnosi Station N  	Target Gr           1   <	Group No.           s         Reserved Static           No Setting	on IP Add 192.16         		Transmitting	Status	0 	0        -	out Count	No Error       	Error Details

### **Displayed** items

The status of the master station is checked in "Master Station Status".

Item	Description
Total Slave Stations (Parameter)	The total number of slave stations set in parameter is displayed.
IP Address	The IP address of the master station is displayed. The display can be switched between decimals and hexadecimals in "Change IP Address Display".
Error Code	The error code of the master station is displayed.
[Error Details] Button	The description of the error and the actions to be taken are displayed.

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The network status including slave stations is checked in "Network Status".

Item	Description				
Link Scan Time/Error Stations	Link scan time (present, maximum, minimum) and number of error stations/unfixed stations of each group is displayed.				
	Error stations (Error Stns) and unfixed stations (Unfixed Stns) refer the following state.				
	Error Stns: Stations where an error has been occurred				
	$\boldsymbol{\cdot}$ Unfixed Stns: Stations (not including reserved stations) where the transmission status has not been fixed				
Diagnostics Target Group	Select a group to display its diagnostic information list.				
Station No.	The station number of the slave station is displayed.				
Occpd Stns	The number of occupied stations set in parameter is displayed.				
Reserved Station	The reserved station status set in parameter is displayed.				
IP Address	The IP address set in parameter is displayed.				
	"-" is displayed when the station is a reserved station and an IP address has not been set.				
Transmission Status	The transmission status of the slave station is displayed.				
	Unfixed: Communications with the master station not established				
	Transmitting: Cyclic transmission being performed				
	Disconnecting: Disconnected from the master station				
Disconnections	The accumulated number of disconnection detection is displayed.				
	0: No disconnections				
	$\cdot$ 1 to 65535: Number of disconnection detection (accumulated number)				
Time-out Count	The accumulated number of timeouts is displayed.				
	0: No timeouts				
	<ul> <li>1 to 65535: Number of timeouts (accumulated number)</li> </ul>				
The Latest Error	The latest error code is displayed an error on the transmission status between the master station and slave stations detected by the master station or an error which has occurred in a slave station. When the slave station is disconnected, an error occurs. After that, even when the disconnected slave station returns to the system, the error is held. When another error occurs, the latest error will be updated (overwritten).				
	When both errors occur, the priority of errors to be displayed is as follows.				
	(1) An error which has occurred in a slave station				
	(2) An error on the transmission status between the master station and slave stations detected by the master station				
Error Details	The description of the error and the actions to be taken are displayed.				
[Clear Latest Error Code] button	The error code is cleared. The button can be clicked only during monitoring.				

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#### Error codes of the CC-Link IE Field Network Basic

The following table lists the error codes detected by the CC-Link IE Field Network Basic function.

Error Code	Error Name	Error details and cause
CFC0H	Cyclic transmission error (master station)	Unable to execute cyclic transmission because multiple master stations exist in the same network address.
CFC8H		Unable to execute cyclic transmission because the slave station controlled by other master station exists.
CFC9H	_	Unable to execute cyclic transmission because the slave station of the same IP address exists in the same network address.
CFE0H	Cyclic transmission error (slave station)	The cyclic transmission was executed for the slave station controlled by other master station.
CFE1H		The unusable number of occupied stations has been specified from master station.
CFE8H		There is no response from slave station.
CFE9H		The slave station of the same IP address has existed in the same network address.
CFF0H	Slave station error	The error occurred in slave station.

### List of SM/SD/Buffer Memory Areas for CC Link IE Field Network Basic

Click on GX Works 3 menu command "Online"  $\rightarrow$  "Monitor"  $\rightarrow$  "Device/Buffer Memory Batch Monitor". The following is the comparison table of the corresponding numbers and addresses.

Name	Description	SM/SD/Buffer memory			
		iQ-R PLC	iQ-F PLC	Q/L PLC	
Cyclic transmission status	This relay turns on when the cyclic transmission starts.	SM1536	SM1536	SM1700	
Cyclic transmission status of each station	The cyclic transmission status of each station is stored. (1 to 16 stations)	SD1536	SD1536	SD1700	
Data link status	This relay turns on when an error exists even in one slave station.	SM1540	SM1540	SM1704	
Data link status of each station	The data link status of each station is stored. (1 to 16 stations)	SD1540	SD1540	SD1704	

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