

Chapter. 7 DIGITAL INPUT AND OUTPUT MODULES

7.1 Notes on Selecting Input and Output Modules

The followings describe instructions for selection of digital I/O modules that will be used in the GLOFA-GM6 series.

1) The types of digital input are current sink input and current source input.

When selecting DC input modules consider the specifications of those input devices as the wiring method of the external input power supply varies complying with the type of digital input.

In the GM6 series, the types are dedicated source input and source/sink common DC input.

2) Maximum simultaneous input points differs with the type of a module. Check the specifications of the input module to be applied before use.

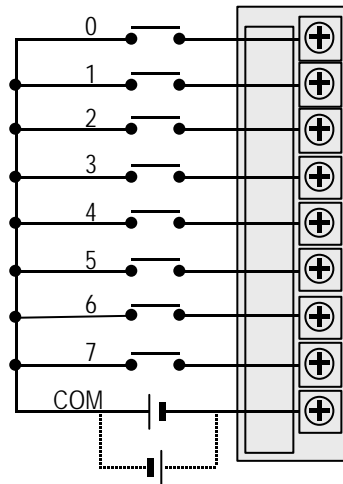
3) Use transistor or triac output modules with a load that is frequently opened and closed or with an inductive load as, in those cases, the life span of a relay output module will become shorter than specified.

7.2 Digital Input Module Specifications

7.2.1 8-points 12 / 24 VDC input module (source / sink type)

Specifications	Model	DC Input Module	
		G6I-D21A	
Number of input points	8 points		
Insulation method	Photo coupler		
Rated input voltage	12 VDC	24 VDC	
Rated input current	3 mA	7 mA	
Operating voltage range	10.2 VDC to 28.8 VDC (ripple: less than 5%)		
Maximum simultaneous input points	100%(8 points/COM) simultaneously ON		
ON voltage/ON current	9.5 VDC or higher / 3.5 mA or higher		
OFF voltage/OFF current	5 VDC or lower / 1.5 mA or lower		
Input impedance	Approx. 3.3 kΩ		
Response time	OFF → ON	5 ms or less	
	ON → OFF	5 ms or less	
Common terminal	8 points/COM		
Internal current consumption	40 mA		
Operating indicator	LED turns on at ON state of input		
External connections	9-points terminal block connector(M3 × 6 screws)		
Weight	0.12 kg		

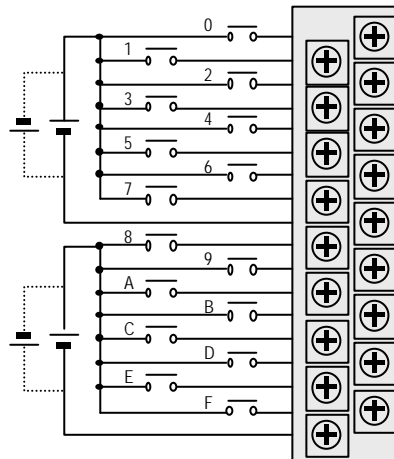
Wiring Diagram



7.2.2 16-points 12 / 24 VDC input module (source / sink type)

Specifications		Model	DC Input Module	
			G6I-D22A	
Number of input points		16 points		
Insulation method		Photo coupler		
Rated input voltage		12 VDC	24 VDC	
Rated input current		3 mA	7 mA	
Operating voltage range		10.2 VDC to 28.8 VDC (ripple: less than 5%)		
Maximum simultaneous input points		100%(8 points/COM) simultaneously ON		
ON voltage/ON current		9.5 VDC or higher / 3.5 mA or higher		
OFF voltage/OFF current		5 VDC or lower / 1.5 mA or lower		
Input impedance		Approx. 3.3 k Ω		
Response time	OFF \rightarrow ON	5 ms or less		
	ON \rightarrow OFF	5 ms or less		
Common terminal		8 points/COM		
Internal current consumption		70 mA		
Operating indicator		LED turns on at ON state of input		
External connections		18-points terminal block connector(M3 \times 6 screws)		
Weight		0.15 kg		

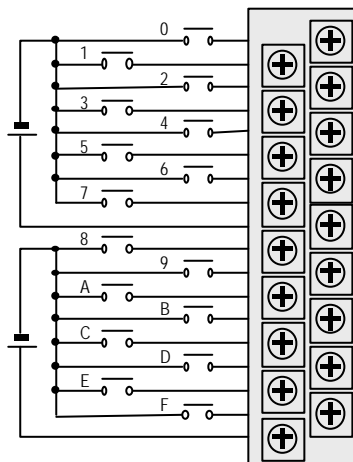
Wiring Diagram



7.2.3 16-points 24 VDC input module (source type)

Specifications		Model	DC Input Module
			G6I-D22B
Number of input points		16 points	
Insulation method		Photo coupler	
Rated input voltage		24 VDC	
Rated input current		7 mA	
Operating voltage range		20.4 VDC to 28.8 VDC (ripple: less than 5%)	
Maximum simultaneous input points		100%(8 points/COM) simultaneously ON	
ON voltage/ON current		15 VDC or higher/4.3 mA or higher	
OFF voltage/OFF current		5 VDC or lower/1.7 mA or lower	
Input impedance		Approx. 3.3 kΩ	
Response time	OFF → ON	5 ms or less	
	ON → OFF	5 ms or less	
Common terminal		8 points/COM	
Internal current consumption		70 mA	
Operating indicator		LED turns on at ON state of input	
External connections		18-points terminal block connector(M3 × 6 screws)	
Weight		0.15 kg	

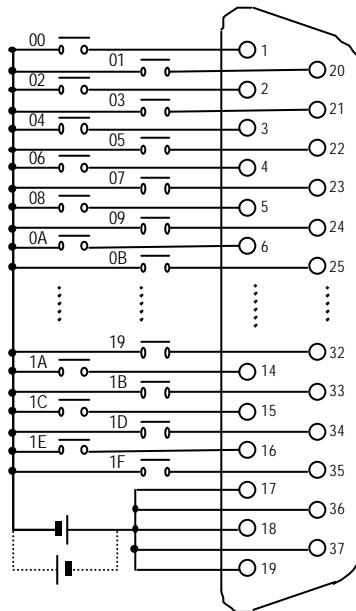
Wiring Diagram



7.2.4 32-points 12 / 24 VDC input module (source / sink type)

Specifications	Model	DC Input Module	
		G61-D24A	
Number of input points	32 points		
Insulation method	Photo coupler		
Rated input voltage	12 VDC	24 VDC	
Rated input current	3 mA	7 mA	
Operating voltage range	10.2 to 28.8 VDC (ripple: less than 5%)		
Maximum simultaneous input points	60% simultaneously ON		
ON voltage/ON current	9.5 VDC or higher / 3.5 mA or higher		
OFF voltage/OFF current	5 VDC or lower / 1.5 mA or lower		
Input impedance	Approx. 3.3 kΩ		
Response time	OFF → ON	5 ms or less	
	ON → OFF	5 ms or less	
Common terminal	32 points/COM		
Internal current consumption	75 mA		
Operating indicator	LED turns on at ON state of input		
External connections	37-point terminal block connector(M3 × 6 screws)		
Weight	0.11 kg		

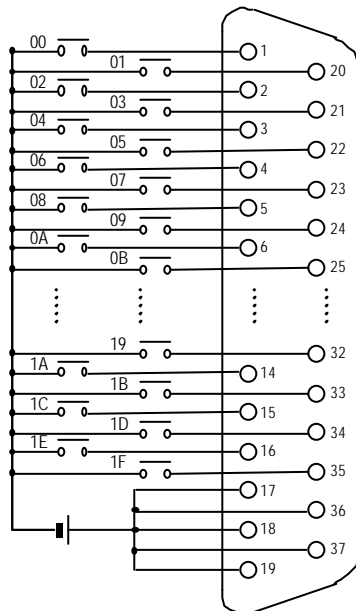
Wiring Diagram



7.2.5. 32-points 24 VDC input module (source type)

Specifications	Model	DC Input Module
		G6I-D24B
Number of input points		32 points
Insulation method		Photo coupler
Rated input voltage		24 VDC
Rated input current		7 mA
Operating voltage range		20.4 to 28.8 VDC (ripple: less than 5%)
Maximum simultaneous input points		60% simultaneously ON
ON voltage/ON current		15 VDC or higher / 4.3 mA or higher
OFF voltage/OFF current		5 VDC or lower / 1.7 mA or lower
Input impedance		Approx. 3.3 kΩ
Response time	OFF → ON	5 ms or less
	ON → OFF	5 ms or less
Common terminal		32 points/COM
Internal current consumption		75 mA
Operating indicator		LED turns on at ON state of input
External connections		37-point terminal block connector(M3 × 6 screws)
Weight		0.11 kg

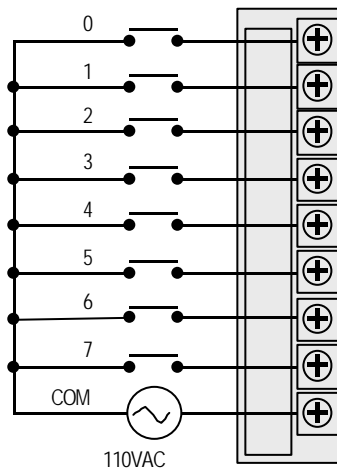
Wiring Diagram



7.2.6 8-points 110 VAC input module

Specifications	Models	AC Input Module
		G61-A11A
Number of input points		8 points
Insulation method		Photo coupler
Rated input voltage		100 to 120 VAC (50/60 Hz)
Rated input current		11 mA (110 VAC / 60 Hz)
Operating voltage range		85 to 132 VAC (50/60 Hz \pm 3 Hz)
Maximum simultaneous input points		100%(8 points / COM) simultaneously ON
Inrush current		300 mA, 0.3 ms or lower (132 VAC)
ON voltage/ON current		80 VAC or higher / 5 mA or higher
OFF voltage/OFF current		30 VAC or lower / 2 mA or lower
Input impedance		Approx. 15 k Ω
Response time	OFF \rightarrow ON	15 ms or less
	ON \rightarrow OFF	25 ms or less
Common terminal		8 points/COM
Internal current consumption		60 mA
Operating indicator		LED turns on at ON state of input
External connections		9-point terminal block connector(M3 \times 6 screws)
Weight		0.14 kg

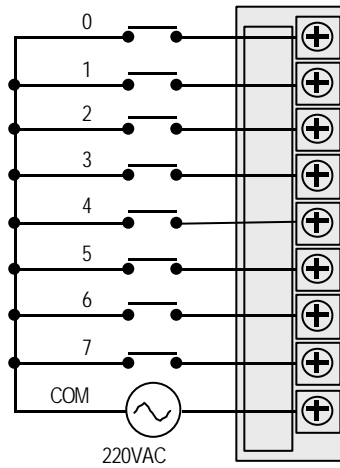
Wiring Diagram



7.2.7 8-points 220 VAC input module

Specifications	Model	GM4
		G61-A21A
Number of input points	8 points	
Insulation method	Photo coupler	
Rated input voltage	200 to 240 VAC (50/60 Hz)	
Rated input current	11 mA (220 VAC / 60 Hz)	
Operating voltage range	170 to 264 VAC (50/60 Hz \pm 3 Hz)	
Maximum simultaneous input points	100%(8 points / COM) simultaneously ON	
Surge input current	600 mA, 0.12 ms or lower (264 VAC)	
ON voltage/ON current	80 VAC or higher / 5 mA or higher	
OFF voltage/OFF current	30 VAC or lower / 2 mA or lower	
Input impedance	Approx. 20 k Ω	
Response time	OFF \rightarrow ON	15 ms or less
	ON \rightarrow OFF	25 ms or less
Common terminal	8 points/COM	
Internal current consumption	41 mA	
Operating indicator	LED turns on at ON state of input	
External connections	9-point terminal block connector(M3 \times 6 screws)	
Weight	0.14 kg	

Wiring Diagram

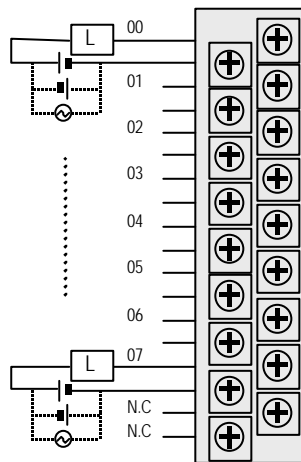


7.3 Digital Output Module Specifications

7.3.1. 8-point relay output module

Specifications	Models	Relay Output Module
		G6Q-RY1A
Number of output points		8 points
Insulation method		Photo coupler
Rated load voltage & current		24 VDC 2A(resistance)/point, 5 A/ COM 220 VAC 2A(COSΨ = 1)/point, 5A/COM
Minimum load voltage/current		5 VDC / 1 mA
Maximum load voltage/current		250 VAC, 110 VDC
Maximum switching frequency		1200 times per hour
Surge absorber		None
Service life	Mechanical	20 million times or more
	Electrical	Rated load voltage/current 100000 times or more
		200 VAC 1.5 A, 240 VAC 1 A (COSΨ = 0.7) : 100000 times or more
		200 VAC 1 A, 240 VAC 0.5 A (COSΨ = 0.35) : 100000 times or more
	24 VAC 1.5 A, 100 VDC 0.1 A (L/R= 7 ms) : 100000 times or more	
Response time	Off → On	10 ms or less
	On → Off	12 ms or less
Common terminal arrangement		1 points/COM
Internal current consumption		250mA
Operation indicator		LED turns on at ON state of output
External connections		18-point terminal block connector (M3 × 6 screws)
Weight		0.19 kg

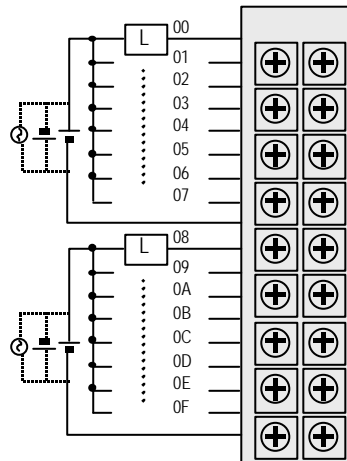
Wiring Diagram



7.3.2. 16-point relay output module

Specifications		Models	Relay Output Module
			G6Q-RY2A
Number of output points		16 points	
Insulation method		Photo coupler	
Rated load voltage & current		24 VDC 2A(resistance)/point, 5 A/ COM 220 VAC 2A(COSΨ = 1)/point, 5A/COM	
Minimum load voltage/current		5 VDC / 1 mA	
Maximum load voltage/current		250 VAC, 110 VDC	
Maximum switching frequency		1200 times per hour	
Surge absorber		None	
Service life	Mechanical	20 million times or more	
	Electrical	Rated load voltage/current 100000 times or more	
		200 VAC 1.5 A, 240 VAC 1 A (COSΨ = 0.7) : 100000 times or more	
		200 VAC 1 A, 240 VAC 0.5 A (COSΨ = 0.35) : 100000 times or more	
24 VAC 1.5 A, 100 VDC 0.1 A (L/R= 7 ms) : 100000 times or more			
Response time	Off → On	10 ms or less	
	On → Off	12 ms or less	
Common terminal arrangement		8 points/COM	
Internal current consumption		415mA	
Operation indicator		LED turns on at ON state of output	
External connections		18-point terminal block connector (M3 × 6 screws)	
Weight		0.19 kg	

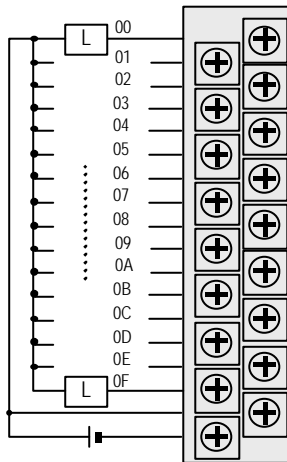
Wiring Diagram



7.3.3 16-point transistor output module (sink type)

Specifications	Models	Transistor Output Module	
		G6Q-TR2A	
Number of output points		16 points	
Insulation method		Photo coupler	
Rated load voltage/current		12/24 VDC	
Operating load voltage range		10.2 to 26.4 VDC	
Maximum load current		0.5 A /point, 4 A / COM	
Off leakage current		0.1 mA	
Maximum inrush current		4 A, 10 ms or less	
Maximum voltage drop at ON circuit		1.5 VDC(0.5A)	
Surge absorber		Clamp Diode	
Response time	Off → On	2 ms or less	
	On → Off	2 ms or less	
Common terminal arrangement		16 points/COM	
Internal current consumption		185 mA	
External power supply	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)	
	Current	48 mA or less (all points ON)	
Operation indicator		LED turns on at ON state of output	
External connections		18-point terminal block connector (M3 × 6 screws)	
Weight		0.18 kg	

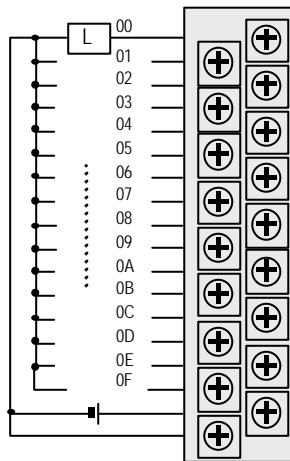
Wiring Diagram



7.3.4 16-point transistor output module (source type)

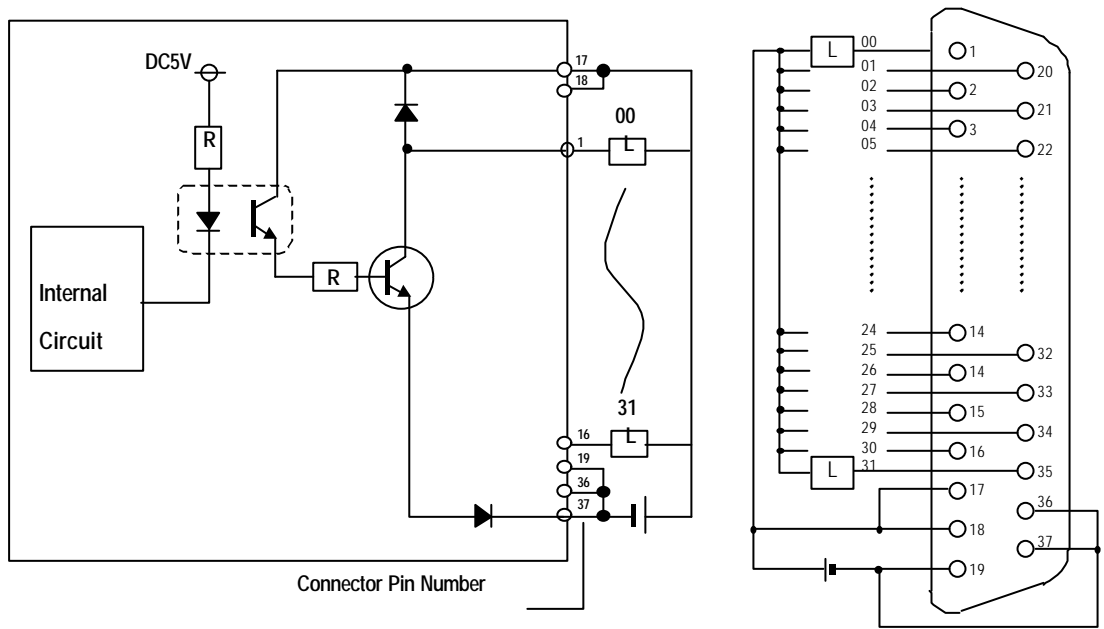
Specifications	Models	Transistor Output Module
		G6Q-TR2B
Number of output points		16 points
Insulation method		Photo coupler
Rated load voltage/current		12/24 VDC
Operating load voltage range		10.2 to 26.4 VDC
Maximum load current		0.5 A /point, 4 A / COM
Off leakage current		0.1 mA
Maximum inrush current		4 A, 10 ms or less
Maximum voltage drop at ON circuit		1.5 VDC(0.5A)
Surge absorber		Clamp Diode
Response time	Off → On	2 ms or less
	On → Off	2 ms or less
Common terminal arrangement		16 points/COM
Internal current consumption		185 mA
External power supply	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)
	Current	48 mA or less (all points ON)
Operation indicator		LED turns on at ON state of output
External connections		18-point terminal block connector (M3 × 6 screws)
Weight		0.18 kg

Wiring Diagram



7.3.5 32-point transistor output module (sink type)

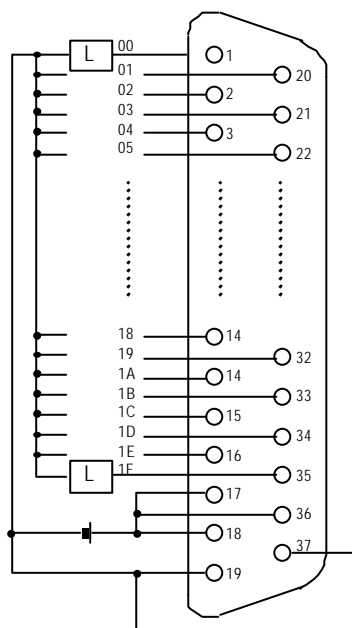
Specifications		Models	Transistor Output Module
			G6Q-TR4A
Number of output points		32 points	
Insulation method		Photo coupler	
Rated load voltage/current		12/24 VDC	
Operating load voltage range		10.2 to 26.4 VDC	
Maximum load current		0.1 A / point, 2 A /COM	
Off leakage current		0.1 mA or less	
Maximum inrush current		4 A, 10 ms or less	
Maximum voltage drop at ON circuit		1.0 VDC	
Surge absorber		None	
Response time	Off → On	2 ms or less	
	On → Off	2 ms or less	
Common terminal arrangement		32 points/COM	
Internal current consumption		139 mA	
External power supply	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)	
	Current	36 mA or less (24 VDC/COM)	
Operation indicator		LED turns on at ON state of output	
External connections		37-pin D Sub-connector	
Weight		0.11 kg	



7.3.6 32-point transistor output module (source type)

Specifications		Models	Transistor Output Module
			G6Q-TR4B
Number of output points		32 points	
Insulation method		Photo coupler	
Rated load voltage/current		12/24 VDC	
Operating load voltage range		10.2 to 26.4 VDC	
Maximum load current		0.1 A / point, 2 A /COM	
Off leakage current		0.1 mA or less	
Maximum inrush current		4 A, 10 ms or less	
Maximum voltage drop at ON circuit		1.0 VDC	
Surge absorber		None	
Response time	Off → On	2 ms or less	
	On → Off	2 ms or less	
Common terminal arrangement		32 points/COM	
Internal current consumption		139 mA	
External power supply	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)	
	Current	36 mA or less (24 VDC/COM)	
Operation indicator		LED turns on at ON state of output	
External connections		37-pin D Sub-connector	
Weight		0.11 kg	

Wiring Diagram



The total current of each 8 points (0-7,8-15,16-23,and 24-31) should be lower than 600mA.

7.3.7 8-point triac output module

Specifications		Models	Triac Output Module
			G6Q-SS1A
Number of output points		8 points	
Insulation method		Photo coupler	
Rated load voltage		100 to 240 VAC (50 to 60 Hz)	
Minimum load voltage		264 VAC	
Maximum load current		1 A / point, 4 A / 1 COM	
Minimum load current		20 mA	
Off leakage current		2.5 mA (220 VAC, 60 Hz)	
Maximum inrush current		40 A, 10 ms or less	
Maximum voltage drop at ON circuit		1.5 VAC or less (2 A)	
Surge absorber		Varistor (387 to 473 V), C.R absorber	
Response time	Off → On	1ms or less	
	On → Off	1ms + 0.5 cycle or less	
Common terminal arrangement		8 points/COM	
Internal current consumption		210 mA	
Operation indicator		LED turns on at ON state of output	
External connections		9-point terminal block connector (M3 × 6 screws)	
Weight		0.16 kg	

Wiring Diagram

