DONGBU ROBOT CO,. LTD
iM-SIGMA/DTR Series
Computer Link Driver

Supported version   TOP Design Studio   V1.0 or higher

CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

1. System configuration

The system configuration of TOP and "DongBu Robot Co,.Ltd – iM-SIGMA/DTR Series Computer Link" is as follows.

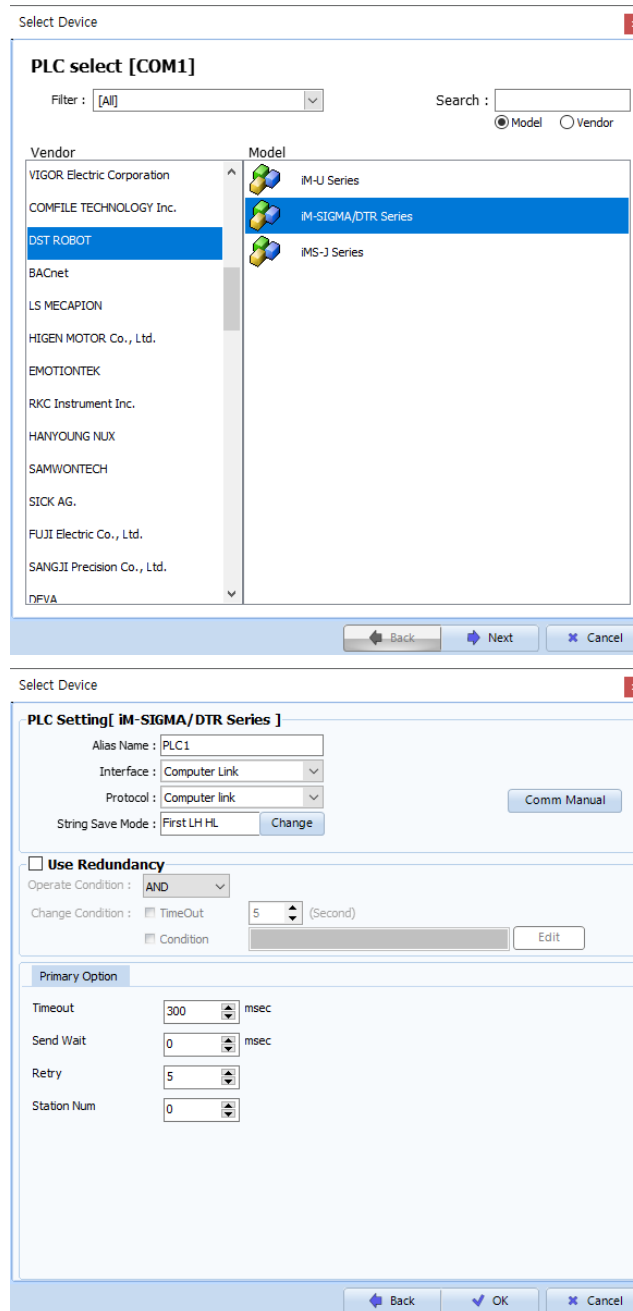| Series	CPU	Link I/F	Communication method	System setting	Cable
iM–SIGMA	iM–∑2 iM–∑3 iM–∑4 iM–∑5 iM–∑6 iM–∑7 iM–∑8	Comm Port on CPU unit	RS–232C	3. TOP communication setting 4. External device setting	5. Cable table
DTR	DTR2–2210T DTR3–2210T DTR2–3310T DTR3–3310T DTR4–3310T DTR2–4410T DTR3–4410T DTR4–4410T DTR2–3310S DTR3–3310S DTR4–3310S DTR2–4410S DTR3–4410S DTR4–4410S DTR4–3510S DTR2–2210ET DTR3–3310ET DTR4–4410ET DTR3–2205–M				

■ **Connection configuration**

・1:1 (one TOP and one external device) connection

2. External device selection

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

Settings		Contents
TOP	Model	Check the TOP display and process to select the touch model.
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "Dongbu(DASAROBOT)".
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
iM-SIGMA/DTR Series	Computer Link	Computer Link

Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system can be configured.

3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project > Project properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Serial]
– Set the TOP communication interface in TOP Design Studio.
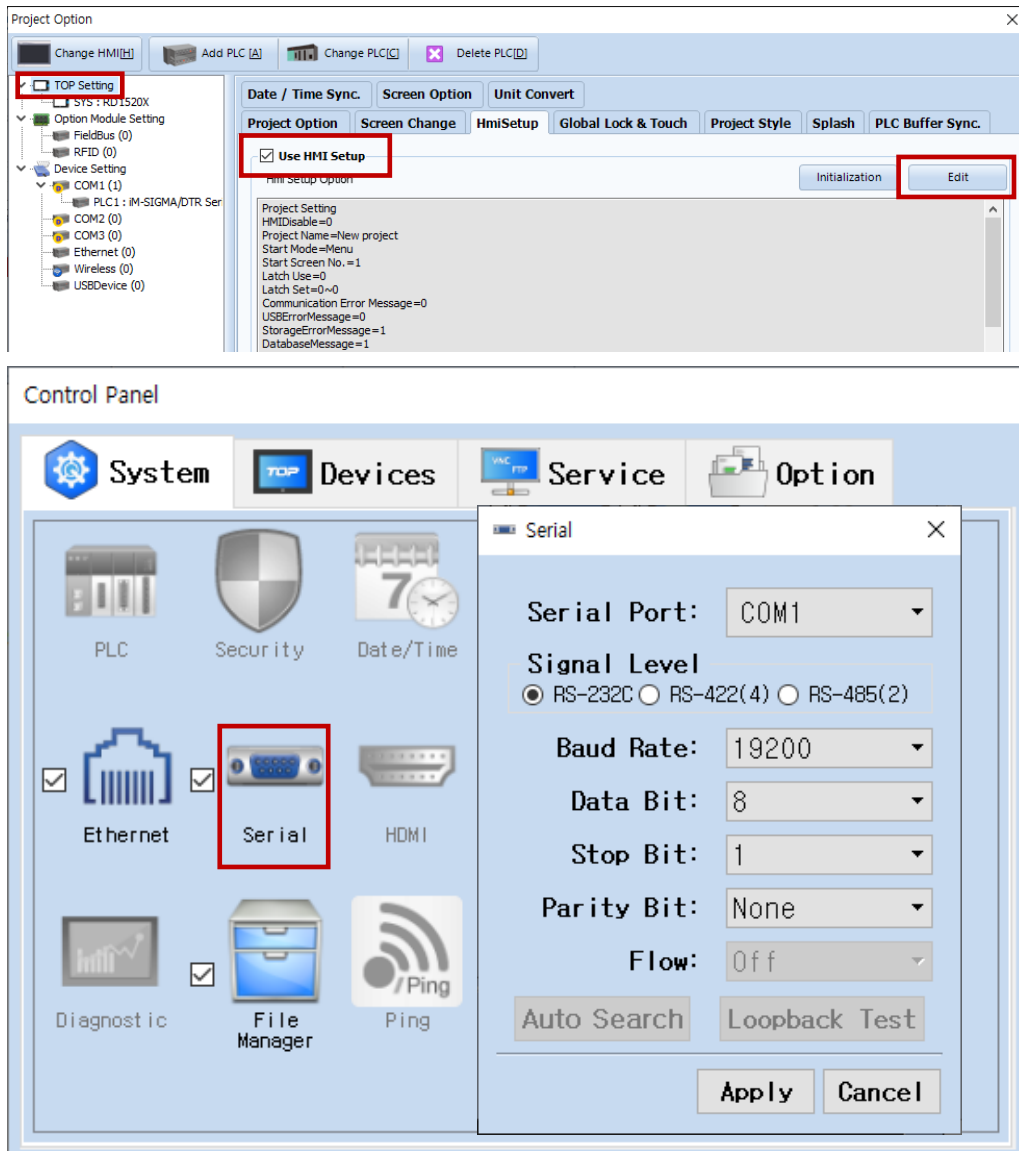
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	19200		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* 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

■ [Project > Project properties > PLC settings > COM1 > "PLC1 : iM-SIGMA/DTR Series"]

– Set the options of the communication driver of DongBu Robot Co,.Ltd – iM-SIGMA/DTR Series Computer Link in TOP Design Studio.
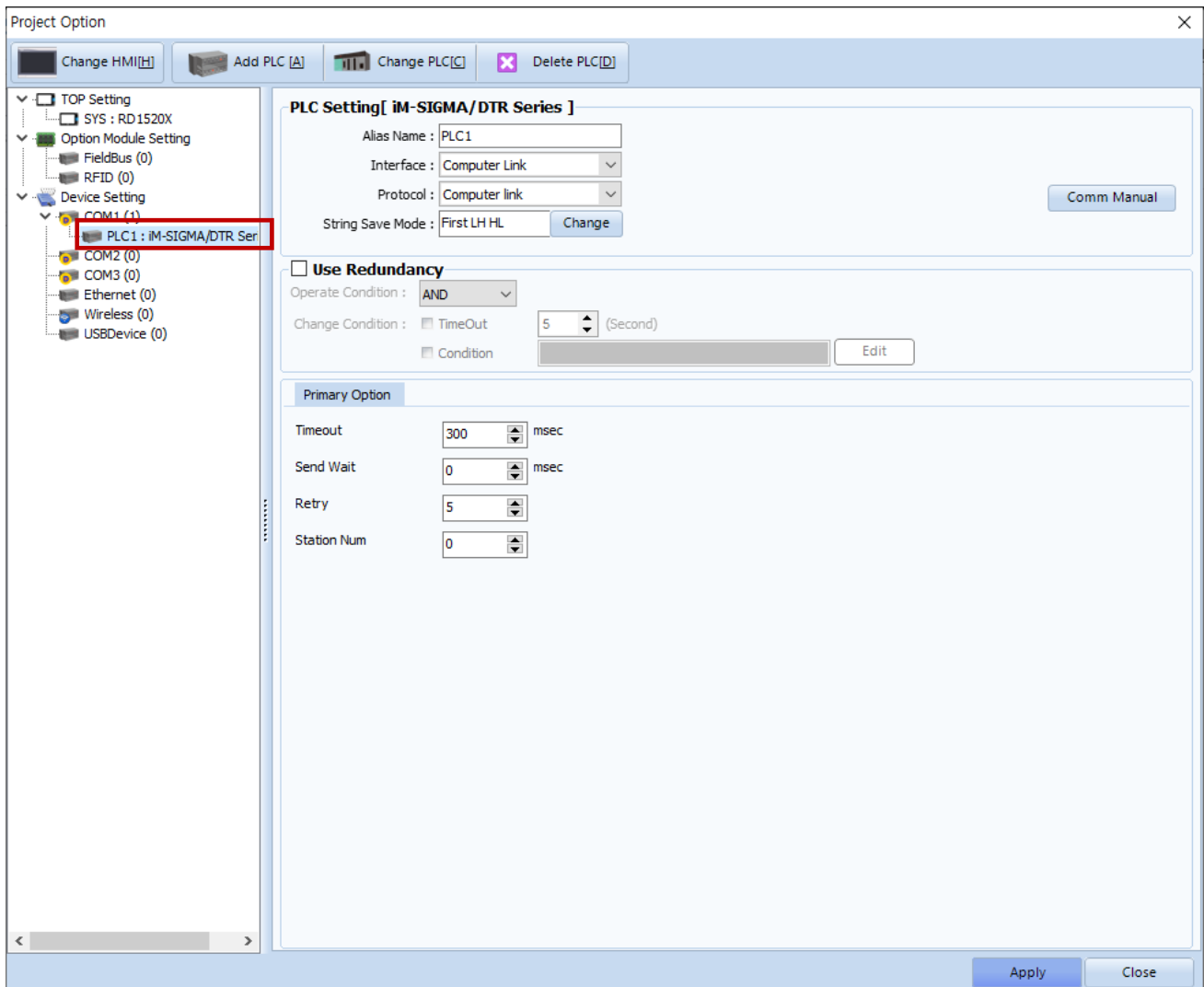
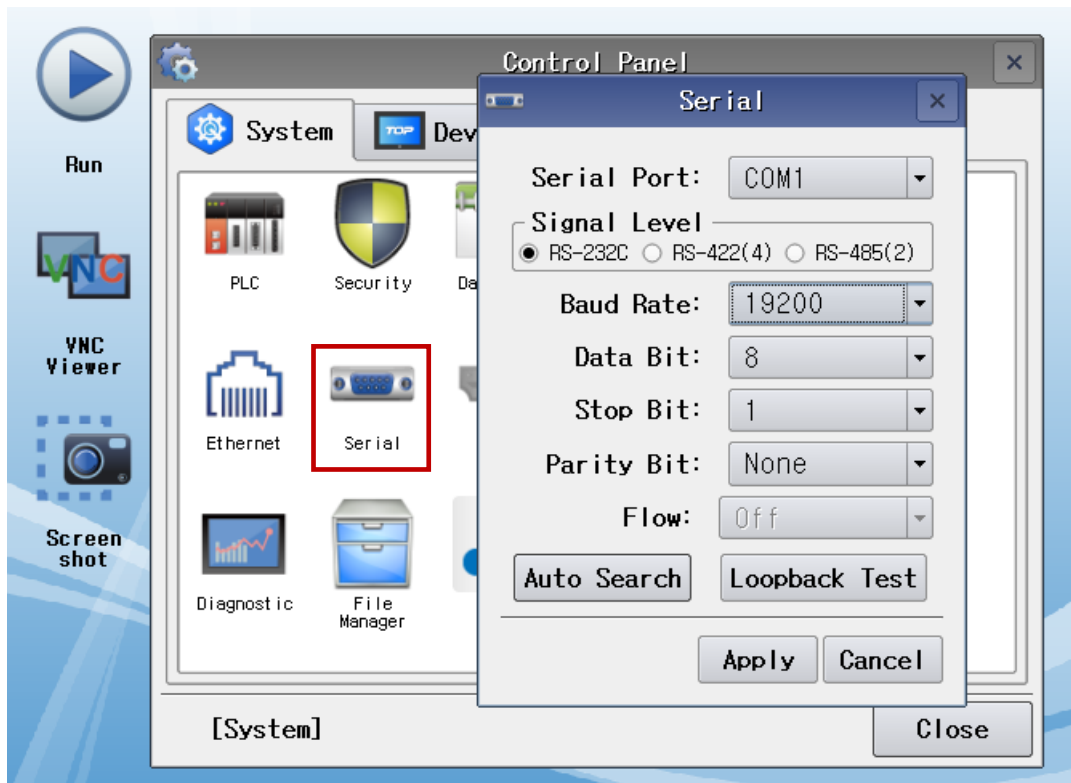| Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Station Num	Enter the prefix of 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

■ [Main screen > Control panel > Serial]

Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	19200		
Data Bit	8		
Stop Bit	1		
Parity Bit	None.		

* The above settings are setting 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

■ [Main screen > Control panel > PLC]

Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External
Protocol	Select "Computer Link".	device selection".
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Station Num	Enter the prefix of 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 whether the port (COM1/COM2) settings you want to use are the same as those of the external device in [Control panel > Serial].

■ Diagnosis of whether the port communication is normal or not

- Touch "Communication diagnostics" in [Control Panel > PLC].

- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

OK	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the cable, TOP, and external device setting status. **(Reference: 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		Check		Remarks
System configuration	How to connect the system		OK	NG	1. System configuration
	Connection cable name		OK	NG	
TOP	Version information		OK	NG	
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	2. External device selection
		Communication diagnostics	OK	NG	3. Communication setting
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
External device	CPU name		OK	NG	
	Communication port name (module name)		OK	NG	
	Protocol (mode)		OK	NG	
	Setup Prefix		OK	NG	
	Other detailed settings		OK	NG	4. External device setting
	Serial Parameter	Transmission Speed	OK	NG	
		Data Bit	OK	NG	
		Stop Bit	OK	NG	
		Parity Bit	OK	NG	
	Check address range		OK	NG	6. Supported addresses (For details, please refer to the PLC vendor's manual.)

4. External device setting

Set as follows using "Operating Loader".

For more detailed setting methods than described in this example, refer to the PLC user manual.

■ After selecting [Miscel] item through the path blow, set the "COMM Port" serial parameter settings as follows.

・ Parameter selecting path

Screen name	iM–Sigma Series		Parameter Editor
Selection item	1. Program Run 2. Program Edit 3. Parameter Setting	1. Basic 2. Advanced 3. Password	1. Device 2. Channel 3. Amp/Mot 4. Gain 5. Miscel
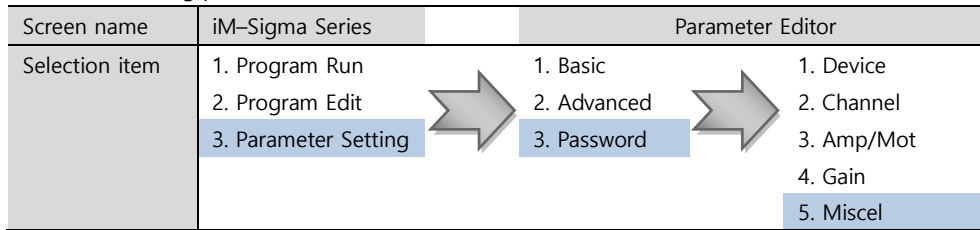
・ [Miscel] setting

Items	Settings	Remarks
Option	Proface	Necessary setting
Cont ID	0	Station Number
Baudrate *Note 1)	1	19200 [bps]

*Note 1) 0 = 9600 bps / 1 = 19200 bps / 2 = 38400 bps / 3 = 57600 bps

5. Cable table

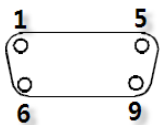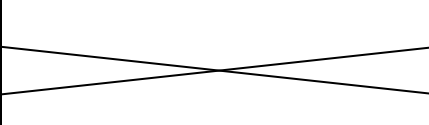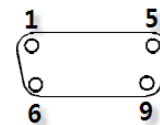This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.

(The cable diagram described in this chapter may differ from the recommendations of "DongBu Robot Co,.Ltd".)

■ **RS-232C** (1:1 connection)

COM			Cable connection	PLC		
Pin arrangement*Note 1)	Signal name	Pin number		Pin number	Signal name	Pin arrangement*Note 1)
Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	CD	1		1	CD	Based on communication cable connector front, D-SUB 9 Pin male (male, convex)
	RD	2		2	RD	
	SD	3		3	SD	
	DTR	4		4	DTR	
	SG	5		5	SG	
	DSR	6		6	DSR	
	RTS	7		7	RTS	
	CTS	8		8	CTS	
		9		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	Code	Bit Address	Word Address	Format	Remarks
Input / Output	IO	000.0 – 399.7	000 – 398	Address	
Command IO	CIO	00.0 – 15.7	——	Address	*Note 2)
Status	STAT	1.0 – 4.7	——	Channel	*Note 3)Note 4)
Running status	RUN	000 – 015	——		*`Note 5)
Program No. set	PROG	——	1 – 4	Channel	*Note 1)Note 6)
Error code	ERR	——	1 – 4	Channel	*Note 4)
Speed set	SPS	——	1 – 4	Channel	*Note 1)
Point file No.	PFNO	——	PFNO		*Note 6)
Speed	SPD	——	1:0 – 4:5	Channel : Axis	*Note 7)
Global integer	GINT	——	000 – 255	Address	
Global float	GFLT	——	000 – 255	Address	
Global point Number + Axis	GPNA	——	0:000 – 6:255	Axis : Point No.	
Global point Axis + Number	GPAN	——	0:000 – 6:255	Axis : Point No.	
Point file Number + Axis	PFNA	——	0:000 – 6:999	Axis : Point No.	*Note 8)
Point file Axis + Number	PFAN	——	0:000 – 6:999	Axis : Point No.	*Note 8)
File move	FMOV	——	1:0:0 – 4:3:99	Channel : Type : File ID	*Note 1)Note 9)
Absolute move	AMOV	——	1:0 – 4:3	Channel : Type	*Note 1)Note 9)
Relative move	RMOV	——	1:0 – 4:3	Channel : Type	*Note 1)Note 9)
Current position	CPOS	——	1:0:0 – 4:2:5	Channel : Type : Axis	*Note 10)

*Note 1) Write-only (data cannot be read) device

A write-only device cannot be used as a bit or number object (object that executes read). Therefore, to execute writing, set the writing operation in [Object properties > Effects and actions tab].

*Note 2) The contents of COMMAND IO contact point are as follows.

Category	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
B0	Select all channel	Select channel 1	Select channel 2	Select channel 3	Select channel 4	Motion operation	Motion reset	Origin operation
B1	Emergency stop	Stop	JogInch	JogXY	JogSpd	JogSpd	JogSpd	JogSpd
B2	Not used	Error reset	JogAxis6+	JogAxis5+	JogAxis4+	JogAxis3+	JogAxis2+	JogAxis1+
B3	Not used	Not used	JogAxis6-	JogAxis5-	JogAxis4-	JogAxis3-	JogAxis2-	JogAxis1-
B4	Not used	AllSvOn	Sv6On	Sv5On	Sv4On	Sv3On	Sv2On	Sv1On
B5	Not used	AllSvOff	Sv6Off	Sv5Off	Sv4Off	Sv3Off	Sv2Off	Sv1Off
B6	Not used	MpgOn	MpgAxis6	MpgAxis5	MpgAxis4	MpgAxis3	MpgAxis2	MpgAxis1

*Note 3) The corresponding bit information is as follows.

Bit	7	6	5	4	3	2	1	0
Contents	Servo On	CMD Fail	——	All channels With or without alarm	Inposition	Runnging	Org OK	Current channel With or without alarm

*Note 4) Read-only device(Data cannot be written)

*Note 5) It displays the operation status for the channel. In this status, the corresponding bit is ON.

0 Bit	1 Bit	2 Bit	3 Bit	4 Bit	5 Bit	6 Bit	7 Bit
Channel 1 Servo On	Channel 1 Run	Channel 1 Orgin	Channel 1 Jog	Channel 2 Servo On	Channel 2 Run	Channel 2 Orgin	Channel 2 Jog
8 Bit	9 Bit	10 Bit	11 Bit	12 Bit	13 Bit	14 Bit	15 Bit
Channel 3 Servo On	Channel 3 Run	Channel 3 Orgin	Channel 1 Jog	Channel 4 Servo On	Channel 1 Run	Channel 4 Orgin	Channel 4 Jog

*Note 6) Writable data range: 00 – 99

*Note 7) It means motor rotation speed data. When writing, only the channel is valid (ignoring the axis).

*Note 8) PFNA: Read/Write the axis based on the point file. (Vertical direction of the table, R/W possible without creating a separate point file)

PFAN: Read/Write the point file based on the axis number. (Horizontal direction of the table, R/W not possible without creating a separate point file)

Axis number	Point number											
1	0	1	2	3	4	5	6	...(omit)...	96	97	98	99
2	0	1	2	3	4	5	6	...(omit)...	96	97	98	99
3	0	1	2	3	4	5	6	...(omit)...	96	97	98	99
4	0	1	2	3	4	5	6	...(omit)...	96	97	98	99
5	0	1	2	3	4	5	6	...(omit)...	96	97	98	99
6	0	1	2	3	4	5	6	...(omit)...	96	97	98	99

*Note 9) Move to the designated position (value of DATA1="GINT231" && value of DATA2="GINT231").

When the movement motion is JOINT or LINEAR, only DATA1 is used, and when the movement motion is ARC or CIRCLE, both DATA1 and DATA2 are used.

– TYPE contents are as follows.

TYPE	Contents
0	PTP
1	LINEAR
2	ARC
4	CIRCLE

*Note 10) TYPE contents are as follows.

TYPE	Contents
0	Encoder pulse
1	Joint
2	XY