MITSUBISHI Electric Corporation
MELSEC-Q Series
ETHERNET(QJ71E71) Driver

Compatible version	OS	Over 4.0
	XDesignerPlus	Over 4.0.0.0

CONTENTS

Thank you for using M2I's °Touch Operation Panel(M2I TOP) Series". Please read out this manual and make sure to learn connection method and process of TOP – External device"

1. System configuration Page 2

It explains device for connection, setup of, cable and structural system.
Please choose proper system referring to this point.

2. TOP Types and External Selection Page 3

Select TOP model and external device..

3. Example of system settings Page 4

It explains setup example for communication connection between the device and external terminal.
Select example according to the system you choose in "1. System structure"

4. Communication settings details Page 10

It explains the way of configuring TOP communication.
If external setup is changed, make sure to have same setup of TOP with external device by referring to this chapter.

5. Support address Page 12

Check available addresses to communicate with external devices referring to this chapter.

1. System configuration

System configuration of TOP and "MITSUBISHI Electric Corporation – MELSEC-Q Series Ethernet(QJ71E71)"

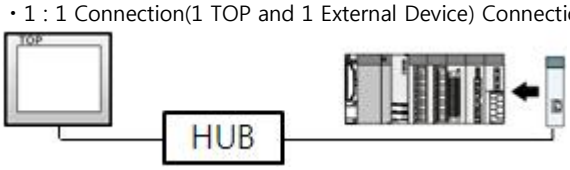
Series	CPU	Link I/F	Method	System settings	Cable
MELSEC-Q	Q00CPU Q00JCPU Q01CPU Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q13UDEHCPU Q26UDEHCPU	QJ71E71	Ethernet (UDP)		Twisted Pair cable *주1)
			Ethernet (TCP)		
		QJ71E71-B2	Ethernet (UDP)		
			Ethernet (TCP)		
		QJ71E71-B5	Ethernet (UDP)		
			Ethernet (TCP)		
		QJ71E71-100	Ethernet (UDP)		
			Ethernet (TCP)		
	Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU Q13UDHCPU Q26UDHCPU	QJ71E71-B2	Ethernet (UDP)		
			Ethernet (TCP)		
		QJ71E71-B5	Ethernet (UDP)		
			Ethernet (TCP)		
		QJ71E71-100	Ethernet (UDP)		
			Ethernet (TCP)		

*Caution1) Twisted pair cable

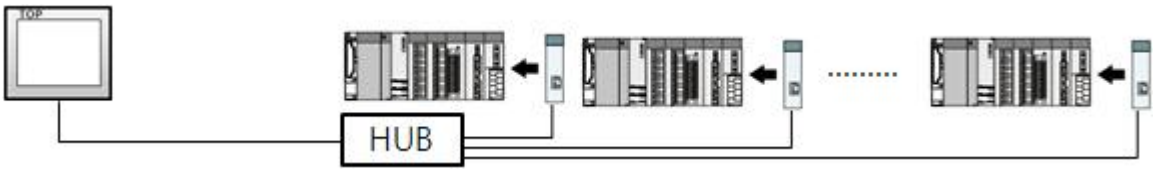
- This means STP(Shielded Twisted Pair cable) or UTP (Unshielded Twisted Pair cable) category 3,4,5.
- You can connect to configurational device such as hub, transceiver depends on the configuration and in this case, use direct cable.

■ Possible Connecting Configuration

・1 : 1 Connection(1 TOP and 1 External Device) Connection

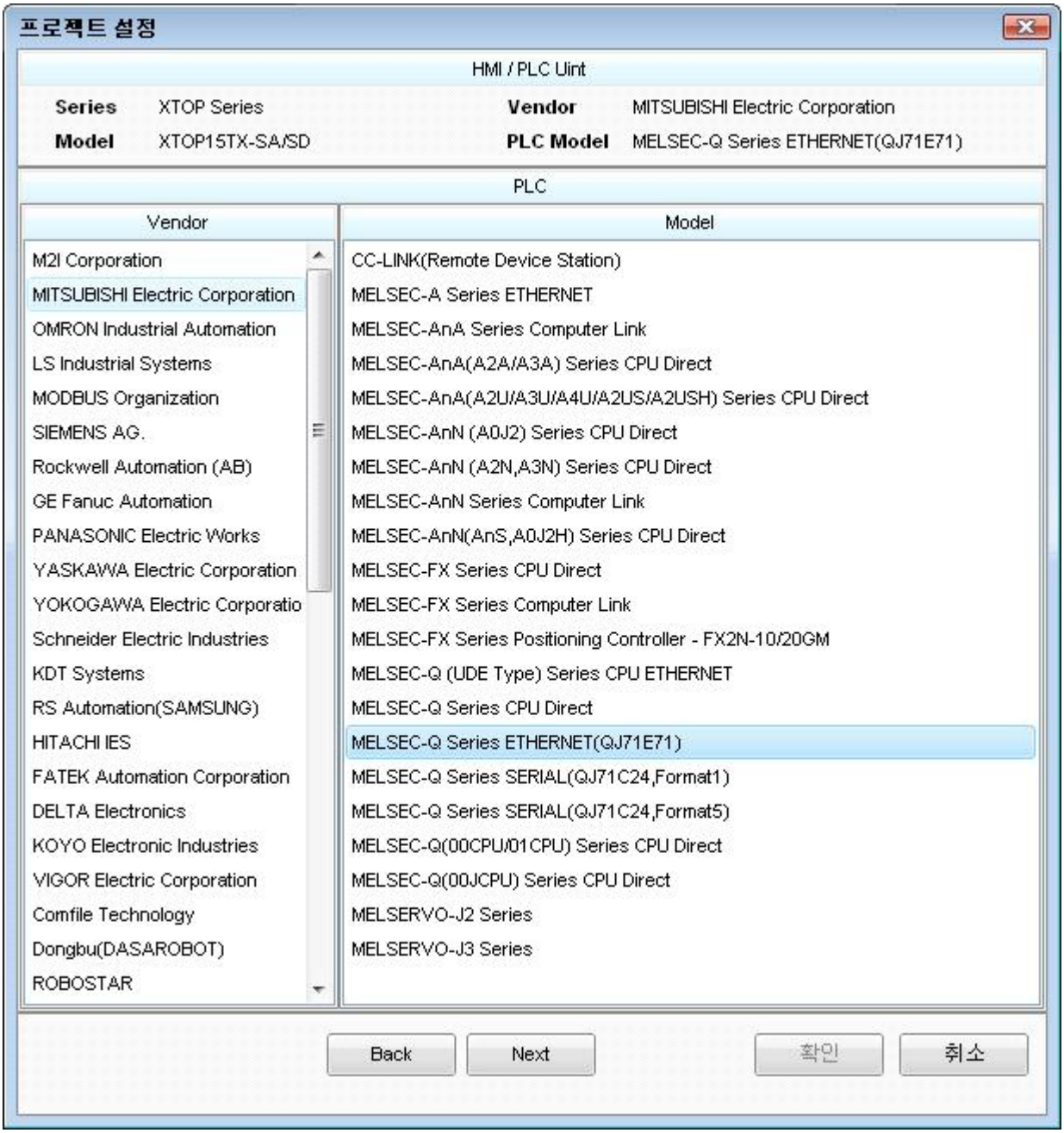


・1 : N Connection (1 TOP and several external devices) Connection



2. Selecting TOP model and external devices

Select the external devices to connect to TOP.



Setting details		Contents
TOP	Series	Select the name of a TOP series that is to be connected to PLC. Before downloading the settings, install the OS version specified in the table below according to TOP series. (ATOP / CTOP Series does not support ethernet communication.) Series: XTOP / HTOP — Version name: V4.0
	Name	Select the model name of TOP product.
Communication Device	Manufacturer	Select the manufacturer of external devices to be connected to TOP. Please select MITSUBISHI Electric Corporation
	PLC	Select the model series of external devices to be connected to TOP Please select "MELSEC-Q SERIES ETHERNET(QJ71E71)". Please check, in the "1. System configuration", if the relevant external device is available to set a

		system configuration.

3. Example of system settings

Regarding of communication interface settings in TOP and external devices, we suggest as below.

3.1 Example of settings 1

Set the system as below.

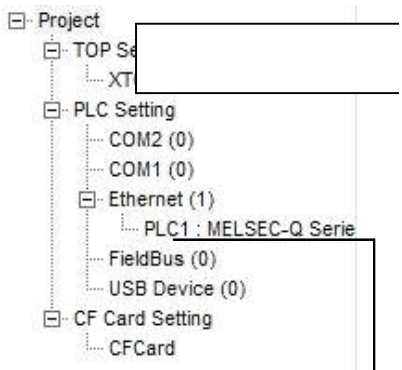
Details	TOP	MELSEC-Q Series	Remark
IP Address*Caution1)Caution2)	192.168.0.50	192.168.0.51	User settings
Protocol	UDP	UDP	User settings
Port	1025_{DEC} (401_{HEX})	5005_{DEC} ($138D_{HEX}$)	User settings

*Caution1) TOP and external devices' network address (front part of IP address 192.168.000) has to be identical.

*Caution2) Please do not use the same IP address in the same network.

(1) XDesignerPlus setup

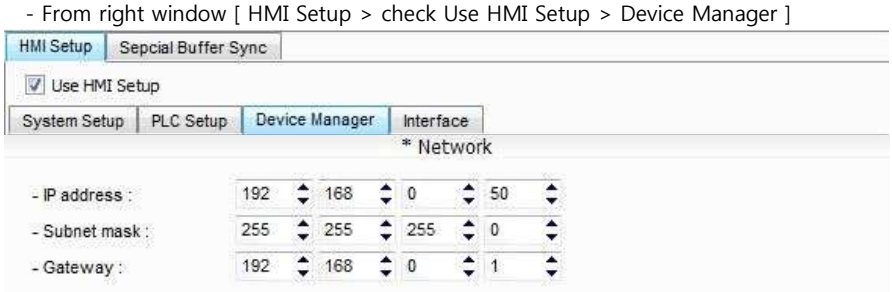
After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.



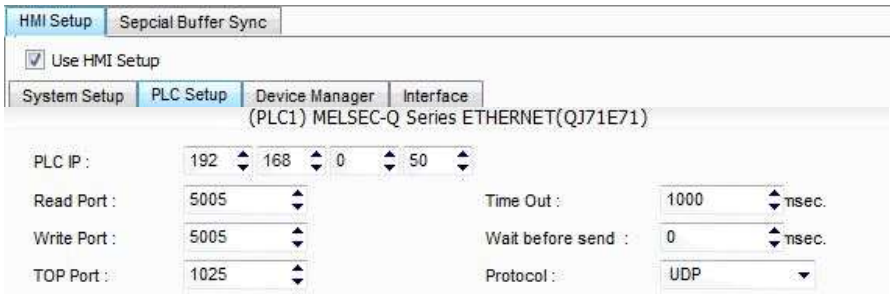
■ [Project > Project property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]

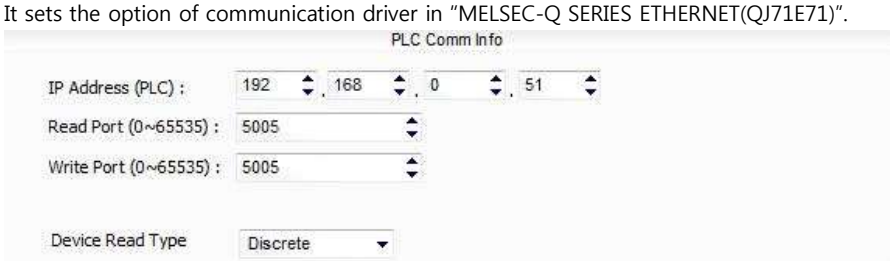


- From right window [HMI Setup > check Use HMI Setup > PLC Setup]



■ External device settings

It sets the option of communication driver in "MELSEC-Q SERIES ETHERNET(QJ71E71)".



- IP Address (PLC): Type the IP address that the external device was given.

- Reading port / writing port: Choose the port number that will be used for ethernet communication. Please input the port number that [GPPW] issued.

- Device reading method : It is for selecting protocol method that will attempt to communicate to external device.

(2) External device settings

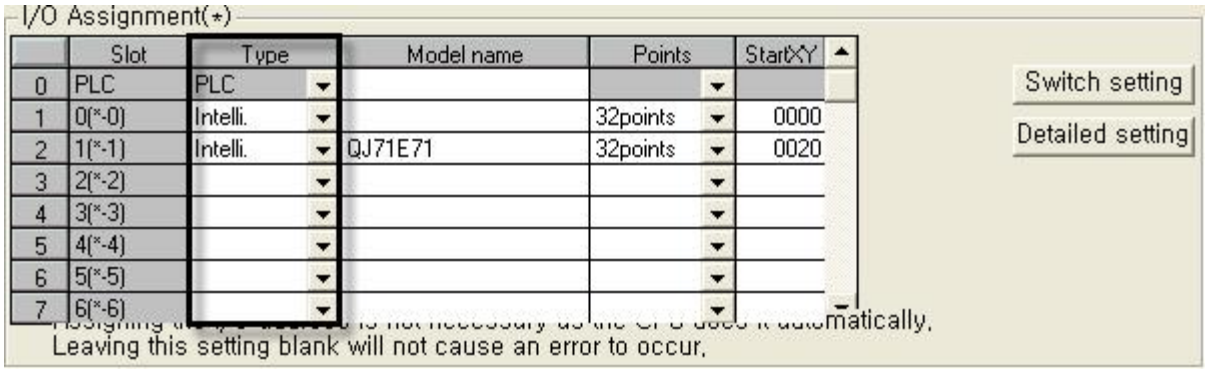
Please set up using MELSEC series Ladder Software "**GX Developer**" as below. Please refer the PLC user manual for more detailed information if you need.

- TOP and external devices' network address (front 3 digits of IP address 192.168.000) must be identical.
- Please do not use the same IP address in the same network.

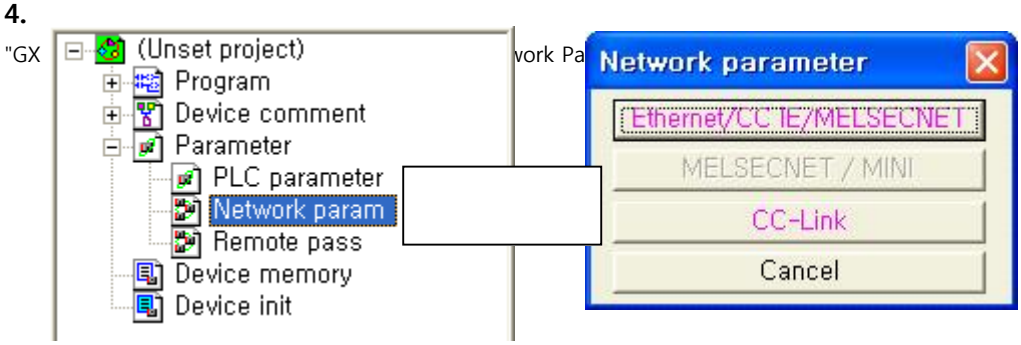
1. From "GX Developer" project window, double click[Parameter] > [PLC parameter] to pop up [Q parameter setting] Dialog Box.

2. Please select [I/O Assignment] tab from [Q parameter setting] Dialog Box.

3. Please set the **[Type]**, which the communication module is installed, to "**Intelligent**" from [I/O Assignment(*)] box.



4.

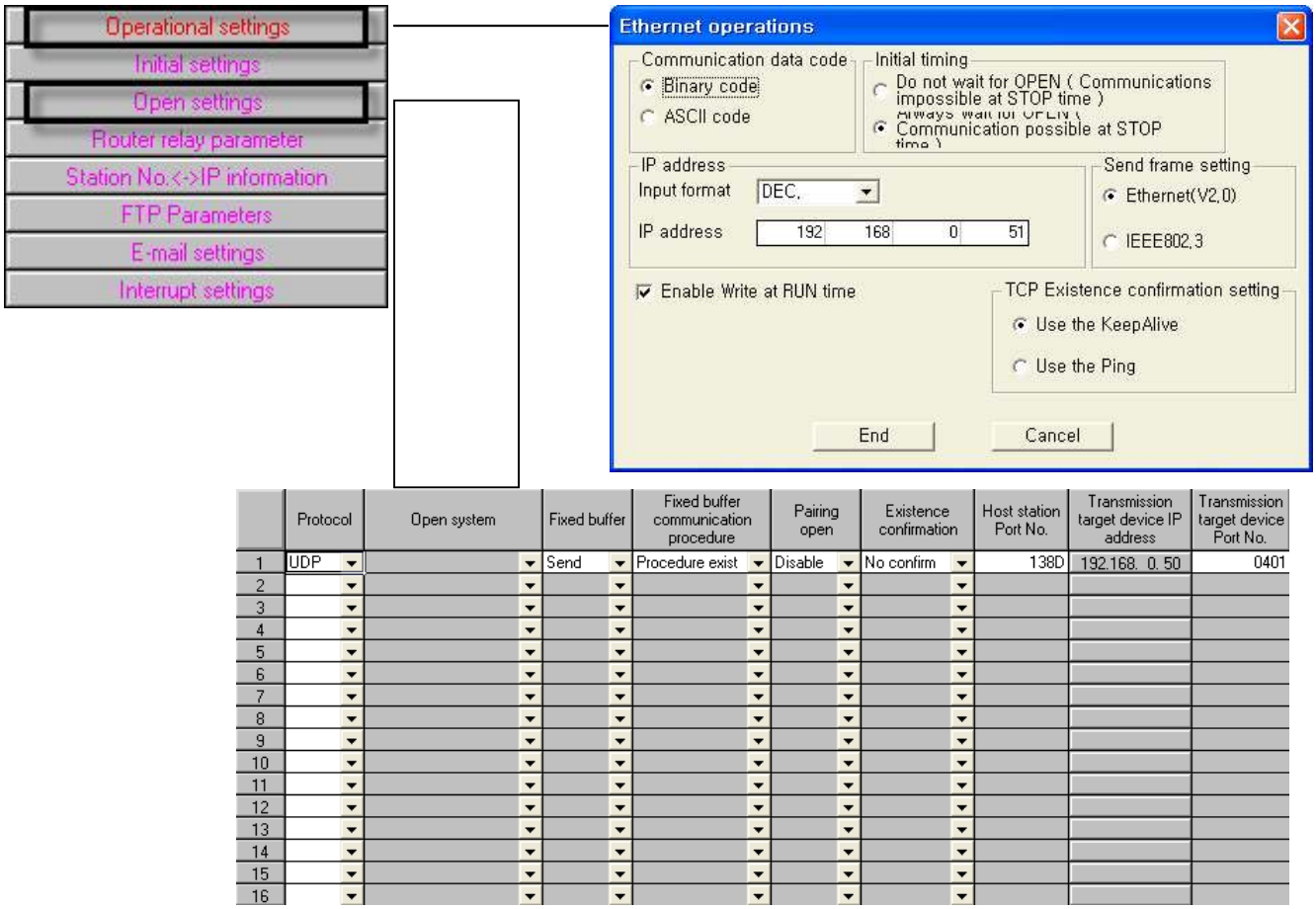


5. It is to set up [Network Parameter MNET/10H Ethernet Settings].

	Module 1
Network type	Ethernet
Starting I/O No.	0020
Network No.	1
Total stations	
Group No.	0
Station No.	1
Mode	On line

Details	Settings
Network type	Ethernet
Starting I/O No.	Please set input, output address in ethernet module.
Network No.	Appoint by User
Group No.	Appoint by User
Station No.	Appoint by User
Mode	On-line

☞ Continue on the next page.



	Protocol	Open system	Fixed buffer	Fixed buffer communication procedure	Pairing open	Existence confirmation	Host station Port No.	Transmission target device IP address	Transmission target device Port No.
1	UDP		Send	Procedure exist	Disable	No confirm	138D	192.168. 0. 50	0401
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

6. [Ethernet Operation Settings]

Details	Settings
Communication data code	Binary code _(Fixed)
Initial timing	Always wait for OPEN (communication possible at Stop time) _(Fixed)
IP address	IP address of MELSEC-Q Ethernet communication module, Assigned by User
Send frame setting	Ethernet(V2.0) _(fixed)
Enable Write at RUN time	Assigned by User (Writing authorization setting during PLC CPU RUN)
TCP existence confirmation setting	Use the keep alive

7. [Open Settings]

Details	Settings
Protocol	UDP
Open system	Not using
Fixed buffer	Assigned by User (Not related with TOP-MELSEC-Q communication)
Fixed buffer communication Procedure	Assigned by User (Not related with TOP-MELSEC-Q communication)
Paring opening	Assigned by User (Not related with TOP-MELSEC-Q communication)
Existence confirmation	Assigned by User (all confirm/no confirm can be used)
Host station port No.	Connection port number of MELSEC-Q Ethernet
Transmission target device IP address	IP of TOP (destination)
Transmission target device Port No.	Connection port number of TOP (Destination)

8. Please confirm if you need the settings below.

Details	Settings
Initial Settings	It is the setting for timer regarding of TCP connection. You can change if you need.
Routing Information	If you use the subnet mask or a router, this setting is mandatory.
Auto-open UDP port	(1) Execute from the list 1~6 of PLC Setups in this example.

<table>
<tr>
<td>(Always allow UDP communication on port number 5000)</td>
<td>(2) You can communicate via UDP without [Open Setting] if you set the XDesignerPlus as below.
<table>
<tr><td>IP Address</td><td>IP that [Ethernet Operation Settings] assigned to PLC</td></tr>
<tr><td>Read /Write Port</td><td>5000</td></tr>
</table>
</td>
</tr>
</table>

9. Please reset PLC after sending parameters that has been set from [Online] > [Write to PLC].

3.2 Example of Settings 2

Set the system as below.

Details	TOP	MELSEC-Q Series	Remark
IP Address*Caution1)Caution2)	192.168.0.50	192.168.0.51	User settings
Protocol	TCP	TCP	User settings
Port	1025DEC (401HEX) *caution3)	5005_{DEC} ($138D_{HEX}$)	User settings

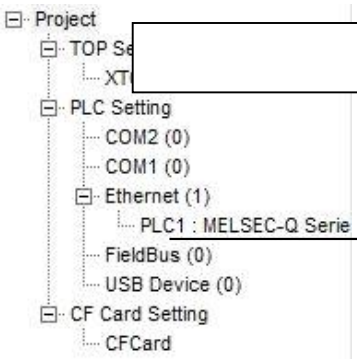
*Caution1) TOP and external devices' network address (front part of IP address 192.168.000) has to be identical.

*Caution2) Please do not use the same IP address in the same network.

*caution3) this is only applicable when Fullpassive is selected in Open Settings.

(1) XDesignerPlus setup

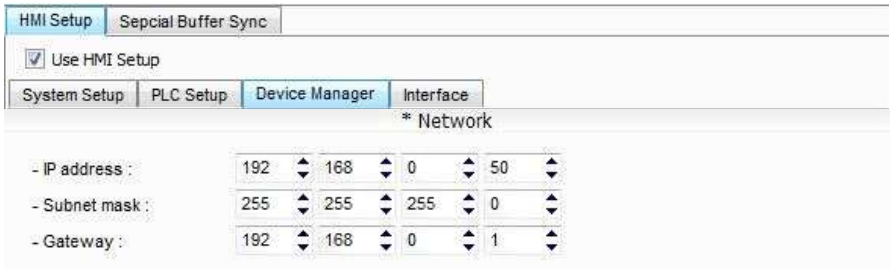
After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.



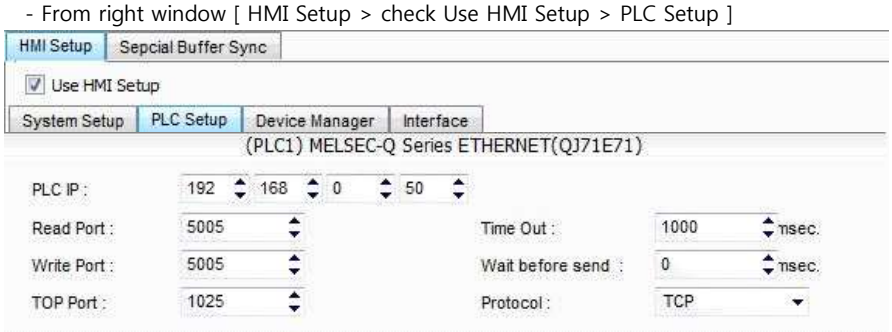
■ [Project > Project property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]

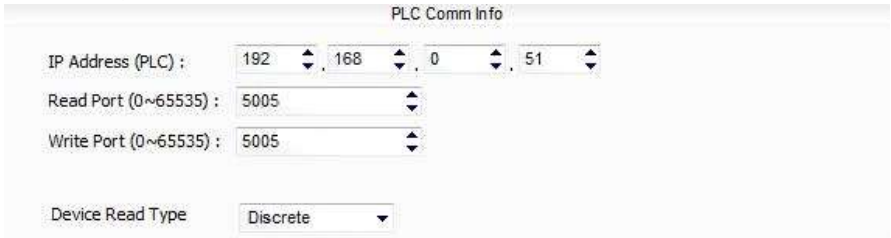


- From right window [HMI Setup > check Use HMI Setup > PLC Setup]



■ External device settings

It sets the option of communication driver in "MELSEC-Q SERIES ETHERNET(QJ71E71)".



- IP Address (PLC): Type the IP address that the external device was given.

-Reading port / writing port: Choose the port number that will be used for ethernet communication. Please input the port number that [GPPW] issued.

- Device reading method : It is for selecting protocol method that will attempt to communicate to external device.

(2) External device settings

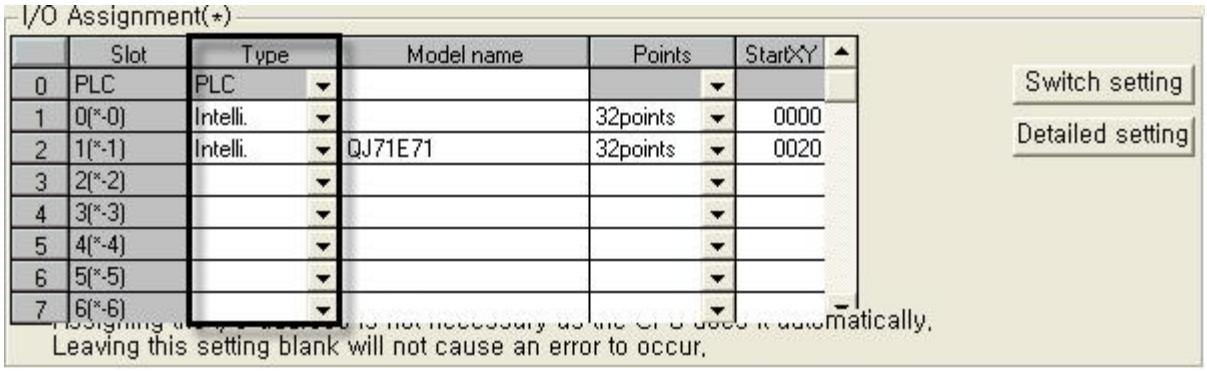
Please set up using MELSEC series Ladder Software "GX Developer" as below. Please refer the PLC user manual for more detailed information if you need.

- TOP and external devices' network address (front 3 digits of IP address 192.168.000) must be identical.
- Please do not use the same IP address in the same network.

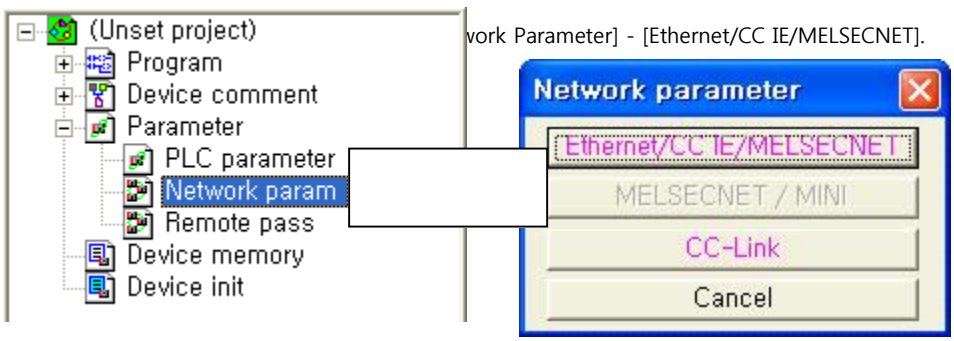
1. From "GX Developer" project window, double click[Parameter] > [PLC parameter] to pop up [Q parameter setting] Dialog Box.

2. Please select [Q parameter setting] Dialog Box에서(in) [I/O Assignment] tab.

3. Please set the **[Type]** which the communication module is installed to "**Intelligent**" from [I/O Assignment(*)] box.



4.

"GX 

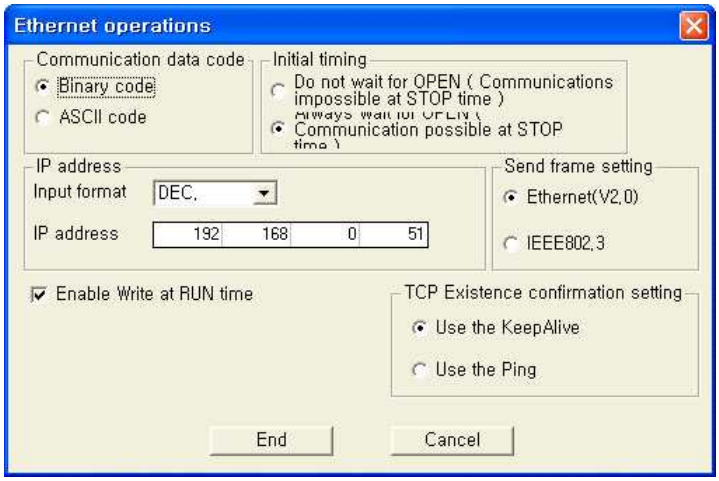
vork Parameter] - [Ethernet/CC IE/MELSECNET].

5. Set up [Network Parameter MNET/10H Ethernet Settings].

	Module 1
Network type	Ethernet
Starting I/O No.	0020
Network No.	1
Total stations	
Group No.	0
Station No.	1
Mode	On line

Details	Settings
Network type	Ethernet
Starting I/O No.	Please set input, output address in ethernet module.
Network No.	Appoint by User
Group No.	Appoint by User
Station No.	Appoint by User
Mode	On-line

☞ Continue on the next page.



	Protocol	Open system	Fixed buffer	Fixed buffer communication procedure	Pairing open	Existence confirmation	Host station Port No.	Transmission target device IP address	Transmission target device Port No.
1	TCP	Unpassive	Send	Procedure exist	Disable	No confirm	138D		
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

6. [Ethernet Operation Settings]

Details	Settings
Communication data code	Binary code _(Fixed)
Initial timing	Always wait for OPEN (communication possible at Stop time) _(Fixed)
IP address	IP address of MELSEC-Q Ethernet communication module, Assigned by User
Send frame setting	Ethernet(V2.0) _(fixed)
Enable Write at RUN time	Assigned by User (Writing authorization setting during PLC CPU RUN)
TCP existence confirmation setting	Use the keep alive

7. [Open Settings]

Details	Settings
Protocol	TCP
Open system	Unpassive / Fullpassive
Fixed buffer	Assigned by User (Not related with TOP-MELSEC-Q communication)
Fixed buffer communication Procedure	Assigned by User (Not related with TOP-MELSEC-Q communication)
Paring opening	Assigned by User (Not related with TOP-MELSEC-Q communication)
Existence confirmation	Assigned by User (all confirm/no confirm can be used)
Host station port No.	Connection port number of MELSEC-Q Ethernet (Hexadecimal number)
Transmission target device IP address	Not using
Transmission target device Port No.	Not using

8. Please confirm if you need the settings below.

Details	Settings
Initial Settings	It is the setting for timer regarding of TCP connection. You can change if you need.
Routing Information	If you use the subnet mask or a router, this setting is mandatory.

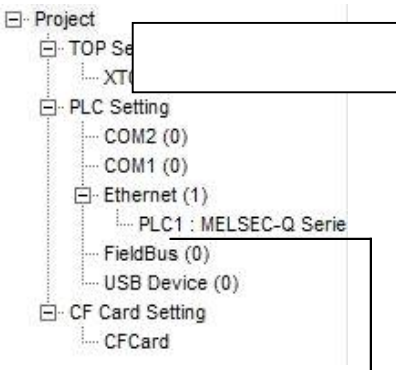
9. Please reset PLC after sending parameters that has been set from [Online] > [Write to PLC].

4. Communication settings details

Communication settings are available at XDesignerPlus or TOP main menu. Communication settings must be identical with the external devices.

4.1 XDesignerPlus settings details

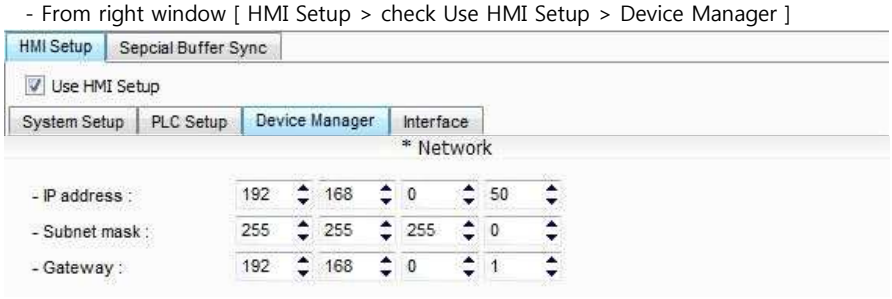
Select [Project > Project property] to show the below window.



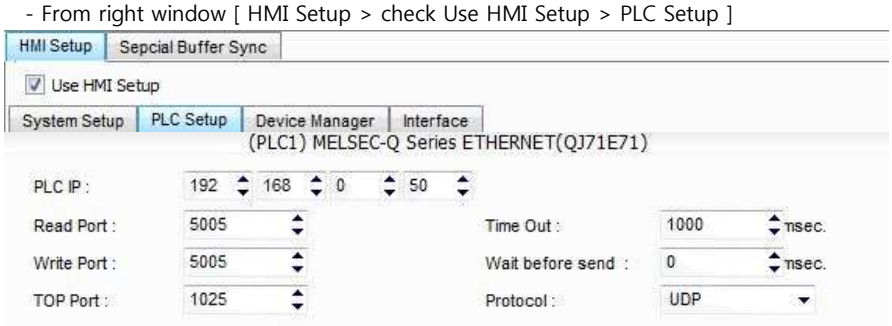
■ [Project > Project property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]

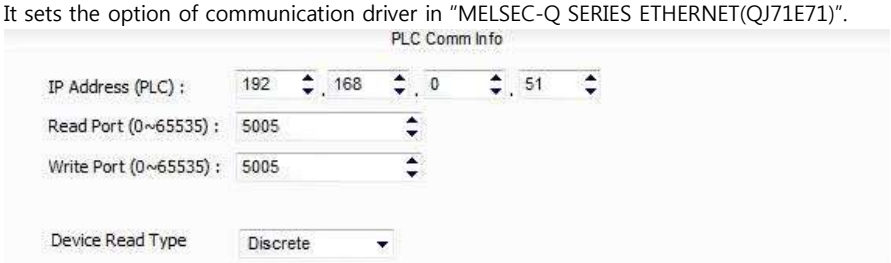


- From right window [HMI Setup > check Use HMI Setup > PLC Setup]



■ External device settings

It sets the option of communication driver in "MELSEC-Q SERIES ETHERNET(QJ71E71)".



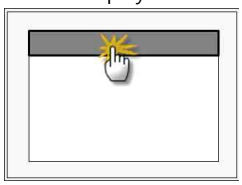
■ Communication Interface Settings

Details	Contents
IP Address	Setup the IP address that TOP receives in the network.
Subnet mask	Input subnet mask of network
Gateway	Input subnet mask of network
PLC IP address	Input IP address that external device gets received.
Read Port / Write Port	Choose port number that will be used for ethernet communication of external device.
TOP port	Setting the TOP port number to connect with external device.
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Ethernet time out	Set up TOP's waiting time from external device at [0 - 99] x 100mSec.
Delay time of transmission [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.

Protocol	Select the protocol method either UDP or TCP.

4.2 TOP main menu setup item

- When a buzzer is on during the power reset, touch 1 spot at the upper LCD to move to "TOP Management Main" display.
- Set up driver interface at TOP according to below Step1 → Step2.
  (Press "TOP ethernet setup" in **Step 1** to change setup at **Step 2**.)



Step 1. [PLC setup] .Setup driver interface.

PLC setup	
PLC IP : 192 . 168 . 0 . 51 Protocol : UDP PLC Read Port : 5005 PLC Write Port : 5005 TOP Port : 1025 PLC Address : 00 Timeout : 1000 [mSec] Delay time of transmission : 0 [mSec] TOP IP : 192 . 168 . 0 . 50 TOP Ethernet setting communication diagnosis	Communication Interface Settings

Step 1–Reference.

Details	**Contents**
PLC IP	It is an IP address that external device was given.
Protocol	Select the protocol method either UDP or TCP.
PLC Read Port	It is the port address that will be used for ethernet of external device.
PLC Write Port	It is the port address that will be used for ethernet of external device.
TOP port	Setting the TOP port number to connect with external device.
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Timeout [x1 mSec]	Set up TOP's waiting time from external device at [0 - 5000] x 1mSec.
Delay Time before transmitting [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.
TOP IP	Setup the IP address that TOP receives in the network.

Step 2. [PLC Setup] > [TOP Ethernet Setup] - Setup the serial parameter of correspond port.

Port Settings	
* Ethernet Communication + Network setting - MAC : 00 - 15 - ID - 00 - 30 - 52 (each device has different address) - IP Address : 192. 168 . 0 . 50 - Subnet mask : 255 255 . 255 . 0 - Gateway : 192 168 . 0 . 1	Ethernet Port Communication Interface Settings

Step 1–Reference.

Details	**Contents**
MAC	Physical official address in the network.
IP Address	Setup the IP address that TOP receives in the network.
Subnet mask	An address that divides the network ID and host ID regarding of IP address.
Gateway	An address that connects a network to another network.

4.3 Communication diagnosis

■ TOP - Confirming interface setting condition between external devices

- Move to Menu by clicking the top side of LCD screen as resetting the power of TOP.
- [Main Menu >Communication setting] Confirm if detail in number 20~24 is identical to the setup information of "■Setup exercise 1".
- PLC Setup > Click the button in "Communication diagnosis" of TOP Ethernet.
- Diagnosis dialog box will pop up on the screen, you can judge by following informations that are shown on box no. 3 section.

OK!	**Communication setting succeeded**
Time Out Error!	Communication setting error - Error in the setting situation of Cable and TOP / External device **(reference : Communication Diagnosis sheet)**

■ Communication Diagnosis Sheet

- Please refer to the information below if you have a problem between external devices and communication connection.

Details	Contents					Confirm	
TOP	Version Information		xDesignerPlus :		O.S :		
	Name of Driver					OK	NG
	External device information (xDesignerPlus Project setting)	IP Address				OK	NG
		Subnet mask				OK	NG
		Gateway				OK	NG
	TOP Information (Main Device Menu Setting)	Protocol	UDP/IP		TCP/IP	OK	NG
		IP Address				OK	NG
		Subnet mask				OK	NG
		Gateway				OK	NG
	Other specified setting info					OK	NG
System configuration	System Connection Method		1:1	1:N	N:1	OK	NG
	Name of cable (Hub usage)		Direct (Use Hub)		Cross (No Hub)	OK	NG
External device	Name of CPU					OK	NG
	Name of communication device					OK	NG
	Protocol(mode)					OK	NG
	Other specified setting info					OK	NG
	IP Address		(Local)		(Destination)	OK	NG
	Port number		(Local)		(Destination)	OK	NG
	Subnet mask					OK	NG
	Gateway					OK	NG
	Address range confirm (other docs)					OK	NG

5. Support address

Devices that are usable with TOP is as below.

There might be difference in the range of device (address) by type / series of CPU module TOP series supports the maximum address range that external device series use Please refer each CPU module user manual carefully for devices that you desired to use to prevent not getting out of range.

Device	Bit Address	Word Address	Word Address NOTE	32 BIT
Input Relay	X0000 - X1FFF (HEX)	X0000 - X1FF0 (HEX)	**X***0 *caution1)**	
Output Relay	Y0000 - Y1FFF (HEX)	Y0000 - Y1FF0 (HEX)	**Y***0 *caution1)**	
Internal Relay	M0000 - M32767	M0000 - M32752	**M0000 + 16*n *caution2)**	
Special Relay	SM0000 - SM2047	SM0000 - SM2032	**SM0000+16*n *caution2)**	
Latch Relay	L0000 - L32767	L0000 - L32752	**L0000 + 16*n *caution2)**	
Annunciator	F0000 - F32767	F0000 - F32752	**F0000 + 16*n *caution2)**	
Edge Relay	V0000 - V32767	V0000 - V32752	**V0000 + 16*n *caution2)**	
Step Relay	S0000 - S8191	S0000 - S8176	**S0000 + 16*n *caution2)**	
Link Relay	B0000 - B7FFF (HEX)	B0000 - B7FF0 (HEX)	**B***0 *caution1)**	
Special Link Relay	SB000 - SB7FF (HEX)	SB000 - SB7F0 (HEX)	**SB***0 *caution1)**	
Timer (contact)	TS00000 - TS23087			
Timer (coil)	TC00000 - TC23087			
Aggregate Timer (contact)	SS00000 - SS23087			**L/H**
Aggregate Timer (coil)	SC00000 - SC23087			***caution3)**
Counter (contact)	CS00000 - CS23087			
Counter (coil)	CC00000 - CC23087			
Timer (current value)		TN00000 - TN23087		
Aggregate Timer (current value)		SN00000 - SN23087		
Counter (current value)		CN00000 - CN23087		
Data Register		D00000 - D25983		
Special Data Register		SD0000 - SD2047		
File Register		☞User Defined Range		

*Caution1) If the bit address is hexadecimal number '0~F', starting bit 0 bit shall be used as word address.

*Caution2) If the bit address is decimal number, it shall be used as word address by every value of '16'.

*Caution3) The address will be saved where the 16BIT data which is subordinate to 32BIT data monitor registered and super ordinate 16BIT data will be saved right after the address that is monitor registered.

Ex) If 32BIT data, hexadecimal data 12345678 is saved to the address number D00100, it shall be saved with 16BIT device address as below.

Details	32BIT	16BIT	
Address	D00100	D00100	D00101
Input data (Hexadecimal Number)	12345678	5678	1234