GLOFA-GM6

Programmable Logic Controller

■ 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: 20			
	Standard function		194			
	Standard function block		12			
	Special function block		Each special module has its own special function block			
Processing speed	Operator		0.5㎲/instruction			
	Standard function		0.5㎲/step			
	Standard 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 type		Scan	100 - (Number of program blocks in task)			
	Task	Time-driven	8			8 in total
		External interrupt	8			
		Internal	8			
		Initialization	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)			Expansion 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)

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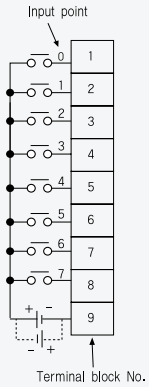
Input modules

■ Input module specifications

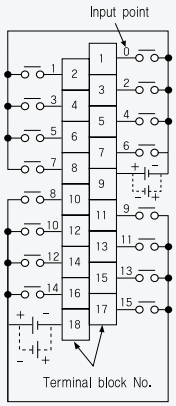
Input type		DC Input					AC Input *1)	
Part number		G6I-D21A	G6I-D22A	G6I-D22B	G6I-D24A	G6I-D24B	G6I-A11A	G6I-A21A
Input point		8 points	16 points		32 points		8 points	
Rated input voltage		DC12/24V	DC12/24V	DC24V	DC12/24V	DC24V	AC100~120V	AC200~240V
Rated input current		3/7mA	3/7mA	7mA	3/7mA	7mA	7mA	11mA
On voltage/current		DC9.5V or more/ 3.5mA or more	DC9.5V or more/ 3.5mA or more	DC15V or more/ 4.3mA or more	DC9.5V or more/ 3.5mA or more	DC15V or more/ 4.3mA or more	AC80V or more/ 5mA or more	AC80V or more/ 5mA or more
Off voltage/current		DC5V or less/ 1.5mA or less	DC5V or less/ 1.5mA or less	DC5V or less/ 1.7mA or less	DC5V or less/ 1.5mA or less	DC5V or less/ 1.7mA or less	AC30V or less/ 2mA or less	AC30V or less/ 2mA 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/COM			32 points/COM		8 points/COM	
Operating indicator		LED						
Insulation method		Photocoupler insulation						
Current consumption (DC5V)		40mA	70mA		75mA		35mA	

*1) AC input modules: 50/60Hz

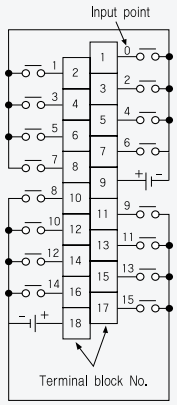
G6I-D21A



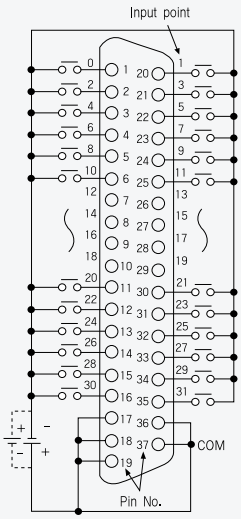
G6I-D22A



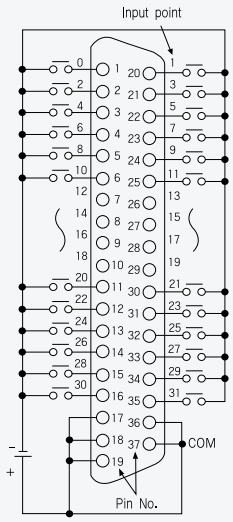
G6I-D22B



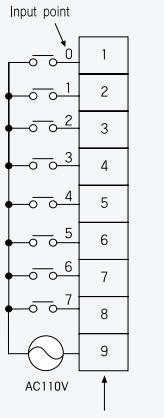
G6I-D24A



G6I-D24B



G6I-A11A



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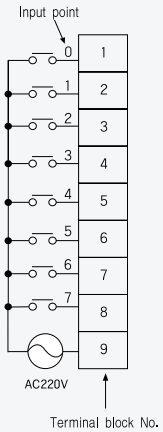


* Refer to user's manual for wiring.

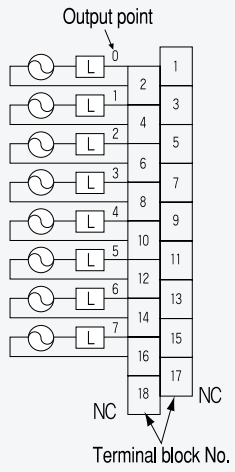
Output modules

■ Output module specifications

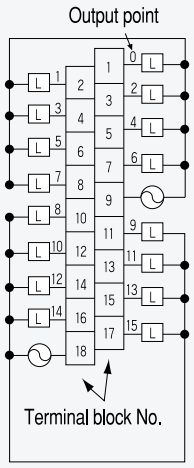
Output module type		Relay output			Transistor output				Triac output
Part number		G6Q-RY1A	G6Q-RY2A	G6Q-RY2B	G6Q-TR2A	G6Q-TR2B	G6Q-TR4A	G6Q-TR4B	G6Q-SS1A
Output point		8 points	16 points		16 points	16 points	32 points	32 points	8 points
Rated load voltage		DC12/24V, AC110/220V (50/60Hz)			DC12/24V				AC110/220V (50/60Hz)
Off leakage current		0.1mA or less							2.5mA or less
On voltage drop		-			DC1.5V or less		DC2.5V or less	DC3V or less	AC1.5V 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/COM	8 points/COM		16 points/COM		32 points/COM		8 points/COM
Operating indicator		LED							
Insulation method		Relay			Photocoupler				
Surge absorber		-		Varistor	Clamp diode				Varistor, CR absorber
Current consumption (DC5V)		210mA	400mA		180mA	170mA	140mA	145mA	190mA
External power supply		-			DC24V				-

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

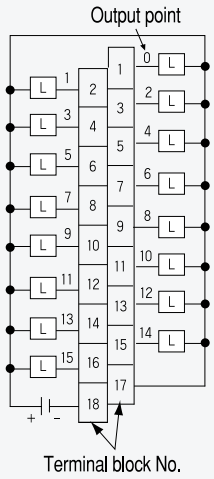
G6Q-RY1A



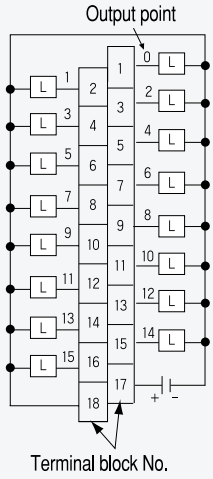
G6Q-RY2A/B



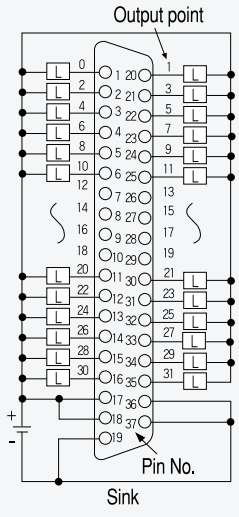
G6Q-TR2A



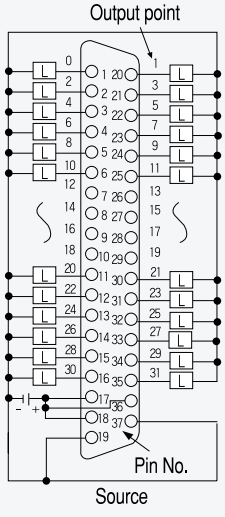
G6Q-TR2B



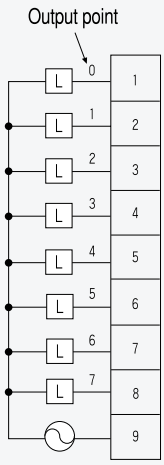
G6Q-TR4A



G6Q-TR4B



G6Q-SS1A



* Refer to user's manual for wiring.

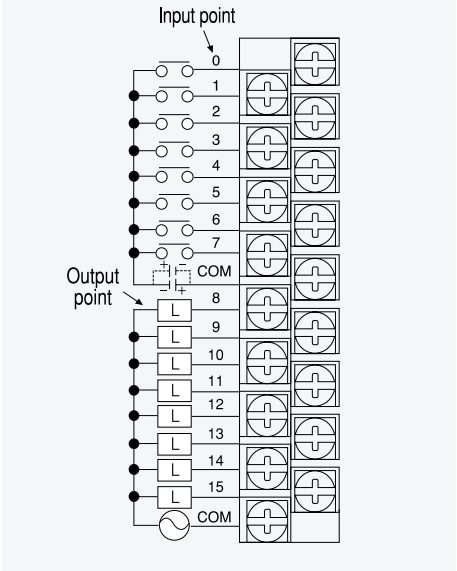
GLOFA-GM6

Programmable Logic Controller

■ I/O hybrid module specifications

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 ø =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 (100% simultaneous ON)	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 impedance		About 3.3㏀	Service life	Mechanical	20 million times or more
Response time	Off → On	5ms or less		Electrical	100,000 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/COM	Common		8 points/COM
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



* Refer to user's manual for wiring.

GLOFA-GM4

Programmable Logic Controller

■ 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
- Cnet, DeviceNet, Fast Ethernet, Fnet, Profibus-DP, Rnet 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: 20			
	Standard function		194		194+ 'Real number function'	
	Standard function block		12			
	Special function block		Each special module has its own special function block			
Processing speed	Operator		0.2㎲/instruction		0.12㎲/instruction	
	Standard function		0.2㎲/step		0.12㎲/step	
	Standard 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)			
Counter			No limitation. Count range: -32,768~32,767			20 bytes per 1 timer in SVA
Operation mode			RUN, STOP, PAUSE, DEBUG			8 bytes per 1 counter in SVA
Data retention at power failure			Set to 'Retain' at data declaration			
Program type		Scan	180 (Number of program blocks) - (Program blocks in task)			
	Task	Time-driven	8		32	
		External interrupt	8			
		Internal	16			
		Initialization	2 (_INIT, _H_INIT)			
		Error	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 expansion stage			3		6 *	
Internal current consumption			130mA			

K: kilobyte

* For 6 stage expansion you need to use special base (main, expansion) and special expansion cable. Refer to P26 and P65, please.

GLOFA-GM4

Programmable Logic Controller

Configuration

■ GMWIN programming with IL, LD, and SFC

Power module			
AC 110V input	GM4-PA1A	DC 5V 4A DC 24V 0.7A	output
	GM4-PA1B	DC 5V 3A DC 24V 0.5A	output
AC 220V input	GM4-PA2A	DC 5V 4A DC 24V 0.7A	output
	GM4-PA2B	DC 5V 3A DC 24V 0.5A	output
	GM4-PA2C	DC 5V 8A 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 G4I-D22C	G4Q-RY2A	G4Q-SS2A G4Q-SS2B	G4Q-TR2A G4Q-TR2B	G4H-DR2A	G4H-DT2A
32 points	-	-	G4I-D24A G4I-D24B G4I-D24C	-	-	G4Q-TR4A G4Q-TR4B	-	-
64 points	-	-	G4I-D28A	-	-	G4Q-TR8A	-	-

Item	Base			
I/O Slot	Main	Expansion	Main (H)	Expansion (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 expansion 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-EUFB	100BASE-Fx, Fiber optic
	G4L-EU5B	10BASE-5, AUI
Fast Enet I/F Dedicated (Master)	G4L-EUTC	10/100BASE-Tx, UTP
	G4L-EUFC	100BASE-Fx, Fiber optic
	G4L-EU5C	10BASE-5, AUI
Fast Enet I/F Dedicated (Slave)	G4L-ERTC	10/100BASE-Tx, UTP
	G4L-ERFC	100BASE-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-PIDB	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
- Operation status monitoring by LED
- Insulated by Photocoupler
- Easy maintenance with terminal block & one touch installation

■ Input module specifications

Input type		DC Input				
Part number		G4I-D22A/C *1)	G4I-D22B	G4I-D24A/C *1)	G4I-D24B	G4I-D28A *2)
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/COM		32 points/COM		
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

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/COM		1 point/COM
Operating indicator		LED		
Insulation method		Photocoupler insulation		
Current consumption (DC 5V)		70mA		

■ 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/COM		2A/COM		
Response time	Off → On	2ms or less				
	On → Off	2ms or less				
Common		8 points/COM		32 points/COM		
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				

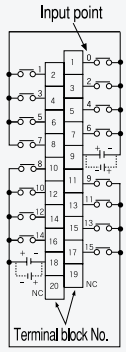
Output type		Relay output	Triac output	
Part number		G4Q-RY2A *3)	G4Q-SS2A	G4Q-SS2B
Output point		16 points		
Rated load voltage		DC 12/24V, AC 110/220V (50/60Hz)	AC 100~240V (50/60Hz)	
Rated load current	1 Point	2A	1A	0.6A
	1 Common	4A/COM	5A/COM	2.4A/COM
Response time	Off → On	10ms or less	0.5cycle +1ms or less	
	On → Off	12ms or less	0.5cycle +1ms or less	
Common		8 points/COM		
Operating indicator		LED		
Type		–		
Insulation method		Photocoupler insulation		
Surge absorber		–	Varistor, CR absorber	
Current consumption (DC 5V)		100mA	330mA	
External power supply		DC24V	-	

*1) Rated input voltage for G4I-D2XC is DC24V and on voltage is 19.6V
*2) G4I-D28A and G4Q-TR8A are connector-type modules
*3) For G4Q-RY2A operation, you need to supply DC24V.

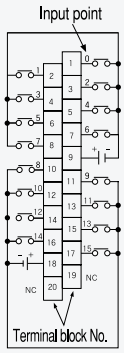
Input/output modules

■ Wiring diagram for input modules

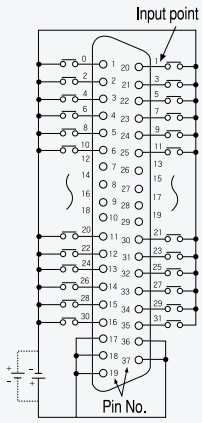
G4I-D22A/C *1)



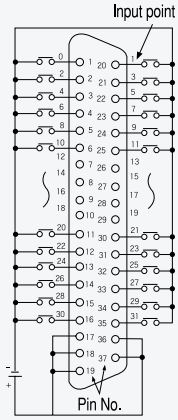
G4I-D22B



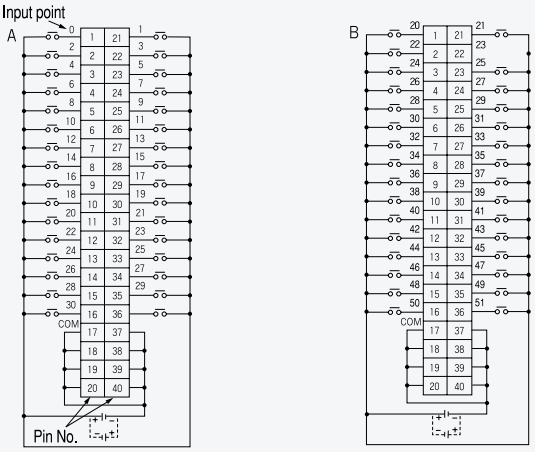
G4I-D24/ *1)



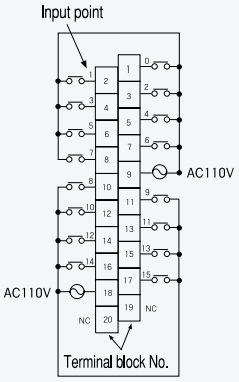
G4I-D24B



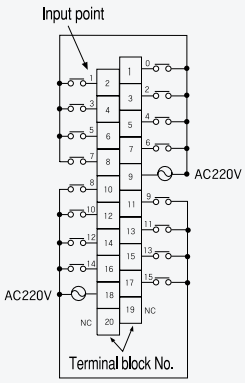
G4I-D28A *2)



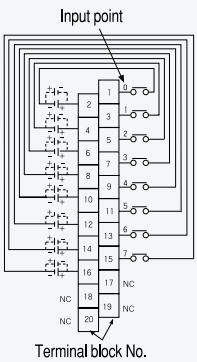
G4I-A12A



G4I-A22A



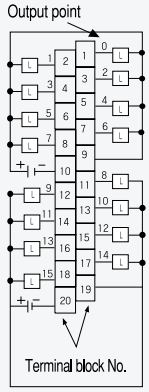
G4F-INTA



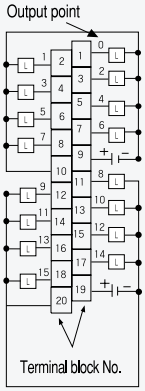
*1) Rated input voltage for G6I-D2XC is DC24V and on voltage is 19.6V.
*2) G4I-D28A is a connector-type module.
* Refer to user's manual for wiring.

■ Wiring diagram for output modules

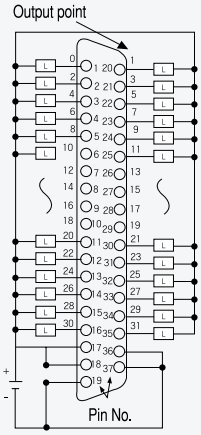
G4Q-TR2A



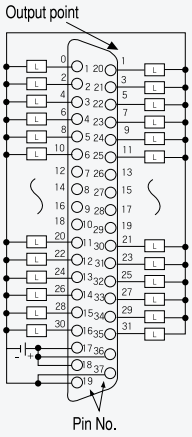
G4Q-TR2B



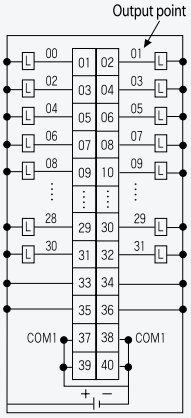
G4Q-TR4A

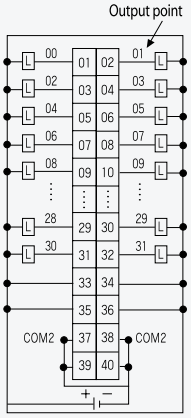


G4Q-TR4B

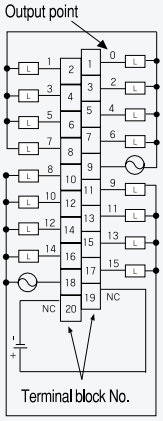


G4Q-TR8A *1)

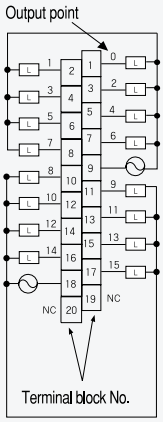




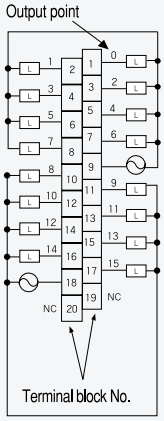
G4Q-RY2A *2)



G4Q-SS2A



G4Q-SS2B



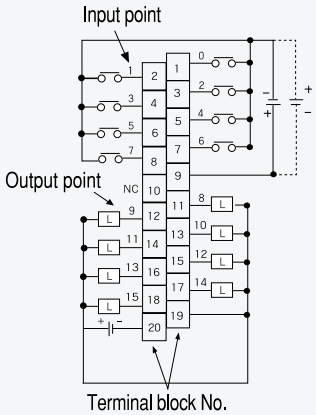
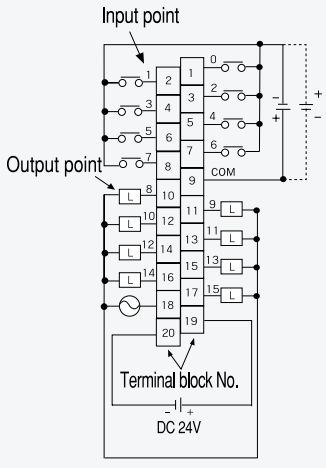
*1) G4Q-TR8A is a connector. type module.
*2) For G4Q-RY2A operation, you need to supply DC24V.
* Refer to user's manual for wiring.

■ I/O hybrid module specifications

Input type		DC Input			
Part number		G4H-DT2A		G4H-DR2A *1)	
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			

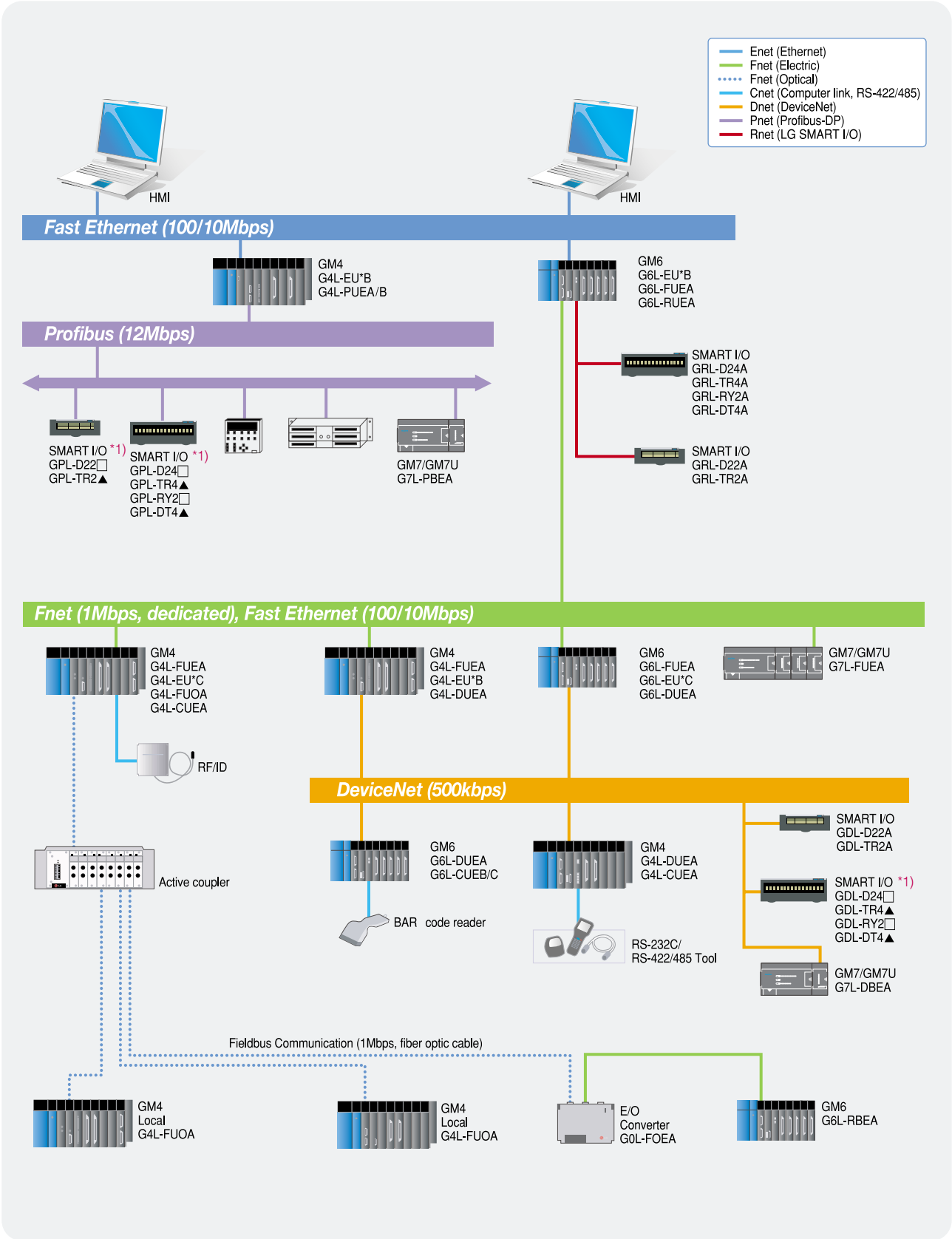
Output type		Transistor output	Relay output
Part number		G4H-DT2A	G4H-DR2A
Output point		8 points	
Rated load voltage		DC 12/24V	DC 24V/AC 220V (50/60Hz)
On voltage drop		DC 1.5V or less	-
Off leakage current		0.1mA or less	
Rated load current		0.5A/1 point	2A/1 point
		3A/COM	5A/COM
Response time	Off → 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) For G4H-DR2A operation, you need to supply DC24V.
* Refer to user's manual for wiring.

System configuration



*1) Refer to P42, please.