HIGEN MOTOR Co., Ltd

FDA Servo Series

Supported version TOP Design Studio

dio V1.4 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".

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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

Describes how to set up communication for external devices.

5. Cable table

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Describes the cable specifications required for connection.

6. Supported addresses

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



1. System configuration

The system configuration of TOP and "HIGEN MOTOR Co., Ltd. - FDA Series Servo Drive" is as follows:

Series	СРИ	Link I/F	Communication method	System setting	Cable
		CN3 Port		3.1 Settings example 1	5.1. Cable table 1
FDA70		(COM Port)	KS-232C	(<u>Page 4)</u>	<u>(Page 9)</u>
		CN3 Port	RS-485	3.2 Settings example 2	5.3. Cable table 3
		(COM Port)	(2 wire)	<u>(Page 5)</u>	<u>(Page 11)</u>
FDA		CN3 Port		3.1 Settings example 1	5.2. Cable table 2
		(COM Port)	K3-232C	(<u>Page 4)</u>	Page 10
		CN4 Port	RS-485	3.2 Settings example 2	5.4. Cable table 4
		(COM Port)	(2 wire)	(Page 5)	(Page 12)

■ Connectable configuration

• 1:1 (one TOP and one external device) connection – configuration which is possible in RS232C/422/485 communication.





• 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.



540						
1	- 40	E I	15			
			12	88	- 21	18
18.			15	88	1.87	ie.
ы.	 -		18	10	- 81	88
	 -		12	88.	0	10
	 47					-



2. External device selection

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

Select Device					х
PLC select [C	ОМ2]				
Filter : TAIN		~		Search :	
[7 m]				Model	Vendor
Vendor		Model			
KDT Systems	^	🜮 FDA	Series		
RS Automation		~			
HITACHI IES					
FATEK Automation Cor	poration				
DELTA Electronics					
KOYO Electronic Indust	tries				
VIGOR Electric Corpora	ation				
COMFILE TECHNOLOG	Y Inc.				
DST ROBOT					
BACnet					
IS MECAPION					
	4				
EMOTIONTEK					
EMOTIONIEK					
RKC Instrument Inc.		1			
alact Davica					
	Sories 1				2
PLC Setting[FDA Alias Name	Series]				3
PLC Setting[FDA Alias Name Interface	Series] : PLC1 : Computer Link				5
PLC Setting[FDA Alias Name Interface Protocol	Series] : PLC1 : Computer Link : MODBUS RTU	×		Co	3 mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode	Series] :: PLC1 :: Computer Link :: MODBUS RTU :: First LH HL	Change		Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL	Change		Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode	Series] :: PLC1 :: Computer Link :: MODBUS RTU :: First LH HL :: First LH HL CY	Change		Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode	Series] :: [PLC1 :: Computer Link I: MODBUS RTU :: [First LH HL CY AND ~ TimeOut	Change	cond)	Co	mm Manual
PLC Setting[FDA Alas Name Interface Protocol String Save Mode	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL :: First LH HL CY AND TimeOut Condition	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND TimeOut Condition	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition : [Primary Option Timeout	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND Condition 300	Change 5 (Se	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND ~ TimeOut Condition 300 © 0 ©	Change 5 Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait Retry	Series] :: PLC1 :: Computer Link :: MODBUS RTU :: First LH HL CY AND COndition 300 5 \$	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Change Condition : Primary Option Timeout Send Wait Retry Unit No	Series] :: PLC1 :: Computer Link :: MODBUS RTU :: First LH HL CY AND COndition 300 5 1 () () () () () () () () () ()	Change 5 € (Se msec	cond)		mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry Unit No FDASERVO	Series] :: PLC1 :: Computer Link :: MODBUS RTU :: First LH HL CY AND TImeOut Condition 300 5 5 1 6000 V	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait Retry Unit No FDASERVO	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND TimeOut Condition 300 5 5 1 6000 ~	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait Retry Unit No FDASERVO	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND TimeOut Condition 300 5 5 1 6000 V	Change	cond)	Co	mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait Retry Unit No FDASERVO	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND ~ TimeOut Condition 300 5 1 5 1 6000 ~	Change	cond)		mm Manual
PLC Setting[FDA Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : [Change Condition :] Primary Option Timeout Send Wait Retry Unit No FDASERVO	Series] :: PLC1 :: Computer Link I: MODBUS RTU :: First LH HL CY AND ~ TimeOut Condition 300 © 5 © 1 © 6000 ~	Change	cond)	C 0	mm Manual

Settings		Contents				
ТОР	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 "HIGEN MOTOR Co., Ltd".				
	PLC	Select an external device to connect to TOP.				
		Select "FDA Series Servo".				
		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 Property > TOP Setting] → [Project Options > "Use HMI Setup" Check > Edit > Serial]
 - Set the TOP communication interface in TOP Design Studio. Project Option × Change HMI[H] 💓 Add PLC [A] 📶 Change PLC[C] 🔀 Delete PLC[D] TOP Setting Date / Time Sync. Screen Option Unit Convert Option Module Setting Project Option Screen Change HmiSetup Global Lock & Touch Project Style Splash PLC Buffer Sync. FieldBus (0) FieldBus (0) FID (0) Covice Setting FieldBus (0) Use HMI Setup Initialization Edit CON12 (0) CON2 (1) PLC1 : FDA Series [1] CON3 (0) Ethernet (0) Project Setting HMIDsable=0 Project Name=New project Start Mode=Menu Start Screen No.=1 Latch Use=0 Latch Set=0-0 Communication Error Messa USBErrorMessage=0 StorageErrorMessage=1 DatabaseMessage=1 Wireless (0) Control Panel Service 🔤 Option System Devices тор 🚥 Serial Х Serial Port: COM2 • 1 ~ Signal Level PLC Security Date/Time ○ RS-232C ○ RS-422(4) ● RS-485(2) Baud Rate: 38400 Ŧ Data Bit: 8 • \checkmark \sim Stop Bit: 1 Ŧ Ethernet Serial HDM I Parity Bit: Ŧ None Flow: Off \checkmark / Ping Auto Search Loopback Test Diagnost ic File Ping Manager Apply Cancel

Items	ТОР	External device	Remarks
Signal Level (port)	RS-232C/RS-485	RS-232C/RS-485	
Baud Rate	3840	00	
Data Bit	8		
Stop Bit	1		
Parity Bit	NON	NE	

* 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 > PLC Setting > COM > "PLC1 : FDA Series Servo"]
 - Set the options of the HIGEN MOTOR Co., Ltd communication driver in TOP Design Studio.

Project Option			×
Change HMI[H] Add PL	C [A] TI Change PLC[C] Nelete PLC[D]		
 TOP Setting SYS : RD 1520X Option Module Setting Fieldbus (0) RFID (0) COM1 (0) COM2 (1) COM2 (1) Ethernet (0) Wireless (0) USBDevice (0) 	PLC Setting[FDA Series] Alas Name : PLC1 Interface : Computer Link Protocol : MODBUS RTU String Save Mode : First LH HL Change Operate Condition : Immovut 300 Retry Seedundarcy Unit No Immovut Seedundarcy Operate Condition : Immovut 300 Immovut 300 Immovut Seed Wait Immovut Alas Name Primary Option Timeout 300 Immovut Seed Wait Immovut Immovut </td <td>Com</td> <td>m Manual</td>	Com	m Manual
		Apply	Close

Items	Settings	Remarks
Interface	"Computer Link	Fixed
Protocol	Modbus Rtu	Fixed
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.	
FDASERVO6000	0 : FDA7000 1 : FDA6000	



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]

	6		Control Panel		×
	🔯 System	🔤 De	💶 Ser	ial	×
Run			Serial Port:	COM1	
MNC	PLC S	ecurity	Signal Level -	22(4) • RS-485(2)	
			Baud Rate:	38400	•
¥NC Viewer	പ്പം	0	Data Bit:	8	-
	Ethernet	Serial	Stop Bit:	1	-
0.			Parity Bit:	None	-
Screen	word		Flow:	Off	
snot	Diagnostic	File Manager	Auto Search	Loopback Test	
				Apply Cance	
	[System]]			Close

Items	ТОР	External device	Remarks
Signal Level (port)	RS-232C/RS-485	RS-232C/RS-485	
Baud Rate	384	00	
Data Bit	8		
Stop Bit	1		
Parity Bit	NOI	NE	

 $\,$ * The above settings are setting $\underline{\text{examples}}$ 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]

	Ö	1001	PLC		×
	🔞 System	Driver(COM2)	PLC1(FDA Series) 💌		
Run		Interface	Computer Link 🔹		
		Protocol	MODBUS RTU -		
MNC	PLC	Timeout	300 🖨 msec		
VNC		Send Wait	0 🖨 msec		
Viewer	പ	Retry	5		
	L	Unit No	1		
	Ethernet	FDASERVO	6000 -		
Constant					
shot	Infl ^{~~}				
	Diagnostic				
	[System]	Diagnostic		App I y Ca	ancel
tems	Settings				Remarks
nterface	"Computer Lir	ık			Eivoc
Protocol	Modbus Rtu				Fixed
TimeOut (ms)	Set the time f	or the TOP to wait fo	or a response from an external device.		
SendWait (ms)	Set the waitin	g time between TOP	's receiving a response from an extern	al device and	
	sending the n	ext command reque	st.		

0 : FDA7000

1 : FDA6000

FDASERVO6000



3.3 Communication diagnostics

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.

ОК	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	Ch	eck	Remarks
System	How to connect th	e system	OK	NG	1 System configuration
configuration	Connection cable r	name	OK	NG	T. System configuration
TOP	Version information	n	OK	NG	
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed sett	ings	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	CPU name		OK	NG	
device	Communication po	ort name (module name)	OK	NG	
	Protocol (mode)		OK	NG	
	Setup Prefix		OK	NG	
	Other detailed sett	ings	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 ran	ge			6. Supported addresses
			OK	NG	(For details, please refer to the PLC
					vendor's manual.)

FDA 7000 Series

• P01-15 :Communication speed "10" Settings

P01–15 setting	RS-232C	RS-485	P01–15 setting	RS-232C	RS-485
value			value		
00	9600	9600	08	38400	9600
01	9600	19200	09	38400	19200
02	9600	38400	10	38400	38400
03	9600	57600	11	38400	57600
04	19200	9600	12	57600	9600
05	19200	19200	13	57600	19200
06	19200	38400	14	57600	38400
07	19200	57600	15	57600	57600

• P01–18 : Terminal Prefix (Station ID) "1" configuration

Item	Description	Remark
P01–18	1	Prefix Station ID



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 "HIGEN MOTOR Co., Ltd.")

■ 1:1 connection



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

(A) TOP CO	(A) TOP COM Port (9 pin) RS 485							
TOP	СОМ			Serv	vo Drive (Cl	N3 port, 20PIN)		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin		
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)		
1 5	RDA	1		- 7	Р			
$\begin{pmatrix} \circ & \circ \end{pmatrix}$		2	÷	- 8	N	()		
6 9		3				11 🗑 1		
Based on	RDB	4						
communication		5				20 10		
cable connector	SDA	6						
front,		7				10120 2000\/E/2N4\		
D-SUB 9 Pin male		8		- 19	SG	10120-3000VE(SIVI)		
(male, convex)	SDB	9						

■ 1:1 connection



*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



■ 1:1 connection

(A) TOP COM Port (9 pin)

TOP	СОМ						Servo Drive	e (CN3 port)
Pin	Signal	Pin		Cable connection		Pin	Signal	Pin
arrangement*Note 1)	name	number				number	name	arrangement*Note 1)
1 5	RDA	1 ·			•	1	GND	
		2			•	2	TRXD-	
6 9		3	+			3	TRXD+	USB–A Type
Based on	RDB	4 ·	-•			4		
communication	SG	5			-4			11
cable connector	SDA	6						
front,		7						4 32 1
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.

	• TOP DESIGN STUDIO Device marking method : Refer to FDA Series User Manual "Address Map" table												
$ \geq $	Address Menu		enu	Data Type	Menu name (variable		Property	Initial	Min	Max	Unit		
						name)				value			
	40011	0x000A		StE-01	INT	Display	Select		R	1203	100	1330	-

(1) How to select a device: Select "INT/FLT" according to "Data Type" in table.

For FLT, select "Float" data class in TOP DESIGN STUDIO.

For INT, select "DEC" data class and data size "32bit" in TOP DESIGN STUDIO.

However, for Alarm Address/ Jog Key Address select ALM/RST device.

(2) How to select address: Select 4 digits as indicated after "4" in address.

(3) Caution relevant to "Properties": Please be careful with the use of devices dedicated to R (Read)/W (Write).

5.1 FDA 7000 Series

/

Standard type								
Device			Bit Address	Word Address	Remarks			
Integer D	Data Type		INT0011.00 – INT2205.15	INT 0011 – INT 2205				
Float Dat	ta Type			FLT 0011 – FLT 2205				
JOG	Key Jog N	Mode		INT 1001				
	Auto Jog	Mode		INT 1003				
	Key Jog S	Speed —		FLT 1002				
	Jog Spee	d, Time/REV		FLT 1003 – FLT 1019				
	Jog Key	JOG ON		INT 2201	*Note 1)			
		JOG OFF		INT 2202	*Note 1)			
		Clockwise (CW)		INT 2203	*Note 1)			
		Counter Clockwise (CCW)		INT 2204	*Note 1)			
		Stop		INT 2205	*Note 1)			
ALM	Current a	larm request		ALM0	*Note 2)			
RST	Current a	larm clear	RSTO		*Note 1)			

*Note 1) Write-only device

*Note 2) Read-only Device

5.2 FDA 6000 Series

Standard type								
Device		Bit Address	Word Address	Remarks				
Integer D	ata Type	INT0011.00 – INT2205.15	INT 0011 – INT 2205					
Float Data Type			FLT 0011 – FLT 2205					
JOG	Auto Jog Speed		FLT 0701 – FLT 0703					
	Auto Jog Time		INT 0704 – INT 0706					
ALM	Current alarm request		ALM0	*Note 2)				
RST	Current alarm clear	RSTO		*Note 1)				

*Note 1) Write-only device

*Note 2) Read-only Device



Device		Bit Address	Word Address	Remarks
Integer D	ata Type	INT0011.00 – INT2205.15	INT 0011 – INT 2205	
Float Dat	а Туре		FLT 0011 – FLT 2205	
JOG	Jog Speed		FLT 0605 – FLT 0606	
	INC Jog Value		FLT 0607 – FLT 0608	
ALM	Current alarm request		ALM0	*Note 2)
RST	Current alarm clear	RST0		*Note 1)

*Note 1) Write-only device

*Note 2) Read-only Device