T-solution Leader in Electrics & Automation

GM7U Series

Automation Equipment

LS Industrial Systems

New Name of LG Industrial Systems

Features

Programmable Logic Controller

Global standard (IEC61131-3) language: IL, ID, SFC

Various main module: 32 types

- 20/30/40/60 points
- AC/DC power, DC input, Relay/Transistor output

Various expansion module: 24 types

- Digital I/O 7 types, Analog I/O 9 types,
  Communication I/F 6 types,
  Option module 2 types

Total I/O control: 120 points

Program memory capacity: 132Kbtye (including parameters)

High speed processing

- 0.1 ~ 0.9㎲/Basic instruction

Batteryless Backup

- Program backup: EEPROM
- Data backup: Supercapacitor

Communication Channel: 3 channels

- Loader: 1CH, Built-in RS-485: 1CH
  Built-in RS-232C or communication I/F: 1CH
- Various mode: Dedicated / User-defined /
  MODBUS / No protocol / LG Inverter mode

Built-in functions

- High speed counter function (32bits)
  - 1 phase: 100kHz 2CH, 20kHz 2CH (4CH in total)
  - 2 phase: 50kHz 1CH, 10kHz 1CH (2CH in total)
- Positioning function: DRT type only
  - Control axis: 2 axes (100kHz)
  - Position/Speed/Synchronous operation
- Improved PID control function
  - Relay and PRC auto-tuning
  - Forward/Reverse
  - PWM output, Delta MV
  - Positioning/Velocity algorithm
- Pulse catch, External Interrupt: 10㎲ 2 points, 50㎲ 6 points
- Input filter: 0~1000ms

* Expansion modules for GM7U and K120S are common.

G7M-DR20U

G7M-DR30U

G7M-DR40U

G7M-DR60U

G7L-CUEC

G7E-RY08A

Line-Up

Programmable Logic Controller

GM7U

Type		Part Number	Specification	Power supply	Remarks
GM7U main		G7M-DR20U (/DC)	DC 24V Input 12 points, Relay output 8 points	AC 100~240V (DC 24V) (50/60Hz)	
		G7M-DR30U (/DC)	DC 24V Input 18 points, Relay output 12 points		
		G7M-DR40U (/DC)	DC 24V Input 24 points, Relay output 16 points		
		G7M-DR60U (/DC)	DC 24V Input 36 points, Relay output 24 points		
		G7M-DRT20U (/DC)	DC 24V Input 12 points, Tr. output 4 points/Relay output 4 points		
		G7M-DRT30U (/DC)	DC 24V Input 18 points, Tr. output 4 points/Relay output 8 points		
		G7M-DRT40U (/DC)	DC 24V Input 24 points, Tr. output 4 points/Relay output 12 points		
		G7M-DRT60U (/DC)	DC 24V Input 36 points, Tr. output 4 points/Relay output 20 points		
		G7M-DT20U (N) (/DC)	DC 24V Input 12 points, NPN Tr. output 8 points		NPN Tr.
		G7M-DT30U (N) (/DC)	DC 24V Input 18 points, NPN Tr. output 12 points		
		G7M-DT40U (N) (/DC)	DC 24V Input 24 points, NPN Tr. output 16 points		
		G7M-DT60U (N) (/DC)	DC 24V Input 36 points, NPN Tr. output 24 points		
		G7M-DT20U (P) (/DC)	DC 24V Input 12 points, PNP Tr. output 8 points		PNP Tr.
		G7M-DT30U (P) (/DC)	DC 24V Input 18 points, PNP Tr. output 12 points		
		G7M-DT40U (P) (/DC)	DC 24V Input 24 points, PNP Tr. output 16 points		
		G7M-DT60U (P) (/DC)	DC 24V Input 36 points, PNP Tr. output 24 points		
Expansion module	Digital I/O	G7E-DR08A	DC 24V Input 4 points, Relay output 4 points	From main module	
		G7E-DR10A	DC 24V Input 6 points, Relay output 4 points		
		G7E-DR20A	DC 24V Input 12 points, Relay output 8 points		
	Input	G7E-DC08A	DC 24V Input 8 points		
	Output	G7E-RY08A	Relay output 8 points		
		G7E-RY16A	Relay output 16 point		
		G7E-TR10A	Tr. output 10 points		
Special module	Analog I/O	G7F-ADHA	Analog input 2CH, Analog output 1CH	DC 24V from external power supply	
		G7F-ADHB	Analog input 2CH, Analog output 2CH		
		G7F-ADHC	Analog input 2CH, Analog output 1CH		
	Analog Input	G7F-AD2A	Analog input 4CH		
		G7F-AD2B	Analog input 4CH		
	Analog Output	G7F-DA2I	Analog current output 4CH		
		G7F-DA2V	Analog voltage output 4CH		
	RTD Input	G7F-RD2A	RTD input 4CH		
	Analog Timer	G7F-AT2A	Analog timer 4CH		
Comm. module	Cnet I/F	G7L-CUEB	RS-232C 1CH	From main module	
		G7L-CUEC	RS-422 1CH		
	Fnet I/F	G7L-FUEA	Fnet (dedicated protocol) I/F master		
	Rnet I/F	G7L-RUEA	Rnet (dedicated protocol for SMART I/Os) I/F master		
	Pnet I/F	G7L-PBEA	Profibus-DP slave unit		
	Dnet I/F	G7L-DBEA	DeviceNet slave unit		
Option	RTC pack	G7E-RTCA	RTC unit		
	Memory pack	G7M-M256B	Memory pack for GM7U		

* If a part number ends with /DC, the supply power is DC24V.
* Slim type: G7E-DC08A, G7E-DR08A, G7E-RY08A, G7F-ADHB, G7F-AD2B, G7F-DA2V, G7F-RD2A

Specifications

Programmable Logic Controller

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			0.1~0.9μs/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 Memory	Direct variable area (DVA)		14K				
	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		Scan	100 - (Number of program blocks in task)				
	Task	Time-driven	8				8 in total
		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 (2 channels) / 20kHz (2 channels) 2-phase: 50kHz (1 channel) / 10kHz (1 channel)				
		Counting method	1-phase up counter				
			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				
	Position	Basic	No. of control axis: 2, Control method: PTP/speed/synchronous, Control unit: pulse Positioning data: 20/axis (operation step no. 1~20)				DRT/DT type only
		Positioning	Position method: absolute/incremental, Operation method: single/repeat				
			Address range: -2,147,483,648~2,147,483,647				
			Speed: Max. 100kpps (setting range: 5~100,000pps)				
			Acceleration/Deceleration method: Trapezoidal method				
		Return to origin	DOG/HOME (ON), DOG/HOME (OFF), approximate origin				
		JOG	Setting range: 5~100,000 (high/low speed)				
	Pulse catch		Minimum pulse width: 10μs (2 points), 50μs (6 points)				
	External interrupt		10μs (2 points), 50μs (6 points)				
	Input filter		0, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000ms (Default: 10ms)				

Built-in Functions

Programmable Logic Controller

20/30/40/60-point main unit

- Standard DRT-unit: Transistor output for position control (except 10-point unit)
- Max. 120 points (if connecting 3 expansion units)

High speed processing

- Basic command: 0.1 ~ 0.9㎲/step
  Application command: A few to several tens of ㎲/step

Batteryless backup

- Program backup: EEPROM backup while online editing
- Data backup: Supercapacitor
  (Over 2000 hours at normal temperature)

GM7U

Various input handling

- Input filter: Filter time can be set from 0 to 1000ms as the unit of 8 points
- Pulse catch: 10㎲ (2points), 50㎲ (6points)
- External interrupt: 10㎲ (2points), 50㎲ (6points)

High speed counter: 32-bit signed counter

- 1 phase: 100kHz 2CH, 20kHz 2CH (4CH in total)
- 2 phase: 50kHz 1CH, 10kHz 1CH (2CH in total)
- Additional functions: preset function, latch counter, comparison output, RPM function

Positioning function

- Control axis: 2 axes (100kHz)
- Operation mode: Single, Repeated, End, Keep, Continuous
- Additional function: Return to origin, JOG operation, PWM output

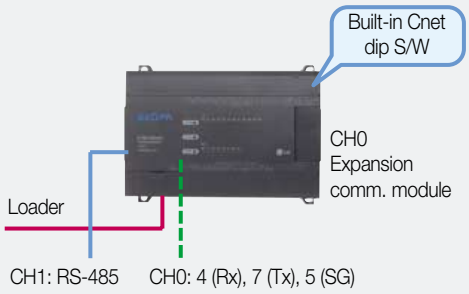
Communication function

- Supports two built-in communication ports RS-232C (CH0) and RS-485 (CH1)
- Supports 'No protocol mode' and communication monitoring

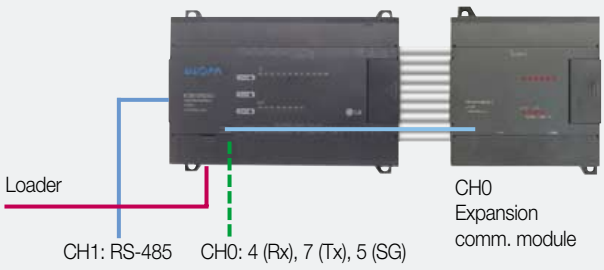
PID control function

- Relay and PRC auto-tuning
- Forward/Reverse
- PWM Output, Anti-derivative kick, Anti-windup, Positioning/Velocity algorithm to assign

Serial communication



[Built- in Cnet dip S/W: ON]



[Built- in Cnet dip S/W: OFF]

When built-in dip S/W is on, you are not supposed to use an expansion communication module while the built-in Cnet port (CH0) is enabled, and if it's off, you can use an expansion communication module but the built-in Cnet port (CH0) is disabled.

System configuration

Programmable Logic Controller

System configuration

Base unit

- Processing speed: 0.1μs
- Program capacity: 132k
- 32 types:
  - G7M-DR/DRT/DT20U (N/P) *1 (/DC)
  - G7M-DR/DRT/DT30U (N/P) (/DC)
  - G7M-DR/DRT/DT40U (N/P) (/DC)
  - G7M-DR/DRT/DT60U (N/P) (/DC)

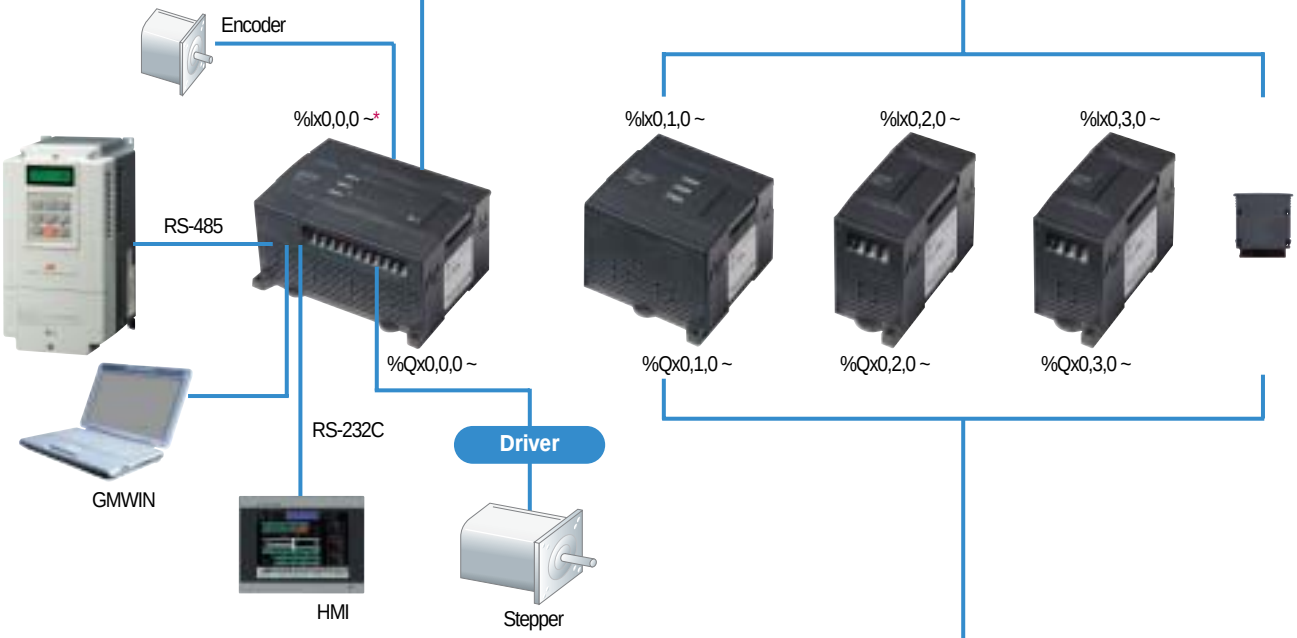
*1) (N): NPN Tr., (P): PNP Tr.

Max. number of expansion unit installation

- Max. 3 units in total

Installation	Max. number of installation
Digital I/O	3
Analog I/O	3
Analog timer	3
Communication I/F	1

- You are able to connect an option pack to the connector of the last expansion module



Expansion modules

Digital I/O modules

- Input
  - G7E-DC08A : DC input 8 points
- Output
  - G7E-TR10A : Tr output 10 points
  - G7E-RY08A : Relay output 8 points
  - G7E-RY16A : Relay output 16 points
- Input/Output
  - G7E-DR08A : DC in 4 points / relay out 4 points
  - G7E-DR10A: DC in 6 points / relay out 4 points
  - G7E-DR20A: DC in 12 points / relay out 8 points

Special modules

- A/D
  - G7F-AD2A, G7F-AD2B : Analog input (4 channels)
- D/A
  - G7F-DA2V : Voltage output (4 channels)
  - G7F-DA2I: Current output (4 channels)
- A/D, D/A
  - G7F-ADHA: Analog (in 2 channels, out 1 channel)
  - G7F-ADHB : Analog (in 2 channels, out 2 channels)
  - G7F-ADHC : Analog (in 2 channels, out 1 channel)
- RTD
  - G7F-RD2A : RTD 4 channels
- Analog timer
  - G7F-AT2A: Analog timer (4 points)

Communication unit *2)

- G7L-CUEB: RS-232C 1 channel
- G7L-CUEC: RS-422 1channel
- G7L-FUEA: Fieldbus I/F (Fnet master)
- G7L-RUEA: Fieldbus I/F (Rnet master)
- G7L-DBEA: DeviceNet (slave)
- G7L-PBEA: Profibus-DP (slave)

Option pack

- G7E-RTCA: RTC (Real timer clock) pack
- G7E-M256B: Memory pack (for program back-up)

*1) stands for a slim type.

*2) Built-in RS-232C and a communication module share the same communication port (CH0) and you are not able to use them at the same time. In case of GM7U, you are able to use built-in RS-485 (CH1) and a comm. module (CH0) at the same time.

* For I/O assignment, please refer to GM7U user's manual.

Communication

Programmable Logic Controller

Communication unit

Cnet (G7L-CUEB, G7L-CUEC)

Item		Specifications
Interface		G7L-CUEB: RS-232C (Modem), G7L-CUEC: RS-422/485
Communi-cation mode	Dedicated mode	Supports 1:1, 1:N and high-speed link
	GMWIN mode	Supports remote programming and mounting via GMWIN
	Modbus mode	Supports master and slave function with Modbus protocol (ASCII, RTU)
	User-defined mode	Supports user-defined 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		1,200 / 2,400 / 4,800 / 9,600 / 19,200 / 38,400 / 57,600bps
Setting method		Communication parameter setting in GMWIN
Distance		Max. 15m (CUEB), Max. 500m (CUEC)
Max. number of stations		Max. 32 stations
Weight		180g

Fnet/Rnet (G7L-FUEA/RUEA) *1)

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

*1) Rnet is a dedicated protocol for LGIS SMART I/Os.

Profibus-DP (G7L-PBEA)

Item		Specifications
Network type		Profibus-DP (Slave)
Protocol		EN50170/DIN19245
Media access		Token passing & Poll
Transmission 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

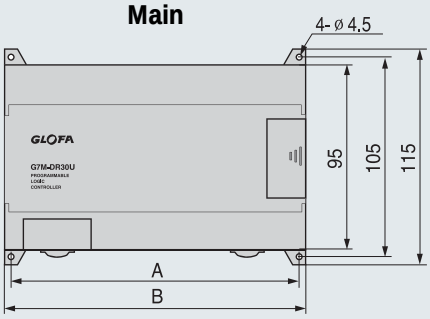
DeviceNet (G7L-DBEA)

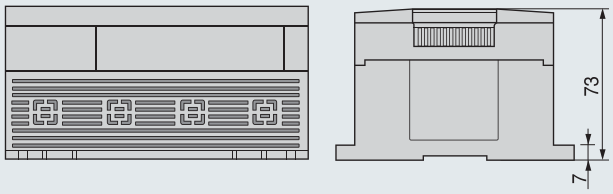
Item		Specifications			
Network structure		Trunk/drop line			
Protocol		Peer explicit message, Predefined explicit message			
		Predefined I/O message (Poll, bit strobe, COS, cyclic)			
Max. extension & speed		Speed	Network distance	Drop cable	Total drop cable
		500kbps	100m or less	6m or less	39m or less
		250kbps	250m or less	6m or less	78m or less
		125kbps	500m or less	6m or less	156m or less
Channel		64 stations			
Diagnosis function		CRC error check/Scan list			
Setting method		Communication parameter setting in GMWIN			
Cable		5 lines (signal 2 lines, power 2 lines, shield 1 line)			

* 1) In case of GM7U, only 1 communication module is available and you are not able to use a communication module and built-in RS-232C at the same time because they are set as CH0 in GMWIN parameter. You are able to use both CH0 and built-in RS-485 (CH1) simultaneously.

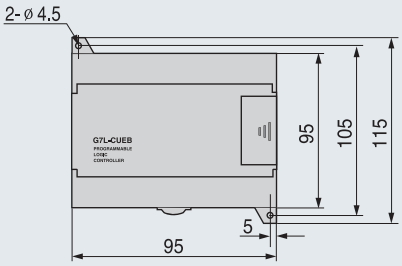
Dimensions

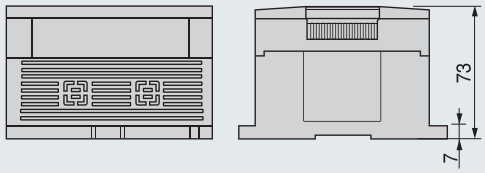
Main



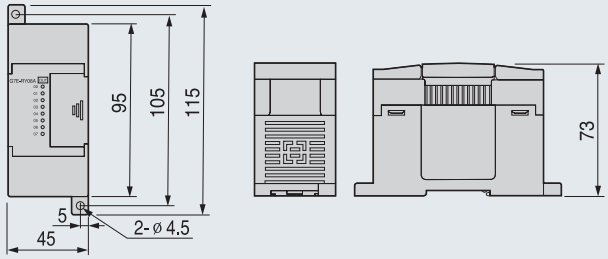


Expansion module





Expansion module (slim type)



GM7U	A	B
G7M-D ▫ 20U	135	145
G7M-D ▫ 30U		
G7M-D ▫ 40U	165	175
G7M-D ▫ 60U	215	225

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