

# TOSHIBA MACHINE

## COMPO ARM ROBOT

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Supported version TOP Design Studio V4.0 or higher



## CONTENTS

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

- 1. System configuration** [Page 2](#)

Describes the devices required for connection, the setting of each device, cables, and configurable systems.
- 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](#)

Describes the cable specifications required for connection.
- 6. Supported addresses** [Page 11](#)

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

# 1. System configuration

The system configuration of TOP and "COMPO ARM ROBOT" is as follows:

Series	CPU	Communication method	System setting	Cable
BA-III	CA25-M	RS-232C	<a href="#">3.1 Settings example 1</a> (Page 4)	<a href="#">5.1. Cable table 1</a> (Page 8)

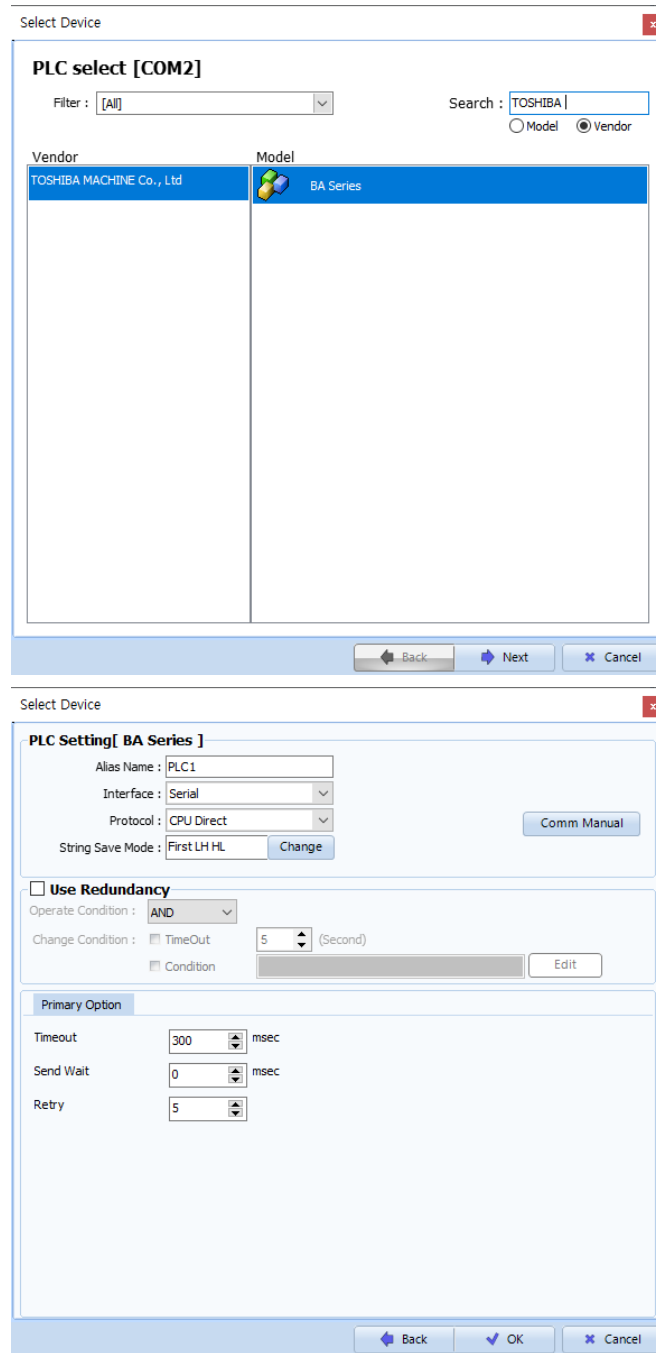
## ■ Connection configuration

- 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 "TOSHIBA MACHINE".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>BA-III CA25-</td> <td>CPU Direct</td> <td>OPEN PROTOCOL</td> </tr> </tbody> </table> <p>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.</p>	Model	Interface	Protocol	BA-III CA25-	CPU Direct
Model	Interface	Protocol					
BA-III CA25-	CPU Direct	OPEN PROTOCOL					

### 3. TOP communication setting

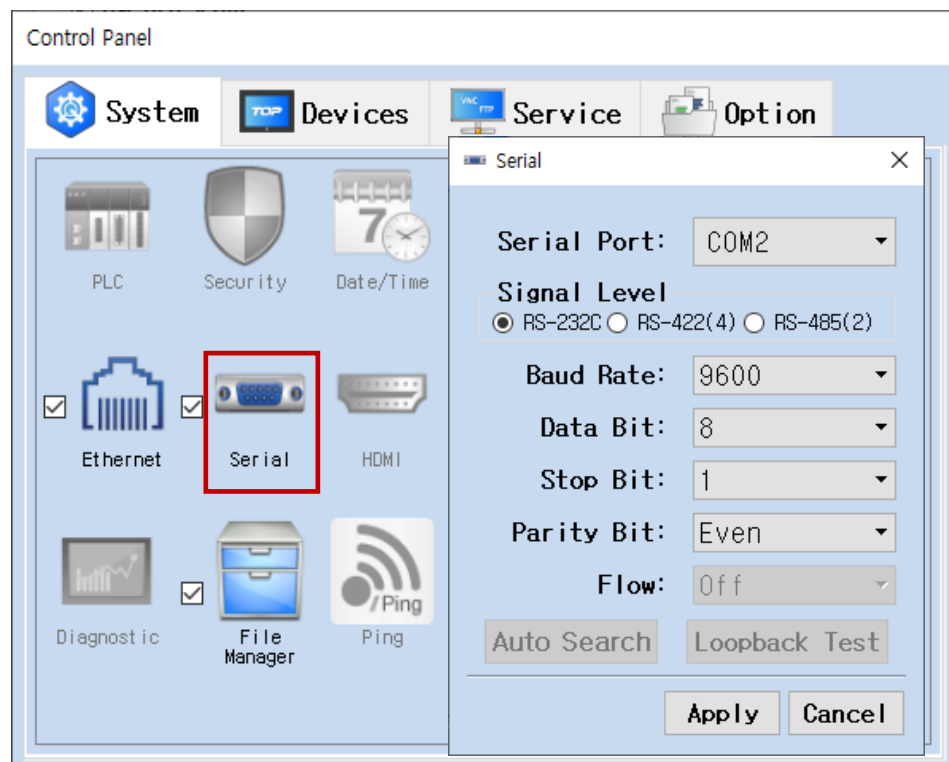
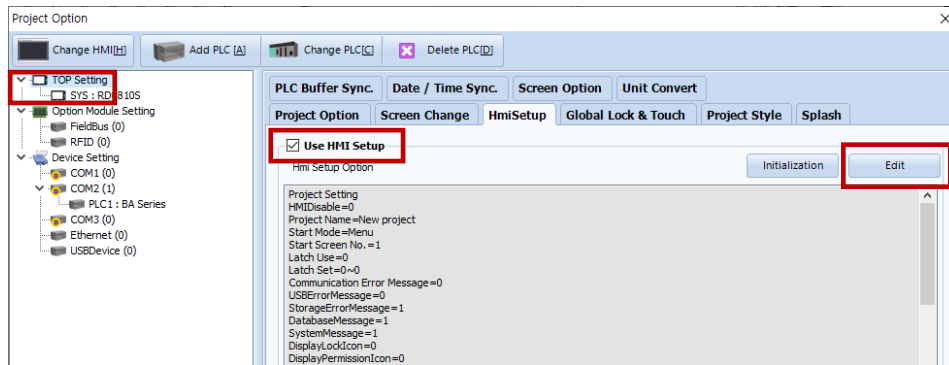
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

#### 3.1 Communication setting in TOP Design Studio

##### (1) Communication interface setting

■ [Project > Project Property > TOP Setting] → [Project Option > "Use HMI Setup" Check > 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		9600	Fixed
Data Bit		8	Fixed
Stop Bit		1	Fixed
Parity Bit		even	Fixed

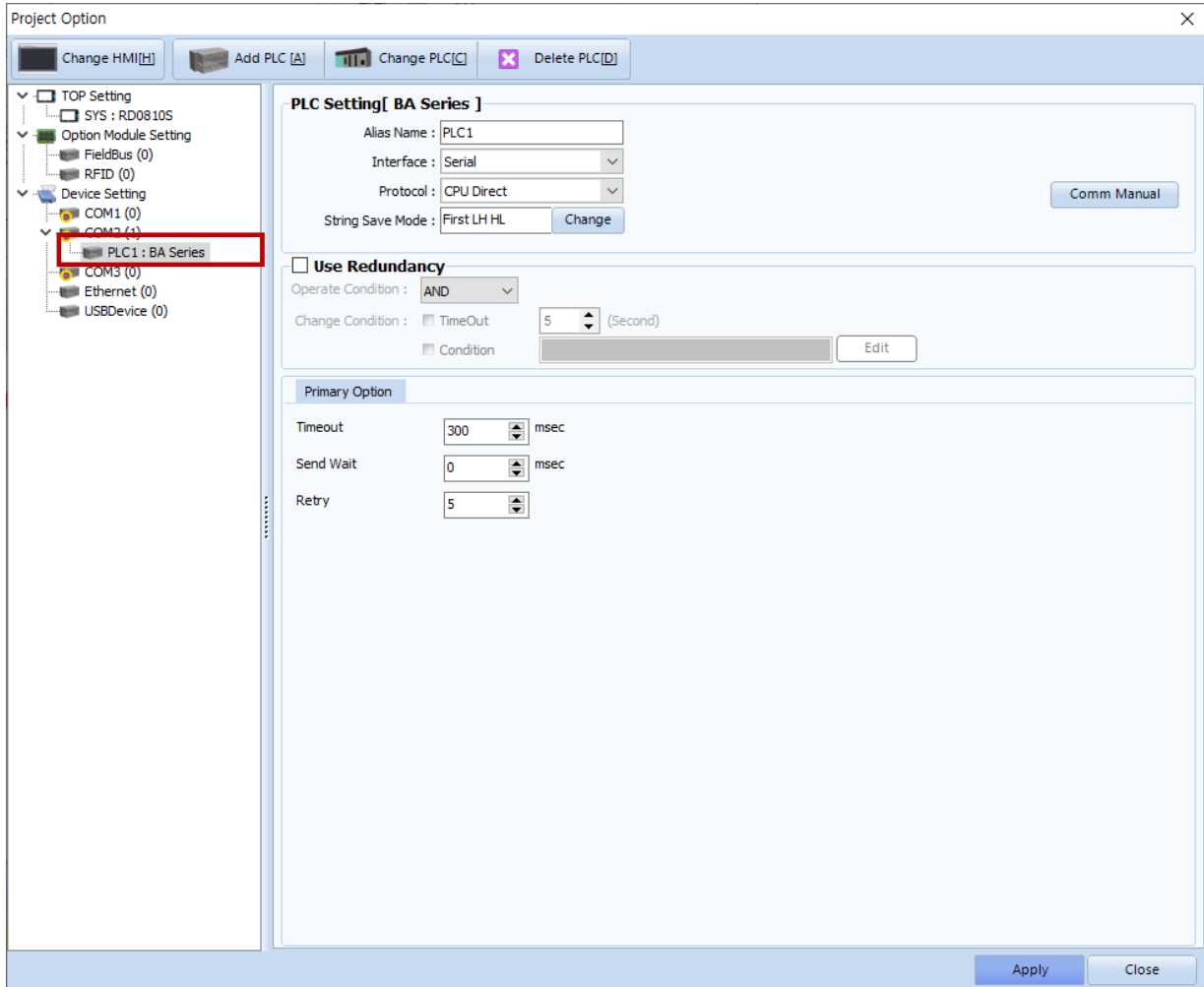
\* The above settings are examples recommended by the company.

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 Property > Device Setting > COM > "PLC1 : BA Series"]

– Set the option of TOSHIBA MACHINE BA Series CPU Direct communication driver in TOP Design Studio.



Items	Settings	Remarks
Interface	Select "CPU Direct".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "CPU Direct".	
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.	

### 3.2. Communication setting in TOP

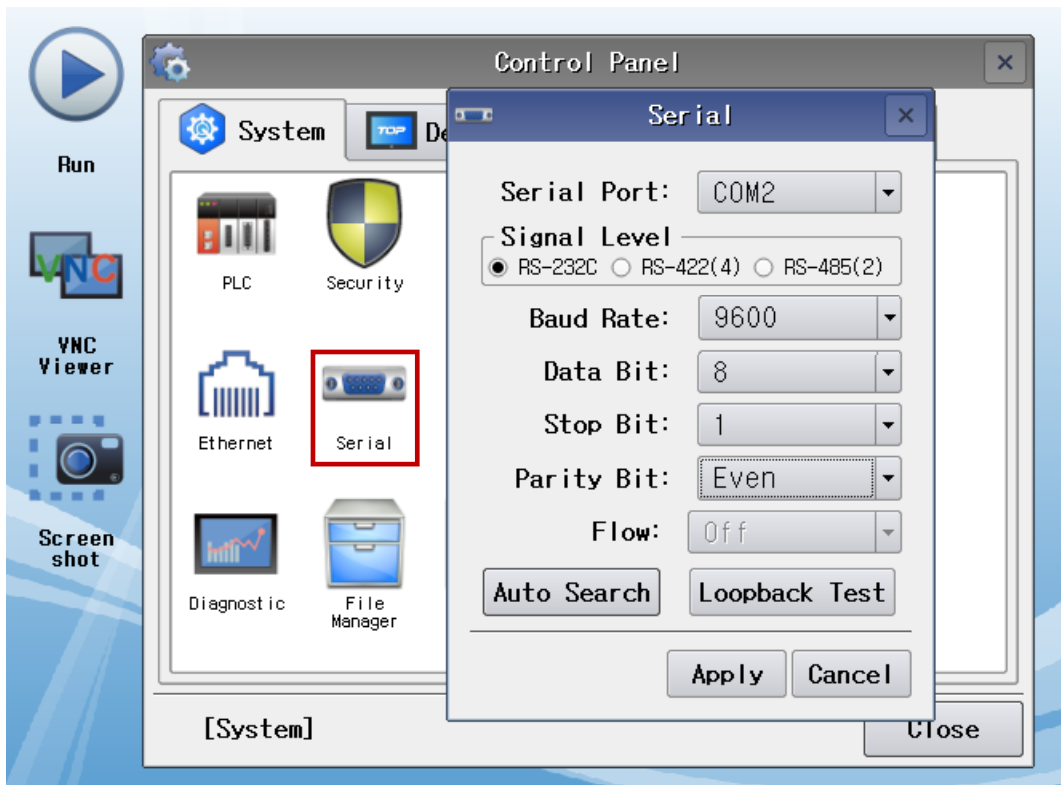
\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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]



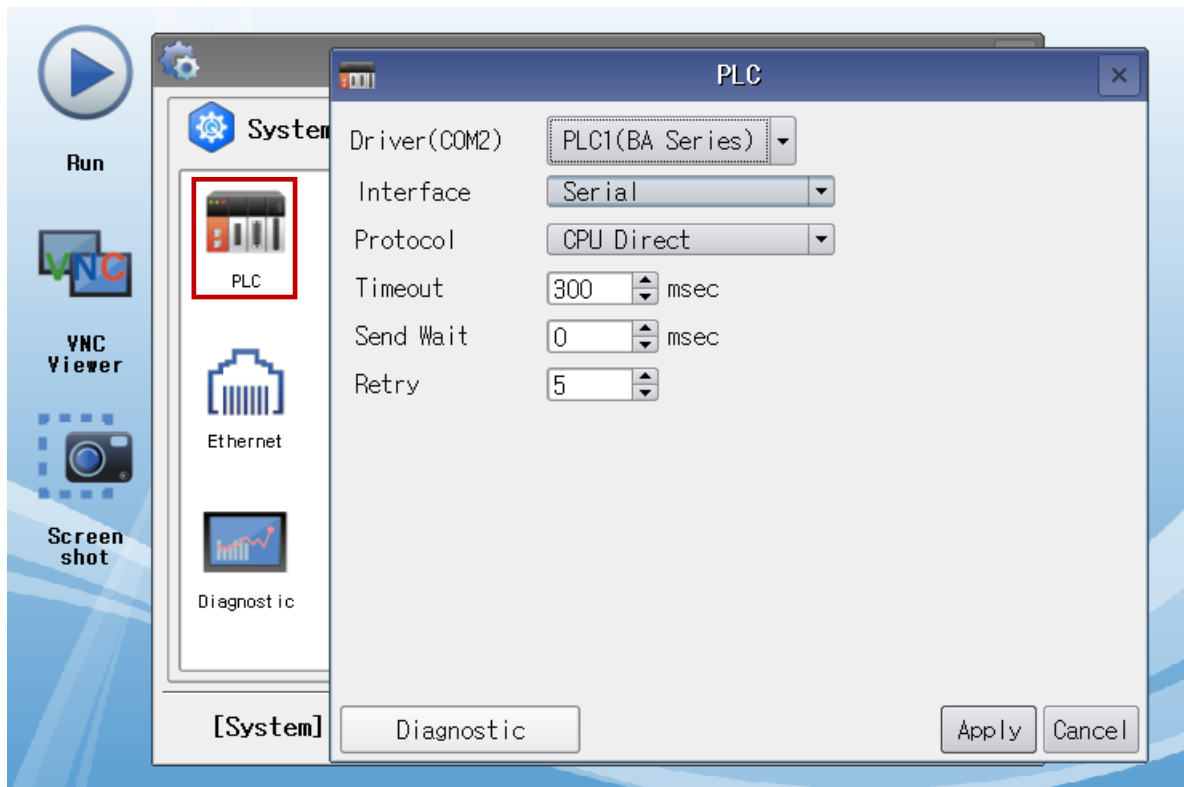
Items	TOP	External device	Remarks
Signal Level (port)	RS-232C	RS-232C	
Baud Rate	9600		Fixed
Data Bit	8		Fixed
Stop Bit	1		Fixed
Parity Bit	even		Fixed

\* 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 "CPU Direct".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select "CPU Direct".	
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.	

### 3.3 Communication diagnostics

- Check the interface setting status between the TOP and 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 if the COM port settings you want to use in [Control Panel > Serial] are the same as those of the external device.
  
- 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.

<b>OK</b>	<b>Communication setting normal</b>
<b>Time Out Error</b>	<b>Communication setting abnormal</b> - Check the cable, TOP, and external device setting status. <b>(Reference: Communication diagnostics sheet)</b>

- 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	<a href="#">1. System configuration</a>	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	<a href="#">2. External device selection</a> <a href="#">3. Communication setting</a>	
	Port in use	OK	NG		
	Driver name	OK	NG		
	Other detailed settings	OK	NG		
	Relative prefix	Project setting	OK		NG
		Communication diagnostics	OK		NG
	Serial Parameter	Transmission Speed	OK		NG
Data Bit		OK	NG		
Stop Bit		OK	NG		
Parity Bit		OK	NG		
External device	CPU name	OK	NG	<a href="#">4. External device setting</a>	
	Communication port name (module name)	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG		
	Serial Parameter	Transmission Speed	OK		NG
		Data Bit	OK		NG
		Stop Bit	OK		NG
Parity Bit		OK	NG		
Check address range	OK	NG	<a href="#">6. Supported addresses</a> (For details, please refer to the PLC vendor's manual.)		



## 4. External device setting

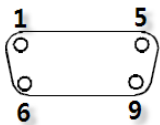
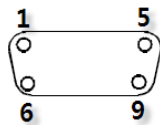
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Configure the communication setting of the external device by referring to its user manual.

## 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 section may differ from the recommendations of "COMPO ARM ROBOT")

### ■ RS-232C (1:1 connection)

COM			Cable connection	PLC		
Pin arrangement* <i>Note 1)</i>	Signal name	Pin number		Pin number	Signal name	Pin arrangement* <i>Note 1)</i>
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	CD	1		1		 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>
	RD	2		5	SD	
	SD	3		6	RD	
	DTR	4		4		
	SG	5		2	SG	
	DSR	6		6		
	RTS	7				
	CTS	8				
		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.

Area	Bit address	Word address	RW	BIT	
MPST	0.00-3.31	0-3	R	32BIT	present position
MOFF	0.00-3.31	0-3	R	32BIT	present offset value
MCNT	1.00-99.15	1-99	R	16BIT	counter value
MTMR	1.00-9.15	1-9	R	16BIT	timer value
MTSK	0.00-0.15	0-0	R	16BIT	Read task No
OVR	0.00-0.15	0-0	R/W	16BIT	Write override,Read override
REST	0.00-0.15	0-0	W	16BIT	Reset
CERR	0-0	0-0	W	16BIT	Cancel error
SORG	0-0	0-0	W	16BIT	Synchronized origin search
HOME	0-0	0-0	W	1BIT	Return to origin
SVON	0-0	0-0	W	1BIT	1 : Servo ON 0 : Servo OFF
HOST	0-0	0-0	W	1BIT	HOST ON
SPEED	1-20.31	1-20	R/W	32BIT	SPEED TABLE
ACCEL	1-20.31	1-20	R/W	32BIT	ACC DEC TABLE
SPST	0.00-0.00	0-0	W	16BIT	Start sequential
JOG-H	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R H SPEED -
JOG+H	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R H SPEED +
JOG-L	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R L SPEED -
JOG+L	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R L SPEED +
JOG-C	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R INCHING-
JOG+C	0.00-3.00	0-3	W	1BIT	0 : X 1 : Y 2 : Z 3 : R INCHING+
JOG_STOP	0.00-0.15	0-0	W	1BIT	JOG Stop
PNT	0-999,0-3.32	0-999,0-3	R/W	32BIT	PNT COORDINATE TABLE
STX	-	0-2500,0-25	R	16BIT	Read sequential text
STAS	0-4,0-1.31	0-4,0-1	R	32BIT	status ST1 ST2
MNIN	1.00-4.15	1-4	R	16BIT	Internal port
MOUT	0-4,1-7,0-3.15	0-4,1-5,0-3	R	16BIT	output data
MINP	0-4,1-7,0-3.15	0-4,1-7,0-3	R	16BIT	input data
MODE	0.00-0.15	0-0	W	16BIT	0 : Program 1 : Step, 2 : Automatic 3 : Sequential 4 : Palletizing mode
STOP	0.00-0.00	0-0	W	1BIT	Stop