MITSUBISHI Electric Corporation MELSEC Q Series

CPU Direct Driver

Supported version TOP Design Studio V1.0 or higher



CONTENTS

We want to thank our customers who use the Touch Operation Panel.

1. System configuration Page 2

Describes connectable devices and network configurations.

2. External device selection Page 3

Select a TOP model and an external device.

3. TOP communication setting Page 4

Describes how to set the TOP communication.

4. External device setting Page 9

Describes how to set up communication for external devices.

5. Cable table

Page 10

Describe the cable specifications required for connection.

6. Supported addresses

Page 12

Refer to this section to check the data addresses which can communicate with an external device.



1. System configuration

The system configuration of TOP and "MITSUBISHI Electric Corporation - MELSEC Q CPU Direct" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
	00/00J/01 CPU Q00 Q01 Q00J				
	QnH CPU Q02 Q02H Q06H Q12H Q25H	CPU port	RS-232C		
MELSEC Q	QnU CPU Q00UJ Q00U Q01U Q02U Q03UD Q04UDH	QJ71C24 QJ71C24-R2 QJ71C24N QJ71C24N-R2	RS-232C	<u>3. TOP</u> <u>communication</u> <u>setting</u> <u>4. External device</u> <u>setting</u>	<u>5. Cable table</u>
	Q06UDH Q10UDH Q13UDH Q20UDH Q26UDH	QJ71C24N-R2 QJ71C24N-R4	RS-422/485		
		RJ71C24	RS-232C		
MELSEC iQ-R	All CPUs	RJ71C24-R2 RJ71C24-R4	RS-422/485		

Connectable configuration

1:1 connection





2. External device selection

■ Select a TOP model and a port, and then select an external device.

PLC select [CO	M1]					
Filter : [All]			~	Search :		
				() N	lodel 🔿 Vendor	
Vendor	•	Model				
M2I Corporation			MELSEC Q Series			
MITSUBISHI Electric Corpo			MELSEC FX Series			
OMRON Industrial Automa	tion	8	MELSEC AnN/AnS Series	;		
LS Industrial Systems		8	MELSEC AnA/AnU Serie	5		
MODBUS Organization			MELSERVO J2 Series			
SIEMENS AG.			MELSERVO J3 Series			
Rockwell Automation						
GE Fanuc Automation			MELSERVO J4 Series			
PANASONIC Electric Works	5	1	MELSEC FX2N-10/20GM	Series		
YASKAWA Electric Corpora	ition		MELSEC iQ-F Series			
YOKOGAWA Electric Corpo	ration					
Schneider Electric Industrie	es					
KDT Systems						
RS Automation	~					
PLC Setting[MELSEC]				
Alias Name : F			~			
Interface : CPU Direct						
Protocol :	QnU/QnH CPL					
Protocol : String Save Mode :					Comm Manual	
String Save Mode : F	First LH HL				Comm Manual	
	First LH HL				Comm Manual	
String Save Mode : Use Redundancy Operate Condition : AND Change Condition : T	First LH HL	Cha				
String Save Mode : Use Redundancy Operate Condition : AND Change Condition : T	First LH HL	Cha	inge		Comm Manual	
String Save Mode : Use Redundancy Operate Condition : AND Change Condition : T	First LH HL	Cha	inge			
String Save Mode : F Use Redundancy Operate Condition : AND Change Condition : T Primary Option	First LH HL	Cha	inge			
String Save Mode : F Use Redundancy Operate Condition : AND Change Condition : T Primary Option Timeout	First LH HL	5	inge			
String Save Mode : F	First LH HL	Cha 5 : msec msec	inge			
String Save Mode : F Use Redundancy Operate Condition : AND Change Condition : T C Primary Option Timeout Send Wait	irrst LH HL	Cha 5 : msec msec	inge			
String Save Mode : F	irrst LH HL	Cha 5 : msec msec	inge			
String Save Mode : F	irrst LH HL	Cha 5 : msec msec	inge			
String Save Mode : F	irrst LH HL	Cha 5 : msec msec	inge			
String Save Mode : F Use Redundancy Operate Condition : AND Change Condition : T C Primary Option Timeout Send Wait	irrst LH HL	Cha 5 : msec msec	inge			
String Save Mode : F Use Redundancy Operate Condition : AND Change Condition : T C Primary Option Timeout Send Wait	irrst LH HL	Cha 5 : msec msec	inge			

Sett	ings		Contents			
ТОР	Model	Check the display and pro	Check the display and process of TOP to select the touch model.			
External device	Vendor		elect the vendor of the external device to be connected to TOP. lease select "MITSUBISHI Electric Corporation".			
	PLC	Select an external device to connect to TOP.				
		Model	Interface	Protocol		
		MELSEC Q Series	CPU Direct	Set Users		
		,	configuration in Chapter 1 to system can be configured.	o see if the external device you want to		



3. TOP communication setting

The communication can be set in TOP Design Studio or TOP system menu.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

- $\blacksquare [Project] \rightarrow [Property] \rightarrow [TOP Setting] \rightarrow [HMI Setup] \rightarrow [Use HMI Setup Check] \rightarrow [Edit] \rightarrow [Serial]$
 - Set the TOP communication interface in TOP Design Studio.

ect Option		1				×
	dd PLC 🛕 🏦 Cha	nge PLC[<u>C</u>]	Delete PLC[D]			
TOP Setting	Date / Time Sy					
 Option Module Setting FieldBus (0) RFID (0) 	Project Option		e HmiSetup Global Lock & Tou	ch Project Style	Splash PLC B	uffer Sync.
Device Setting	Use HMI Se	tup		(Initialization	Edit
PLC1: MELSEC Q Serie COM2 (0) COM2 (0) Ethernet (0) Wireless (0) USBDevice (0)	HMIDisable=0 Project Name=N Start Mode=Mer Start Screen No. Latch Use=0 Latch Set=0~0	nu .=1 Error Message=0 le=0 ssage=1				
ontrol Panel						
🔯 System	De	evices_	Service	r Or	otion	_
	-		🚥 Serial		×	1
: []]		7	Serial Port:	COM1	•	
PLC	Security	Date/Ti	Signal Level ● RS-232C ○ RS-4	22(4) 🔿 RS-	485(2)	
~	0.0000		Baud Rate:	115200	•	
			Data Bit:	8	•	
Ethernet	Serial	HDMT	Stop Bit:	1	•	
			Parity Bit:	Odd	•	
infi 🗸		Die	Flow:	Off	Υ.	
Diagnostic	File Manager	Ping	Auto Search	Loopback	Test	
	Manager			Apply (Cancel	

Items	ТОР	External device	Remarks	
Signal Level (port)	RS-232C	RS-232C		
	RS-422/485	RS-422/485		
Baud Rate	115200			
Data Bit	8			
Stop Bit	1			
Parity Bit	0	dd		

 \ast The above settings are $\underline{examples}$ recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.



(2) Communication option setting

 $\blacksquare [Project] \rightarrow [Project Property] \rightarrow [Device Setting > COM > MELSEC Q Series]$

- Set the options of the MELSEC Q Series CPU Direct communication driver in TOP Design Studio.

Project Option			×
Change HMI[H] Add P	LC [A] TTTT Change PL	IC Delete PLCD	
 TOP Setting SYS: RD 1520X Option Module Setting FieldBus (0) RFID (0) Device Setting COM1 (1) Ethernet (0) Wireless (0) USBDevice (0) 	String Save Mode : Use Redundancy Operate Condition : AND Change Condition : I Primary Option Timeout Send Wait	PLC1 CPU Direct V QnU/QnH CPU V First LH HL Change	Comm Manual
	×		Apply Close

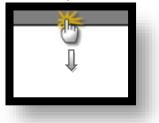
Items	Settings	Remarks
Interface	Select "CPU Direct".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	



3.2. Communication setting in TOP

* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

■ [Control Panel] → [Serial]



ТОР	External device	Remarks		
RS-232C	RS-232C			
RS-422/485	RS-422/485			
11!	115200			
8				
1				
Odd				
_	RS-232C RS-422/485 115	RS-232C RS-232C RS-422/485 RS-422/485 115200 8 1 1		

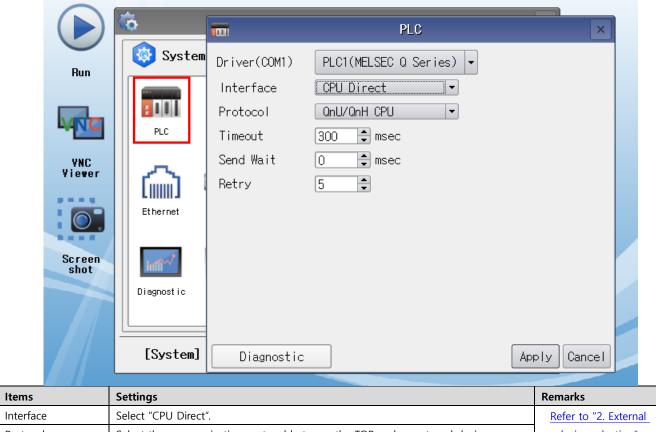
* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.



(2) Communication option setting

 $\blacksquare [Control Panel] \rightarrow [PLC]$



Interface	Select "CPU Direct".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
TimeOut (ms)	Set the time to wait for a response from an external device.	
SendWait (ms)	Set the waiting time before sending a data request to an external device.	



3.3 Communication diagnostics

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
- Check that the settings of the connected ports in [Control Panel] \rightarrow [Serial] are the same as the settings of the external device.
- Diagnosis of whether the port communication is normal or not
- Touch "Communication diagnostics" in [Control Panel] \rightarrow [PLC].
- Check whether communication is connected or not.

Communication	Communication setting normal
diagnostics	
succeeded	
Error message	Communication setting abnormal
	- Check the cable, TOP, and external device settings. (Refer to Communication diagnostics sheet.)

Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Contents		Ch	eck	Remarks
System	How to connect the system		OK	NG	1 Oustom configuration
configuration	Connection cable nar	ne	OK	NG	1. System configuration
TOP	Version information		OK	NG	
	Port in use	OK	NG		
	Driver name		OK	NG	
	Other detailed setting	js	OK	NG	
	Relative prefix	Project setting	OK	NG	
		Communication diagnostics	ОК	NG	2. External device selection 3. Communication setting
	Serial Parameter	Transmission Speed	ОК	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name	OK	NG		
	Communication port	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	ОК	NG		
	Other detailed setting	OK	NG	4. External device setting	
	Serial Parameter	Transmission Speed	ОК	NG	4. External device setting
		Data Bit	OK	NG	
		Stop Bit	OK	NG]
		Parity Bit	OK	NG]
	Check address range	OK	NG	6. Supported addresses	



4. External device setting

4.1. CPU port

- The loader port communication interface for MELSEC-Q Series do not require a separate configuration.
- Communication speed automatically adjusts to the TOP's configuration.

4.2. Serial communication module

• Configure the switch set value of channels as 0.

			Input Format HD	× 🔽			
Slot	Туре	Model Nam	e Switch1	Switch2	Switch3	Switch4	Switch5 🔺
	PLC			+	+	 	<u> </u>
	Intelligent C	QJ71C24N					<u> </u>
2 1(*-1) 3 2(*-2)				-			
3 2(*-2) + 3(*-3)					-		
5 4(*-4)							
5(*-5)							
7 6(*-6)				<u> </u>	<u> </u>		
3 7(*-7)							
8(*-8) 0 9(*-9)							
1 10(*-10)							
2 11(*-11)							
3 12(*-12)							
4 13(*-13)							
5 14(*-14)							•
	Item		CH1			СН	2
		Ind		•			-
	Operation setting	Ind	CH1 ependent 7	•		CH Indeper 7	ndent
	Operation setting Data Bit	Ind	ependent 7	-		Indeper 7	ndent
	Operation setting Data Bit Parity Bit	Ind	ependent 7 None	•		Indeper 7 Nor	ndent
Transmission	Operation setting Data Bit Parity Bit Even/odd parity	Ind	ependent 7 None Odd	Ţ		Indeper 7 Nor Od	ndent ne ld
Transmission Setting	Operation setting Data Bit Parity Bit Even/odd parity Stop bit	Ind	ependent 7 None Odd 1	-		Indeper 7 Nor Od	ndent ne Id
	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code		ependent 7 None Odd 1 None	-		Indepen 7 Nor Od 1 Nor	ndent ne Id
	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change		Pependent 7 None Odd 1 None Disable	-		Indeper 7 Nor Od 1 Nor Disa	ndent ne Id ne ble
Setting	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications	5	Pendent 7 None Odd 1 None Disable Disable	v		Indeper 7 Nor Od 1 Nor Disal Disal	ndent ne Id ne ble ble
Setting	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications ation rate setting	5 A	Pependent 7 None Odd 1 None Disable Disable uto Setting			Indeper 7 Nor Od 1 Nor Disal Disal Auto Se	ndent ne ld ne ble ble etting
Setting Communicat	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications ation rate setting ion protocol setting	5 A	Pendent 7 None Odd 1 None Disable Disable		MEL	Indeper 7 Nor Od 1 Nor Disal Disal Auto Se	ndent ne Id ne ble ble
Setting Communicat	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications ation rate setting	5 A	Pependent 7 None Odd 1 None Disable Disable uto Setting		MEI	Indeper 7 Nor Od 1 Nor Disal Disal Auto Se	ndent ne ld ne ble ble etting
Setting Communicat Station numb re following set	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications ation rate setting ion protocol setting per setting (0 to 31)	A MELS(Pependent 7 None Odd 1 None Disable Disable uto Setting DFT Connectio 0	n		Indepen 7 Nor Od 1 Nor Disal Disal Auto Se LSOFT C	ndent ne ld ne ble ble etting
Communic Communicat Station numb ee following set mmunication p Predefined pro	Operation setting Data Bit Parity Bit Even/odd parity Stop bit Sum check code Online Change Setting modifications ation rate setting ion protocol setting per setting (0 to 31) tting is available for pr protocol setting	A MELS	ependent 7 None Odd 1 None Disable Disable uto Setting DFT Connectio 0	n 00000000		Indepen 7 Nor Od 1 Nor Disal Disal Auto Se LSOFT C	ndent ne ld ne ble ble etting

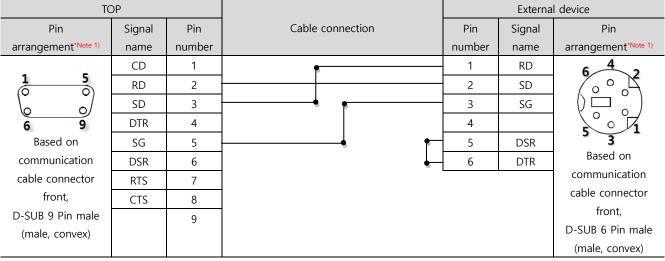


5. Cable table

This chapter introduces a cable diagram for normal communication between the TOP-R and the corresponding device. (The cable diagram described in this section may differ from the recommendations of "Mitsubishi Electric Corporation")

5.1. CPU port





*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

5.2. Serial communication module

RS-232C (1:1 connection)

ТОР				External device		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement ^{*Note 1)}	name	number		number	name	arrangement ^{*Note 1)}
15	CD	1		1	CD	5 1
$\left(\circ \circ \right)$	RD	2		2	RD	$\left(\circ \circ \right)$
	SD	3		3	SD	
6 9 Based on	DTR	4	•	4	DTR	9 6
communication	SG	5		5	SG	Based on communication
cable connector	DSR	6		6	DSR	cable connector
front,	RTS	7	•	7	RTS	front,
D-SUB 9 Pin male	CTS	8		8	CTS	D-SUB 9 Pin male
(male, convex)		9		9		(male, convex)

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

■ **RS-422** (1:1 connection)

ТОР				External device		
Pin	Signal	Pin	Cable connection	Signal	Pin arrangement	
arrangement ^{*Note 1)}	name	number		name	r in analyement	
1 5	RDA	1		SDA		
$(\circ \circ)$		2	•	SDB		
6 9		3	•	RDA		
Based on	RDB	4	<u>├</u> ────	RDB		
communication	SG	5		SG	RDB SG FG RDA	
cable connector	SDA	6	•			
front,		7				
D-SUB 9 Pin male		8				
(male, convex)	SDB	9	•			

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.

External device connection manual for TOP Design Studio



■ **RS-485** (1:1 connection)

ТОР					PLC
Pin	Signal	Pin	Cable connection	Signal	Din errengement
arrangement ^{*Note 1)}	name	number		name	Pin arrangement
1 5	RDA	1	- p	SDA	
(° °)		2	•	SDB	
69		3		RDA	SDA SDB SG SG SGA
6 9 Based on	RDB	4	<u> </u>	RDB	RDA SDB
communication	SG	5		SG	RDB FG RDA
cable connector	SDA	6			
front,		7			
D-SUB 9 Pin male		8			
(male, convex)	SDB	9	•		

*Note 1) The pin arrangement is as seen from the connecting side of the cable connection connector.



6. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

Device	Bit Address	Word Address	Word Address NOTE	32 BIT
Input Relay	X0000 ~ X1FFF (HEX)	X0000 ~ X1FF0 (HEX)	X***0 *Note 1)	
Output Relay	Y0000 ~ Y1FFF (HEX)	Y0000 ~ Y1FF0 (HEX)	Y***0 *Note 1)	
Internal Relay	M0000 ~ M61439	M0000 ~ M61424	M0000 + 16*n *Note 2)	
Special Relay	SM0000 ~ SM2047	SM0000 ~ SM2032	SM0000 + 16*n *Note 2)	
Latch Relay	L0000 ~ L32767	L0000 ~ L32752	L0000 + 16*n *Note 2)	
Annunciator	F0000 ~ F32767	F0000 ~ F32752	F0000 + 16*n *Note 2)	
Edge Relay	V0000 ~ V32767	V0000 ~ V32752	V0000 + 16*n *Note 2)	
Step Relay	S0000 ~ S8191	S0000 ~ S8176	S0000 + 16*n *Note 2)	
Link Relay	B0000 ~ BEFFF (HEX)	B0000 ~ BEFF0 $_{(HEX)}$	B***0 *Note 1)	
Special Link Relay	SB0000 ~ SB7FF0 (HEX)	SB0000 ~ SB7FF0 $_{(HEX)}$	SB***0 *Note 1)	
Timer (contact)	TS00000 ~ TS25471	TS00000 ~ TS25456		
Timer (coil)	TC00000 ~ TC25471	TC00000 ~ TC25456		
Aggregate Timer (contact)	SS00000 ~ SS25471	SS00000 ~ SS25456		
Aggregate Timer (coil)	SC00000 ~ SC25471	SC00000 ~ SC25456		L/H *Note
Counter (contact)	CS00000 ~ CS25471	CS00000 ~ CS25456		
Counter (coil)	CC00000 ~ CC25471	CC00000 ~ CC25456		
Timer (current value)	TN00000.0 ~ TN25471.15	TN00000 ~ TN25471		
Aggregate Timer (current value)	SN00000.0 ~ SN25471.15	SN00000 ~ SN25471		
Counter (current value)	CN00000.0 ~CN25471.15	CN00000 ~ CN25471		
Data Pagistar	D0000000.0 ~ D4212223.15	D0000000 ~ D4212223	Binary Protocol	
Data Register	D000000.0 ~ D999999.15	D000000 ~ D999999	ASCII Protocol	
Special Data Register	SD0000.0 ~ SD2255.15	SD0000 ~ SD2255		
File Register		Custom range		7

*Note 1) For bit addresses with hexadecimal "0~F" notations, use the initial 0 bit as the word address

*Note 2) When using a bit address that uses decimals, use a word address in units of "16"

*Note 3) The lower 16 BIT data of 32 BIT data is saved in the address whose screen has been registered, and the upper 16 BIT data is saved in the address next to the address whose screen has been registered.

Ex. When saving 32BIT data hexadecimal data 12345678 in address D00100, it is saved to 16BIT device address as follows:

Items	32BIT	16BIT		
Address	D00100	D00100	D00101	
Input data (hexadecimal)	12345678	5678	1234	