

GLOFA-GM7

Programmable Logic Controller

■ Features

- High function and high performance with dedicated MPU chip
 - IEC 61131-3
- 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-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



■ Specifications

Item			Specifications	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: 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 μ s / instruction	
	Standard function/function block		0.5 μ s / 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: -32768~32767	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	Task	Scan	100 - (Number of program blocks in task)	8 in total
		Time-driven	8	
		External	8	
		Internal	8	
		Initialization	1 (_INIT)	
Self-diagnostic function			Watchdog timer, Memory error, I/O error, etc	
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		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)	
		Multiplication	2-phase up/down counter (up/down: Automatic selection by phase difference)	
	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 available to use	
	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)

* 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.

GLOFA-GM7

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Input/output specifications

Input part

Item	Type	Main					Expansion
		G7M-DR10A (/DC) G7M-DT10A	G7M-DR20A (/DC) G7M-DT20A	G7M-DR30A (/DC) G7M-DT30A	G7M-DR40A (/DC) G7M-DT40A	G7M-DR60A (/DC) G7M-DT60A	G7E-DR10A
Power supply for main module		G7M-DR□□A, G7M-DT□□A: AC100~240V (50/60Hz), G7M-DR□□A/DC: DC24V					
Input point		6	12	18	24	36	6
Insulation method		Photocoupler					
Rated input voltage		DC24V					
Rated input current		7mA (%I×0.0.0~%I×0.0.2: 16mA)					
Operation voltage range		DC20.4V~28.8V (Ripple rate < 5%)					
Max. simultaneous input		100% Simultaneous ON					
On voltage/current		DC19V or higher/5.7mA or higher (%I×0.0.0~%I×0.0.2: 12.7mA or higher)					
Off voltage/current		DC6V or lower/1.8mA or lower (%I×0.0.0~%I×0.0.2: 4mA or lower)					
Input impedance		3.3kΩ					
Response time	Off → On	15ms or less*					
	On → Off	15ms or less*					
Operating indicator		LED					

* It is available to set from 1ms to 15ms in parameter of GMWIN (unit: ms)

Relay output part

Item	Type	Main					Expansion
		G7M-DR10A (/DC)	G7M-DR20A (/DC)	G7M-DR30A (/DC)	G7M-DR40A (/DC)	G7M-DR60A (/DC)	G7E-DR10A
Output point		4	8	12	16	24	4
Insulation method		Relay insulation					
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS φ = 1)/point, 5A/COM					
Min. load voltage/current		DC5V/1mA					
Max. load voltage		AC250V, DC110V					
Off leakage current		0.1mA or less (AC220V, 60Hz)					
Max. on/off frequency		1,200 times/hr					
Surge absorber		-					
Service life	Mechanical	20million times or more					
	Electrical	100,000 times or more (Rated voltage/current load) AC200V/1.5A, AC240V/1A (COS φ = 0.7) 100,000 times or more AC200V/1A, AC240V/0.5A (COS φ = 0.35) 100,000 times or more DC24V/1A, DC100V/0.1A (L/R=7ms) 100,000 times or more					
Response time	Off → On	10ms or less					
	On → Off	12ms or less					
Operating indicator		LED					

Transistor output part

Item	Type	Main				
		G7M-DT10A	G7M-DT20A	G7M-DT30A	G7M-DT40A	G7M-DT60A
Output point		4	8	12	16	24
Insulation method		Photocoupler				
Rated load voltage		DC12/24V				
Operating load voltage		DC10.2~26.4V				
Rated load current		0.5A/point, 3A/COM				
Off leakage current		0.1mA or less				
On voltage drop		1.5V or less (Max.load)				
Surge absorber		Clamp diode				
Common		4 points/COM	8 points/COM	8 points/COM	8 points/COM (× 2)	8 points/COM (× 3)
		Sink type	Sink type	4 points/COM Sink type	Sink type	Sink type
Response time	Off → On	2ms or less				
	On → Off	2ms or less				
Operating indicator		LED				



GLOFA-GM7U

Programmable Logic Controller

GLOFA GM Series



■ Features

Powerful built-in functions

- High-speed counter: 32-bit signed operation,
 - Counter range: -2,147,483,648 ~ 2,147,483,647
 - Function: ring counter, latch counter, comparison (equal /zone/task), RPM
- Positioning function (DRT/DT type)
 - Control axis: 2 axes (100kHz)
 - Operation method: single, repeat
 - Operation mode: end, keep, continuous
 - Additional functions: return to origin, JOG operation, PWM output
- PID operation function
 - Relay/PRC auto-tuning, SV ramp, delta MV, PWM output, position/velocity algorithm, Forward/Reverse

Various expansion modules

- 7 Digital I/O modules: G7E-DR(08/10/20)A, G7E-TR10A, G7E-DC08A, G7E-RY(08/16)A
- 9 Analog I/O modules: G7F-ADHA(B/C), G7F-AD2A(B), G7F-DA2I(V), G7F-AT2A, G7F-RD2A
- 6 Comm. modules: G7L-CUEB(C), G7L-DBEA, G7L-PBEA, G7L-FUEA, G7L-RUEA
- 2 Option modules: G7E-RTCA, G7M-M256B

■ Specifications

Item		Specifications				Remark	
		20	30	40	60		
Output type	DR type: Relay output						
	DRT type: NPN Tr output + Relay output						
	DT (N) type: NPN Tr output						
	DT (P) type: PNP Tr output						
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	Function blocks for built-in functions, special, communication modules					
Processing speed for operator		0.1~0.9 μ s/step					
Program memory capacity		132 Kbyte (including parameters)					
I/O points		Input: 12, Output: 8 Input: 18, Output: 12 Input: 24, Output: 16 Input: 36, Output: 24				Max. 120	
Data	Direct variable area (DVA)	14K					
Memory	Symbolic variable area (SVA)	30K					
Timer		No limitation. Time range: 0.001~4294967.295 sec (1193 hours)					
Counter		No limitation. Count range: -32768~32767					
Operation mode		RUN, STOP, PAUSE, DEBUG					
Data retention at power failure		Set to 'Retain' at data declaration					
Number of program blocks		100					
Program type	Task	Scan	100 - (Number of program blocks in task)				8 in total
		Time-driven	8				
		External	8				
		Internal	8				
		HSC	4				
		Initialization	1 (_INIT)				
Self-diagnostic function		Watchdog timer, Memory error, I/O error, etc					
Restart mode		Cold, Warm					
Built-in function	PID control		Control by function block, Autotuning, Forward/Reverse operation, Manual output, Delta MV, SV ramp function, Anti-windup, etc				
	Cnet interface		Dedicated, LG Inverter, MODBUS, User-defined, No protocol				
	HSC	Counting speed	1-phase: 100kHz (2channels) / 20kHz (2channels) 2-phase: 50kHz (1channel) / 10kHz (1channel)				
			1-phase up counter				
		Counting method	1-phase up/down counter (up/down: selection by B-phase)				
			2-phase up/down counter (up/down: pulse input)				
	2-phase up/down counter (up/down: automatic selection by phase difference)						
	Additional	Internal/external preset, Latch counter, Comparison output, RPM					
		No. of control axis: 2, Control method: PTP/speed/synchronous, Control unit: pulse					
	Position	Basic	Positioning data: 20/axis (operation step no. 1~20)				
			Position method: absolute/incremental, Operation method: single/repeat				
		Positioning	Address range: -2,147,483,648~2,147,483,647				
			Speed: Max. 100kpps (setting range: 5~100,000pps)				
Return to origin JOG	Acceleration/Deceleration method: Trapezoidal method						
	DOG/HOME (ON), DOG/HOME (OFF), approximate origin						
	Setting range: 5~100,000 (high/low speed)						
Pulse catch		Minimum pulse width: 10 μ s (2 points), 50 μ s (2 points)					
External interrupt		10 μ s (2 points), 50 μ s (2 points)					
Input filter		0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)					

GLOFA-GM7U

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Input/output specifications

■ Input part

Item	Type	Main			
		G7M-DR20U (DC)	G7M-DR30U (DC)	G7M-DR40U (DC)	G7M-DR60U (DC)
		G7M-DT20U (N) (DC)	G7M-DT30U (N) (DC)	G7M-DT40U (N) (DC)	G7M-DT60U (N) (DC)
		G7M-DT20U (P) (DC)	G7M-DT30U (P) (DC)	G7M-DT40U (P) (DC)	G7M-DT60U (P) (DC)
		G7M-DRT20U (DC)	G7M-DRT30U (DC)	G7M-DRT40U (DC)	G7M-DRT60U (DC)
Power supply		G7M-DR□□U, G7M-DT□□U, G7M-DRT□□U: AC100~240V (50/60Hz), G7M-DR□□U/DC, G7M-DT□□U/DC, G7M-DRT□□U/DC: DC12/24V			
Input point		12	18	24	36
Insulation method		Photocoupler			
Rated input voltage		DC24V			
Rated input current		7mA (%Ix0.0.0~%Ix0.0.3 [9mA])			
Operating voltage range		DC20.4V~28.8V (Ripple rate <5%)			
Max. simultaneous input		100% simultaneous ON			
On voltage/current		DC19V or higher/5.7mA or higher			
Off voltage/current		DC6V or lower/1.8mA or lower			
Input impedance		About 3.3kΩ (%Ix0.0.0~%Ix0.0.3 [2.7kΩ])			
Response time	Off → On	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
	On → Off	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
Operating indicator		LED			

■ Relay output part

Item	Type	Main			
		G7M-DR20U (DC)	G7M-DR30U (DC)	G7M-DR40U (DC)	G7M-DR60U (DC)
Output point		8	12	16	24
Insulation method		Relay insulation			
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS φ = 1)/point, 5A/COM			
Min. load voltage/current		DC5V/1mA			
Max. load voltage		AC250V, DC110V			
Off leakage current		0.1mA or less (AC220V, 60Hz)			
Max. on/off frequency		1200 times/hr			
Surge absorber		None			
Service life	Mechanical	20 million times or more			
	Electrical	100,000 times or more (rated load voltage)			
Response time	Off → On	10ms or less			
	On → Off	12ms or less			
Operating indicator		LED			

■ Transistor/mixed output part

Item	Type	Main			
		G7M-DT20U (N)*1 (DC)	G7M-DT30U (N) (DC)	G7M-DT40U (N) (DC)	G7M-DT60U (N) (DC)
		G7M-DT20U (P)*2 (DC)	G7M-DT30U (P) (DC)	G7M-DT40U (P) (DC)	G7M-DT60U (P) (DC)
		G7M-DRT20U (DC)	G7M-DRT30U (DC)	G7M-DRT40U (DC)	G7M-DRT60U (DC)
Output point	DT-type output point	8	12	16	24
	DRT-type Tr. output point	4	4	4	4
	DRT-type relay output point	4	8	12	20
Insulation method		Photocoupler (Tr. output points), Relay insulation (Relay output points)			
Rated load voltage		DC12V/24V			
Operation load voltage		DC10.2~26.4V			
Max. load voltage		0.5A/point (DRT type: %Qx0.0.0~%Qx0.0.3 (0.1A/point), DT type: %Qx0.0.0~%Qx0.0.1 (0.1A/point))			
Off leakage current		0.1mA or less			
Voltage drop		Less than DC0.3V			
Surge absorber		Zener diode			
Inrush current		Less than 4A, 10ms			
Response time	Off → On	0.2ms or less (Tr)			
	On → Off	0.2ms or less (Tr)			
Operating indicator		LED			

*1) (N) stands for NPN Tr.

*2) (P) stands for PNP Tr.

* For the characteristics of relay outputs in a DRT-type module, please refer to the output part (relay) in the above.

Expansion specifications

■ Input part

Item	Type	Expansion			
		G7E-DC08A *	G7E-DR08A *	G7E-DR10A	G7E-DR20A
Input point		8	4	6	12
Insulation method		Photocoupler			
Rated input voltage		DC24V			
Rated input current		7mA			
Operating voltage range		DC20.4V~28.8V (Ripple rate <5%)			
Max. simultaneous input		100% simultaneous ON			
On voltage/current		DC19V or higher/5.7mA or higher			
Off voltage/current		DC6V or lower/1.8mA or lower			
Input impedance		About 3.3k Ω			
Response time	Off $\rightarrow$ On	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
	On $\rightarrow$ Off	0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)			
Operating indicator		LED			

■ Relay output part

Item	Type	Expansion				
		G7E-RY08A *	G7E-RY16A	G7E-DR08A *	G7E-DR10A	G7E-DR20A
Output point		8	16	4	4	8
Insulation method		Relay insulation				
Rated load voltage/current		DC24V/2A (Resistive load), AC220V/2A (COS ϕ =1)/point, 5A/COM				
Min. load voltage/current		DC5V/1mA				
Max. load voltage		AC250V, DC110V				
Off leakage current		0.1mA or less (AC220V, 60Hz)				
Max. on/off frequency		1200 times/hr				
Surge absorber		None				
Service life	Mechanical	20 million times or more				
	Electrical	100,000 times or more (rated load voltage)				
Response time	Off $\rightarrow$ On	10ms or less				
	On $\rightarrow$ Off	12ms or less				
Operating indicator		LED				

■ Transistor output

Item	Type	Expansion	
		G7E-TR10A	
Output point		10	
Insulation method		Photocoupler	
Rated load voltage		DC12/24V	
Operation load voltage		DC10.2~26.4V	
Max. load voltage		0.5A/points, 4A/COM	
Off leakage current		0.1mA or less	
Inrush current		Less than 4A, 10ms	
Voltage drop		Less than DC1.5V	
Surge absorber		Clamp diode	
Response time	Off $\rightarrow$ On	2ms or lower	
	On $\rightarrow$ Off	2ms or lower	
Operating indicator		LED	

* Slim type