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)

	Model	DC Inpu	t Module
Specifications			D21A
Number of input po	oints	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 that	an 5%)
Maximum simultan	eous input points	100%(8 points/COM) simultaneously O	N
ON voltage/ON cu	rrent	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. $3.3 \text{ k}\Omega$	
Doonanaa tima	$OFF \rightarrow ON$	5 ms or less	
Response time	$ON \rightarrow OFF$	5 ms or less	
Common terminal		8 points/COM	
Internal current cor	nsumption	40 mA	
Operating indicator	r	LED turns on at ON state of input	
External connection	ns	9-points terminal block connector(M3 >	< 6 screws)
Weight		0.12 kg	
00 07 COM DC12/24V	1 8 9 9	Photo coupler DC5V Interna	

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

Model	·	t Module
Specifications		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 that	an 5%)
Maximum simultaneous input points	100%(8 points/COM) simultaneously O	N
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 $OFF \rightarrow ON$	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 × 6 screws)	
Weight	0.15 kg	
00 1 07 COM 8 DC12 / 24V 08 10	DC5V R R Inter Circle	
COM 18 J		

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

	Model	DC Input Module
Specifications		G6I-D22B
Number of input po	oints	16 points
Insulation method		Photo coupler
Rated input voltage		24 VDC
Rated input currer		7 mA
Operating voltage	_	20.4 VDC to 28.8 VDC (ripple: less than 5%)
Maximum simultar		100%(8 points/COM) simultaneously ON
ON voltage/ON cu		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. $3.3 \text{ k}\Omega$
Response time	$OFF \rightarrow ON$	5 ms or less
1103porise time	$ON \rightarrow OFF$	5 ms or less
Common terminal		8 points/COM
Internal current co	nsumption	70 mA
Operating indicato	r	LED turns on at ON state of input
External connection	ons	18-points terminal block connector(M3 × 6 screws)
Weight		0.15 kg
DC24V	COM 8 9 10 10 17 COM 18	DC5V Internal Circuit Circuit

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

Specifications	Model	DC Inpu	ut Module
Specifications		G6I	-D24A
Number of input po	oints	32 points	
Insulation method		Photo coupler	
Rated input voltage	е	12 VDC	24 VDC
Rated input currer	nt	3 mA	7 mA
Operating voltage	range	10.2 to 28.8 VDC (ripple: less than 5	%)
/laximum simultar	neous input points	60% simultaneously ON	
ON voltage/ON cu	ırrent	9.5 VDC or higher / 3.5 mA or higher	
FF voltage/OFF	current	5 VDC or lower / 1.5 mA or lower	
nput impedance		Approx. 3.3 k Ω	
Response time	$OFF \to ON$	5 ms or less	
reshouse mue	$ON \rightarrow OFF$	5 ms or less	
Common terminal		32 points/COM	
nternal current co	nsumption	75 mA	
Operating indicato	or	LED turns on at ON state of input	
External connection	ons	37-point terminal block connector(M3	× 6 screws)
Neight		0.11 kg	
			l
31	35 17 36 18	DC5V Interna	

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

	Model	DC Input Module
Specifications		G6I-D24B
Number of input po	oints	32 points
Insulation method		Photo coupler
Rated input voltage	e	24 VDC
Rated input curren	nt	7 mA
Operating voltage	range	20.4 to 28.8 VDC (ripple: less than 5%)
Maximum simultar	neous input points	60% simultaneously ON
ON voltage/ON cu	rrent	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. $3.3 \text{ k}\Omega$
Response time	$OFF \rightarrow ON$	5 ms or less
Response time	$ON \rightarrow OFF$	5 ms or less
Common terminal		32 points/COM
Internal current co	nsumption	75 mA
Operating indicato	r	LED turns on at ON state of input
External connection	ons	37-point terminal block connector(M3 × 6 screws)
Weight		0.11 kg
vvergrit		
31 35 17 17 36 18 37 19	R R	Internal Circuit

7.2.6 8-points 110 VAC input module

Mode	AC Input Module
Specifications	G6I-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 ± 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
Despense time OFF → ON	15 ms or less
Response time	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 × 6 screws)
Weight	0.14 kg
OO 1 R R R AC 110V Terminal B	Internal Circuit Ock Number

7.2.7 8-points 220 VAC input module

	Model	GM4
Specifications	Wiodei	G6I-A21A
Number of input po	pints	8 points
Insulation method		Photo coupler
Rated input voltage		200 to 240 VAC (50/60 Hz)
Rated input curren		11 mA (220 VAC / 60 Hz)
Operating voltage		170 to 264 VAC (50/60 Hz ± 3 Hz)
Maximum simultan		100%(8 points / COM) simultaneously ON
Surge input curren		600 mA, 0.12 ms or lower (264 VAC)
ON voltage/ON cu		80 VAC or higher / 5 mA or higher
OFF voltage/OFF of Input impedance	current	30 VAC or lower / 2 mA or lower
input impedance	$OFF \to ON$	Approx. 20 k Ω 15 ms or less
Response time	$0 \downarrow 0 \downarrow$	25 ms or less
Common terminal		8 points/COM
Internal current cor	nsumption	41 mA
Operating indicator		LED turns on at ON state of input
External connection		9-point terminal block connector(M3 × 6 screws)
Weight		0.14 kg
00 07 07 AC 220V	R R	Internal Circuit Circuit Circuit Circuit
	Terminal Block	

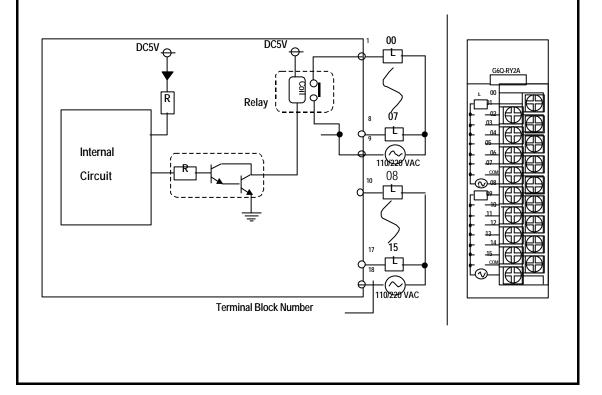
7.3 Digital Output Module Specifications

7.3.1. 8-point relay output module

	Models	Relay Output Module
Specifications		G6Q-RY1A
Number of outpu		8 points
Insulation method		Photo coupler
Rated load volta	ige & current	24 VDC 2A(resistance)/point, 5 A/ COM
		220 VAC 2A(COS Ψ = `1)/point, 5A/COM
Minimum load v		5 VDC / 1 mA
Maximum load \		250 VAC, 110 VDC
Maximum switch	ing trequency	1200 times per hour
Surge absorber	Mechanical	None 20 million times or more
	Mechanical	Rated load voltage/current 100000 times or more
Service life		200 VAC 1.5 A, 240 VAC 1 A (COS Ψ = 0.7) : 100000 times or more
Jervice ille	Electrical	200 VAC 1.3 A, 240 VAC 1 A (COS Y = 0.7) : 100000 times of more
		24 VAC 1.5 A, 100 VDC 0.1 A (L/R= 7 ms) : 100000 times or more
	$Off \rightarrow On$	10 ms or less
Response time	$On \rightarrow Off$	12 ms or less
Common termin		1 points/COM
Internal current		250mA
Operation indica		LED turns on at ON state of output
External connec	tions	18-point terminal block connector (M3 × 6 screws)
Weight		0.19 kg
	DC5V	DC5V 1 00 C60.RY1A
Internal Circuit	R	Relay AC110/220V AC110/220V 15 07 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

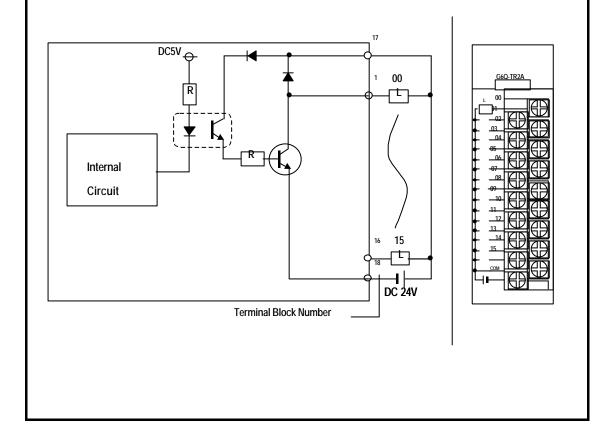
7.3.2. 16-point relay output module

	Models	Relay Output Module
Specifications		G6Q-RY2A
Number of outpu	ıt points	16 points
Insulation metho	d	Photo coupler
Rated load volta	ige & current	24 VDC 2A(resistance)/point, 5 A/ COM
		220 VAC 2A(COSΨ = `1)/point, 5A/COM
Minimum load v	oltage/current	5 VDC / 1 mA
Maximum load v	oltage/current	250 VAC, 110 VDC
Maximum switch	ing frequency	1200 times per hour
Surge absorber		None
	Mechanical	20 million times or more
		Rated load voltage/current 100000 times or more
Service life	Electrical	200 VAC 1.5 A, 240 VAC 1 A (COSΨ = 0.7) : 100000 times or more
	Electrical	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
Decree the	$Off \rightarrow On$	10 ms or less
Response time	$On \rightarrow Off$	12 ms or less
Common termin	al arrangement	8 points/COM
Internal current		415mA
Operation indica	tor	LED turns on at ON state of output
External connec	tions	18-point terminal block connector (M3 × 6 screws)
Weight		0.19 kg



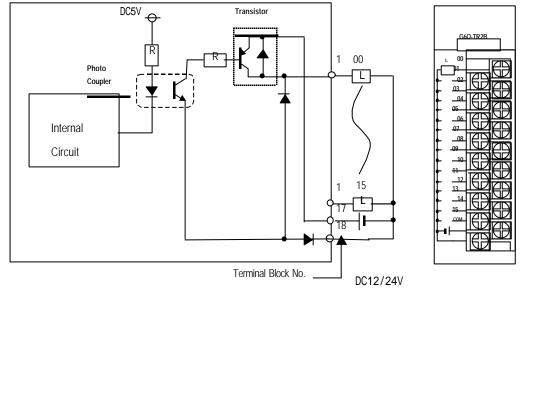
7.3.3 16-point transistor output module (sink type)

	Models	Transistor Output Module
Specifications		G6Q-TR2A
Number of outp	out points	16 points
Insulation meth	od	Photo coupler
Rated load volt	age/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 cur	rrent	0.1 mA
Maximum inrus	h current	4 A, 10 ms or less
Maximum volta	ge drop at ON circuit	1.5 VDC(0.5A)
Surge absorber		Clamp Diode
Response	$Off \rightarrow On$	2 ms or less
time	$On \rightarrow Off$	2 ms or less
Common termi	nal arrangement	16 points/COM
Internal current	consumption	185 mA
External	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)
power supply	Current	48 mA or less (all points ON)
Operation indicator		LED turns on at ON state of output
External conne	ctions	18-point terminal block connector (M3 \times 6 screws)
Weight		0.18 kg



7.3.4 16-point transistor output module (source type)

	Models	Transistor Output Module
Specifications		G6Q-TR2B
Number of outp	out points	16 points
Insulation meth	od	Photo coupler
Rated load volt	age/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 cur	rrent	0.1 mA
Maximum inrus	h current	4 A, 10 ms or less
Maximum volta	ge drop at ON circuit	1.5 VDC(0.5A)
Surge absorber	r	Clamp Diode
Response	$Off \rightarrow On$	2 ms or less
time	$On \rightarrow Off$	2 ms or less
Common termi	nal arrangement	16 points/COM
Internal current	consumption	185 mA
External	Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)
power supply	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 \times 6 screws)
Weight		0.18 kg



7.3.5 32-point transistor output module (sink type)

Models	Transistor Output Module
Specifications	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 $Off \rightarrow On$	2 ms or less
time $On \rightarrow Off$	2 ms or less
Common terminal arrangement	32 points/COM
Internal current consumption	139 mA
External Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)
power supply 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
Internal Circuit	18 00 02 02 021 05 02 021 05 03 022 021 05 03 022 03 04 05 05 034 05 05 034 05 05 034 05 05 034 05 05 034 05 05 034 05 05 05 05 05 05 05 05 05 05 05 05 05
Connec	ctor Pin Number

7.3.6 32-point transistor output module (source type)

Models	Transistor Output Module	
Specifications	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 $Off \rightarrow On$	2 ms or less	
time On \rightarrow Off	2 ms or less	
Common terminal arrangement	32 points/COM	
Internal current consumption	139 mA	
External Voltage	24 VDC ± 10 % (ripple voltage : 4VP-P or less)	
power supply 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	
Internal circuit R DCSV R Internal circuit R DCSV R Internal circuit R Internal cir		
Connector Pin No COM : 17,18,36		

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

Models	Triac Output Module
Specifications	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 \rightarrow On	1ms or less
Response time $On \rightarrow Off$	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
DC5V R R R R R R R R R R R R R R R R R R R	
	Terminal Block Number