T-solution Leader in Electrics & Automation

GLOFA GM Series

Electric Equipment

LG Industrial Systems

www.lgis.com

IEC61131-3 Language / Open Network System

GM7

ISO9001

Number : E124950

GM6

GM4

Global standard (IEC61131-3) language

- IL (Instruction list)
- LD (Ladder diagram)
- SFC (Sequential function chart)

Dedicated CPU (one-chip) for high speed processing time

- GM4 (0.2μs/step)
- GM4C (0.12μs/step)
- GM6 (0.5μs/step)
- GM7 (0.5μs/step)

Convenient programming tool

- Windows 95/98/ME/NT/2000/XP based
- Editing, Monitoring, Debugging function by symbol
- Supports IL, LD, SFC language
- Simulation without PLC

International standard communication protocol suitable for CIM.

- Enet Modules (Ethernet, 10/100Mbps)
- Fnet Modules (Fieldbus, 1Mbps)
- Dnet Modules
  (DeviceNet, 125k, 250k, 500kbps)
- Pnet Modules
  (Profibus-DP, 9.6kbps~12Mbps)

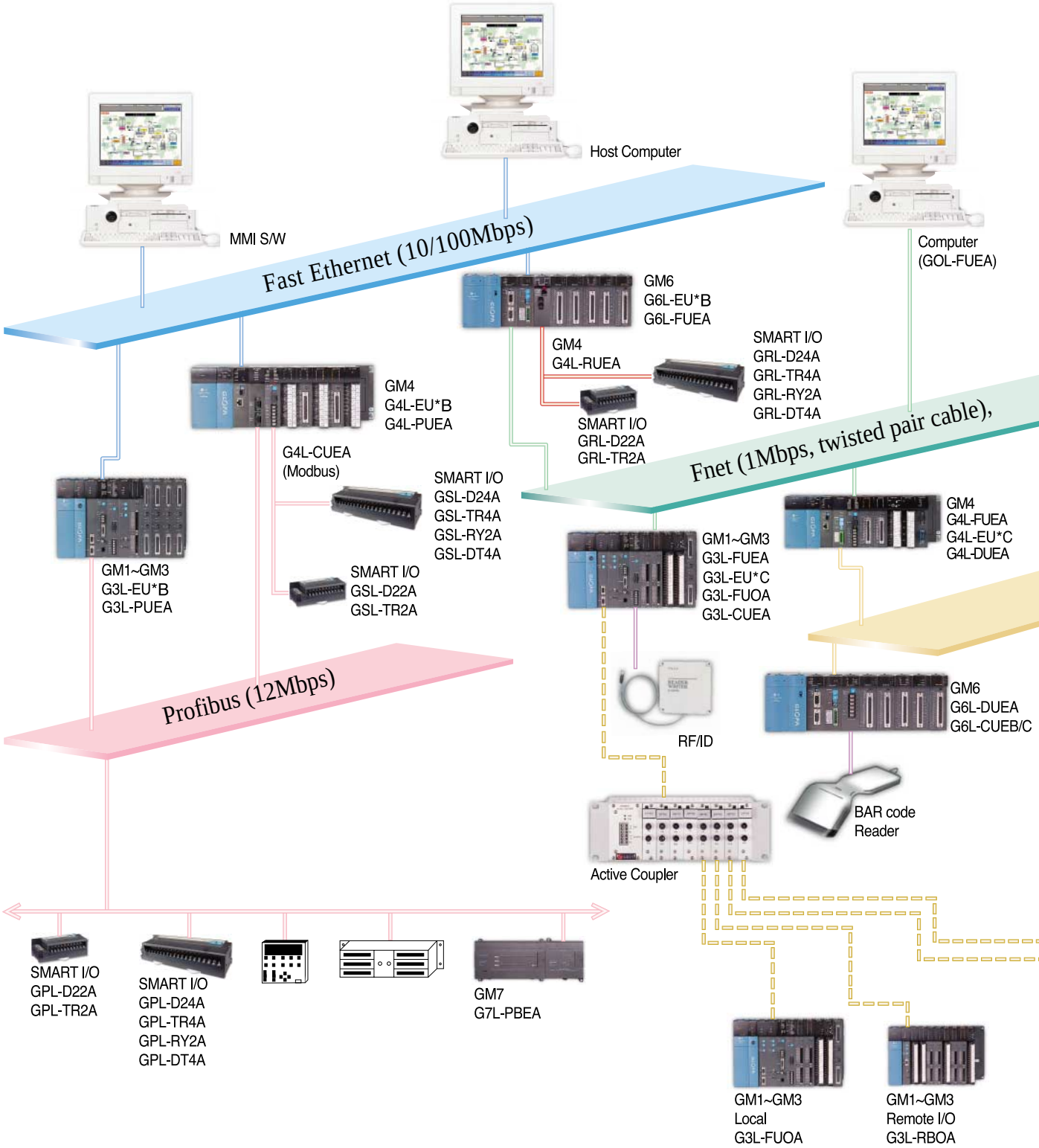
Various special function module

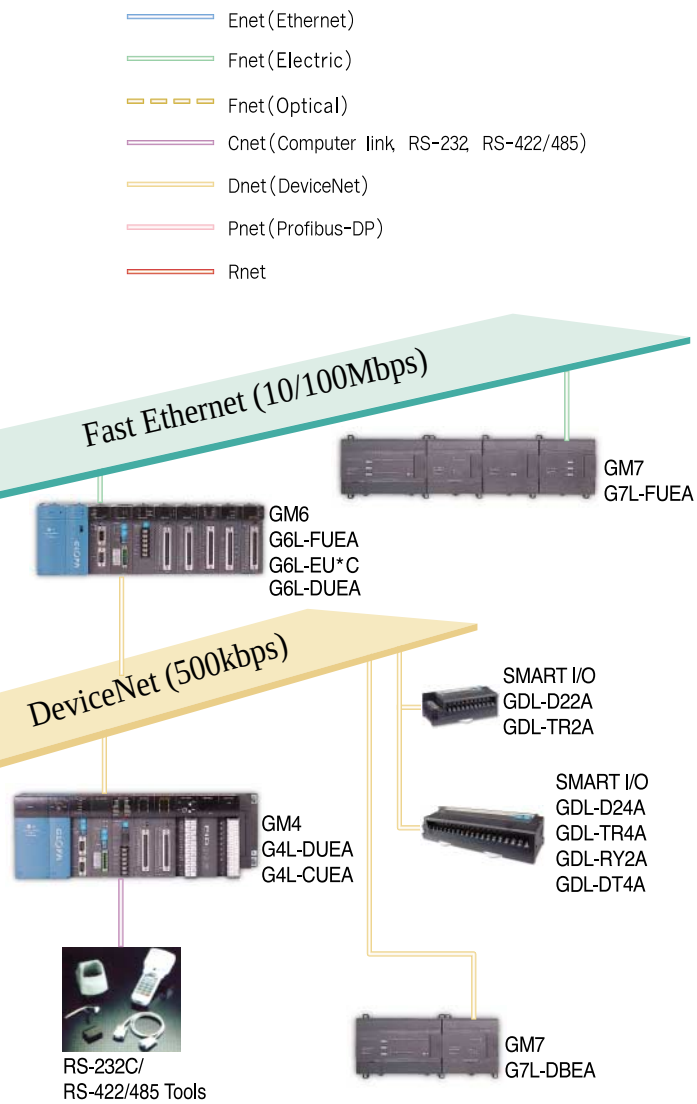
- Analog I/O modules
- High speed counter modules
- Position control modules
- RTD, Thermocouple input modules
- PID, Analog timer module

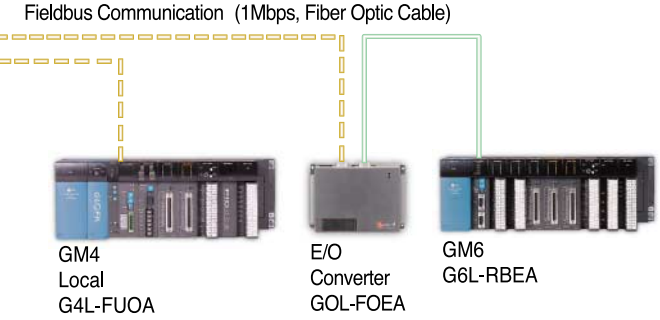
International standard Ethernet (GM4/6)

- Fast Ethernet (10/100Mbps)
- 10Base5, 10Base2, 10BaseT supported
  (GM4: 10Base5, 10BaseT)
- IEEE802.3 & Protocol
  (TCP/IP, UDP/IP, ARP, ICMP)
- Communication with other
  PLC Systems using function block (FB)
- Two types : open Ethernet, dedicated
  Ethernet

GLOFA-GM System covers from simple mechanical control to complicated process control







GLOFA Fast Ethernet (Ethernet)

- 10/100Mbps support (Fast Ethernet)
- 10Base5, 10Base2, 10BaseT (IEEE802.3)
- Communication with other Devices using Frame Editor S/W
- GMWIN service using Ethernet
- Simultaneous connection with max. 16 channels
- Various MMI S/W connection available
- High-speed process with 32-bit processor

GLOFA-Fnet (Fieldbus)

- Reliable & deterministic proprietary network (Circulated token passing)
- Transmission speed: 1Mbps
- Transmission media: Twisted pair/Fiber optic
- Max. distance: 5.25km (6 repeaters)
- Max. No. of stations: 64 (Master and Remote)

GLOFA-Cnet (Computer link)

- Communication using Cnet Frame Editor and function block
- Stand-alone or interlocking mode with RS-232C/RS-422/RS-485 ports
- Transmission speed: 300~76,800bps
- Dedicated & User-defined protocol service
- Modbus & DF1 (AB) protocol support

GLOFA-Dnet (DeviceNet)

- ODVA standard specification
- Transmission speed: 125~500kbps
- 63 slave modules control by one master module (Max. 2,048 pts)
- ODVA membership

GLOFA-Pnet (Profibus-DP)

- Profibus-DP standard specification
- Transmission speed: 9.6kbps~12Mbps
- Communication distance: 100~1,200m
- Max. 99 stations (32 station per segment) available
- Various slave devices provided by Profibus-DP venders

GLOFA-GM Series

Series	Specification				Network				
	Max. I/O points (Using remote I/O)	Execution speed (μs/step)	Memory capacity (byte)		Fast Enet	Fnet / Cnet	Dnet	Pnet	Rnet
			Program	Data					
GM4 	GM4-CPUA 2,048 GM4-CPUB 2,048 (8,192)	0.2	128K	64K	●	●	●	●	●
	GM4-CPUC * 3,584 (32,000)	0.12	1M	428K					
GM6 	384	0.5	68K	32K	●	●	●	●	●
GM7 	10~80	0.5	68K	32K	●	●	●	●	●

●Enet: Ethernet ●Fnet: Fieldbus ●Cnet: Computer Link ●Dnet: DeviceNet ●Pnet: Profibus-DP ●Rnet: Dedicated communication for LGIS SMART I/O

Series	Special modules						
	Analog I/O	High speed control	Position control	PID control	Thermocouple input	RTD	Analog timer
GM4 	7 Types G4F-AD3A (8Ch) G4F-AD2A (4Ch) G4F-DA3V (8Ch) G4F-DA2V (4Ch) G4F-DA3I (8Ch) G4F-DA2I (4Ch) G4F-DA1A (2Ch)	3 Types G4F-HSCA (1Ch) G4F-HO1A (2Ch) G4F-HD1A (2Ch)	6 Types G4F-PPXO G4F-PPXD * (Axis X=1, 2, 3)	3 Types G4F-PIDA (8 loops) G4F-PIDB (16 loops) G4F-TMCA (2 loops)	1 Type G4F-TC2A (4Ch)	1 Type G4F-RD2A (4Ch)	1 Type G4F-AT3A (8 points)
GM6 	3 Types G6F-AD2A (4Ch) G6F-DA2V (4Ch) G6F-DA2I (4Ch)	3 Types G6F-HSCA (1Ch) G6F-HO1A (2Ch) G6F-HD1A (2Ch) *	6 Types G6F-PPXO G6F-PPXD * (Axis X=1, 2, 3)	Built-in (CPUB/CPUC)	1 Type G6F-TC2A (4Ch)		
GM7 	2 Types G7F-ADHA (In 2Ch/Out 1Ch) G7F-AD2A (In 2Ch)	Built-in (1Ch)	Built-in (1Ch) (Pulse output)	Built-in			1 Type G7F-AT2A (4 points)

* G4F-PPXO: Open collector type, G4F-PPXD: Line drive type

General specifications

Item	Description				Standard
Ambient temperature	0~55℃ (32 ~131°F)				
Storage temperature	-25~70℃ (-13~167°F)				
Ambient humidity	5~95%RH (Non-condensing)				
Storage humidity	5~95%RH (Non-condensing)				
Vibration	Occasional vibration			3 times each direction, each axis	IEC61131-2
	Frequency	Acceleration	Pulse width		
	10≤f< 57㎐	-	0.075mm		
	57≤f≤150㎐	9.8㎨ (1G)	-		
	Continuous vibration				
	Frequency	Acceleration	Pulse width		
	10≤f< 57㎐	-	0.035mm		
	57≤f< 150㎐	4.9㎨ (0.5G)	-		
Shocks	· Peak Acceleration: 147 ㎨ (15G)				
	· Duration: 11ms				
	· Half-sine, 3 times each direction per each axis				
Impulse noise	Isolation		±1,500Vp-p		LGIS Standard
	Electrostatic discharge		±4kV		IEC61131-2/IEC801-2
	Radiated susceptibility		27~500MHz, 10V/m		IEC61131-2/IEC801-3
	Fast transient / burst noise	Power supply	Digital I/O (more than 24V)	Digital I/O (less than 24V)	IEC61131-2/IEC801-4
		2kV	1kV	0.25kV	
Operation condition	Free from corrosive gases and excessive dust				
Altitude	Up to 2,000m (6,562 ft)				

Technical specifications

Item		GM4-CPUA/B	GM4-CPUC	GM6	GM7
Control method		Cyclic execution of stored program, Interrupt task execution			
I/O Updating method		Program refresh per 1 scan			
Program languages		IL (Instruction list) / LD (Ladder diagram) / SFC (Sequential function chart)			
Configuration	Operator	IL: 21, LD: 13			
	Basic function	194	194 + 'real number ft.'	194	
	Special function block	Special function blocks for special modules			
Configuration speed	Operator	0.2㎲/step	0.12㎲/step	0.5㎲/step	
	Basic function/ Basic function block	0.2㎲/step	0.12㎲/step	0.5㎲/step	
Program capacity		128K *	1M	68K	
I/O points	Using 32pt module	1,024	1,792	384	10~80
	Using 64pt module	2,048	3,584	-	-
	Network	4,096 / 8,192	32,768	-	-
Direct variable area		2~16K	8~64K	2~8K	
Symbolic variable area *		52K	428K	32K	
Timer *		Not limited, Timer range: 0.001~4294967.295 sec (1,193 hours)			
Counter *		Not limited, Count range: -32,768~32,767			
Operation mode		RUN, STOP, PAUSE, DEBUG			
Data retention method at power failure		Set "retain" at data declaration			
Program block number		180		100	
Execution control element	Cyclic	(180 - Program blocks used in task)		100 - Task No.	
	Time driven (interval)	8	32	8	
	Event driven (external, interrupt)	8			
	Event driven (interrupt, single)	16		8	
	Initializing task	_INIT, _H _INIT		_INIT	
Self-diagnosis		Execution, Delay, Memory error, I/O error, Battery error, Power supply error			
Restart mode		Cold, Warm, Hot restart		Cold, Warm restart	

* K: kilobyte
* Symbolic variable area: Maximum symbolic area - Direct variable area
* One timer occupies 20 bytes in symbolic variable area
* One counter occupies 8 bytes in symbolic variable area

GM4

New

GM4-CPU

Features

- Max. I/O points: GM4A/B (2,048), GM4C (3,584)
- Fast processing time with high-speed gate array
- Fit for small- and medium-sized manufacturing line network
- In case of remote system configuration, large-scale control available
- Fast Enet, Fnet, DeviceNet, Profibus-DP support
- Downsizing and high performance/function
- Special function modules
  - Analog I/O, PID, High-speed counter, Position control (APM), AT, TC, RTD, etc

Specifications

GM4		GM4-CPUA	GM4-CPUB	GM4-CPUC	Remark
Operation method		Cyclic execution of stored program, Time-driven operation, Internal task operation			
I/O control method		Scan synchronized batch processing method (Refresh method)			
Program language		IL (Instruction list) / LD (Ladder diagram) / SFC (Sequential function chart)			
Number of instructions	Operator	LD: 13, IL: 21			
	Basic function	194		194+ 'Real number function'	
	Basic function block	11			
	Special function block	Each special module has its own special function block			
Processing speed	Operator	0.2㎲/instruction		0.12㎲/instruction	
	Basic function	0.2㎲/step		0.12㎲/step	
	Basic function block				
Real number operation		No		Yes	
Programming memory capacity		128K (32Ksteps)		1M	
I/O points	With 32-pt modules	1,024 points		1,792 points	
	With 64-pt modules	2,048 points		3,584 points	
	With remote I/Os	4,096 points	8,192 points	32,768 points	
Data memory	Direct variable area (DVA)	2~16K		8~64K	Setting in GMWIN
	Symbolic variable area (SVA)	52K-Direct variable area		428K-Direct variable area	
Timer		No limitation. Time range: 0.001~4294967.295 sec (1193 hours)			20 bytes per 1 timer in SVA
Counter		No limitation. Count range: -32,768~32,767			8 bytes per 1 counter in SVA
Operation mode		RUN, STOP, PAUSE, DEBUG			
Data retention at power failure		Set to 'Retain' at data declaration			
Program types	Scan	180 (Number of program blocks) - (Program blocks in task)			
	Time-driven tasks	8		32	
	External interrupt tasks	8			
	Internal tasks	16			
	Initialization tasks	2 (_INIT, _H_INIT)			
	Error tasks	None		1 (_ERR_SYS)	
Self-diagnostic functions		Watchdog timer, Memory error, I/O error, Battery error, Power supply error			
Restart mode		Cold, Warm, Hot			
Flash memory		External (128K)	Built-in (512K)	Built-in (6M)	CPUC: Program 1M, Upload 5M
Program port		RS-232C		RS-232C, USB	
Maximum extension stage		3		6 *	
Internal current consumption		130mA			

K: kilobyte

* For 6 stage extension you need to use special base (main, extension) and special extension cable. Reefer to P9 and P54, please.

Configuration

- GMWIN programming with IL, LD, and SFC

Power module		
AC 110V input	GM4-PA1A	DC 5V 4A output DC 24V 0.7A
	GM4-PA1B	DC 5V 3A output DC 24V 0.5A
AC 220V input	GM4-PA2A	DC 5V 4A output DC 24V 0.7A
	GM4-PA2B	DC 5V 3A output DC 24V 0.5A
	GM4-PA2C	DC 5V 6A output
DC 24V input	GM4-PD3A	DC 5V 4A output

CPU module	
Type	I/O points
GM4-CPUA	2,048 / 4,096
GM4-CPUB	2,048 / 8,192
GM4-CPUC	3,584 / 32,768

Memory module (Option)	
G4M-M032	128K *1)

I/O module								
Item	Input module			Output module			I/O hybrid module	
	AC 110V	AC 220V	DC 12/24V	Relay	Triac	Transistor	DC/Relay	DC/Transistor
16 points	G4I-A12A	G4I-A22A	G4I-D22A G4I-D22B	G4Q-RY2A	G4Q-SS2A G4Q-SS2B	G4Q-TR2A G4Q-TR2B	G4H-DR2A	G4H-DT2A
32 points	-	-	G4I-D24A G4I-D24B	-	-	G4Q-TR4A G4Q-TR4B	-	-
64 points	-	-	G4I-D28A	-	-	G4Q-TR8A	-	-

Item	Base			
I/O Slot	Main	Extension	Main (H)	Extension (H)
4	GM4-B04M	GM4-B04E	GM4-B4MH	GM4-B4EH
6	GM4-B06M	GM4-B06E	GM4-B6MH	GM4-B6EH
8	GM4-B08M	GM4-B08E	GM4-B8MH	GM4-B8EH
12	GM4-B12M *2)	-	-	-

Expansion cable		High function extension cable	
0.4m	G4C-E041	0.6m	G4C-E061
1.2m	G4C-E121	6m	G4C-E601
3m	G4C-E301	10m	G4C-E102
		15m	G4C-E152

Communication module		
Fast Enet I/F (Open)	G4L-EUTB	10/100BASE-Tx, UTP
	G4L-FUFB	100BASE-Fx, Fiber optic
	G4L-FU5B	10BASE-5, AUI
Fast Enet I/F Dedicated (Master)	G4L-EUTC	10/100BASE-Tx, UTP
	G4L-EUFC	100-BASE-Fx, Fiber optic
	G4L-EU5C	10BASE-5, AUI
Fast Enet I/F Dedicated (Slave)	G4L-ERTC	10/100BASE-Tx, UTP
	G4L-ERFC	100-BASE-Fx, Fiber optic
	G4L-ER5C	10BASE-5, AUI
Fnet I/F	G4L-FUEA	1Mbps, Twisted pair cable
	G4L-FUOA	1Mbps, Fiber Optic
Rnet I/F	G4L-RUEA	1Mbps, Twisted pair cable
Dnet I/F	G4L-DUEA	DeviceNet Master/Slave
Pnet I/F	G4L-PUEA	Profibus-DP Master/Slave (1K)
	G4L-PUEB	Profibus-DP Master/Slave (7K)
Cnet I/F	G4L-CUEA	RS-232C/422 1Ch each

Special module		
Analog input	G4F-AD2A/G4F-AD3A	4/8 Ch
Analog output	G4F-DA1A	2 Ch
	G4F-DA2I/G4F-DA3I	4/8 Ch
	G4F-DA2V/G4F-DA3V	4/8 Ch
Thermocouple input	G4F-TC2A	4 Ch
RTD input	G4F-RD2A	4 Ch
Analog timer	G4F-AT3A	8 points
PID control	G4F-PIDA/G4F-PIDB	8/16 loops
High speed counter	G4F-HSCA	1 Ch
	G4F-HD1A/G4F-HO1A	2 Ch
Position control	G4F-PPxD (X=1,2,3)	1/2/3 axes
Interrupt	G4F-INTA	16 points
Temperature control	G4F-TMCA	2 loops

*1) GM4-CPUB and GM4-CPUC have a built-in flash memory that you can't use memory module.
*2) In case of GM4-B12M, you can't extend I/O modules; the base and slot number of from slot number 8 to 11 is set as base number 1, slot number from 0 to 3.
In case of GM4-CPUA, you can't install a communication module after slot number 8.

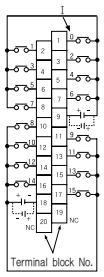
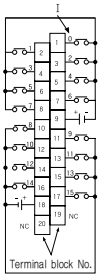
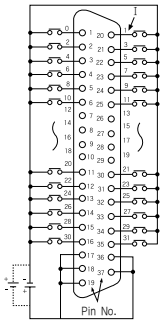
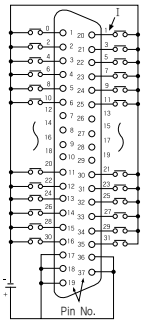
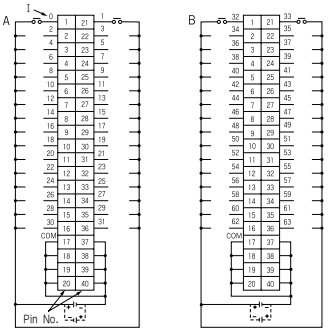
Input/Output modules

Features

- 16/32/64 points
- Insulated by photocoupler
- Operation status monitoring by LED
- Easy maintenance with terminal block & one touch installation

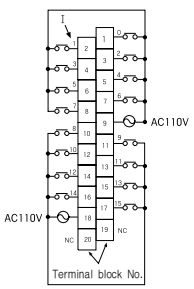
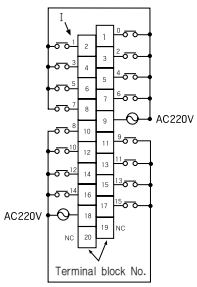
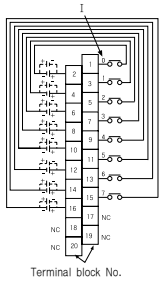
Input module specifications

Input type		DC Input				
Part number		G4I-D22A/C	G4I-D22B	G4I-D24A/C	G4I-D24B	G4I-D28A
Input point		16 points		32 points		64 points
Rated input voltage		DC 12/24V *1)				
Rated input current		5/11mA		3/7mA		3/6mA
On voltage/current		DC 9.5V or more/4mA or more		DC 9.5V or more/3mA or more		
Off voltage/current		DC 6V or less/1.0mA or less				
Response time	Off → On	10ms or less				
	On → Off	10ms or less				
Common		8 points/1COM		32 points/1COM		
Type		Source/Sink	Source (+COM)	Source/Sink	Source (+COM)	Source/Sink
Operating indicator		LED				
Insulation method		Photocoupler insulation				
Current consumption (DC 5V)		70mA		75mA		250mA

G4I-D22/	G4I-D22B	G4I-D24/	G4I-D24B	G4I-D28A *2)
				

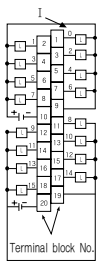
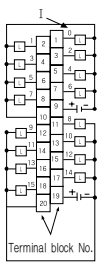
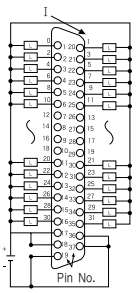
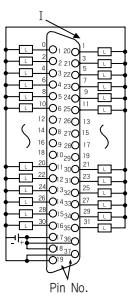
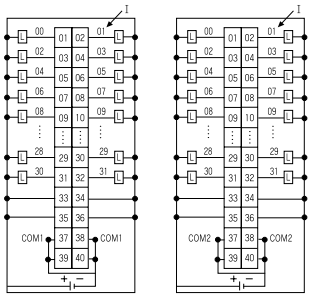
*1) G4I-D2xC modules are 24V input only and on voltage 19.6V.
*2) G4I-D28A is a connector-type module.

Input type		AC Input		Interrupt
Part number		G4I-A12A	G4I-A22A	G4F-INTA
Input point		16 points		8 points
Rated input voltage		AC 100~120V (50/60Hz)	AC 200~240V (50/60Hz)	DC 24V
Rated input current		11mA		10mA
On voltage/current		AC 80V or more/6mA or more	AC 150V or more/4.5mA or more	DC 15V or more
Off voltage/current		AC 30V or less/3mA or less	AC 50V or less/3mA or less	DC 5V or less
Response time	Off → On	15ms or less		0.5ms or less
	On → Off	25ms or less		0.5ms or less
Common		8 points/1COM		1 point/1COM
Operating indicator		LED		
Insulation method		Photocoupler insulation		
Current consumption (DC 5V)		70mA		

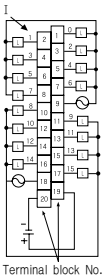
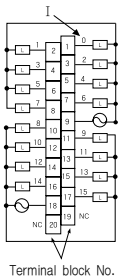
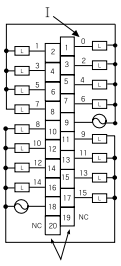
G4I-A12A	G4I-A22A	G4F-INTA
		

Output module specifications

Output type		Transistor output				
Part number		G4Q-TR2A	G4Q-TR2B	G4Q-TR4A	G4Q-TR4B	G4Q-TR8A
Output point		16 points		32 points		64 points
Rated load voltage		DC 12/24V				
Rated load current	1 Point	0.5A		0.1A		
	1 Common	3A/1COM		2A/1COM		
Response time	Off → On	2ms or less				
	On → Off	2ms or less				
Common		8 points/1COM		32 points/1COM		
Operating indicator		LED				
Type		Sink (-COM)	Source (+COM)	Sink (-COM)	Source (+COM)	Sink (-COM)
Insulation method		Photocoupler insulation				
Surge absorber		Varistor				
Current consumption (DC 5V)		100mA		160mA		250mA
External power supply		DC 24V				

G4Q-TR2A	G4Q-TR2B	G4Q-TR4A	G4Q-TR4B	G4Q-TR8A *1)
				

Output type		Relay output	Triac output	
Part number		G4Q-RY2A	G4Q-SS2A	G4Q-SS2B
Output point		16 points		
Rated load voltage		DC 12/24V, AC 110/220V (50/60Hz)	AC 100~240V (50/60Hz)	
Rated load current	1 Point	2A	1A	0.6A
	1 Common	4A/1COM	5A/1COM	2.4A/1COM
Response time	Off → On	10ms or less	0.5cycle +1ms or less	
	On → Off	12ms or less	0.5cycle +1ms or less	
Common		8 points/1COM		
Operating indicator		LED		
Type		-		
Insulation method		Photocoupler insulation		
Surge absorber		-	Varistor, CR absorber	
Current consumption (DC 5V)		100mA	330mA	
External power supply		DC24V	-	

G4Q-RY2A *2)	G4Q-SS2A	G4Q-SS2B
		

*1) G4Q-TR8A is a connector-type module.

*2) In case of G4Q-RY2A, you need to input DC 24V for its operation.

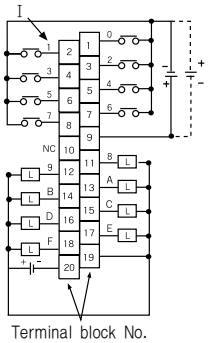
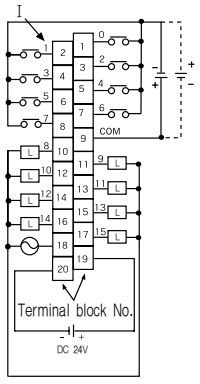
Input/Output modules

I/O hybrid module specifications

Input type		DC Input			
Part number		G4H-DT2A		G4H-DR2A	
Input point		8 points			
Rated input voltage		DC 12V	DC 24V	DC 12V	DC 24V
Rated input current		5mA	11mA	5mA	11mA
On voltage/current		DC 9.5V or more/4.0mA or more			
Off voltage/current		DC 6V or less/1.0mA or less			
Response time	Off → On	10ms or less			
	On → Off	10ms or less			
Common		8 points/1COM			
Operating indicator		LED			
Insulation method		Photocoupler insulation			
Current consumption (DC 5V)		100mA			

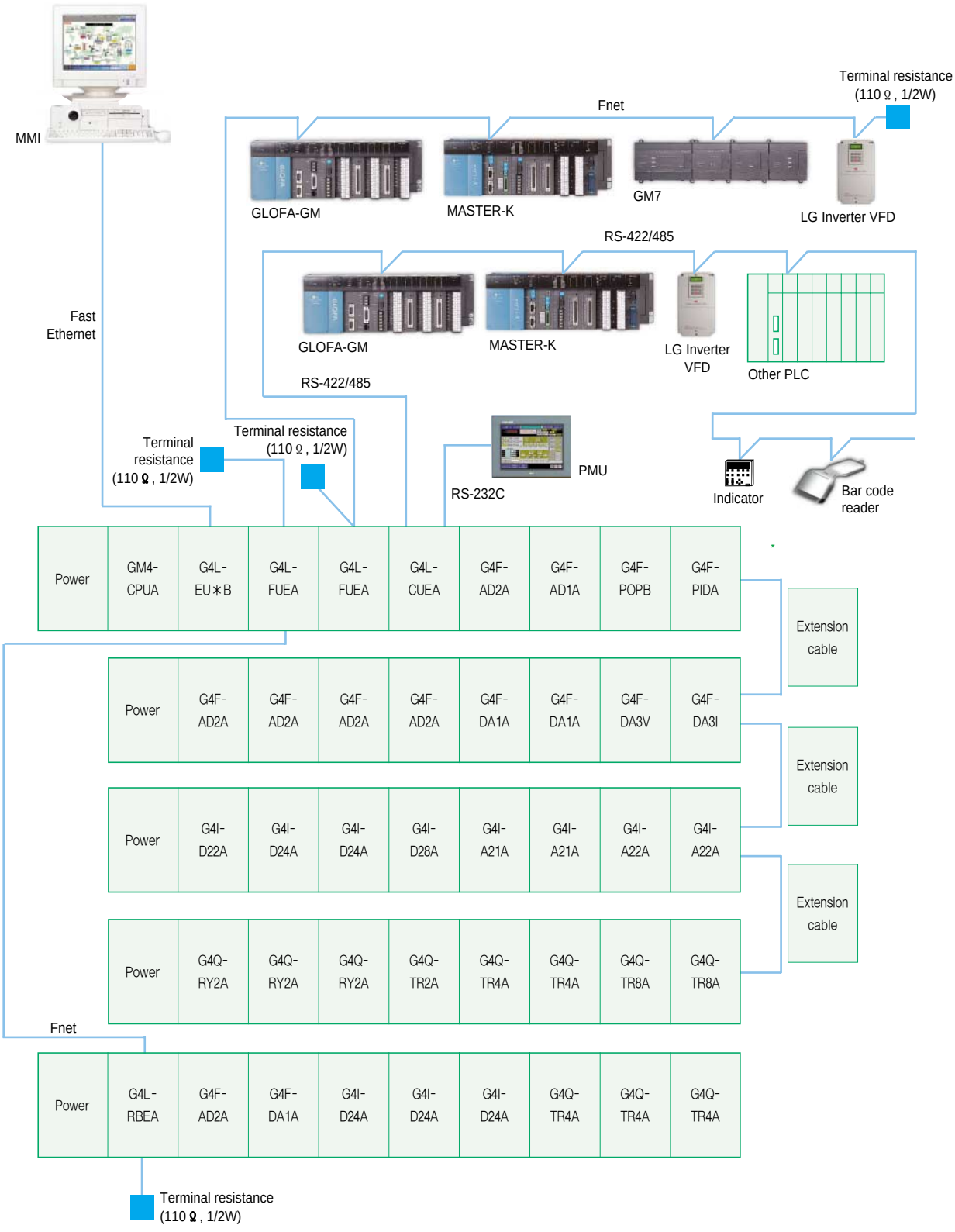
Output type		Transistor output	Relay output
Part number		G4H-DT2A	G4H-DR2A
Output point		8 points	
Rated load voltage		DC 12/24V	DC 24V/AC 220V (50/60Hz)
On voltage drop		DC 1.5V or less	-
Off leakage current		0.1mA or less	
Rated load current		0.5A/1 point	2A/1 point
		3A/1COM	5A/1COM
Response time	Off → On	2ms or less	10ms or less
	On → Off	2ms or less	10ms or less
Common		8 points/1COM	
Operating indicator		LED	
Insulation method		Photocoupler insulation	
Surge absorber		Varistor	-

Wiring diagram

G4H-DT2A	G4H-DR2A *1)
	

*1) In case of G4H-DR2A, you need to input DC 24V for its operation.

Network configurations



* In GM4-CPUA, you can't install a communication module in extension base and up to two high-speed communication modules (Dnet, Enet, FEnet, Fnet, Pnet, Rnet) are available.
In case of GM4-CPUB and GM4-CPUC, you can install a communication module in extension base and up to four/eight high-speed communication modules (Dnet, Enet, FEnet, Fnet, Pnet, Rnet) are available.

GM6-CPU

Features

- High performance features with compact size
- High-speed processing using dedicated CPU
- Designed by international standard language (IEC61131-3): IL, LD, SFC
- Max. I/O points: 384 points

Specifications

GM6		GM6-CPUA	GM6-CPUB	GM6-CPUC	Remark
Operation method		Cyclic execution of stored program, Time-driven operation, Internal task operation			
I/O control method		Scan synchronized batch processing method (Refresh method)			
Program language		IL (Instruction list) / LD (Ladder diagram) / SFC (Sequential function chart)			
Number of Instructions	Operator	LD: 13, IL: 21			
	Basic function	194			
	Basic function block	11			
	Special function block	Each special module has its own special function block			
Processing speed	Operator	0.5μs/instruction			
	Basic function	0.5μs/step			
	Basic function block				
Programming memory capacity		68K			Built-in flash memory (128K)
I/O points	With 32-pt modules	192 points			
	With 64-pt modules	384 points			
	With remote I/Os	512 points			
Data memory	Direct variable area (DVA)	2~8K			Setting in GMWIN
	Symbolic variable area (SVA)	30K - Direct variable area			
Timer		No limitation. Time range: 0.001~4294967.295 sec (1193 hours)			20 bytes per 1 timer in SVA
Counter		No limitation. Count range: -32,768~32,767			8 bytes per 1 counter in SVA
Operation mode		RUN, STOP, PAUSE, DEBUG			
Data retention at power failure		Set to 'Retain' at data declaration			
Number of program blocks		100			
Program types	Scan	100 - (Number of program blocks)			
	Time-driven tasks	8			8 in total
	External interrupt tasks	8			
	Internal tasks	8			
	Initialization task	1 (_INIT)			
Self-diagnostic functions		Watchdog timer, Memory error, I/O error, Battery error, Power supply error			
Restart mode		Cold, Warm			
Base type		4/6/8/12 slot *1)			Extension is not available
Built-in functions		· Cnet (RS-232C) *2)	· PID control · Cnet (RS-422/485) · RTC function	· PID control · Cnet (RS-232C) *2) · HSC (50kHz) · RTC function	
Internal current consumption		170mA	210mA	170mA	

*1) In case of GM6-B12M, the module installed in slot number 8 or later is designated as base number 1 and slot number 0 or later; the suitable power module for GM6-B12M is GM6-PAFC, which can't support an analogue module. For analog modules or TC module, you are supposed to use GM6-PAFB or GM6-PDFB considering internal current consumption of each module.
Communication modules are not to be installed in after slot number 7.

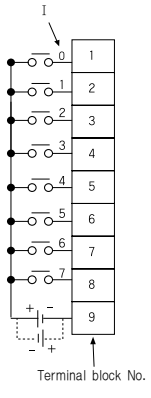
*2) Built-in RS-232C port: 4 (Rx), 7 (Tx), 5 (SG)

Input/Output modules

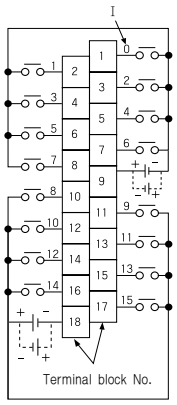
Input module specifications

Input type		DC Input					AC Input *1)	
Part number		G6I-D21A	G6I-D22A	G6I-D22B	G6I-D24A	G6I-D24B	G6I-A11A	G6I-A21A
Input point		8 points	16 points		32 points		8 points	
Rated input		DC 12/24V	DC 12/24V	DC 24V	DC 12/24V	DC 24V	AC 100~120V	AC 100~240V
Rated input current		3/7mA	3/7mA	7mA	3/7mA	7mA	7mA	5/11mA
On voltage/current		DC 9.5V or more/ 3.5mA or more	DC 9.5V or more/ 3.5mA or more	DC 15V or more/ 4.3mA or more	DC 9.5V or more/ 3.5mA or more	DC 15V or more/ 4.3mA or more	AC 80V or more/ 5mA or more	AC 80V or more/ 3mA or more
Off voltage/current		DC 5V or less/ 1.5mA or less	DC 5V or less/ 1.5mA or less	DC 5V or less/ 1.7mA or less	DC 5V or less/ 1.5mA or less	DC 5V or less/ 1.7mA or less	AC 30V or less/ 2mA or less	AC 30V or less/ 1mA or less
Response time	Off→On	5ms or less	5ms or less	5ms or less	5ms or less	5ms or less	15ms or less	15ms or less
	On→Off	5ms or less	5ms or less	5ms or less	5ms or less	5ms or less	25ms or less	25ms or less
Common		8 points/1COM			32 points/1COM		8 points/1COM	
Operating indicator		LED						
Insulation method		Photocoupler insulation						
Current consumption (DC 5V)		40mA	70mA		75mA		35mA	

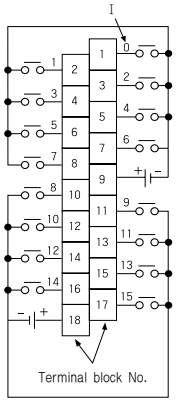
G6I-D21A



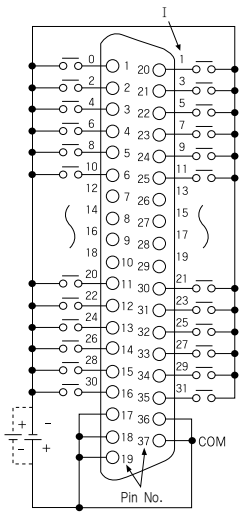
G6I-D22A



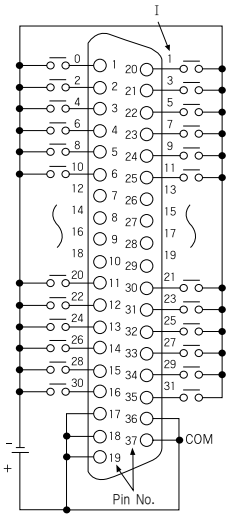
G6I-D22B



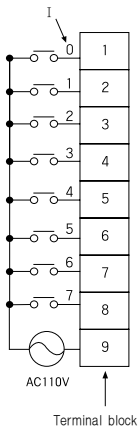
G6I-D24A



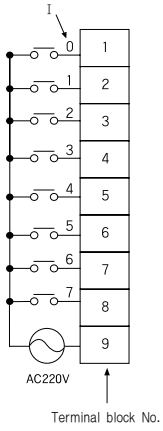
G6I-D24B



G6I-A11A



G6I-A21A

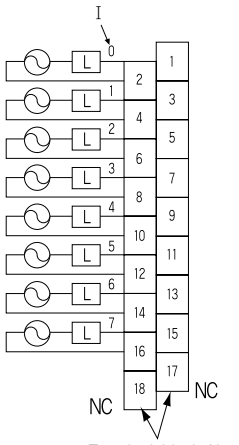
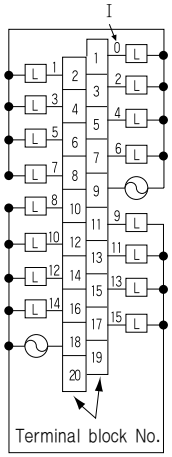
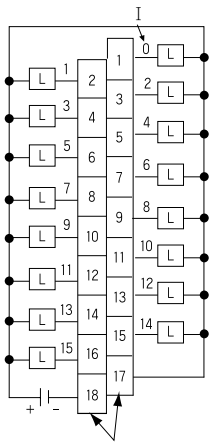
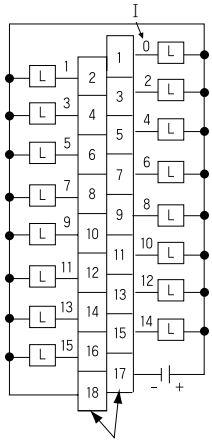


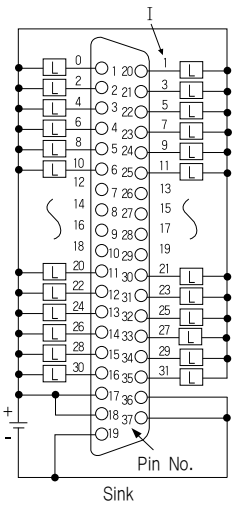
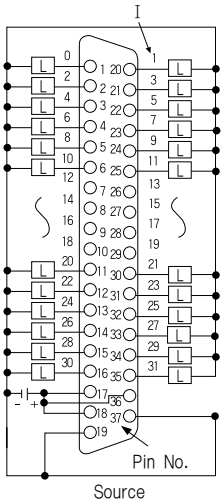
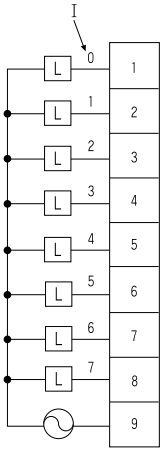
*1) AC input modules: 50/60Hz

Output module specifications

Output module type		Relay output		Transistor output				Triac output
Part number		G6Q-RY1A	G6Q-RY2A	G6Q-TR2A	G6Q-TR2B	G6Q-TR4A	G6Q-TR4B	G6Q-SS1A
Output point		8 points	16 points	16 points	16 points	32 points	32 points	8 points
Rated load voltage		DC 12/24V, AC 110/220V (50/60Hz)		DC 12/24V				AC 110/220V (50/60Hz)
Off leakage current		0.1mA or less						2.5mA or less
On voltage drop		-		DC 1.5V or less		DC 2.5V or less	DC 3V or less	AC 1.5V or less
Rated load current	1 Point	2A		0.5A		0.1A		1A
	1 Common	-	5A	3A		2A		4A
Response time	Off → On	10ms or less		2ms or less				1ms or less
	On → Off	12ms or less		2ms or less				0.5cycle+1ms or less
Common		1 point/1COM	8 points/1COM	16 points/1COM		32 points/1COM		8 points/1COM
Operating indicator		LED						
Insulation method		Relay		Photocoupler				
Surge absorber		-		Clamp diode				Varistor, CR absorber
Current consumption (DC 5V)		210mA	400mA	180mA	170mA	140mA	145mA	190mA
External power supply		-		DC24V				-

* G6Q-TR2A/TR4A: Sink type, G6Q-TR2B/TR4B: Source type

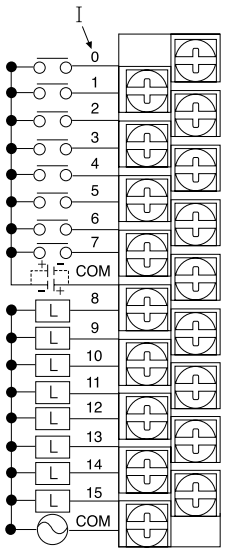
G6Q-RY1A	G6Q-RY2A	G6Q-TR2A	G6Q-TR2B
			

G6Q-TR4A	G6Q-TR4B	G6Q-SS1A
		

I/O hybrid module specifications

GM6					
G6H-DR2A					
Input			Output		
Input point		8 points	Output point		8 points
Insulation method		Photocoupler	Insulation method		Relay
Rated input voltage		DC 12/24V	Rated load voltage/current		DC 24V, 2A (Resistance)/1 point, 4A/COM AC 220V, 2A (COS ϕ =1)/1 point, 4A/COM
Rated input current		3/7mA	Min. load voltage/current		DC 5V/1mA
Operating voltage range		DC 10.2~28.8V (Ripple rate < 5%)	Max. load voltage		AC 250V, DC 125V
Max. simultaneous input		8 points	Off leakage current		0.1mA (AC 220V, 60Hz)
On voltage/current		DC 9.5V/3.5mA or more	Max. switching frequency		1,200 times/hour
Off voltage/current		DC 5V/1.5mA or less	Surge absorber		-
Input resistance		3.3㏀	Service life	Mechanical	20 million times or more
Response time	Off → On	5ms or less		Electrical	10,000 times or more (Rated load V/C)
	On → Off	7ms or less	Response time	Off → On	10ms or less
-		-		On → Off	12ms or less
Common		8 points/1COM	Common		8 points/1COM
Operating indicator		LED	Operating indicator		LED
External connection		18-point terminal block connector (M3×6 screws)			
Current consumption (DC 5V)		250mA			
Weight		200g			

G6H-DR2A



GM7 Main unit

Features

- High function and high performance with dedicated MPU chip
  - IEC61131
- GLOFA-GM Network
  - Fnet, Rnet as master module
  - DeviceNet, Profibus-DP as slave module
- Various built-in functions
  - High speed counter 1 point (1-phase 16kHz, 2-phase 8kHz)
  - Pulse output 1 point (2kHz only available in Tr-type output module)
  - PID loop with autotuning
  - Pulse catch 8 points (pulse catch: Min. 0.2ms)
  - Input filter (Noise reduction)
  - External interrupt point: 8 points (Task program execution by external interrupt input)
  - RS-232C interface 1 channel (Built-in Cnet): dedicated, User-defined, Modbus protocol

* G7M-DR10A, G7M-DR10A(/DC), G7M-DT10A: RS-232C and RS-485 port are embedded. (Simultaneous use is not allowed) and a communication option module is not available.

Specifications

Item			Content	Remark
Operation method			Cyclic execution of stored program, Time-driven operation, Internal task operation	
I/O control method			Scan synchronized batch processing method (Refresh method)	Immediate input/output is available by 'Direct I/O' function
Program language			IL (Instruction list) / LD (Ladder diagram) / SFC (Sequential function chart)	
Number of Instructions	Operator		LD: 13, IL: 21	
	Basic function		194	
	Basic function block		11	
	Special function block		Each special module has its own special function block	
Processing speed	Operator		0.5㎲/instruction	
	Basic function/function block		0.5㎲/step	
Programming memory capacity			68K	Built-in flash memory (128K)
I/O points			From 10 to 80 points (according to modules)	
Data memory	Direct variable area (DVA)		2~8K	Setting in GMWIN
	Symbolic variable area (SVA)		32K - Direct variable area	
Timer			No limitation. Time range: 0.001~4294967.295 sec (1193 hours)	20 bytes per 1 timer in SVA
Counter			No limitation. Count range: -32,768~32,767	8 bytes per 1 counter in SVA
Operation mode			RUN, STOP, PAUSE, DEBUG	
Data retention at power failure			Set to 'Retain' at data declaration	
Number of program blocks			100	
Program types	Scan		100 - (Number of program blocks)	
	Time-driven tasks		8	8 in total
	External interrupt tasks		8	
	Internal tasks		8	
	Initialization task		1 (_INIT)	
Self-diagnostic functions			Watchdog timer, Memory error, I/O error, Battery error, Power supply error	
Restart mode			Cold, Warm	
Built-in function	PID control		Control by function block, Autotuning, Forward/Reverse operation, Manual output, Operation scan time setting	
	Cnet interface *1)		Dedicated, Modbus, User-defined protocol	
	HSC	Counting speed	1-phase 16kHz, 2-phase 8kHz	
		Counting method	1-phase up/down counter (Up/down: Selection by program) 1-phase up/down counter (Up/down: Selection by B-phase) 2-phase up/down counter (Up/down: Automatic selection by phase difference)	
		Multiplication	1, 2 or 4	
		Task program running	Task program running when the current value of HSC reaches the setting value	
	Pulse catch		Min. pulse width: 2ms, Maximum 8 points	
	Pulse output		2kHz, 1Ch	
	External interrupt input		8 points	
	Input filter function		0~15ms (Setting by 1ms)	

*1) Built-in RS-232C signal: 4 (Rx), 7 (Tx), 5 (SG)

Input/Output specifications

Input/Output (Base & Expansion module)

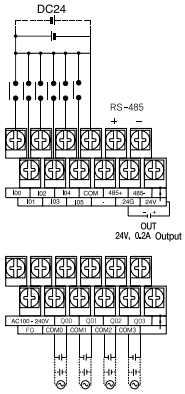
Item \ Type			Base					Expansion
			G7M-DR10A (/DC)	G7M-DR20A (/DC)	G7M-DR30A (/DC)	G7M-DR40A (/DC)	G7M-DR60A (/DC)	G7E-DR10A
			G7M-DT10A	G7M-DT20A	G7M-DT30A	G7M-DT40A	G7M-DT60A	-
Input	Main power		G7M-DT□□A, G7M-DR□□A: AC 100~240V (50/60Hz) G7M-DR□□A/DC: DC 24V					
	Input point		6	12	18	24	36	6
	Insulation method		Photocoupler					
	Rated input voltage		DC 24V					
	Rated input current		7mA					
	Operating voltage range		DC 20.4~28.8V (Ripple rate < 5%)					
	Max. simultaneous input		100% Simultaneous ON					
	On voltage/current		9.5V/5.7mA					
	Input resistance		3.3㏀					
	Response time	Off → On	15ms or less *1)					
		On → Off	15ms or less *1)					
	Operating indicator		LED					
	External connection		Terminal block (M3×6 screws)					
Item \ Type			G7M-DR10A (/DC)	G7M-DR20A (/DC)	G7M-DR30A (/DC)	G7M-DR40A (/DC)	G7M-DR60A (/DC)	G7E-DR10A
Relay output	Output point		4	8	12	16	24	4
	Output device		Relay					
	Insulation method		Relay insulation					
	Rated load voltage/current		DC 24V/2A, AC 220V/2A (COSϕ=1)/1 point, 5A/COM					
	Min. load voltage/current		DC 5V/1mA					
	Max. load voltage		AC 250V, DC 110V					
	Off leakage current		0.1mA or less					
	Surge absorber		-					
	Service life	Mechanical	20 million times or more					
		Electrical	100 times or more (Rated load voltage)					
	Response time	Off → On	10ms or less					
		On → Off	12ms or less					
	Operating indicator		LED					
	External connection		Terminal block (M3×6 screws)					
Item \ Type			G7M-DT10A	G7M-DT20A	G7M-DT30A	G7M-DT40A	G7M-DT60A	-
Tr. output	Output point		4	8	12	16	24	-
	Rated load voltage		DC 12/24V					
	Rated load current		0.5A/1 point, 3A/COM					
	Off leakage current		0.1mA or less					
	Response time	Off → On	2ms or less					
		On → Off	2ms or less					
	Common		4 points/1COM or 8 points/1COM, Sink					
	Operating indicator		LED					
	Insulation method		Photocoupler					
	Surge absorber		Clamp diode					
	Current consumption (DC 5V)		170mA					

*1) 1ms-unit setting is available in parameter (1~15ms)

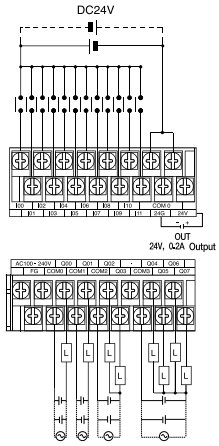
Wiring diagram

Input/Output (Relay output)

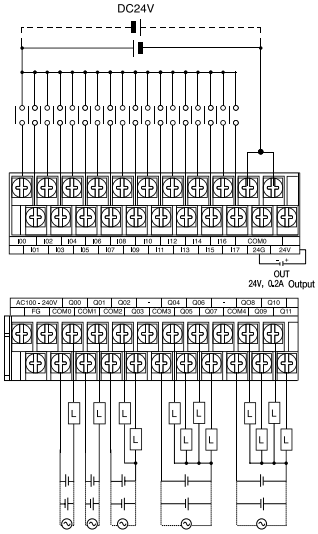
G7M-DR10A(/DC)



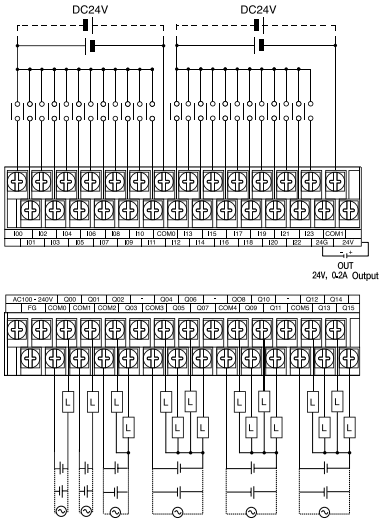
G7M-DR20A(/DC)



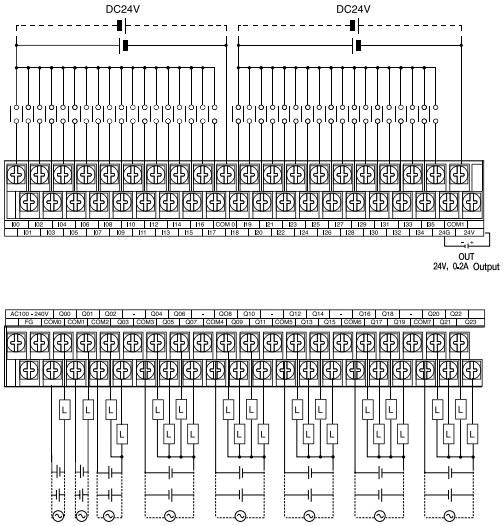
G7M-DR30A(/DC)



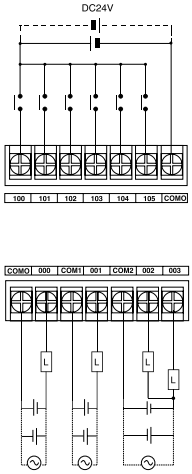
G7M-DR40A(/DC)



G7M-DR60A(/DC)



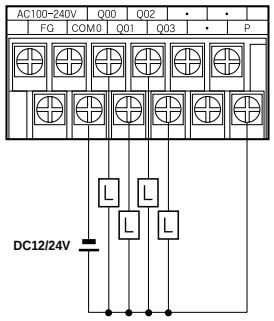
G7E-DR10A



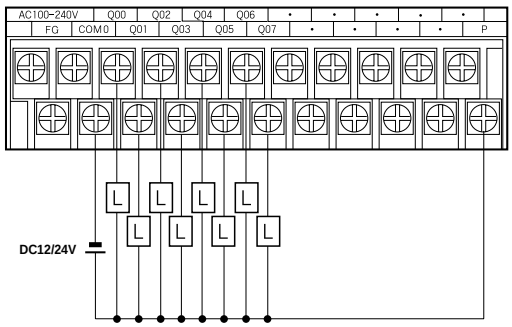
* You should use DC24V for G7M-DRxxA/DC operation.

Output (Transistor output)

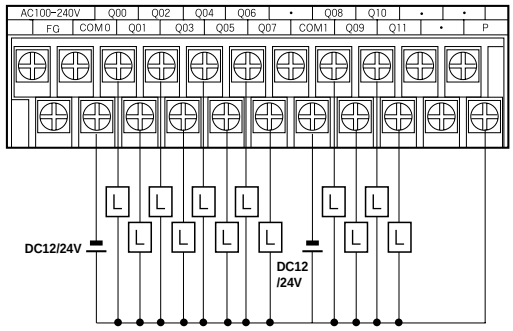
G7M-DT10A



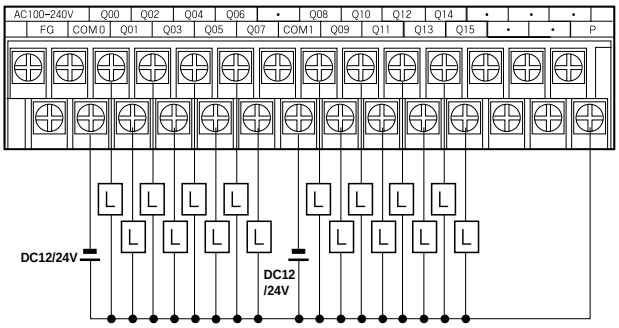
G7M-DT20A



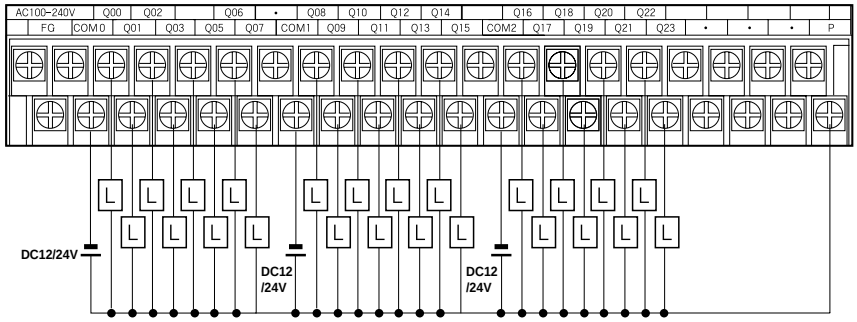
G7M-DT30A



G7M-DT40A



G7M-DT60A



*1) Input terminal of transistor output modules is identical to that of relay output.
*2) You should connect DC24V to P terminal when you use an external power supply for load operation.

Expansion unit

Analog Input/Output unit

Item			G7F-ADHA	G7F-AD2A
Analog input	Input range	Voltage	DC 0~10V	
		Current	DC 0~20mA or 4~20mA	
	Digital output		0~4,000 (12bits)	
	Voltage/current selection		· Selection by dip switch · Short I and V terminal for current input	Input terminal selection
	Number of channel		2 Channels	4 Channels
	Absolute max. input	Voltage	DC -0.5V, +12V	
		Current	DC -2mA, +25mA	
Analog output	Digital output		0~4,000 (12bits)	
	Analog output	Voltage	DC 0~10V (External load impedance: 2㏀~1㏁)	
		Current	DC 0~20mA (External load impedance: 560Ω or less)	
	Voltage/current selection		Separate terminal connection	
	Number of channel		1 Channel	
	Absolute Max. input	Voltage	DC +15V	
		Current	DC +24mA	
Maximum resolution		DC 0~10V	2.5mA (1/4000)	
		DC 0~20mA	5㎂ (1/4000)	
		DC 4~20mA	5㎂ (1/3200)	
Accuracy			±0.5% or less (Full scale)	
Conversion time			Scan time + 1.5ms/channel	Scan time + 2ms/channel
Insulation method			Photocoupler between input terminal and ground (No insulation between channels)	
External wiring			14 points terminal block	
Power supply			DC 24V, 80mA	DC 24V, 100mA
Current consumption			DC 5V, 10mA	+5/100mA, +15V/100mA, -15V/50mA
Weight			235g	300g

Analog timer unit (G7F-AT2A)

Item	Specifications
Number of timer	4 points
Digital output range	0~200 (8 bits)
Setting type	Setting by variable resistance
Accuracy	±2.0% (Full scale)
Operating method	By function block (AT2RD)
Current consumption	50mA
Weight	200g

System configuration

● **Base unit**
- Processing speed: 0.5㎲
- Program capacity: 64K
- Type
  G7M-DR10A, G7M-DR10A/DC, G7M-DT10A
  G7M-DR20A, G7M-DR20A/DC, G7M-DT20A
  G7M-DR30A, G7M-DR30A/DC, G7M-DT30A
  G7M-DR40A, G7M-DR40A/DC, G7M-DT40A
  G7M-DR60A, G7M-DR60A/DC, G7M-DT60A

● **Digital input/output expansion unit**
- G7E-DR10A: DC in 6 points/relay out 4 points

● **Special unit**
- Analog I/O: Input 2 channels, output 1 channel
- Analog input: 4 channels
- Analog timer: 4 points

● **Communication unit**
- Cnet: RS-232C, RS-422 • Fnet (master)
- Rnet (master) • DeviceNet (slave)
- Profibus-DP (slave)

● **Available system (3 units in total)**
- Digital I/O: 2 units
- Analog I/O: 2 units
- Analog input: 2 units
- Analog timer: 3 units
- Communication unit: 1 unit

● **Option pack**
- RTC (Real timer clock) pack
- Memory pack (for program back-up)

* You can't attach a communication unit to G7M-DR10A, G7M-DR10A(/DC) or G7M-DT10A.
And you can use only one communication port/unit (simultaneous use is not allowed) in GM7 series.

Cnet interface unit (G7L-CUEB, G7L-CUEC)

Item		Specifications
Functions		G7L-CUEB: RS-232C interface (modem connectable)
		G7L-CUEC: RS-422/485 interface
Communi-cation mode	Dedicated mode	Supports 1:1, 1:N communication and high-speed link communication
	GMWIN mode *1)	Supports remote programming and monitoring
	Modbus mode	Supports master/slave function with Modbus protocol (ASCII, RTU)
	User-defined mode	Supports user-defined protocol communication
Data structure	Data bit	7 or 8
	Stop bit	1 or 2
	Start bit	1 or 2
	Parity bit	EVEN/ODD/NONE
Synchronization		Asynchronous method
Transmission speed		1200/2400/4800/9600/19200/38400/57600bps
Setting method		Communication parameter setting in GMWIN
Distance		Max. 15m (G7L-CUEB), Max. 500m (G7L-CUEC)
Max. number of stations		Max. 32 stations (G7L-CUEC)
Weight		180g

*1) A dial-up modem is not available in GMWIN mode.

Fnet interface unit (G7L-FUEA)

Item		Specifications
Transmission speed		1Mbps
Communi-cation	Segment	Max. 750m
	Repeater (up to 6)	Max. 5.25km
Max. number of station		Max. 64 stations
Setting method		Communication parameter setting in GMWIN
Cable		Shielded twisted pair cable
Weight		220g

Profibus-DP interface unit (G7L-PBEA)

Item		Specifications
Network type		Profibus - DP (Slave)
Protocol		EN50170/DIN19245
Media access		Token passing & Poll
Transmission distance and speed		1200m (9.6~187kbps)/400m (500kbps)/200m (1.5Mbps)/100m (3~12Mbps)
Max. node	Network	127 stations
	Segment	32 stations
Interface		RS-485 (Electric)
Setting method		Communication parameter setting in GMWIN
Cable		Shielded twisted pair cable
Weight		210g

DeviceNet interface unit (G7L-DBEA)

Item	Specifications			
Network structure	Trunk/drop line			
Protocol	Peer explicit message, Predefined explicit message			
	Predefined I/O message (Poll, Bit-strobe, COS, Cyclic)			
Transmission distance and speed	Speed	Network distance	Drop cable	Total drop cable
	500kbps	100m or less	6m or less	39m or less
	250kbps	250m or less	6m or less	78m or less
	125kbps	500m or less	6m or less	156m or less
Max. number of stations	64 stations			
Diagnosis	CRC error check/Scan list use			
Setting method	Communication parameter setting in GMWIN			
Cable	5 lines (Signal 2 lines, Power 2 lines, Shield 1 line)			

*1) GMWIN mode is not available in case of a dial-up modem.

*2) You can't attach a communication unit to G7M-DR10A, G7M-DR10A(/DC) or G7M-DT10A. And you can use only one communication port/unit (simultaneous use is not allowed) in GM7 series.

GLOFA-Fast Enet (Ethernet) system

Features

- 10/100BASE-TX, 100BASE-FX (optical), 10BASE-5 support
- High reliability and performance
  - 32-bit processor
- Open (Information level) Ethernet and LGIS dedicated (between LG PLCs) Ethernet
- Internet service support: open Ethernet
  - E-mail send/receive (POP3, SNMP)
- User-defined protocol editing and connection to other system using other function block
  - Open Ethernet only
- GMWIN service for remote programming, Remote monitoring and PLC mode control

Specifications

- Open Ethernet

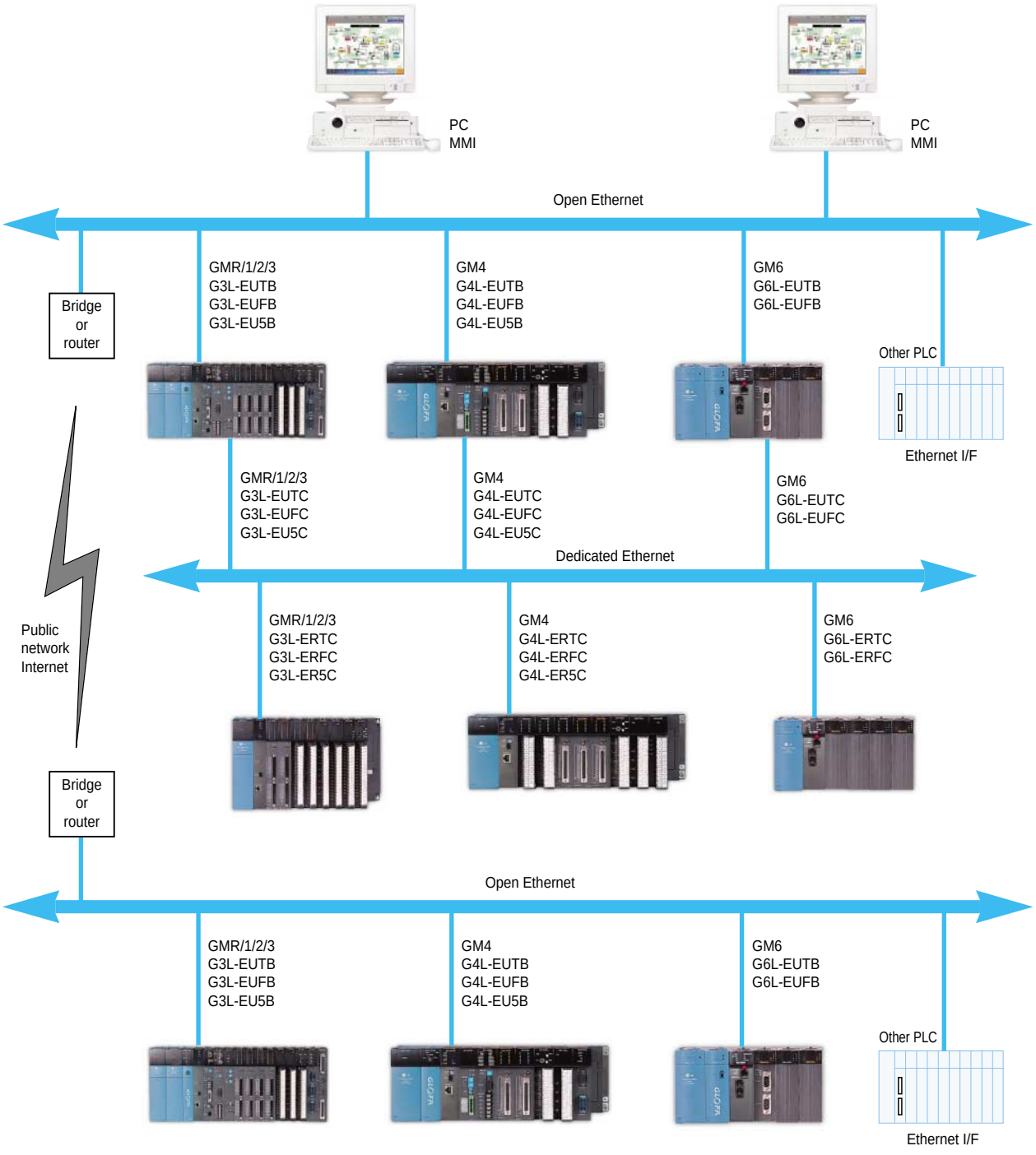
Item		GxL-EUTB	GxL-EUFB *1)	GxL-EU5B
Network		10/100BASE-TX, UTP (TP)	100BASE-FX, Fiber optic	10BASE-5, AUI
Support protocol		TCP/IP, UDP/IP, ARP, ICMP		
Service	With LG PLC	High-speed link, Function block service		
	With other devices	Function block service		
	Application	GMWIN service, Internet service (E-mail send/receive)		
Communication data		200 words/block (Max. 64 blocks), 1446 bytes/frame		
Number of channels		16		
Usage		Communication between LG PLC and other devices (PC, HMI), High-speed link between LG PLCs		
Available type		GM4/6		GM4

- Dedicated Ethernet

Item	Master	GxL-EUTC	GxL-EUFC *1)	GxL-EU5C
	Slave	GxL-ERTC	GxL-ERFC *1)	GxL-ER5C
Network		10/100BASE-TX, UTP (TP)	100BASE-FX, Fiber optic	10BASE-5, AUI
Support protocol		Token passing		
Service	With LG PLC	High-speed link, Function block service		
	With other devices	-		
	Application	GMWIN service		
Communication data		200 words/block (Max. 64 blocks), 1446 bytes/frame		
Number of connecting stations		64		
Usage		High-speed link between LG PLCs		
Available type		GM4/6		GM4

*1) ST-type connector is used.

System configuration



GLOFA-Fnet (Fieldbus) system

Features

- Transmission speed: 1Mbps, Transmission distance: 750m
- Communication available up to 5.25km with a repeater (Max.: 6)
- High-speed link capacity: Max. 61,440
- Convenient to configure various multi-drop network systems with SMART I/O

Specifications

Item			Electrical module	Optical module
Transmission speed			1Mbps	
Encoding type			Manchester Biphase-L	
Transmission distance (per segment)			Max. 750m	Max. 3km
Max. extension distance			Max. 5.25km (6 repeaters)	Max. 21km (6 EOCs)
Transmission medium			Twisted pair cable	Optical cable
Number of nodes			64	
Communication method			Circulated token passing, Address prove method	
High-speed link		Max. data size/station	61,440 points (3840 words)	
		Max. sending data size	30,720 points (1920 words)	
		No. of data block in transmission	64 blocks	
		Data block size in transmission	60 words	
Comm. module	Local	GM4	G4L-FUEA	G4L-FUOA
		GM6	G6L-FUEA	-
		GM7	G7L-FUEA *1)	-
	Remote	GM4	G4L-RBEA	-
		GM6	G6L-RBEA	-
Others			• Local module is to be set in the I/O slot of the main base. • Remote module is to be set in the CPU slot of the main base. • GM4-CPUA: Up to 2 modules • GM4-CPUB: Up to 4 modules • GH4-CPUC: Up to 8 modules • GM6: Up to 2 modules *2) • GM7: 1 module	

*1) You are not able to use the built-in Cnet or other communication unit when you use G7L-FUEA.
*2) GM6: Up to 2 Fnet modules, GM7: Only 1 communication module
*3) GOL-FREB: AC 110~220V, GOL-FREC: DC 24V

Fieldbus active coupler	
Transmission speed	1Mbps
Cable	Optical cable
Transmission distance	3km
Function of signal regeneration	Regenerating, Reshaping function
On reception of abnormal data	Error data transmission
Frame error check	CRC 16
Max. number of coupling station	8
Power supply	AC 110V/220V, DC 24V
Coupling optic card	Rack type (Branch off/select the number of stations)

Fieldbus repeater (GOL-FREB, FREC) *3)	
Transmission speed	1Mbps
Cable	Shielded twisted pair cable
Max. extension distance	750m per module
Max. number of repeaters	6 units between stations
Max. distance	5.25km between stations (when 6 repeaters used)
Frame error check	CRC 16

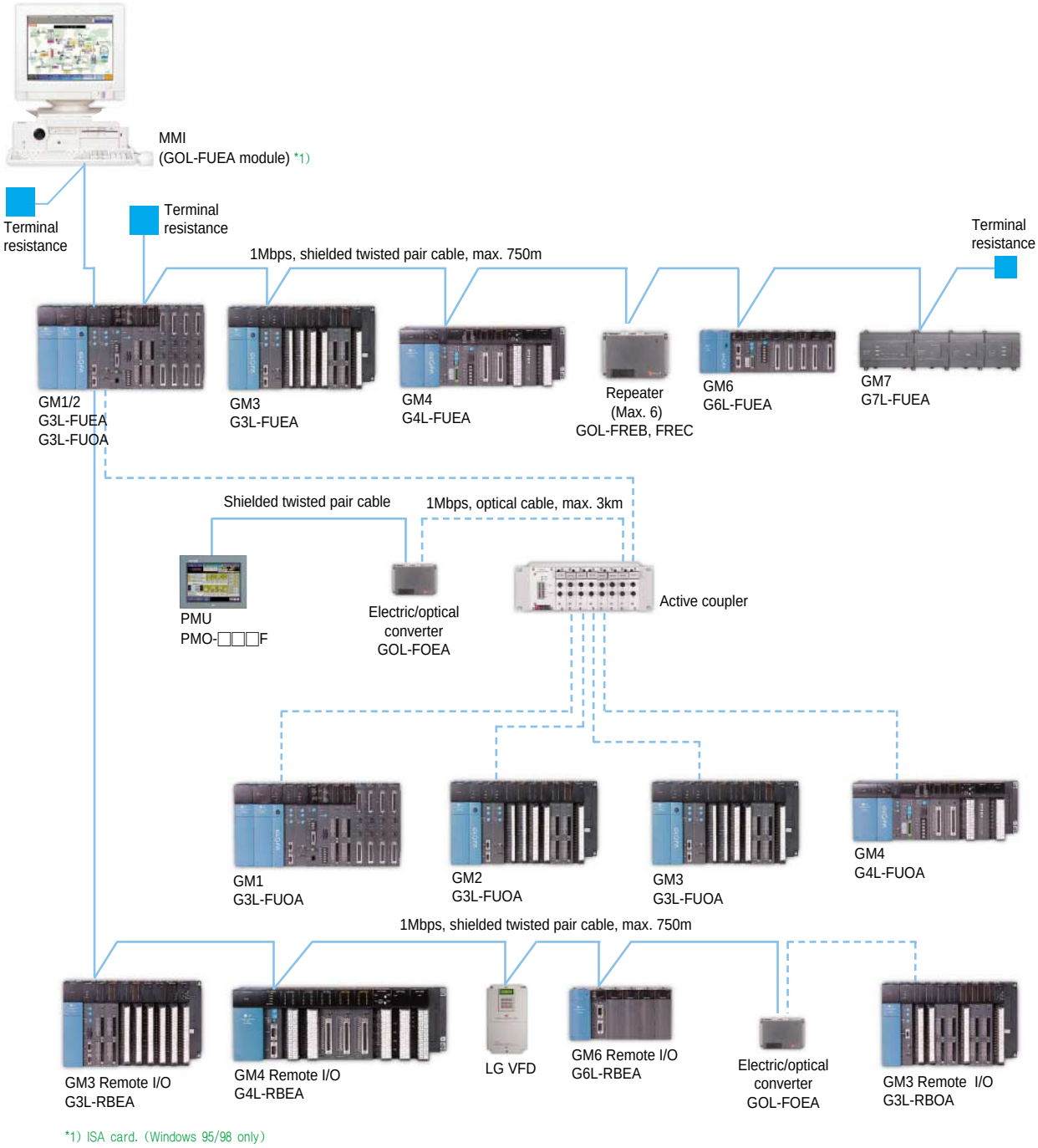
Fieldbus electric/optical converter (GOL-FOEA)	
Transmission speed	1Mbps
Cable	Optical cable, Shielded twisted pair cable
Max. transmission distance	3km
Function of signal regeneration	Regenerating, Reshaping
On reception of abnormal data	Error data transmission
Frame error check	CRC 16

Network cable

Item	Specifications	Maker
Shielded twisted pair cable	LIREV-AMESB	LG CABLE CO. LTD
	2×1mm, 18 AWG	
Optical cable	Y220909	HP (Indoor standard)
	Multi-mode, ST type	
	OJC-DP-MM-XX-ST-ST (XX = Number in meter)	HP (Outdoor standard)
Terminal resistance	110Ω, 1/2 Watt	

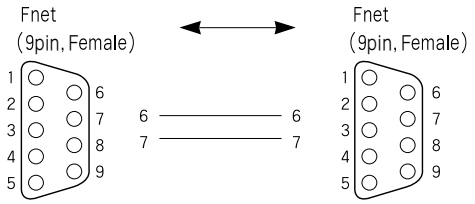
* The above cables are used in development and performance test, and we can't guarantee system performance as is shown in user's manual, if you use other cables.

System configuration

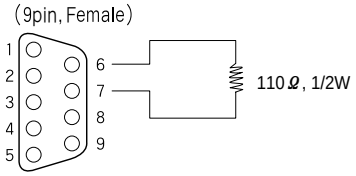


*1) ISA card. (Windows 95/98 only)

Cable connection



Terminal resistance



GLOFA-Cnet (Computer link system)

Features

- Various protocol communication thanks to Frame Editor and function block
- Easy to make a communication program
- GMWIN connection via phone line using an external modem connection
- Long-distance communication via phone line using a dedicated line modem connection
- Up to 32 stations connectable: Multi-drop service of LGIS dedicated protocol
- RS-232C/RS-422 communication port (Interlocking/Standalone mode)
- Various communication speed setting (300~38,400bps)
- Parameter setting in Frame Editor
- Full duplex and half duplex support
- GM4A/B: Up to 4 modules, GM4C: Up to 8 modules,
  GM6: Up to 4 modules (including a built-in port), GM7: Only 1 communication module
- Remote operating mode change in online mode (Cnet version 2.0 or later)
- Easy interface with other PLCs due to AB DF1/Modbus communication driver support
- Easy upgrade using flash memory: Cnet version 2.0 or later

Operation mode

Operation mode	Remark
GMWIN mode	Program download, upload by GMWIN protocol (RS-232C)
Dedicated protocol	Data communication using LGIS dedicated protocol
User-defined protocol	Data communication using user-defined frame and function block
Test mode	Self-diagnosis (except GM7)

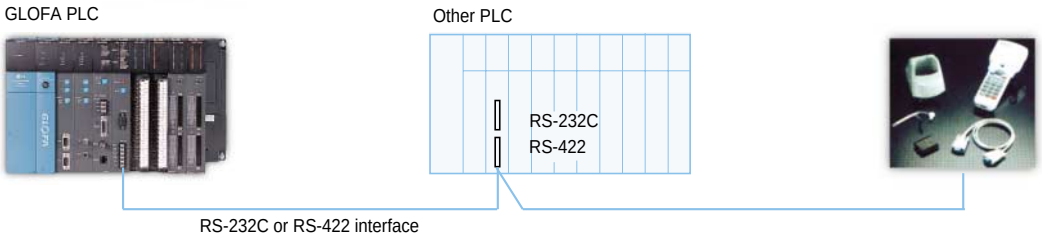
Specifications

Item		G4L-CUEA	G6L-CUEB	G6L-CUEC	G7L-CUEB	G7L-CUEC
Interface		RS-232C, RS-422/485	RS-232C	RS-422/485	RS-232C	RS-422/485
Comm. mode	Dedicated	1:1 or 1:N communication using GLOFA-GM dedicated mode				
	GMWIN	Program download, upload and remote control using GMWIN protocol (RS-232C, 1:1)				
	User-defined	Communication using user-defined protocol by Frame Editor (Interface with other PLCs)				
Data form	Start bit	1 *1)				
	Data bit	7 or 8 *1)				
	Stop bit	1 *1) or 2				
	Parity bit	Even / Odd / None				
Channel selection		By mode switch				
Synchronization		Asynchronous				
Transmission speed		300/600/1,200/2,400/4,800/9,600/19,200/38,400/76,800 *2)			1,200~57,600	
Network configuration		1:1, 1:N, N:M available (N≤31)		1:1, 1:N		1:1, 1:N
Modem communication		Available through RS-232C	Available		Available	
Transmission	RS-232C	15m (extendible using a modem)	15m		15m	
	RS-422/485	500m		500m		500m
Max. number of installation		4	4		1 *3)	
Diagnostic function		Loop-back test mode				
Current consumption (DC 5V)		160mA			100mA	

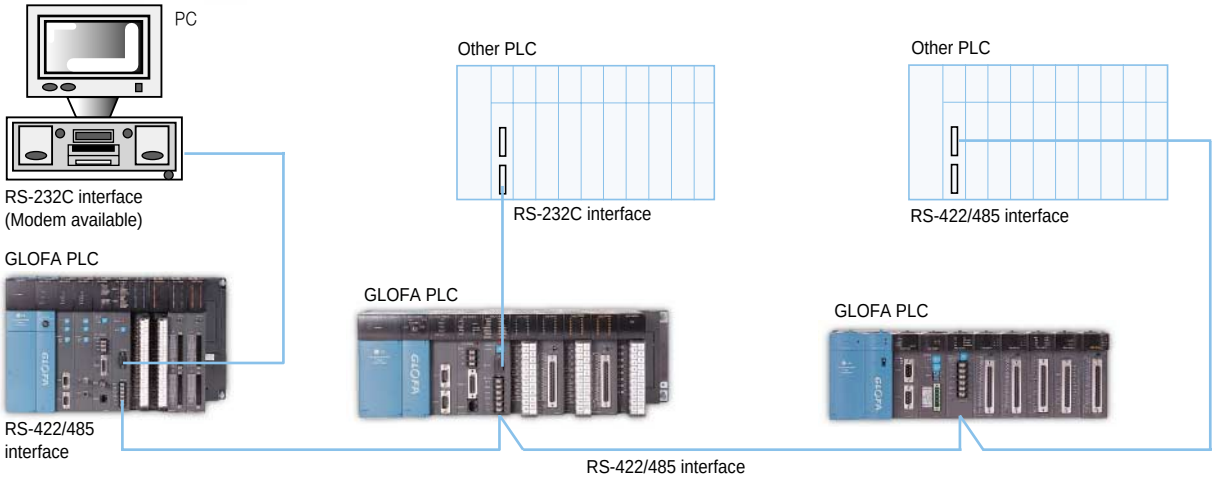
*1) Default value
*2) RS-232C: 300~38,400bps, RS-422/485: 300~76,800bps
*3) If you use G7L-CUEB or G7L-CUEC, which is not available to use in G7M-DR10A, G7M-DR10A (/DC), or G7M-DT10A, you are not able to use built-in Cnet or any other communication module.

GLOFA-Cnet (Computer link) system configuration

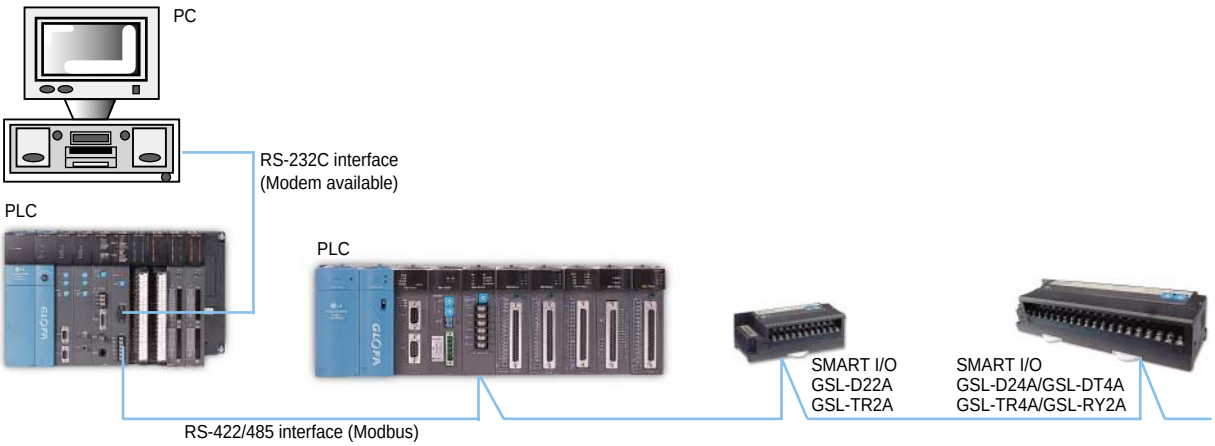
Communication with RS-232C/422 devices



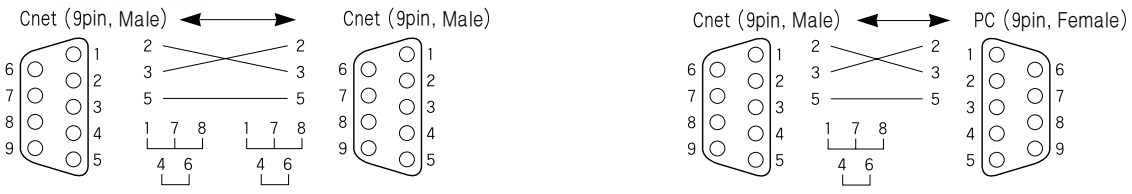
1:1 and N:M connection (dedicated + user-defined)



Modbus



Cnet cable connection (RS-232C)



GLOFA-Dnet (DeviceNet system)

Features

- Real time control of various I/O devices in network system
- Max. 63 slave modules control with one master module
- Max. 2,048 I/O points control with one master module
- Flexibility in network configuration: Multi-drop and T branch connection
- Connectable to other master module and various slave modules
  - Communication with other slave modules as master
  - Communication with other master module as slave
    (Mode change by mode switch in master module)
- GM4-CPUC: 8 in total, GM4-CPUB: 4 in total,
  GM4-CPUA/GM6: 2 in total
- GM7: 1 slave module
- Master/slave communication as predefined master/slave connection communication using scan list enabling high-speed link without other configuration tool
- Connectable to various slave modules

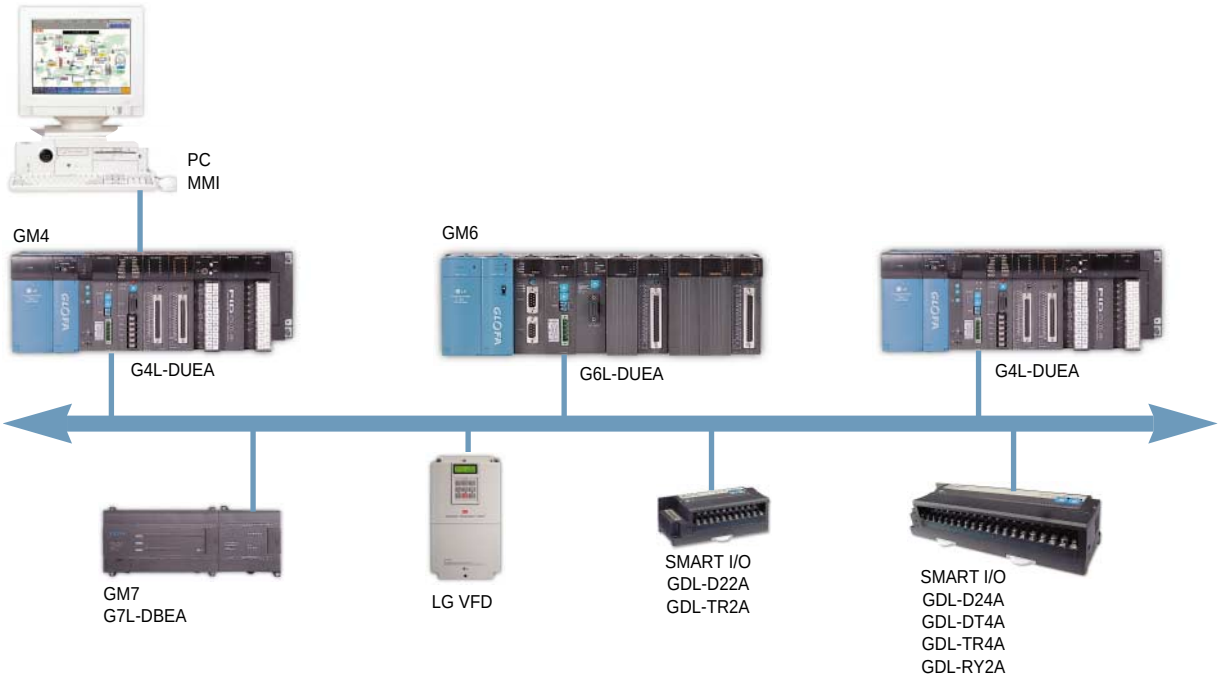
Specifications

Item	G4L-DUEA		G6L-DUEA	G7L-DBEA
Module type	Master/Slave (setting by dip switch)			Slave
Protocol	CAN			
Transmission distance and speed *1)	Transmission speed	Max. network length	Max. drop cable length	Max. extension length (Drop cable)
	500kbps	100m	6m or less	39m
	250kbps	250m	6m or less	78m
	125kbps	500m	6m or less	156m
Max. number of stations	64			
Cable	DeviceNet cable: 5 wires (signal: 2 wires, power: 2 wires, shield: 1 wire)			
Bus type	Multi slave / Multi casting			
	1:1 (Peer-to-peer type)			
	Poll, Strobe, COS/Cyclic type *2)			
Max. node number	Max. 64 MAC ID (Max. 2,048 points)			
System features	Available to insert/remove a node when power is on			
Diagnostic function	Check a duplicated station, Detect an abnormal station, Check the CRC error, Usage of scan list, LED (operation)			
Current consumption (DC 5V)	G4L-DUEA: 285mA, G6L-DUEA: 230mA			

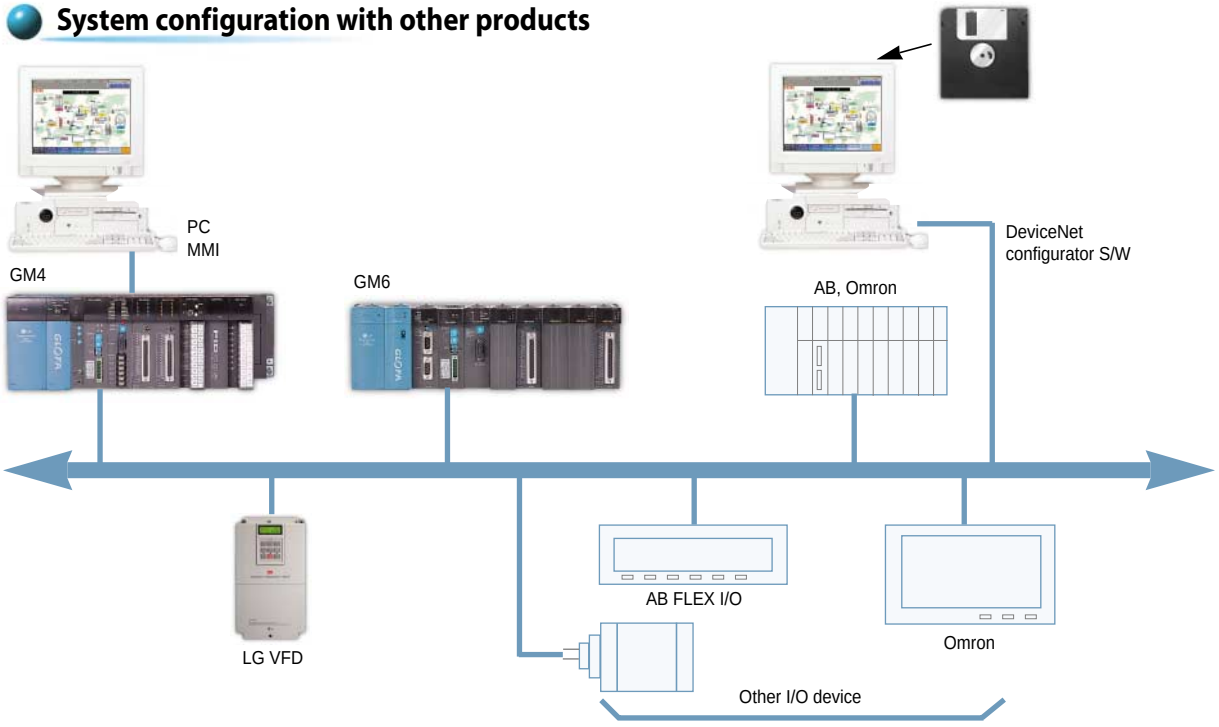
*1) In case of thin cable, the max. distance is 100m regardless of transmission speed.
2) The type of Strove, COS/Cyclic on bus type will be served later.

GLOFA-Dnet system configuration

LGIS system configuration



System configuration with other products



GLOFA-Pnet (Profibus-DP system)

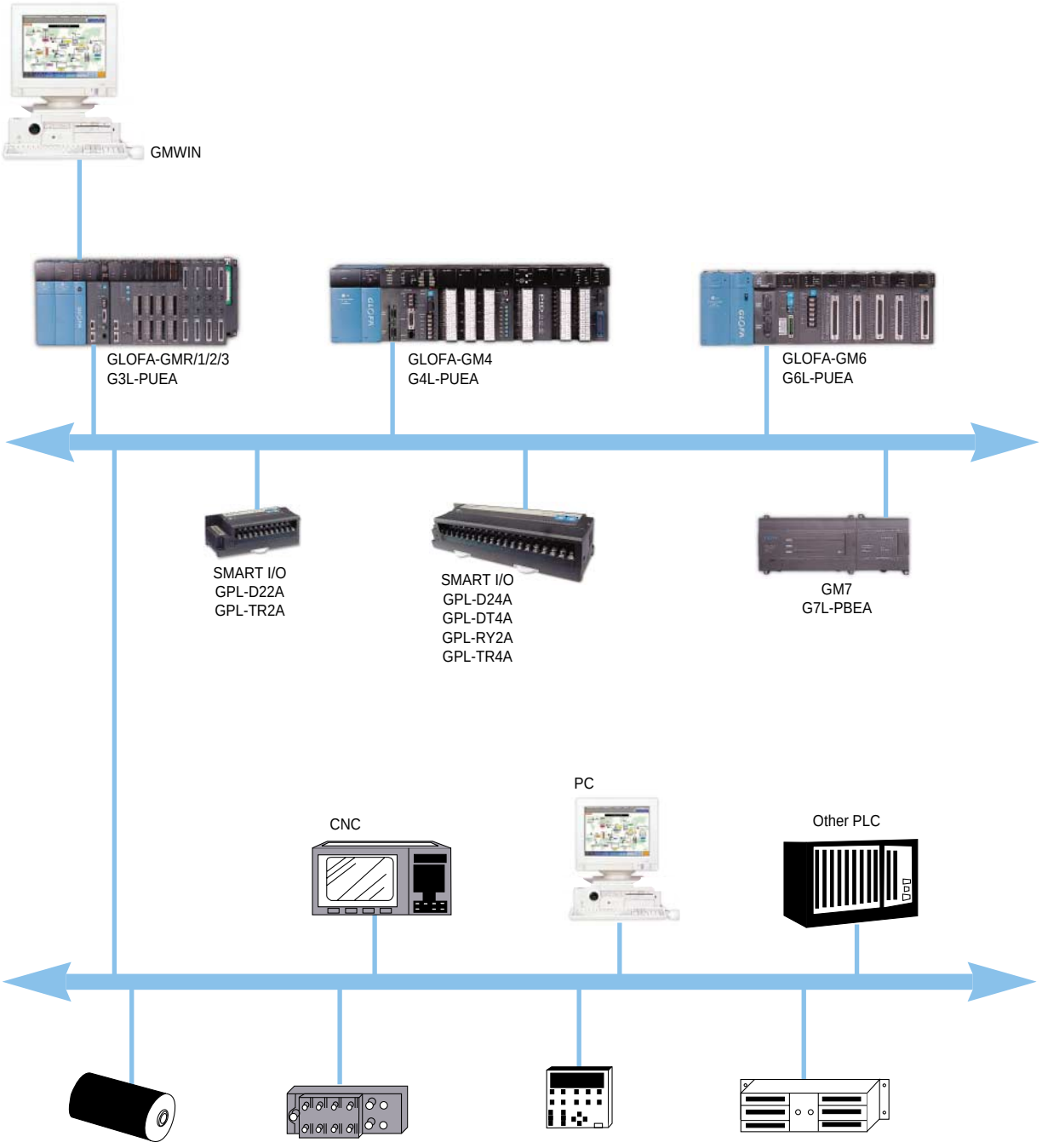
Features

- Profibus-DP (Decentralized Periphery)
- Low cost network appropriate to field level
- Proper to communicate among a master automation device and distributed slave I/O devices
- Master slave network
- Fast slave communication omitting application layer
- Based on RS-485 communication as transmission medium
- Communication speed: 9.6kbps~12Mbps
- Communication distance: 100~1,200m
- Max. 99 stations (32 stations/segment) support
- Network setup using Sycon (configuration tool)
- Communication using high-speed link parameter

Specifications

Item	G4/6L-PUEA	G4/6L-PUEB	G7L-PBEA	Remark
Module type	Master		Slave	Class 1
Network	Profibus-DP			
Protocol	EN 50170/DIN 19245			
Interface	RS-485 (Electric)			
Medium access	Token passing & poll			
Topology	Bus			
Modulation	NRZ			Asynchronous
Cable	Shielded twisted pair cable			
Transmission distance	1,200m (9.6kbps~187kbps)			
	400m (500kbps)			
	200m (1.5Mbps)			
	100m (3M~12Mbps)			
Max. number of slave/network	99			
Max. number of slave/segment	32			
Dual port memory size	1K	7K		
Max. I/O data	In: 512 bytes	In: 3584 bytes	In: 244 bytes	
	Out: 512 bytes	Out: 3584 bytes	Out: 244 bytes	
Communication parameter setting	High-speed link parameter in GMWIN		Sycon	
Configuration tool	Sycon			
Configuration port	RS-232C Configuration port support			
Current consumption (DC 5V)	560/520mA	670/700mA	350mA	

System configuration



New

SMART I/O

Features

- Reduction in the amount of wiring
- Real-time control of distributed I/O devices
- Rnet, Profibus-DP, DeviceNet, Modbus (RS-422/485) support
- Various I/O modules (DC, TR, Relay types)
  - A: Sink (NPN), fixed terminal block, 0.1A (rated current)
  - B: Source (PNP), fixed terminal block, 0.5A (rated current)
  - C: Source (PNP), removable terminal block, 0.5A (rated current)
  - A1: Sink (NPN), fixed terminal block, 0.5A (rated current)
  - C1: Sink (NPN), removable terminal block, 0.5A (rated current)

Specifications

Item		Input		Output			Mixed Input/output	
		DC (Sink/Source)		TR (Sink)		Relay	DC (Sink/Source)	TR (Sink)
Point		16	32	16	32	16	16	16
Rated Input (Load voltage)		DC 24V		DC 24V		DC 24V, AC 110V/220V	DC 24V	DC 24V
Rated Input Current (Load current) *1)		7mA		0.1A/2A		2A/5A	7mA	0.1A/2A
Response time	Off → On	Under 3ms		Under 0.5ms		Under 10ms	Under 3ms	Under 0.5ms
	On → Off	Under 3ms		Under 1ms		Under 10ms	Under 3ms	Under 1ms
Common (Point/COM)		16/COM		16/COM		8/COM	16/COM	16/COM
Supporting network & part number	Rnet	GRL-D22A	GRL-D24A	GRL-TR2A	GRL-TR4A	GRL-RY2A	GRL-DT4A	
	Profibus	GPL-D22A□ *2)	GPL-D24A□	GPL-TR2A▲ *3)	GPL-TR4A▲	GPL-RY2A□	GPL-DT4A▲	
	DeviceNet	GDL-D22A□	GDL-D24A□	GDL-TR2A▲	GDL-TR4A▲	GDL-RY2A□	GDL-DT4A▲	
	Modbus	GSL-D22A	GSL-D24A	GSL-TR2A	GSL-TR4A	GSL-RY2A	GSL-DT4A	

*1) It is for A type. For other types, refer to Features.
*2) □: A, C
*3) ▲: A, A1, B, C, C1

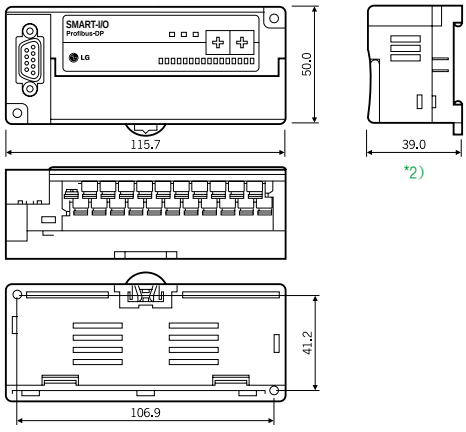
Field network support

Item	Rnet (LG SMART I/O)	Profibus-DP	DeviceNet	Modbus
Protocol	LGIS Dedicated Rnet protocol (Fnet for remote)	Profibus-DP (RS-485/EN50170)	DeviceNet (CAN)	Modbus (RS422/485) *1)
Transmission speed	1Mbps	9.6kbps~12Mbps	125/250/500kbps	2.4kbps~38.4kbps
Transmission distance	750m/segment	100m~1.2km	500/250/125m (Thin cable: 100m)	500m
Topology	Bus token	Bus	Trunk & Drop	Bus
Transmission method	Token pass & Broadcast	Token pass & Master/Slave (Poll)	CSMA/NBA (Poll, Cyclic, COS, Strobe)	Master/Slave (Poll)
Max. number of stations	32/segment (In 32/Out 32)	32/segment	64	32
Link capacity	2,048 pt./master (64 sta.× 32 pt.)	1K*/master: -PUEA 7K*/master: -PUEB	2,048 pt./master	64 pt./station

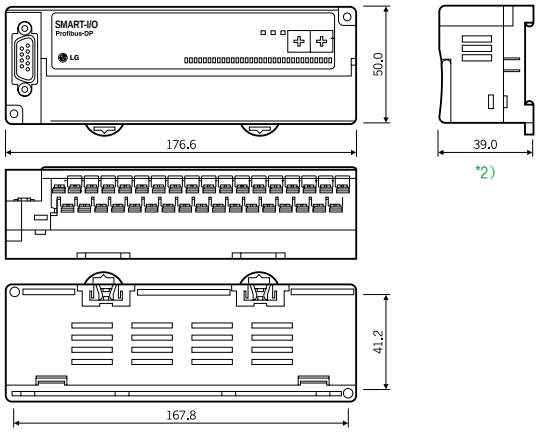
*1) RS-485 is available at Modbus SMART I/O version 1.2 or later.

Dimensions

16 points



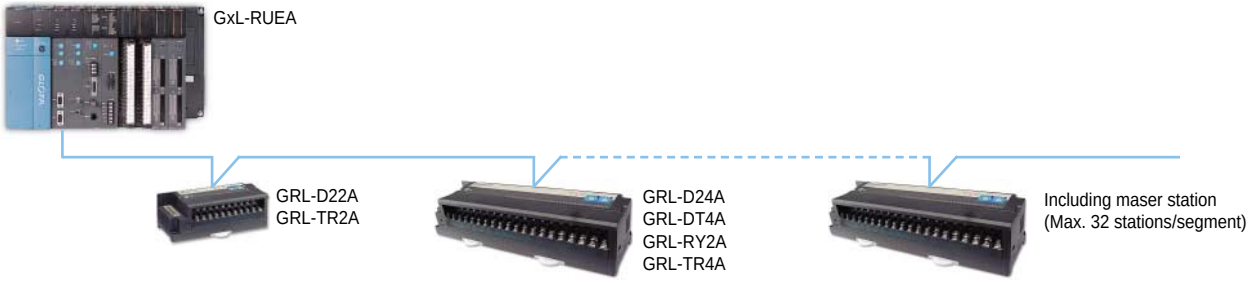
32 points *1)



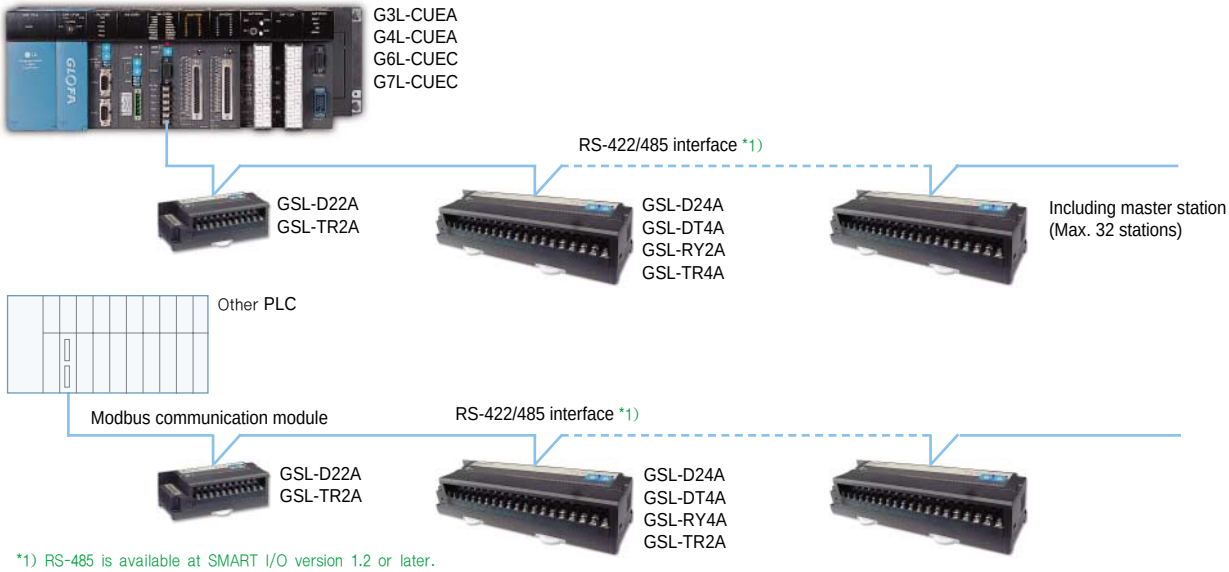
*1) The dimensions of relay type SMART I/O is equivalent to those of 32-point SMART I/O.
*2) C, C1 type: 47.5

SMART I/O system configuration

SMART I/O Rnet system

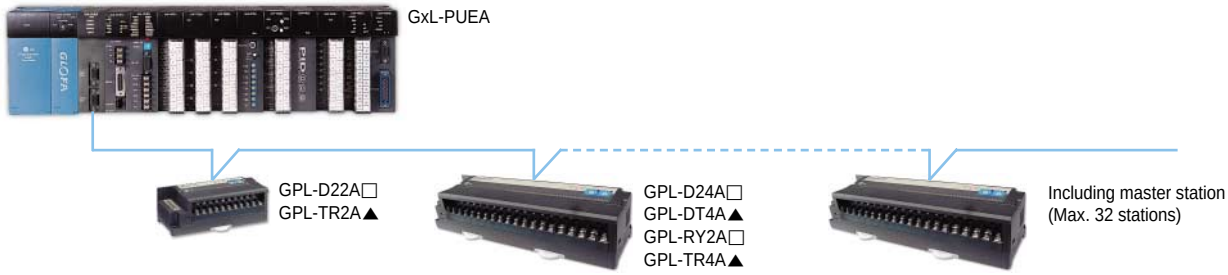


SMART I/O Modbus system

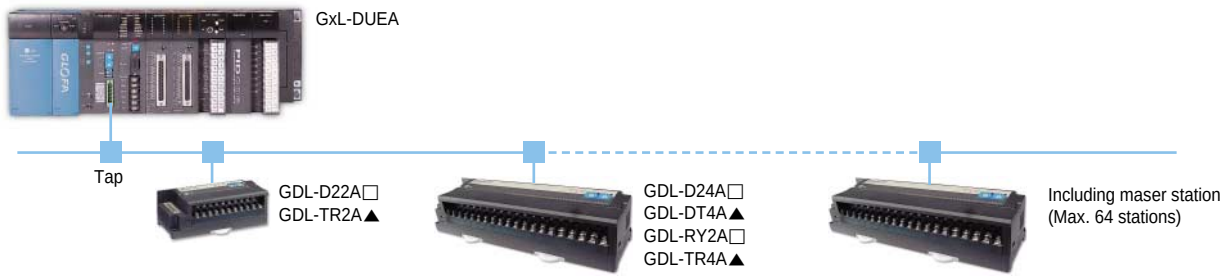


*1) RS-485 is available at SMART I/O version 1.2 or later.

SMART I/O Profibus-DP system



SMART I/O DeviceNet system



* Segment: communication section where a repeater or other master station is not used.

Analog input module (GM4/6)

Features

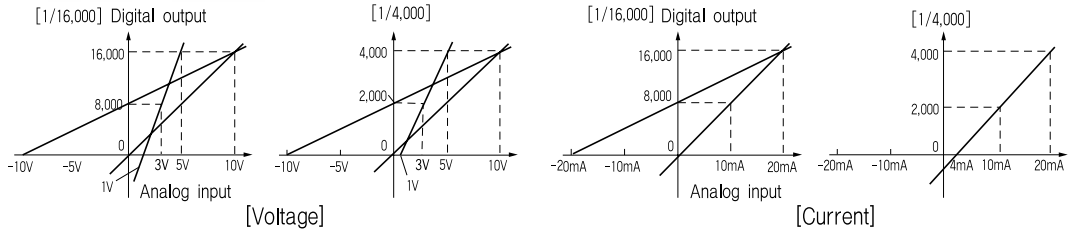
- 4-/8-channel analog input per module
- Voltage/Current selection by dip switch/terminal
- Digital range selection (-8,192~8,191 or -192~16,191): G4F-AD2A
- High resolution (1/16,000, 1/4,000)

Specifications

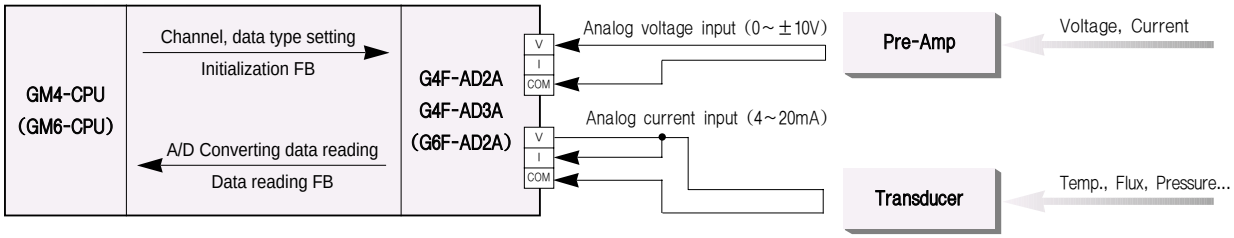
Item		G4F-AD2A *1)	G4F-AD3A	G6F-AD2A *2)
CPU		GM4-CPUA/B/C		GM6-CPUA/B/C
Analog input	Voltage	DC -5~+5	DC 1~5V	DC 1~5V
		DC -10~+10V	DC 0~10V	DC 0~10V, -10~+10V
	Current *3)	DC -20~+20mA	DC 4~20mA	DC 4~20mA
	Voltage/Current select	Input range selection switch	Input selection switch	Input range selection switch
	Voltage range select		Program	
Digital output		-192~16,191 -8,192~8,191	-48~4,047	-48~4,047 -2,048~2,047
Resolution	DC 1~5V	-	1.0mV (1/4,000)	1.0mV (1/4,000)
	DC 0~10V	-	2.5mV (1/4,000)	2.5mV (1/4,000)
	DC -5~5V	0.625mV (1/16,000)	-	-
	DC -10~10V	1.25mV (1/16,000)	-	5mV (1/4,000)
	DC -20~20mA	2.5㎂ (1/16,000)	-	-
	DC 4~20mA	-	4㎂ (1/4,000)	4㎂ (1/4000)
Accuracy		±0.5% (Full scale) ±0.3% at 25℃	±0.5% (Full scale) ±0.3% at 25℃	±0.5% (Full scale) ±0.3% at 25℃
Max. conversion speed		5ms/Ch	5ms/Ch	5ms/Ch
Max. absolute output	Voltage	±12V		
	Current	±25mA		
Analog input point		4 Channels	8 Channels	4 Channels
Offset/gain		Available	Not available	
Insulation method		Between input terminal and PLC power supply: Photocoupler, Between channels: No insulation		
Current consumption		400mA (5V)	500mA (5V)	40mA (+5V), 50mA (+15V), 20mA (-15V)

*1) You are able to adjust offset and gain value in G4F-AD2A so that you can adjust input range.
*2) If you use analog modules in GM6, you are supposed to use GM6-PAFB or GM6-PDFB for power module.
*3) For current input, connect V and I terminal.

A/D conversion characteristics



Configuration



Analog output module (GM4/6)

Features

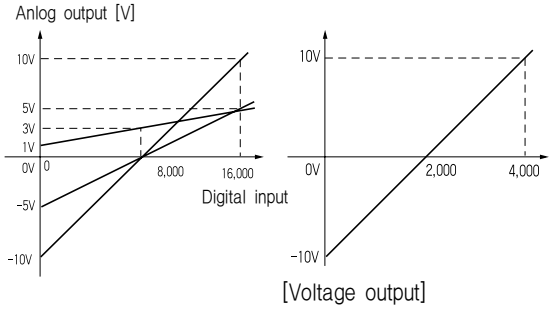
- 2-/4-/8-channel analog output per module
- Analog voltage/current output when CPU stops (set in FB)
  - medium, previous, max., min. value: G4F-DA1A
- Various modules according to output types

Specification

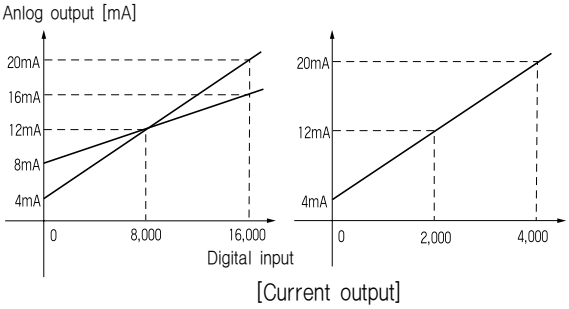
Item		G4F-DA1A *1)	G4F-DA2V	G4F-DA3V	G4F-DA2I	G4F-DA3I *2)	G6F-DA2V *3)	G6F-DA2I *3)
CPU		GM4-CPUA/B/C					GM6-CPUA/B/C	
Digital input		-192~16,191	-48~4047					
		-8,092~8,191						
Analog output	Voltage	DC -10~10V	DC -10~10V		-	-	DC -10~10V	-
	Current	DC 4~20mA	-	-	DC 4~20mA		-	DC 4~20mA
	V/C selection	Output terminal	-	-	-	-	-	-
Resolution	DC 10V~10V	1.25mA (1/16000)	5mV (1/4000)		-	-	5mV (1/4000)	-
	DC 4~20mA	2.5㎂ (1/6000)	-	-	4㎂ (1/4000)		-	4㎂ (1/4000)
Accuracy		±0.3% (Full scale)	±0.5% (Full scale)					
Max. conversion speed		3ms/module	10ms/module	15ms/module	10ms/module	15ms/module	10ms/module	
Max. absolute output	Voltage	DC 15V	DC 15V		-	-	DC 15V	-
	Current	DC 24mA	-	-	DC 24mA		-	DC 24mA
Analog output point		2 Channels	4 Channels	8 Channels	4 Channels	8 Channels	4 Channels	
Insulation		Between input terminal and PLC power supply: Photocoupler, Between channels: No insulation						
External power supply	Voltage	-	-	-	-	DC 21.6~26.4V	-	-
	Current	-	-	-	-	230mA	-	-
Current consumption		450mA (5V)	400mA (5V)	700mA (5V)	680mA (5V)	70mA	5V (40mA) 5V (80mA) -15V (60mA)	5V (40mA) 15V (120mA) -15V (25mA)

*1) You are able to adjust offset and gain value so that you can adjust output range.
*2) If you use G4F-DA3I, you are supposed to supply external DC 24V for its operation.
*3) If you use analog modules in GM6, you are supposed to use GM6-PAFB or GM6-PDFB for power module.

A/D conversion characteristics



[Voltage output]



[Current output]

Temperature control module (GM4)

Features

- Simultaneous control of different processors with one module
- Forward/reverse control selectable
- Manual output (forced output) available
- Autotuning (P, I, D values are found automatically)
- No additional input/output is needed due to various input/output built-in functions
- Input: RTD (2 types), Thermocouple (7 types), Voltage, Current
- Output: Current, Open collector output of time proportional control
- Cascade function: Interworking control of a processor
- On/Off control available

Specifications (G4F-TMCA)

● Input/output specifications

Item				Specifications				
Input	Thermocouple			Type	DIN specification	BS specification	Measuring temperature range (℃)	Measuring voltage range (㎶)
				K	NiCr-Ni	NiCr-NiAl	-200.0~1,300.0	-5,891~52,398
				J	-	Fe-CuNi	-200.0~1,000.0	-7,890~57,942
				E	-	NiCr-CuNi	200.0~800.0	-8,824~61,022
				T	-	Cu-CuNi	-200.0~400.0	-5,603~20,869
				B	-	PtRh30-PtRh6	400.0~1,800.0	0~20,215
				R	-	PtRh13-Pt	0.0~1,750.0	0~17,942
				S	PtRh-Pt	PtRh10-Pt	0.0~1,750.0	786~13,585
	RTD			Type			Measuring temperature range (℃)	Measuring resistance range (Ω)
				Pt100			-200.0~600.0	18.49~313.59
				JPt100			-200.0~600.0	17.14~317.28
	Analog	Input range	I	DC 4~20mA				
			V	DC 1~5V				
		Max. resolution	I	2㎂ (1/8,000)				
			V	0.25㎷ (1/8,000)				
		Absolute Max. Input		Voltage: 15V, Current: 25mA				
	Insulation method			Between input terminal and PLC power supply: Photocoupler, Between channels: No insulation				
	Number of loops			2 (Simultaneous 2 loops, including thermocouple, RTD, V and I input, available to use)				
	Digital output			PV (Present value) 1. Thermocouple, RTD: Temperature detection value [Measuring temperature value×10 (displaying decimal one point)] 2. Voltage, Current Input: 0~8,000				
Output	Analog	Current output		DC 4~20mA				
		Max. resolution		4㎂ (1/4,000)				
		Absolute max. output		Voltage: 15V, Current: 25mA				
	Transistor output			Max. pulse output			1ms (1/4000: 1ms unit)	
				Output control period			1~100sec (1/1,000)	
				Rated load voltage			DC 24V	
				Load voltage range for usage			DC 20.4~26.4V	
				Max. load current			70mA	
				Max. voltage drop (ON)			DC 1.5V (70mA)	
				Response time	Off → On		1ms	
					On → Off		1ms	
				Common method			2 points/COM	
	Insulation method			Between output terminal and PLC power supply: Photocoupler, Between loops: No insulation				
	Number of loops			2 (Simultaneous 2 loops, including V and transistor output, available to use)				
	Digital input			MV (Manipulated value): Current, Transistor output: 0~4,000				

● PID specifications

Item		Specifications
Setting range of PID values	P	1~10,000 [0.01~100.00 (%)] (Proportion control when I/D values are 0.0)
	I	1~36,000 [0.0~3600.0 (sec)] (Integration control disabled if set 0.0)
	D	1~36,000 [0.0~3600.0 (sec)] (Differentiation control disabled if set 0.0)
SV and PV range		1. Thermocouple, RTD: Temperature detection value [Measuring temperature value×10 (Displaying decimal one point)] 2. Voltage, Current input: 0~8,000
MV range		0~4,000
MMV range		0~4,000
No. of control loops		2 loops
Control period		200ms
Processing type		Measured-value derivative (pre-derivative) type

● Common specifications

Item		Specifications
External power supply	Voltage range	DC 20.4~26.4V
	Current consumption	90mA
Internal current consumption		354mA
Weight		370g

Thermocouple module (GM4/6)

Features

- 5 type thermocouple available (KS, JIS, ANSI, DIN, BS)
- Automatic reference junction compensation
- Burn-out detection in every channel

Specifications

Item	G4F-TC2A			G6F-TC2A *1)	
CPU	GM4-CPUA/B/C			GM6-CPUA/B/C	
Thermocouple	K, J, E, T, B, R, S (Setting per channel available)				
TC input point	4 Channels				
Digital input	Digital conversion value: 0~16,000				
	Temperature conversion value: (Measuring temperature range of thermocouple) × 10				
Temperature input range	Thermocouple type	DIN Specification	BS Specification	Measuring temperature range (℃)	Measuring voltage range (μV)
	K	NiCr-Ni	NiCr-NiAl	-200.0~1200.0	-5,891~48,828
	J	-	Fe-CuNi	-200.0~800.0	-7,890~45,498
	E	-	NiCr-CuNi	-150.0~600.0	-7,279~45,085
	T	-	Cu-CuNi	-200.0~400.0	-5,603~20,869
	B	-	PtRh30-PtRh6	400.0~1,800.0	786~13,585
	R	-	PtRh13-Pt	0.0~1,750.0	0~21,006
	S	PtRh-Pt	PtRh10-Pt	0.0~1,750.0	0~18,612
Reference junction compensation	Automatic compensation				
Max. conversion speed	50ms/Channel				
Burn-out detection	Every channel				
Accuracy	± [Full scale×0.3%+1℃ (Reference junction compensation error)]				
Current consumption	450mA			5V/100mA, 15V/40mA, -15V/20mA	

*1) If you use an analog module (G6F-TC2A) in GM6, you are supposed to do GM6-PAFB or GM6-PDFB for its operation.

RTD* module (GM4)

Features

- Burn-out detection in every channel

Specifications

Item	G4F-RD2A
CPU	GM4-CPUA/B/C
Connectable RTD	Pt100 (JIS C1640-1989, DIN 43760-1980)
	JPt100 (KS C1603-1991, JIS C1604-1981)
Input channel	4 Channels
Digital output	Digital conversion value: 0~16,000, Detected temperature conversion value: -2,000~6,000
Temperature input range	Pt100: -200.0~600.0℃ (18.48~313.59Ω)
	JPt100: -200.0~600.0℃ (17.14~317.28Ω)
Burn-out detection	Every channel
Max. conversion speed	50ms/Channel (Full scale)
Accuracy	±0.5% (Full scale)
Current consumption	420mA

* RTD: Resistance thermometer device.

PID control module (GM4)

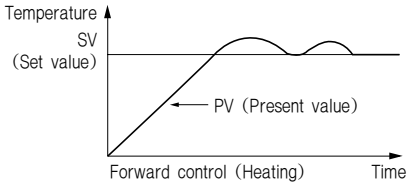
Features

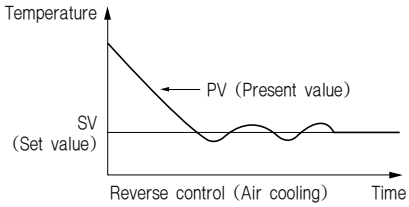
- PID control: Max. 16 loops
- Forward/Reverse control selectable
- Manually manipulated value output available
- Measured-value derivative type
- LED display for an error and operation condition of each loop
- Autotuning function

Specifications

Item		G4F-PIDA	G4F-PIDB
CPU		GM4-CPUA/B/C	
PID control loops		8	16
PID constant	P value (P)	0.01~100.00 (%)	
	I value (I)	0.0~3,000.0 (sec)	
	D value (D)	0.0~3,000.0 (sec)	
Setting range (SV)		0~16,000	
Input range (PV)		0~16,000	
Output range (MV)		0~16,000	
Manually manipulated value		0~16,000	
LED function	Run/Stop	LEDs of corresponding loops ON if they run	
	Error	LED flickering	
Control action		Forward/Reverse action control available	
Control cycle		0.1	0.01
Processing type		Measured-value derivative (Pre-derivative) type	
Internal current consumption (DC 5V)		200mA	600mA
Output part/COM		-	16
		-	16 points/COM

PID control operation





Analog timer module (GM4)

Features

- Setting and adjusting time (highly precise range) available
- Max. 8 points of Analog Timer per module applicable
- Various range of setting time (0.1~600sec)
- Easy timer setting with switch manipulation
- LED display for timer operation status
- Timer setting available in run mode

Specifications

Item		G4F-AT3A
Point		8 points
CPU		GM4-CPUA/B/C
Timer setting value range (sec)		0.1~1.0, 1~10, 10~60, 60~600 Setting can be done for each point
Setting method		Set the operation mode selection SW to TEST side
Backup method		Setting by adjustment volume
Accuracy		±2.0% (Full-scale)
LED function	Operation LED	8 points
	Contact LED	8 points
Operation		CR analog type (On-delay) operation
Internal current consumption (DC 5V)		200mA

New

Positioning module (APM): (GM4/6)

Features

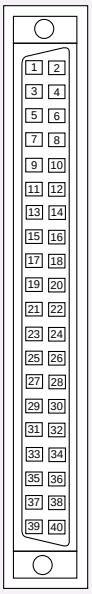
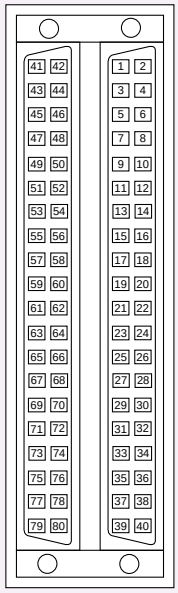
- Highly reliable position control with LGIS ASIC-embedded processor
- Enhanced control with fast control processing speed
- High-speed motor control (Max. pulse output: 1Mbps)
- Arc/linear interpolation, separate/synchronous operation
- Trapezoidal & S-curve acceleration/deceleration function
- Easy and quick to control through external input (JOG operation included)
- Encoder input support
- Self-diagnosis, monitoring and test by APM
  - Diagnosis for I/O signal line
  - Easy to set position control parameters
  - Monitoring/tracking/simulation
  - Information and solution for each error provided
  - Available to edit operation parameter data in EXCEL

Specifications

Item		Open collector type			Line drive type		
Number of axes		1	2	3	1	2	3
CPU type	GM4	G4F-PP1O	G4F-PP2O	G4F-PP3O	G4F-PP1D	G4F-PP2D	G4F-PP3D
	GM6	G6F-PP1O	G6F-PP2O	G6F-PP3O	G6F-PP1D	G6F-PP2D	G6F-PP3D
Output signal		Pulse					
Interpolation		2- and 3-axis linear interpolation/2-axis arc interpolation					
Speed (Position) control		Yes					
Positioning data		400/axis					
Setting unit		mm, inch, degree, pulse					
Data backup		Flash memory					
Position address range		-2,147,483,648~2,147,483,647					
Positioning speed range		0.01~20000000.00 (mm/min)					
		0.001~2000000.000 (inch/min)					
		0.001~2000000.000 (degree/min)					
		1~200000 pulse/s			1~1000000 pulse/s		
Max. output pulse		200kbps			1Mbps		
Output frequency/distance		200kbps/2m			1Mbps/10m		
Acceleration/Deceleration pattern and time		Trapezoidal & S-curve acceleration/deceleration					
		1~65,535ms					
Origin point return method		Approximate origin point dog, Z phase (encoder), Upper/lower limit switch					
High-speed return to origin point		Yes					
Manual operation		JOG/MPG/Inching operation					
M code		1~65,535					
Synchronous operation		Yes					
Backlash compensation		Yes					
Others		Speed change during operation					
		Position address change during operation					
		Speed/position switching					
		Zone output: 3 range settings available (GM4 only)					
		Simultaneous operation					
Current consumption (5V)		730mA	760mA	770mA	700mA	720mA	740mA
		480mA	490mA	500mA	630mA	750mA	840mA

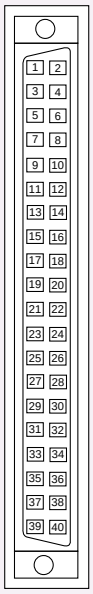
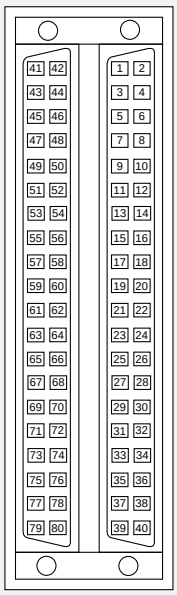
I/O interface with external equipment

Pin layout for (G4F-PP□O, G4F-PP□D)

Pin layout	For	Pin number X	Pin number Y	Pin number Z	Signal name		Signal direction APM - Ext. device	Condition
 1 axis	Axis	21	41	61	FP+	Pulse output (Differential +)	→	
		22	42	62	FP-	Pulse output (Differential -)	→	
		23	43	63	RP+	Pulse sign (Differential +)	→	
		24	44	64	RP-	Pulse sign (Differential -)	→	
		25	45	65	OV+ *	High limit	←	
		26	46	66	OV- *	Low limit	←	
		27	47	67	STOP	External stop signal	←	
		28	48	68	DOG	Approximate origin	←	
		29	49	69	VTP	Speed/Position switching signal	←	
		30	50	70	ECMD	External command signal: Start	←	
						External command signal: Skip	←	
						External command signal: JOG+ (Forward)	←	
		31	51	71	JOG-	JOG reverse operation	←	
		32	52	72	COM	Common (OV+, OV-, STOP, DOG, VTP, ECMD, JOG-)	⇔	
		33	53	73	DRVIN *	Drive unit ready signal	←	
		34	54	74	DRVIN COM	Drive unit ready signal common	⇔	
		35	55	75	HOME +24V	Zero signal (+24V)	←	
		36	56	76	NC	Not used		
		37	57	77	HOME +5V	Zero signal (+5V)	←	
		38	58	78	HOME COM	Zero signal (+24V, +5V) Common	⇔	
		39	59	79	NC	Not used		
		40	60	80	NC	Not used		
 2/3 axes	Common	1			MPG A+	Manual pulse generator/Encoder A+ Input	←	
		2			MPG A-	Manual pulse generator/Encoder A- Input	←	
		3			MPG B+	Manual pulse generator/Encoder B+ Input	←	
		4			MPG B-	Manual pulse generator/Encoder B- Input	←	
		5			MPG Z+	Encoder Z+ Input	←	
		6			MPG Z-	Encoder Z- Input	←	
		7			CON	External simultaneous start	←	
		8			EMG *	Emergency stop	←	
		9			NC	Not used		
		10			COM	(CON, EMG) Common	⇔	
		11			Out 1	Transistor output of Zone 1	→	
		12			Out 2	Transistor output of Zone 2	→	
		13			Out 3	Transistor output of Zone 3	→	
		14			COM	ZONE Common	⇔	
		15, 16, 17, 18, 19, 20			NC	Not used		

* High/low limit, drive unit ready signal, emergency stop signal should be connected to DC 24V.

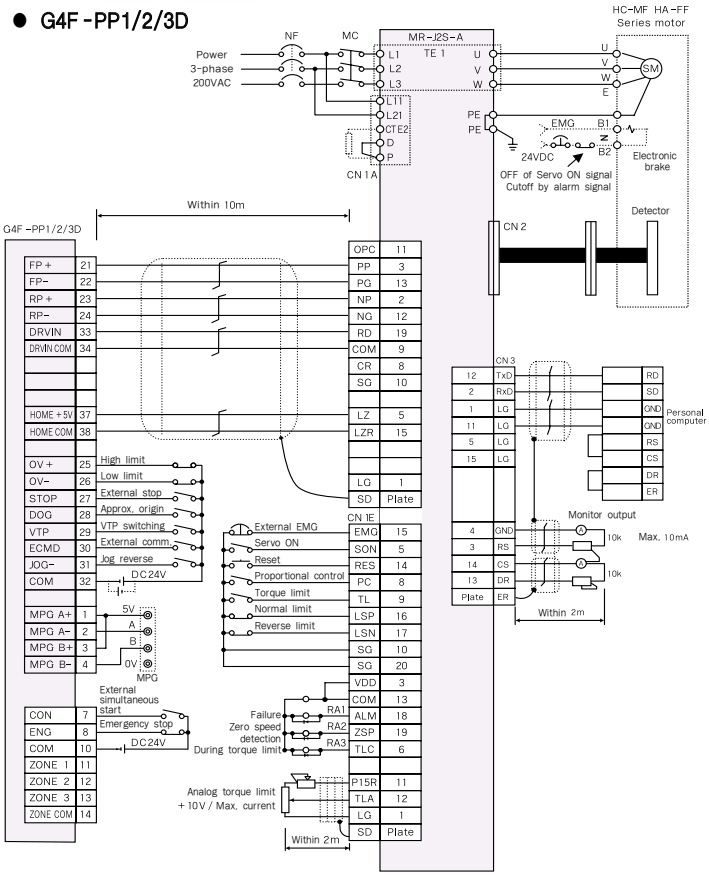
Pin layout for (G6F-PP□O, G6F-PP□D)

Pin layout	For	Pin number X	Pin number Y	Pin number Z	Signal name		Signal direction APM - Ext. device	Condition
 1 axis	Axis	21A	1B	21B	FP+	Pulse output (Differential +)	→	
		22A	2B	22B	FP-	Pulse output (Differential -)	→	
		23A	3B	23B	RP+	Pulse sign (Differential +)	→	
		24A	4B	24B	RP-	Pulse sign (Differential -)	→	
		25A	5B	25B	OV+ *	High limit	←	
		26A	6B	26B	OV- *	Low limit	←	
		27A	7B	27B	STOP	External stop signal	←	
		28A	8B	28B	DOG	Approximate origin	←	
		29A	9B	29B	VTP	Speed/Position switching signal	←	
		30A	10B	30B	ECMD	External command signal: Start	←	
						External command signal: Skip	←	
						External command signal: JOG+ (Forward)	←	
		31A	11B	31B	JOG-	JOG reverse operation	←	
		32A	12B	32B	COM	Common (OV+, OV-, STOP, DOG, VTP, ECMD, JOG-)	⇔	
		33A	13B	33B	DRVIN *	Drive unit ready signal	←	
		34A	14B	34B	DRVIN COM	Drive unit ready signal common	⇔	
		35A	15B	35B	HOME +24V	Zero signal (+24V)	←	
		36A	16B	36B	HOME COM	Zero signal (+24V, +5V) Common	⇔	
		37A	17B	37B	HOME +5V	Zero signal (+5V)	←	
		38A	18B	38B	P COM	External 5V, 24V GND (Not used in case of line drive output)	⇔	
		39A	19B	39B	5V	External 5V Power input (Not used in case of line drive output)	←	
		40A	20B	40B	24V	External 24V Power input (Not used in case of line drive output)	←	
 2/3 axes	Common	1A			MPG A+	Manual pulse generator/Encoder A+ Input	←	
		2A			MPG A-	Manual pulse generator/Encoder A- Input	←	
		3A			MPG B+	Manual pulse generator/Encoder B+ Input	←	
		4A			MPG B-	Manual pulse generator/Encoder B- Input	←	
		5A			NC	Not used		
		6A			NC	Not used		
		7A			CON	External simultaneous start (Not used in case of 1 axis APM)	←	
		8A			EMG *	Emergency stop	←	
		9A			NC	No use		
		10A			COM	(CON, EMG) Common	⇔	
		11A, 12A, 13A, 14A, 15A, 16A, 17A, 18A, 19A, 20A			NC	Not used		

* High/low limit, drive unit ready signal, emergency stop signal should be connected to DC 24V.

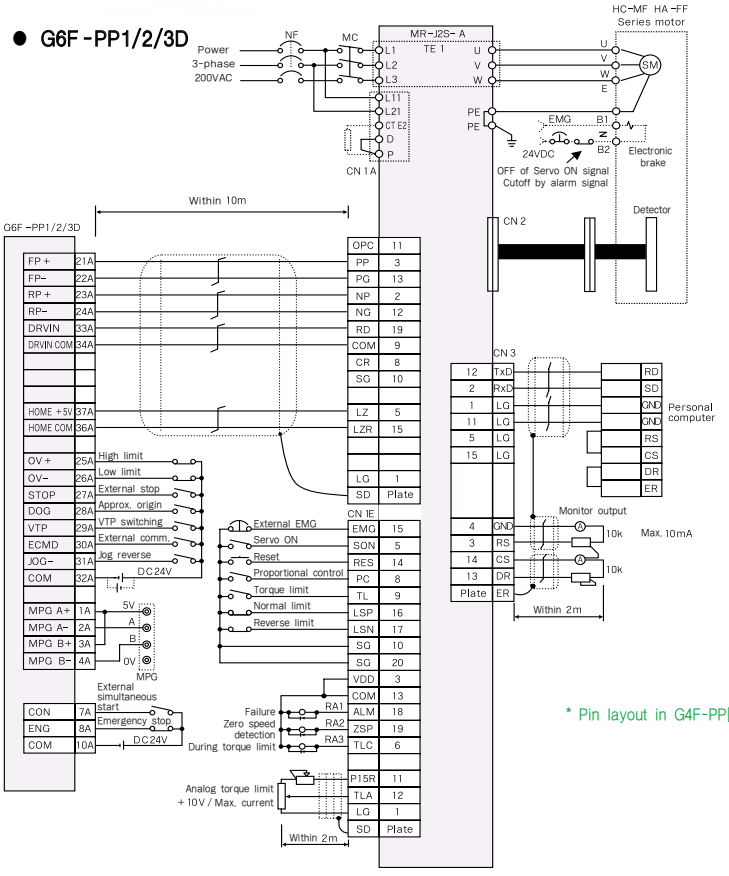
MR-J2/J2S-□A connection (line drive)

- G4F-PP1/2/3D



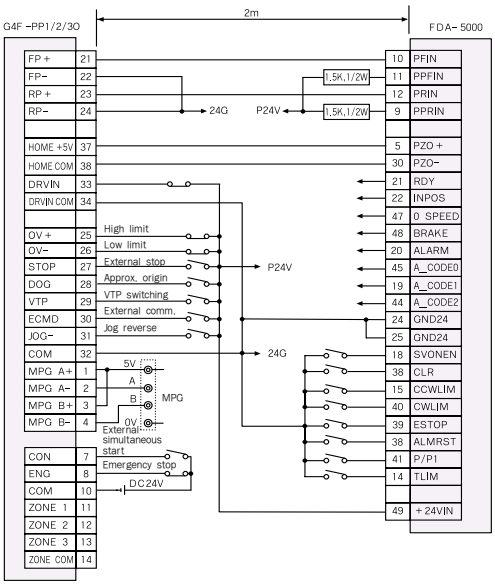
MR-J2/J2S-□A connection (line drive)

- G6F-PP1/2/3D



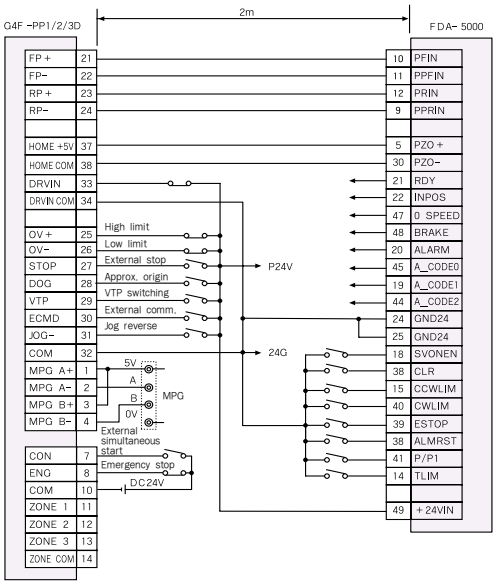
FDA-5000 AC Servo driver connection (open collector)

- G4F-PP1/2/3O



FDA-5000 AC Servo driver connection (line drive)

- G4F-PP1/2/3D

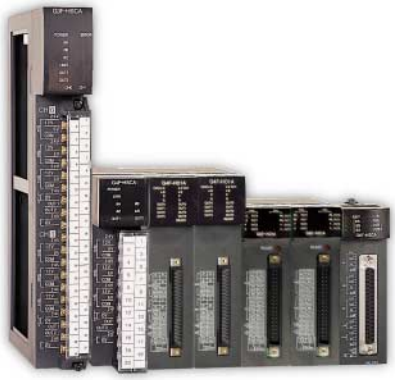


* Pin layout in G4F-PP□D(O) and G6F-PP□D(O) is different.

High speed counter module (GM4/6)

Features

- Pulse input support (5V, 12V, 24V)
- Counting range from -2,143,483,648 to 2,147,483,647
- Max. counting speed: 500kpps
- Coincidence output selection (Max. 4 points)
- Various multiplication (1/2/4-multiplication phase up/down counter)
- Phase input (A, B and Z phase)
- External preset input (G4F-PO1A, G4F-PD1A, G6F-PO1A, G4F-PD1A, G6F-HSCA)
- Incremental encoder available to use (Absolute encoder: Not available)



Specifications

New

Item		G4F-HSCA	New type		G6F-HSCA
			G4F-HO1A * / G6F-HO1A *	G4F-HD1A * / G6F-HD1A *	
CPU		GM4-CPUA/B/C	GM4-CPUA/B/C / GM6-CPUA/B/C		GM6-CPUA/B/C
Number of channel(s)		1	2		1
Counter input signal	Phase	A, B, Z (phase)	A, B (phase)		A, B, Z (phase)
	Level	DC 5V, 12V, 24V		EIA RS-422A standard	DC 5V, 12V, 24V
	Type	Voltage input			
Counting range		0~16,777,215 (Binary 16bits)	-2,147,483,648~2,147,483,647 (Binary 32bits)		0~16,777,215 (Binary 16bits)
Counting speed		50kpps	200kpps	500kpps	50kpps
Up/down counter setting	1-phase input	Program or B phase			
	2-phase input	Phase difference			
	CW/CCW	-	A-phase: Up count, B-phase: Down count		-
Multiplication	1-phase input	-	1/2 multiplication	-	-
	2-phase input	1/2/4 multiplication (DIP S/W)	1/2/4 multiplication (Program)		1/2/4 multiplication (DIP S/W)
External input	Preset	-	DC 5V, 12V, 24V		DC 24V
	Limit switch	DC 24V	-		DC 24V
	Gate	-	DC 5V, 12V, 24V		-
External output	Type	OUT1, OUT2 (Select: 〉, =, 〈)	OUT1, OUT2, OUT3, OUT4 (Select: 〉, =, 〈, section)		OUT1, OUT2 (Select: 〉, =, 〈)
	Signal	Tr output DC 24V, 200mA	Tr. output DC 24V		Tr. output DC 24V, 200mA
Additional functions		-	Count clear, Count latch, Sampling count, Pulse frequency count, Periodic pulse count		-
Current consumption		250mA	400mA / 450mA	400mA / 450mA	180mA

GMWIN software

Features

- Supports the international language (IEC61131-3)
  - IL, LD, SFC
- Supports Windows 95, 98, ME, NT, 2000, XP
- Simulation
  - Program test and debugging without PLC
- Editing, monitoring, debugging using symbol and variable name
- Automatic memory allocation support
  - Compiler sets a variable location automatically
- Optimization (PLC code) by compiler method
- User-defined function/function block support

System requirement

- Intel compatible PC (Intel 486 or later)
- Windows 95, 98, ME, NT, 2000, XP
- Video adapter (VGA or later)
- Mouse/Printer compatible with Windows
- 16M RAM and 30M free hard disk space

Basic

- Function (Type conversion, Arithmetic, Comparison, Array operation function)
- Function block (Timer, Counter, etc)

Languages

- IL (Instruction list)
- LD (Ladder diagram)
- SFC (Sequential function chart)

System configuration

IBM-PC

RS-232C

- Program creating, editing, monitoring
- Information management (error/warning)
- Debugging operation
- Parameter setting function

Printer

- IL, LD, SFC program print
- Basic, I/O, high-speed link parameter print
- Project hierarchy and detail information print

G□M-M□□□

Memory module (option)

Max. 3,584 points control

GM4

Max. 384 points control

GM6

Max. 80 points control

GM7

PMU 30 Series




Features

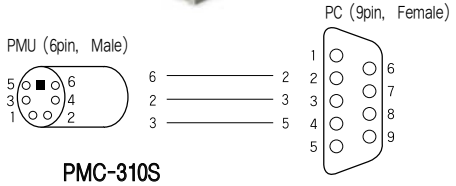
- High-speed communication
  - 32-bit processor adopted for high-speed graphic process
  - Max. communication speed: 115,200bps
- Easy operation
  - Recipe function for batch processing of parameter data
  - Data logging for running data back-up
- Various image functions
  - Screen configuration with 256 colors
  - Various network configurations thanks to various comm. drivers and comm. functions
- Flash memory for saving screen data

Specifications

Product name		PMU-830	PMU-730		PMU-530	PMU-330		
Item		PMU-830TT	PMU-730TT		PMU-530ST	PMU-330TT		
			PMU-730ST			PMU-330ST		
						PMU-330BT		
Display	Component	TFT Color	TFT Color		STN Color	TFT Color		
			STN Color			STN Color		
						STN Mono		
	Screen size	12.1″	10.4″		7.5″	5.5″/5.7″		
	Color	256 Colors				256 Colors/Blue & White		
	Touch resolution	1×1 (Dot)	20×20 (Dot)		1×1 (Dot)	20×20 (Dot)		
	Touch cell	800×600	32×24		640×480	16×12		
	Touch type	Analog	Matrix		Analog	Matrix		
	Screen resolution	800×600	640×480		640×480	320×240		
	Diagram type	Circle, Straight line, Oval, Square, Polygon						
	Graph type	Bar, Trend, Meter, Pie, Polygon, XY chart						
	Language	English, Chinese, Japanese, Korean						
	Brightness (cd/m²)	135	200	230	83	250	75	220
Interface	RS-232C *1)	Built-in						
	RS-422 *1)	Built-in						
	Fnet	PMO-730F			PMO-530F	PMO-330F		
	Rnet	PMO-730R			PMO-530R	PMO-330R		
	Printer port	Built-in			PMO-530PRT	PMO-330PRT		
Memory	Screed data save	4M	4M	2M	2M	2M	1M	1M
	System buffer	2,048 words						
	logging/recipe	256K						
Size	Appearance size	305 (W) × 292 (H) × 55 (D)			240 (W) × 170 (H) × 62 (D)	206 (W) × 136 (H) × 64 (D)		
	Panel cut	295 (W) × 228 (H)			231 (W) × 161 (H)	198(W) × 128(H)		

*1) You are not supposed to use RS-232C and RS-422 at the same time.

Downloading cable connection

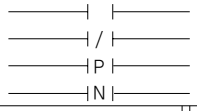
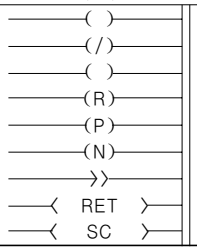


PMC-310S

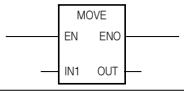
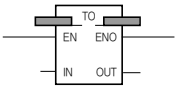
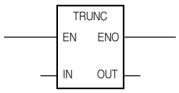
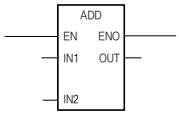
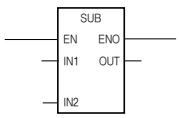
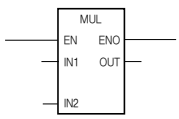
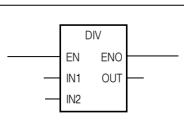
Option

Item	Name	Remark
Cable	PMC-310S	Program downloading cable
	PMC-422C	Mitsubichi loader comm. cable
Software	PMU-Editor	Software for PMU 30 Series

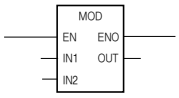
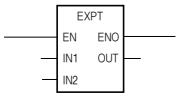
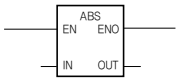
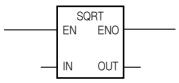
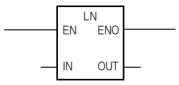
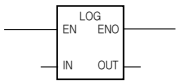
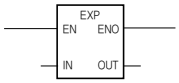
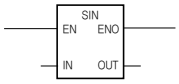
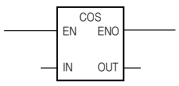
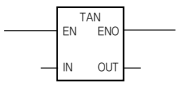
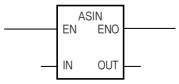
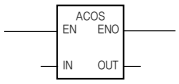
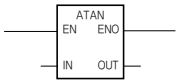
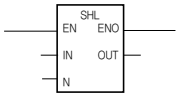
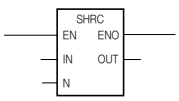
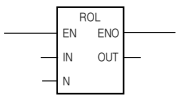
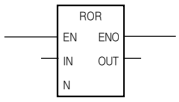
Sequence operation

Symbol	Description	Remark
	Normally open contact	
	Normally closed contact	
	Positive transition-sensing contact	
	Negative transition-sensing contact	
	Coil	
	Negative coil	
	Set (Latch) coil	
	Reset (Unlatch) coil	
	Positive transition-sensing coil	
	Negative transition-sensing coil	
	Jump to label	
	End subroutine program	
	Call subroutine	

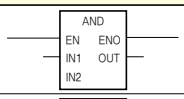
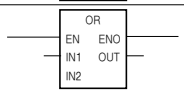
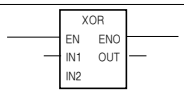
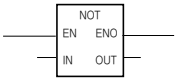
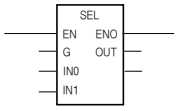
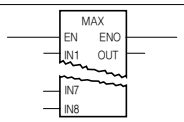
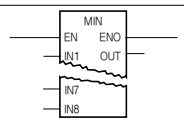
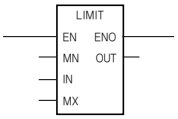
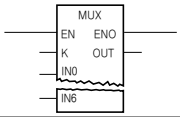
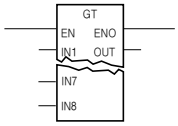
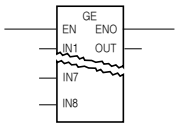
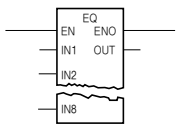
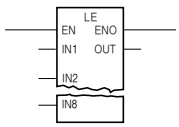
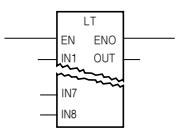
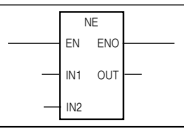
Function

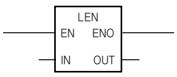
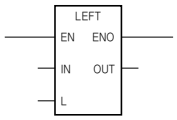
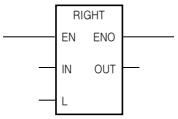
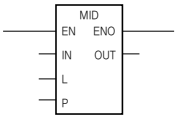
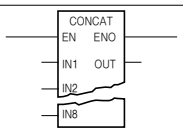
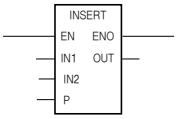
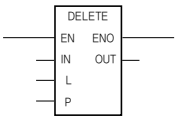
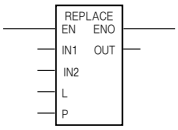
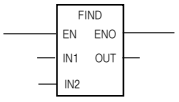
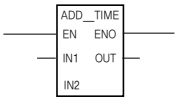
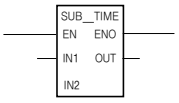
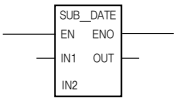
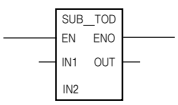
Instruction	Symbol	Description	Remark
MOVE		Data movement IN1: Value to be moved (ANY) OUT: Moved value (ANY)	
**** __TO__ ****		Type conversion IN: Input OUT: Output Type conversion function SINT__TO__INT plus 14 types INT__TO__SINT plus 14 types DINT__TO__SINT plus 14 types LINT__TO__SINT plus 14 types USINT__TO__SINT plus 14 types UINT__TO__SINT plus 15 types UDINT__TO__SINT plus 16 types ULINT__TO__SINT plus 14 types BOOL__TO__SINT plus 12 types BYTE__TO__SINT plus 13 types WORD__TO__SINT plus 13 types DWORD__TO__SINT plus 15 types LWORD__TO__SINT plus 14 types BCD__TO__SINT plus 8 types REAL__TO__SINT plus 9 types LREAL__TO__SINT plus 9 types STRING__TO__SINT plus 18 types NUM__TO__STRING TIME__TO__UDINT plus 2 types DATE__TO__UINT plus 2 types TOD__TO__UDINT plus 2 types DT__TO__DATE plus 3 types	LINT, ULINT LWORD, REAL, LREAL are available in GM4C *
TRUNC		Converting Real to Integer number IN: Input (REAL, LREAL) OUT: Output (DINT, LINT)	GM4C only
ADD		Addition IN1: Value to be added IN2~IN8: Value to add (ANY__NUM) OUT: Added value (ANY__NUM)	
SUB		Subtraction IN1: Value to be subtracted (ANY__NUM) IN2: Value to subtract (ANY__NUM)	
MUL		Multiplication IN1: Multiplicand IN2~IN8: Multiplier (ANY__NUM) OUT: Multiplied value (ANY__NUM)	
DIV		Division IN1: Dividend (ANY__NUM) IN2: Divisor (ANY__NUM) OUT: Quotient (ANY__NUM)	

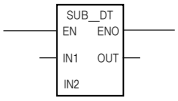
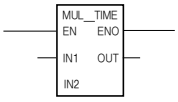
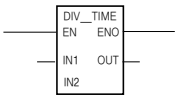
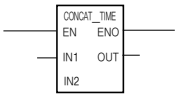
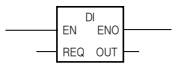
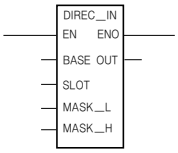
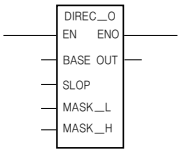
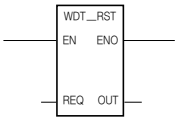
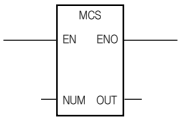
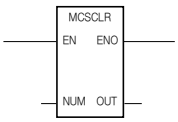
* GM4C: GM4-CPUC

Instruction	Symbol	Description	Remark
MOD		Divided result (Remainder) IN1: Dividend (ANY_INT) IN2: Divisor (ANY_INT) OUT: Remainder (ANY_INT)	
EXPT		Exponential operation IN1: Real number (ANY_REAL) IN2: Exponent (ANY_NUM) OUT: Result (ANY_REAL)	GM4C only
ABS		Absolute value operation IN: Input (ANY_NUM) OUT: Absolute value (ANY_NUM)	GM4C only
SQRT		Square root operation IN: Input value (ANY_REAL) OUT: Square root value (ANY_REAL)	GM4C only
LN		Natural logarithm operation IN: Input value (ANY_REAL) OUT: Natural logarithm value (ANY_REAL)	GM4C only
LOG		Base 10 logarithm operation IN: Input value (ANY_REAL) OUT: Base 10 logarithm value (ANY_REAL)	GM4C only
EXP		Natural exponential operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
SIN		Sine operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
COS		Cosine operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
TAN		Tangent operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
ASIN		Arc Sine operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
ACOS		Arc Cosine operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
ATAN		Arc Tangent operation IN: Input value (ANY_REAL) OUT: Result (ANY_REAL)	GM4C only
SHL		Shift left operation IN: Bit string (ANY_BIT) N: Bit number to be shifted (INT) OUT: Shifted value (ANY_BIT)	
SHR		Shift right operation IN: Bit string (ANY_BIT) N: Bit number to be shifted (INT) OUT: Shifted value (ANY_BIT)	
ROL		Rotate to left IN: Value to be rotated (ANY_BIT) N: Bit number to rotate (INT) OUT: Rotated value (ANY_BIT)	
ROR		Rotate to right IN: Value to be rotated (ANY_BIT) N: Bit number to rotate (INT) OUT: Rotated value (ANY_BIT)	

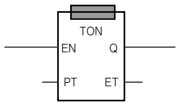
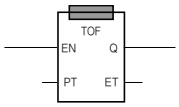
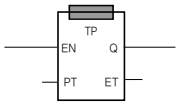
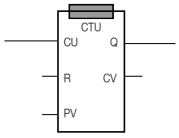
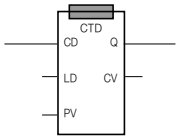
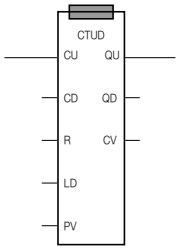
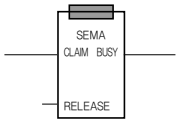
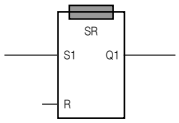
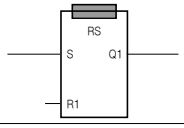
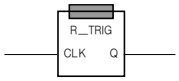
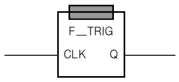
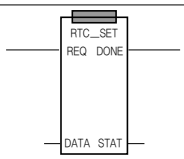
* GM4C: GM4-CPUC

Instruction	Symbol	Description	Remark
AND		Logical AND IN1~IN8: Input (ANY_BIT) OUT: AND Result (ANY_BIT)	
OR		Logical OR IN1, IN2: Input (ANY_BIT) OUT: OR Result (ANY_BIT)	
XOR		Exclusive OR IN1, IN2: Input (ANY_BIT) OUT: XOR Result (ANY_BIT)	
NOT		Logic inversion (NOT) IN: Input (ANY_BIT) OUT: NOT Result (ANY_BIT)	
SEL		Selection G: Selection IN0, IN1: Value to be selected (ANY) OUT: Selected value (ANY)	
MAX		Maximum value IN1: Value to be compared (ANY) IN2~IN8: Value to compare (ANY) OUT: Maximum value (ANY)	
MIN		Minimum value IN1: Value to be compared (ANY) IN2~IN8: Value to compare (ANY) OUT: Minimum value (ANY)	
LIMIT		Limit upper and lower boundary MN: Minimum value (ANY) IN: Value to be limited (ANY) MX: Maximum value (ANY) OUT: Value in the range (ANY)	
MUX		Multiplexer K: Selection (INT) IN0~IN6: Value to be selected (ANY) OUT: Selected value (ANY)	
GT (>)		'Greater than' comparison IN1: Value to be compared (ANY) IN2~IN8: Comparing value (ANY) OUT: Comparison result (BOOL) If IN1 > IN2 > ··· IN7 > IN8, output is 1	
GE (≥)		'Greater than or equal to' comparison IN1: Value to be compared (ANY) IN2~IN8: Comparing value (ANY) OUT: Comparison result (BOOL) If IN1 ≥ IN2 ≥ ··· IN7 ≥ IN8, output is 1	
EQ (=)		'Equal to' comparison IN1: Value to be compared (ANY) IN2~IN8: Comparing value (ANY) OUT: Comparison result (BOOL) If IN1 = IN2 = ··· IN7 = IN8, output is 1	
LE (≤0)		'Less than or equal to' comparison IN1: Value to be compared (ANY) IN2~IN8: Comparing value (ANY) OUT: Comparison result (BOOL) If IN1 ≤ IN2 ≤ ··· IN7 ≤ IN8, output is 1	
LT (<)		'Less than' comparison IN1: Value to be compared (ANY) IN2~IN8: Comparing value (ANY) OUT: Comparison result (BOOL) If IN1 < IN2 < ··· IN7 < IN8, output is 1	
NE (≠)		'Not equal to' comparison IN1, IN2: Comparing value (ANY) OUT: Comparing result (BOOL) If IN1 ≠ IN2, output is 1	

Instruction	Symbol	Description	Remark
LEN		Character string length IN: Character string Input (STRING) OUT: Character string length (INT)	
LEFT		Left part of a character string IN: Input character string (STRING) L: Character string length to output (INT) OUT: Output character string (STRING)	
RIGHT		Right part of a character string IN: Input character string (STRING) L: Character string length to output (INT) OUT: Output character string (STRING)	
MID		Middle part of a character string IN: Input character string (STRING) L: Character string length to output (INT) P: String location of character string (INT) OUT: Output character string (STRING)	
CONCAT		Concatenation of a character string IN1~IN8: Input character string (STRING) OUT: Output character string (STRING)	
INSERT		Insertion of s character string IN1: Character string to be inserted (STRING) IN2: Character string to insert (STRING) P: Position to insert a character string (INT) OUT: Output character string (STRING)	
DELETE		Deletion of a character string IN: Input character string (STRING) L: Length of a character string to be deleted (INT) P: Position of a character string to delete (INT) OUT: Output character string (STRING)	
REPLACE		Character string Replacement IN1: Character string to be replaced (STRING) IN2: Character string to replace (STRING) L: Length of character string to be replaced (INT) P: Position of character string to be replaced (INT) OUT: Character string output (STRING)	
FIND		Find a character string IN1: Input character string (STRING) IN2: Character string to find (STRING) OUT: Location of character string to be found (INT)	
ADD_TIME		Time addition IN1: Reference time (TIME, TOD, TD) IN2: Time to add (TIME) OUT: Added result of TOD or time (TIME, TOD, TD)	
SUB_TIME		Time subtraction IN1: Reference time (TIME, TOD, TD) IN2: Time to subtract (TIME) OUT: Subtracted result of TOD or time (TIME, TOD, TD)	
SUB_DATE		Date and time subtraction IN1: Reference Date (DATE) IN2: Date to be subtracted (DATE) OUT: The difference between two dates as time (TIME)	
SUB_TOD		TOD subtraction IN1: Reference TOD (TIME_OF_DAY) IN2: TOD to subtract (TIME_OF_DAY) OUT: Subtracted resuit time (TIME)	

Instruction	Symbol	Description	Remark
SUB_DT		Date and time subtraction N1: Reference DATE_AND_TIME (DATE_AND_TIME) IN2: DATE_AND_TIME to be Subtracted (DATE_AND_TIME) OUT: Subtracted result time (TIME)	
MUL_TIME		Time multiplication IN1: Time to be multiplied (TIME) IN2: Multiplying value (ANY_NUM) OUT: Multiplied result (TIME)	
DIV_TIME		Time division IN1: Time to divide (TIME) IN2: Value to divide (ANY_NUM) OUT: Divided result time (TIME)	
CONCAT_TIME		Character string concatenation IN1: Date input (DATE) IN2: TOD input (TOD) OUT: DT output	
DI		Not to permit task program operation REQ: Requires to invalidate task program (BOOL) OUT: If DI is executed, if will be 1 (BOOL)	
EI		To permit running for task program REQ: Requires to permit running task program (BOOL) OUT: If EI is executed, if will be 1 (BOOL)	
STOP		Stop by program REQ: STOP Request (BOOL) OUT: If STOP is executed, it will be 1 (BOOL)	
ESTOP		Emergency stop by program REQ: Emergency stop request (BOOL) OUT: If ESTOP is executed, it will be 1 (BOOL)	
DIREC_IN		Instant refreshment of input data BASE: Base number of input module (USINT) SLOT: Slot number of input module (USINT) MASK_L: Designating bits not to be refreshed among lower 32-bit data of input (DWORD) MASK_H: Designating bits not to be refreshed among upper 32-bit data of input (DWORD) OUT: If refreshment is completed, it will be 1 (BOOL)	
DIREC_O		Instant Refreshment of output data BASE: Base number of output module (USINT) SLOT: Slot number of output module (USINT) MASK_L: Designating bits not to be refreshed among lower 32-bit data of output (DWORD) MASK_H: Designating bits not to be refreshed among upper 32-bit data of output (DWORD) OUT: If refreshment is completed, it will be 1 (BOOL)	
WDT_RST		Watchdog timer reset REQ: Watchdog timer initialization request (BOOL) OUT: If WDT_RST is executed, it will be 1 (BOOL)	
MCS		Master control NUM: Nesting number (INT) OUT: Dummy (Always 0)	
MCSCLR		Master control clear NUM: Nesting number (INT) OUT: If MCSCLR is executed, it will be 1 (BOOL)	

Function block

Instruction	Symbol	Description	Remark
TON		On delay timer EN: Timer operation condition (BOOL) PT: Preset time (TIME) Q: Timer output (BOOL) ET: Elapsed time (TIME)	
TOF		Off delay timer EN: Timer operation condition (BOOL) PT: Preset time (TIME) Q: Timer output (BOOL) ET: Elapsed time (TIME)	
TP		Pulse timer EN: Timer operation condition (BOOL) PT: Preset time (TIME) Q: Timer output (BOOL) ET: Elapsed time (TIME)	
CTU		Up counter CU: Up counter pulse input (BOOL) R: Reset input (BOOL) PV: Preset value (INT) Q: Up counter output (BOOL) CV: Current value (INT)	
CTD		Down counter CD: Down counter pulse input (BOOL) LD: Load preset value (BOOL) PV: Preset value (INT) Q: Down counter output (BOOL) CV: Current value (INT)	
CTUD		Up/Down counter CU: Up counter pulse input (BOOL) CD: Down counter pulse input (BOOL) R: Reset input (BOOL) LD: Load preset value (BOOL) PV: Preset value (INT) QU: Up counter output (BOOL) QD: Down counter output (BOOL) CV: Current value (INT)	
SEMA		Semaphore for system resource allocation CLAIM: Resource monopoly request signal (BOOL) RELEASE: Release signal (BOOL) BUSY: Waiting signal not to obtain the claimed resource (BOOL)	
SR		Set priority bistable S1: Set condition (BOOL) R: Reset condition (BOOL) Q1: Operation result (BOOL)	
RS		Reset priority bistable S: Set condition (BOOL) R1: Reset condition (BOOL) Q1: Operation result (BOOL)	
R_TRIG		Rising edge detection CLK: Input clock (BOOL) Q: Rising edge detection result (BOOL)	
F_TRIG		Falling edge detection CLK: Input signal (BOOL) Q: Falling edge detection result (BOOL)	
RTC_SET		RTC data setting REQ: Request (BOOL) DATA: Time data to input (ARRAY) DONE: Without an error, it will be 1 (BOOL) STAT: If an error occurs, an error code appears (USINT)	

GM4

Type	Part number	Specifications	Remark
CPU	GM4-CPUA	Max. I/O: 2,048 points, Program memory: 128K, Data memory: 64K	
	GM4-CPUB	Max. I/O: 2,048 points, Program memory: 128K, Data memory: 64K	
	GM4-CPUC	Max. I/O: 3,584 points, Program memory: 1M, Data memory: 428K	
Main base	GM4-B04M	4-slot main base board	
	GM4-B06M	6-slot main base board	
	GM4-B08M	8-slot main base board	
	GM4-B12M	12-slot main base board (Slot No. 8 is treated as slot No.0 of base No.1)	Not extensible
Main base * (High functional)	GM4-B4MH	4-slot main base board (High functional)	
	GM4-B6MH	6-slot main base board (High functional)	
	GM4-B8MH	8-slot main base board (High functional)	
Extension base	GM4-B04E	4-slot extension base board	
	GM4-B06E	6-slot extension base board	
	GM4-B08E	8-slot extension base board	
Extension base * (High functional)	GM4-B4EH	4-slot extension base board (High functional)	
	GM4-B6EH	6-slot extension base board (High functional)	
	GM4-B8EH	8-slot extension base board (High functional)	
Memory module	G4M-M032	Capacity: 128K (32kstep)	
Extension cable	G4C-E041	Length: 0.4m	
	G4C-E121	Length: 1.2m	
	G4C-E301	Length: 3.0m	
Extension cable * (High functional)	G4C-E061	Length: 0.6m	
	G4C-E601	Length: 6m	
	G4C-E102	Length: 10m	
	G4C-E152	Length: 15m	
Power module	GM4-PA1A	AC 110V input, DC 5V: 4A, DC 24V: 0.7A	
	GM4-PA2A	AC 220V input, DC 5V: 4A, DC 24V: 0.7A	
	GM4-PA1B	AC 110V input, DC 5V: 3A, DC 24V: 0.5A	
	GM4-PA2B	AC 220V input, DC 5V: 3A, DC 24V: 0.5A	
	GM4-PA2C	AC 220V input, DC 5V: 6A	
	GM4-PD3A	DC 24V input, DC 5V: 3A	
DC input module	G4I-D22A	16 points DC 12/24V input (Current Sink/Source type)	
	G4I-D22B	16 points DC 12/24V input (Current Source type)	
	G4I-D22C	16 points DC 24V input (Current Sink/Source type)	
	G4I-D24A	32 points DC 12/24 input (Current Sink/Source type)	
	G4I-D24B	32 points DC 12/24 input (Current Source type)	
	G4I-D24C	32 points DC 24 input (Current Sink/Source type)	
	G4I-D28A	64 points DC 12/24 input (Current Sink/Source type)	
AC input module	G4I-A12A	16 points AC 110V input	
	G4I-A22A	16 points AC 220V input	
Relay output module	G4Q-RY2A	16 points Relay output (2A)	AC, DC
Transistor output module	G4Q-TR2A	16 points Tr. (NPN) output (0.5A) (Sink type)	DC
	G4Q-TR2B	16 points Tr. (PNP) output (0.5A) (Source type)	
	G4Q-TR4A	32 points Tr. (NPN) output (0.1A) (Sink type)	

Type		Part number	Specifications	Remark
Transistor output module		G4Q-TR4B	32 points Tr. (PNP) output (0.1A) (Source type)	DC
		G4Q-TR8A	64 points Tr. (NPN) output (0.1A) (Sink type)	
Triac output module		G4Q-SS2A	16 points Triac output (1.0A)	AC
		G4Q-SS2B	16 points Triac output (0.6A)	
I/O hybrid module		G4H-DR2A	8 points DC 12/24V input, 8 points relay output	
		G4H-DT2A	8 points DC 12/24V input, 8 points Tr. output	
Special module	A/D module	G4F-AD2A	V/I input: 4 CHs (DC -5~5V/-10~10V/DC -20~20mA)	
		G4F-AD3A	V/I input: 8 CHs (DC 1~5V/0~10V/DC 4~20mA)	
	D/A module	G4F-DA1A	V/I output: 2 CHs (DC -10~10V, DC 4~20mA)	
		G4F-DA3V	V output: 8 CHs (DC -10~10V)	
		G4F-DA3I	I output: 8 CHs (DC 4~20mA)	
		G4F-DA2V	V output: 4 CHs (DC-10~10V)	
		G4F-DA2I	I output: 4 CHs (4~20mA)	
	HSC module	G4F-HSCA	1 CH, 50kHz, Counting range: 0~16,777,215	
		G4F-HO1A	2 CHs, 200kpps, Counting range: -2,147,483,648~+2.147,483,647, Open collector type	
		G4F-HD1A	2 CHs, 500kpps, Counting range: -2,147,483,648~+2.147,483,647, Line drive type	
	Positioning module	G4F-PPxO	X=1, 2, 3: axis, Pulse output, 200kpps, Open Collector Type	CPU V2.6↑
		G4F-PPxD	X=1, 2, 3: axis, Pulse output, 1Mbps, Line Drive Type	
	Thermocouple input module	G4F-TC2A	Input: 4 CHs (Thermocouple: K, J, E, T, B, R, S)	
	Temperature control module	G4F-TMCA	Temp. control (AI/AO=2/2 CHs) PID 2 loops, 2-point digital output	
	RTD input	G4F-RD2A	Input: 4 CHs	
	PID control module	G4F-PIDA	Max. 8-loop control (Autotuning)	
		G4F-PIDB	Max. 16-loop control (Autotuning), 16-point digital output	
	Analog timer module	G4F-AT3A	Input: 8 points	Make to order
	Interrupt module	G4F-INTA	Input: 8 CHs	
Comm. module	Fast Enet I/F module (Open type)	G4L-EUTB	10/100BASE-TX, UTP	CPU V2.7↑
		G4L-EUFB	100BASE-FX, Fiber optic	
		G4L-EU5B	10BASE-5, AUI	
	Dedicated Fast Enet I/F Module (Master)	G4L-EUTC	10/100BASE-TX, UTP	
		G4L-EUFC	100BASE-FX, Fiber optic	
		G4L-EU5C	10BASE-5, AUI	
	Dedicated Fast Enet I/F module (Slave)	G4L-ERTC	10/100BASE-TX, UTP	
		G4L-ERFC	100BASE-FX, Fiber optic	
		G4L-ER5C	10BASE-5, AUI	
	Fnet I/F module	G4L-FUEA	Fnet master module (Shielded twisted pair cable), 1Mbps	
		G4L-FUOA	Fnet master module (Optic cable)	
	Fnet remote I/F module	G4L-RBEA	Fnet remote module (Shielded twisted pair cable), 1Mbps	
	Dnet I/F module	G4L-DUEA	DeviceNet master module (500kbps MAX.)	
	Pnet I/F module	G4L-PUEA	Profibus-DP master module (1Kbyte)	
		G4L-PUEB	Profibus-DP master module (7Kbyte)	
	Rnet I/F module	G4L-RUEA	Rnet master module	
	Cnet I/F module	G4L-CUEA	RS-232C/RS-422: 1Ch each, Stand-alone/Interlocking mode	
Dummy module		GM4-DMMA	Dummy module for empty I/O slot	

* In GM4-CPUC, you are supposed to use high-functional base (main/extension) and high-functional cable when you want to make more than 3-stage extension.

GM6

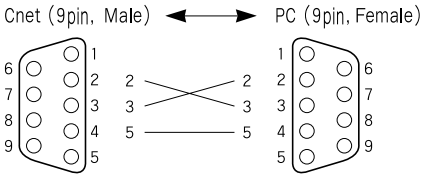
Type		Part number	Specifications	Remark
CPU		GM6-CPUA	Max. I/O: 384 points, Program memory: 68K, Built-in function: RS-232	
		GM6-CPUB	Max. I/O: 384 points, Program memory: 68K, Built-in function: RS-422, PID, RTC	
		GM6-CPUC	Max. I/O: 384 points, Program memory: 68K, Built-in function: RS-232C, PID, RTC, HSC (50kpps)	
Power module		GM6-PAFA	AC input (Free), output: DC 5V 2A, DC 24V 0.3A	
		GM6-PAFB	AC input (Free), output: DC 5V 2A, DC 15V 0.5A, DC -15V 0.3A, when analog module used	Analog
		GM6-PAFC	AC input (Free), output: DC 5V 3.5A, DC 24V 0.3A	
		GM6-PA2A	AC 220V Only, DC 5V 6A	
		GM6-PDFA	DC 12/24V input, output: DC 5V 2A	
		GM6-PDFB	DC 12/24V input, output: DC 5V 2A, DC 15V 0.5A, DC -15V 0.3A, when analog module used	Analog
Base		GM6-B04M	4-slot base board	Not extensible
		GM6-B06M	6-slot base board	
		GM6-B08M	8-slot base board	
		GM6-B12M	12-slot base board	
DC input module		G6I-D21A	DC 12/24V input 8 points, Current Sink/Source type	
		G6I-D22A	DC 12/24V input 16 points, Current Sink/Source type	
		G6I-D22B	DC 24V input 16 points, Current Source type	
		G6I-D24A	DC 12/24V input 32 points, Current Sink/Source type	
		G6I-D24B	DC 24V input 32 points, Current Source type	
AC input module		G6I-A11A	AC 110V input 8 points	
		G6I-A21A	AC 220V input 8 points	
Relay output module		G6Q-RY1A	Relay output 8 points, DC 12/24V, AC 220V, 2A	AC, DC
		G6Q-RY2A	Relay output 16 points, DC 12/24V, AC 220V, 2A	
		G6Q-RY2B	Relay output 16 points, DC 12/24V, AC 220V, 2A, Surge	
Transistor output module		G6Q-TR2A	Tr. (NPN) output 16 points, DC 12/24V, 0.5A	DC
		G6Q-TR2B	Tr. (PNP) output 16 points, DC 12/24V, 0.5A	
		G6Q-TR4A	Tr. (NPN) output 32 points, DC 12/24V, 0.1A	
		G6Q-TR4B	Tr. (PNP) output 32 points, DC 12/24V, 0.1A	
Triac output module		G6Q-SS1A	Triac output 8 points, AC 100~240V, 0.6A	AC
I/O hybrid module		G6H-DR2A	Tr. input 8 points, Relay output 8 points	
Special module	A/D module	G6F-AD2A	V/I input: 4 CHs, DC 1~5V, 0~10V, -10~10V, 4~20mA	GM6-PAFB/PDFB
	D/A module	G6F-DA2V	V output: 4 CHs, DC -10~10V	
		G6F-DA2I	I output: 4 CHs, DC 4~20mA	
	HSC module	G6F-HSCA	1Ch, Counting range: 0~16,777,215	
		G6F-HD1A	2 CHs, 500kpps, Counting range: -2,147,483,648~2,147,483,647, Line drive type	
		G6F-HO1A	2 CHs, 200kpps, Counting range: -2,147,483,648~2,147,483,647, Open collector type	
	Positioning module	G6F-PPxO	X=1, 2, 3: axis, Pulse output, 200kpps, Open collector type	CPU V2.0↑
		G6F-PPxD	X=1, 2, 3: axis, Pulse output, 1M, Line drive type	
Comm. module	Thermocouple input module	G6F-TC2A	Input: 4 CHs (Thermocouple: K, J, E, T, B, R, S)	GM6-PAFB/PDFB
	Dedicated Fast Enet I/F module (Open type)	G6L-EUTB	10/100BASE-TX, UTP	CPU V2.1↑
		G6L-EUFB	100BASE-FX, Fiber optic	
	Dedicated Fast Enet I/F module (Master)	G6L-EUTC	10/100BASE-TX, UTP	
		G6L-EUFC	100BASE-FX, Fiber optic	
	Dedicated Fast Enet I/F module (Slave)	G6L-ERTC	10/100BASE-TX, UTP	
		G6L-ERFC	100BASE-FX, Fiber optic	
	Fnet I/F module	G6L-FUEA	Fnet master module (Shielded twisted pair cable, 1Mbps)	
	Fnet remote I/F module	G6L-RBEA	Fnet remote module (Shielded twisted pair cable, 1Mbps)	
	Dnet I/F module	G6L-DUEA	DeviceNet master module (500kbps MAX.)	
	Pnet I/F module	G6L-PUEA	Profibus-DP master module, Memory (1Kbyte)	
		G6L-PUEB	Profibus-DP master module, Memory (7Kbyte)	
	Rnet I/F module	G6L-RUEA	Rnet master module	
	Cnet I/F module	G6L-CUEB	RS-232C	
		G6L-CUEC	RS-422/485	
Dummy module		GM6-DMMA	Dummy module for empty I/O slot	

GM7

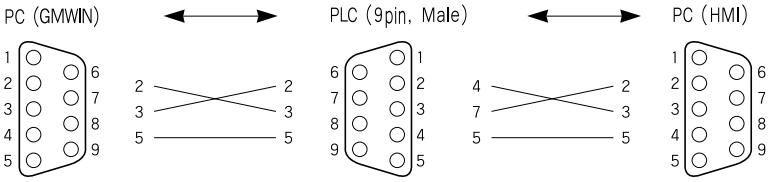
Type		Part number	Specifications	Remark
Main		G7M-DR10A	DC 24V input 6 points, Relay output 4 points	
		G7M-DR20A	DC 24V input 12 points, Relay output 8 points	
		G7M-DR30A	DC 24V input 18 points, Relay output 12 points	
		G7M-DR40A	DC 24V input 24 points, Relay output 16 points	
		G7M-DR60A	DC 24V input 36 points, Relay output 24 points	
		G7M-DR10A/DC	DC 24V input 6 points, Relay output 4 points	
		G7M-DR20A/DC	DC 24V input 12 points, Relay output 8 points	
		G7M-DR30A/DC	DC 24V input 18 points, Relay output 12 points	
		G7M-DR40A/DC	DC 24V input 24 points, Relay output 16 points	
		G7M-DR60A/DC	DC 24V input 36 points, Relay output 24 points	
		G7M-DT10A	DC 24V input 6 points, Tr. output 4 points	
		G7M-DT20A	DC 24V input 12 points, Tr. output 8 points	
		G7M-DT30A	DC 24V input 18 points, Tr. output 12 points	
		G7M-DT40A	DC 24V input 24 points, Tr. output 16 points	
		G7M-DT60A	DC 24V input 36 points, Tr. output 24 points	
		Built-in functions	Program memory: 68K, HSC 1 point: 16kHz (1-phase) or 8kHz (2-phase) Pulse output 1 point: 2kHz (Tr. output type), Pulse catch input 8 points: Min. pulse width 0.2ms External interrupt input 8 points: 0.4ms, PID control (Autotuning) Input filter: 0～15ms (1ms unit), RS-232C I/F	
Ext.	Digital I/O	G7E-DR10A	DC 24V input 6 points, Relay output 4 points	
Special	Analog input	G7F-AD2A	A/D: 4 CHs	
	Analog I/O	G7F-ADHA	A/D: 2 CHs, D/A: 1 Ch	
	Analog timer	G7F-AT2A	Input: 4 points	
Comm.	Dnet I/F unit	G7L-DBEA	DeviceNet slave unit	
	Pnet I/F unit	G7L-PBEA	Profibus-DP slave unit	
	Fnet I/F unit	G7L-FUEA	Fieldbus master unit 1Mbps	
	Rnet I/F unit	G7L-RUEA	Rnet master unit	
	Cnet I/F unit	G7L-CUEB	RS-232C: 1 Ch (Dedicated modem connection available)	
		G7L-CUEC	RS-422: 1 Ch	
Option	RTC pack	G7E-RTCA	Real time clock pack	
	Memory pack	G7M-M256	Program backup: 256K	

Cable connection

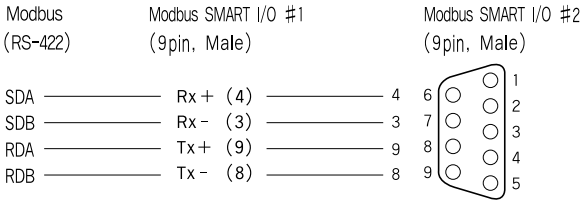
- Loader cable



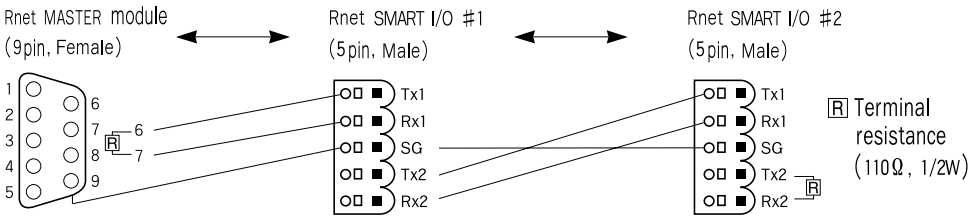
- GM6 (A/C), GM7 loader and built-in Cnet



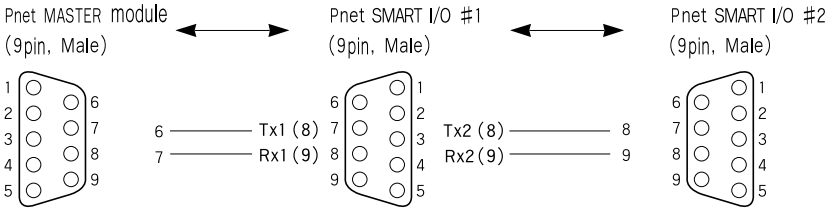
- Modbus (RS-422) ◀——▶ SMART I/O (9pin, Male)



- Rnet cable I
  (SMART I/O 5pin)

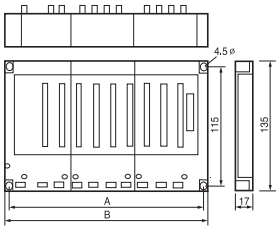


- Rnet cable II
  (SMART I/O 9pin)

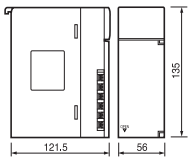


GM4

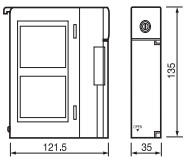
● Base



● Power



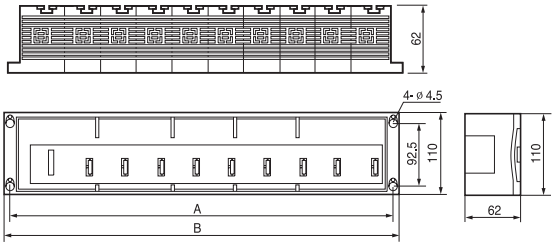
● CPU and I/O module



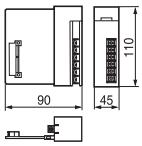
● Width of base

	Main				Extension		
	GM4-B04M	GM4-B06M	GM4-B08M	GM4-B12M	GM4-B04E	GM4-B06M	GM4-B08E
A	284	354	424	524	284	354	424
B	297	367	440	540	297	367	440

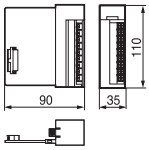
GM6



● Power



● CPU and I/O module

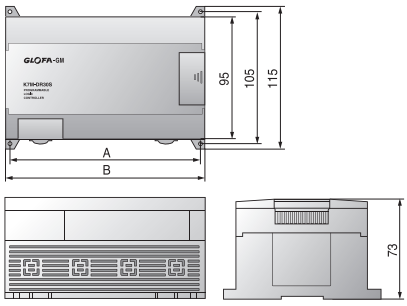


● Width of base

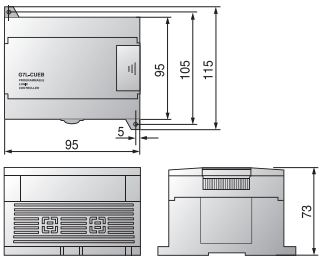
	GM6-B04M	GM6-B06M	GM6-B08M	GM6-B12M
A	230.5	300.5	370.5	510.5
B	244	314	384	524

GM7

● Main



● Extension module



(Unit: mm)

	A	B
G7M-D□10A(/DC)	85	95
G7M-D□20A(/DC)	135	145
G7M-D□30A(/DC)	135	145
G7M-D□40A(/DC)	165	175
G7M-D□60A(/DC)	215	225
Ext. unit Special unit Comm. unit	85	95

Leader in Electrics & Automation

Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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