# LS Industrial Systems

**GLOFA-GM** Series

# **CPU Direct Driver**

V1.0 or higher

Supported version TOP Design Studio



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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 how to set up communication for external devices.

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Describes the cable specifications required for connection.

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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 "LS Industrial Systems – GLOFA-GM Series CPU Direct" is as follows:

Series	CPU	Link I/F	Communication method	System setting	Cable
CMD	GMR-CPUA				
GMR	GMR-CPUB				
CN 41	GM1-CPUA				
GINI	GM1-CPUB				
CN42	GM2-CPUA				
GIVIZ	GM2-CPUB				
GM3	GM3-CPUA				
	GM4-CPUA			3. TOP communication setting 4. External device setting	<u>5. Cable table</u>
GM4	GM4-CPUB				
	GM4-CPUC		RS-232C		
	GM6-CPUA	CPU Direct <sup>*Note 1)</sup>			
GM6	GM6-CPUB				
	GM6-CPUC				
	G7M-D□10A				
	G7M-D□20A				
GM7	G7M-D□30A				
	G7M-D□40A				
	G7M-D□60A				
	G7M-D□20U				
GM711	G7M-D□30U				
GIVI7 U	G7M-D□40U				
	G7M-D□60U				

\*Note 1) PC connection loader port

#### 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.

DIC soloct [C	OM1]				
PLC select [C	OMIJ				
Filter : [All]			$\sim$	Search :	del 🔿 Vendor
Vendor		Model			
M2I Corporation	^	8	XGI/XGR/XEC Series		
MITSUBISHI Electric Co	rporation	8	XGK/XBM/XBC Series		
OMRON Industrial Auto	mation	8	GLOFA-GM Series		
LS Industrial Systems			MASTER-K(805/1205/20	05/3005/10005) Se	ries
MODBUS Organization		<b>~</b>	STADVEDT Series		
SIEMENS AG.			STARVERT Selles		_
Rockwell Automation			XCODE RFID HF Reader	Series IH-1306/130	17
GE Fanuc Automation			MASTER-K(500H/1000H)	Series	
PANASONIC Electric Wo	orks	<b> </b>	MASTER-K 10S, 10S1 Ser	ies	
YASKAWA Electric Corp	oration				
YOKOGAWA Electric Co	rporation				
Schneider Electric Indus	stries				
KDT Systems					
RS Automation	~				
elect Device					
elect Device PLC Setting[ GLOF	A-GM Series	]			
elect Device PLC Setting[ GLOF Alias Name	A-GM Series	]			
elect Device PLC Setting[ GLOF Alias Name Interface Protocol	A-GM Series PLC1 CPU Direct CPU	]	Y Y		
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode	A-GM Series PLC1 : CPU Direct : CPU : First LH HL	] Chi	∼ ∼		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode	A-GM Series PLC1 CPU Direct CPU First LH HL	] Chi	↓ ↓ ange		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundann Operate Condition : A	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY ND	] Chi	∽ ∽ ange		Comm Manual
PLC Setting [GLOF Alias Name Interface Protocol String Save Mode	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY NND ~ TimeOut	] Chi	✓ ✓ ✓ ✓ (Second)		Comm Manual
elect Device PLC Setting[GLOF Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : Change Condition :	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY TimeOut Condition	] Cha	ange		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundann Operate Condition : Change Condition : Pimary Option	A-GM Series : [PLC1 : CPU Direct : CPU : First LH HL CY NND : TimeOut Condition	] Cha	ange (Second)		Comm Manual
elect Device PLC Setting[GLOF Alias Name Interface Protocol String Save Mode Use Redundanm Operate Condition : Change Condition : Primary Option Timeout	A-GM Series  PLC1  CPU Direct CPU First LH HL  CY TimeOut Condition	] Cha	ange (Second)		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Change Condition : Primary Option Timeout Send Wait	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY MD Cy ImeOut Condition 300 0	] Chi 5 msec msec	ange (Second)		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundam Operate Condition : Primary Option Timeout Send Wait Retry	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY TimeOut Condition 300 5 5	Charles and the second	ange (Second)		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : Primary Option Timeout Send Wait Retry	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY TimeOut Condition 300 5 5 ©	Chu	ange		Comm Manual
elect Device PLC Setting[ GLOF Alias Name Interface Protocol String Save Mode Use Redundann Operate Condition : Primary Option Timeout Send Wait Retry	A-GM Series : [PLC1 : CPU Direct : CPU : First LH HL CY NND : TimeOut : Condition 300 : 5 : 5 : 5 : 5 : 5 : 5 : 5 : 5	] Chu msec msec	<ul> <li>✓</li> <li>✓</li> <li>(Second)</li> </ul>		Comm Manual
elect Device PLC Setting[GLOF Alias Name Interface Protocol String Save Mode Use Redundann Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry	A-GM Series : [PLC1 : CPU Direct : CPU : First LH HL CY NND CY : Condition 300 5 5 •	] Chu s msec msec	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		Comm Manual
elect Device PLC Setting[GLOF Alias Name Interface Protocol String Save Mode USe Redundanm Operate Condition : Primary Option Timeout Send Wait Retry	A-GM Series : PLC1 : CPU Direct : CPU : First LH HL CY : Condition 300 5 : S : S : S : S : S : S : S : S	Chu 5 msec	singe (Second)		Edit
elect Device PLC Setting[GLOF Alias Name Interface Protocol String Save Mode USe Redundanm Operate Condition : Primary Option Timeout Send Wait Retry	A-GM Series  PLC1 CPU Direct CPU FirstLH HL CY TimeOut Gondition	Chu 5 msec msec	ange (Second)		Edit

Settings			Contents		
ТОР	Model	Check the TOP display and pro	Check the TOP display and process to select the touch model.		
External device	Vendor	Select the vendor of the extern Select "LS Industrial Systems".	t the vendor of the external device to be connected to TOP. t "LS Industrial Systems".		
PLC Select an external device to co		nnect to TOP.			
		Model	Interface	Protocol	
		GLOFA-GM Series	CPU Direct	CPU	
		Please check the system conf connect is a model whose syst	iguration in Chapter 1 to see if em can be configured.	the external device you want to	



## 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	ТОР	External device	Remarks	
Signal Level (port)		RS-232C		
	KS-232C	(CPU port)	Fixed	
Baud Rate	38400		Fixed	
Data Bit	8	3	Fixed	
Stop Bit	1		Fixed	
Parity Bit	No	ne.	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: GLOFA-GM Series"]

- Set the option of GLOFA-GM Series CPU Direct communication driver in TOP Design Studio.

Project Option			×
Change HMI[ <u>H</u> ] Mdd Pl	LC [A] TIT Change PLC[C] Delete PLC[D]		
Change HMI[H] Change HMI[H] Change HMI[H] Change HMI[H] Change Add P	C (A) Change PLC(2) PLC Setting[ GLOFA-GM Series ] Alas Name: PLC1 Interface: [PU Direct ] Protocol: [PU ] String Save Mode: First LH HL Change Use Redundancy Operate Condition : TimeOut 5 \$ (Second) Condition Edit Primary Option TimeOut 300 \$ msec Send Wait 0 \$ msec Retry 5 \$	Cor	mm Manual
		Apply	Close

Items	Settings	Remarks
Interface	Select "CPU Direct".	Refer to "2. External
Protocol	Select "CPU".	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.	



#### 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	ТОР	External device	Remarks	
Signal Level (port)		RS-232C	Final	
	K3-232C	(CPU port)	Fixed	
Baud Rate	38400		Fixed	
Data Bit	8		Fixed	
Stop Bit	1		Fixed	
Parity Bit	None.		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]

		6	m	PLC	×
		🔯 System	Driver(COM1)	PLC1(GLOFA-GM Series) 🕶	
	Run		Interface	CPU Direct 💌	
			Protocol	CPU 💌	
	VNC	PLC Se	Timeout	300 🚔 msec	
	VNC		Send Wait	0 🖨 msec	
	Viewer	∭ ഹോ ⊠	Retry	5	
		Ethernet S			
	<u> </u>				
	Screen	-			
	shot				
		Diagnostic Ma			
				]	
		[System]	Diagnostic	:	Apply Cancel
		L			
ns		Settings			Remarks

Items	Settings	Remarks
Interface	Select "CPU Direct".	Refer to "2. External
Protocol	Select "CPU".	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.	



#### **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.

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		Check		Remarks	
System	How to connect the sys	OK	NG	1 Custom and investiga		
configuration	Connection cable name		OK	NG	1. System configuration	
ТОР	Version information		OK	NG		
	Port in use		OK	NG		
	Driver name		OK	NG		
	Other detailed settings	Other detailed settings				
	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	ОК	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	CPU name	OK	NG			
	Communication port name)	ОК	NG			
	Protocol (mode)	OK	NG			
	Setup Prefix	OK	NG			
	Other detailed settings	OK	NG	4. External device setting		
	Serial Parameter	Transmission	ОК	NG		
		Speed				
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
	Check address range		ОК	NG	<u>6. Supported addresses</u> (For details, please refer to the PLC vendor's manual.)	



# 4. External device setting

• CPU Direct port communication interface of the "GLOFA-GM Series" is fixed as the target configuration value of the following example.



### 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 "LS Industrial Systems Co., Ltd.")

E F	RS-	232	2C	(1:1	connection)	)
-----	-----	-----	----	------	-------------	---

COM1 / COM2				External device		
Pin	Signal	Pin	Cable connection	Pin	Signal	Pin
arrangement*Note 1)	name	number		number	name	arrangement*Note 1)
1 5	CD	1		1	CD	1 5
	RD	2 -		2	RD	( )
	SD	3 -		3	SD	
6 9	DTR	4		4	DTR	69
Based on	SG	5 -		5	SG	Based on
communication cable connector front,	DSR	6		6	DSR	communication cable
	RTS	7		7	RTS	connector 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.



# 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.

<b>T</b>	Daria	Address Area			
Туре	Device	Bit	Word		
GM1	l (Input)	IX00.0.0 – IX63.7.63	IW00.0.0 – IW63.7.3		
	Q (Output)	QX00.0.0 – QX63.7.63	QW00.0.0 – QW63.7.3		
	M (Internal memory)	MX00000 – MX95983	MW00000 – MW59999		
GM2	l (Input)	IX00.0.0 – IX31.7.63	IW00.0.0 – IW31.7.3		
	Q (Output)	QX00.0.0 – QX31.7.63	QW00.0.0 – QW31.7.3		
	M (Internal memory)	MX00000 – MX95983	MW00000 – MW59999		
GM3, GM4	l (Input)	IX00.0.0 – IX07.7.63	IW00.0.0 – IW07.7.3		
	Q (Output)	QX00.0.0 – QX07.7.63	QW00.0.0 – QW07.7.3		
	M (Internal memory)	MX00000 – MX47991	MW00000 – MW32767		
GM6, GM7	l (Input)	IX00.0.0 – IX07.7.63	IW00.0.0 – IW07.7.3		
	Q (Output)	QX00.0.0 – QX07.7.63	QW00.0.0 – QW07.7.3		
	M (Internal memory)	MX00000 – MX23995	MW00000 – MW16383		

\* Additional description of input/output (IW/QW) address

**00.0.0**  $\longrightarrow$  The last digit corresponds to card number

 $\downarrow$   $\rightarrow$  Third digit corresponds to slot number (Slots start from 0 after the CPU)

First two digits correspond to the base number (starts from 0)

\* Card number description: cards with 16 points are labeled 0; cards with 32 points are labeled 0 for 0–15 bit, or 1 for 16–31 bit; cards with 64 points are labeled 0 for 0–15 bit, 1 for 16–31 bit, 2 for 32–47 bit, and 3 for 48–63 bit.