

Product list

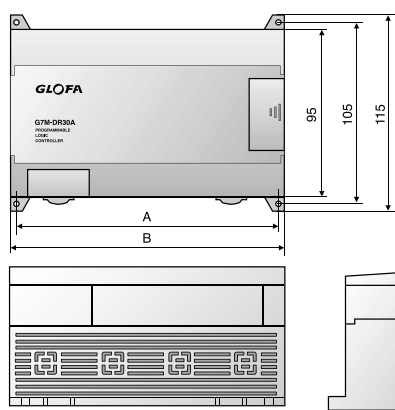
| Types         | Part Numbers  | Specification  | Power Supply                | Remarks |
|---------------|---|--|-----------------------------|---------|
| Base Unit     | G7M-DR10A   | · 6 DC 12/24V Inputs · 4 Relay Outputs               | AC85-264V<br>(Free voltage) | 1       |
|               | G7M-DR20A   | · 12 DC 12/24V Inputs · 8 Relay Outputs              |                             |         |
|               | G7M-DR30A   | · 18 DC 12/24V Inputs · 12 Relay Outputs             |                             |         |
|               | G7M-DR40A   | · 24 DC 12/24V Inputs · 16 Relay Outputs             |                             |         |
|               | G7M-DR60A   | · 36 DC 12/24V Inputs · 24 Relay Outputs             |                             |         |
|               | G7M-DT10A   | · 6 DC 12/24V Inputs · 4 Transistor Outputs          |                             |         |
|               | G7M-DT20A   | · 12 DC 12/24V Inputs · 8 Transistor Outputs         |                             |         |
|               | G7M-DT30A   | · 18 DC 12/24V Inputs · 12 Transistor Outputs        |                             |         |
|               | G7M-DT40A   | · 24 DC 12/24V Inputs · 16 Transistor Outputs        |                             |         |
|               | G7M-DT60A   | · 36 DC 12/24V Inputs · 24 Transistor Outputs        |                             |         |
|               | G7M-DR10A/ DC   | · 6 DC 12/24V Inputs · 4 Relay Outputs               |                             |         |
|               | G7M-DR20A/ DC   | · 12 DC 12/24V Inputs · 8 Relay Outputs              |                             |         |
|               | G7M-DR30A/ DC   | · 18 DC 12/24V Inputs · 12 Relay Outputs             |                             |         |
|               | G7M-DR40A/ DC   | · 24 DC 12/24V Inputs · 16 Relay Outputs             |                             |         |
| G7M-DR60A/ DC | · 36 DC 12/24V Inputs · 24 Relay Outputs  |  |                             |         |
| Exp. Module   | Built-in functions  |  | DC12-24V<br>(Free voltage)  |         |
|               | · 1 High speed counter (16 KHz for 1 Phase, 8 KHz for 2 Phases)                       |  |                             |         |
|               | · 8 PID Loops with auto Tuning  |  |                             |         |
|               | · 8 Pulse catch Inputs (Min. 0.2ms)   |  |                             |         |
|               | · Discrete Inputs with filters (0-15ms, each 1ms)                                     |  |                             |         |
|               | · 8 External Interrupt Inputs (0.4ms)   |  |                             |         |
|               | · 1 RS-232C and 1 Loader port<br>(Dedicated, user defined, Modbus protocol available) |  |                             |         |
|               | G7E-DR10A   | · 6 DC 12/24V Inputs · 4 Relay Outputs               |                             |         |
|               | G7F-ADHA  | · 2 Analog Inputs · 1 Analog Outputs                 |                             |         |
|               | G7L-CUEC  | · RS-422/485 Communication module                    |                             |         |
|               | G7L-CUEB  | · RS-232C Communication module (Modem available)     |                             |         |
|               | G7L-DBEA  | · DeviceNet slave module                             |                             |         |
|               | G7L-PBEA  | · Profibus-DP slave module                           |                             |         |
|               | G7L-FUEA  | · Fnet master module                                 |                             |         |
| G7F-AT2A      | · Analog potentiometer, 4 points  |  |                             |         |
| Exp. Pack     | G7F-RTCA  | · Real time clock pack                               |                             |         |
|               | G7M-M256  | · Flash memory pack for program back-up (256K bytes) |                             |         |

\*G7M-DR10A (/DC), G7M-DT10A : built-in 1 RS-232C port (or 1 RS-485 port) available

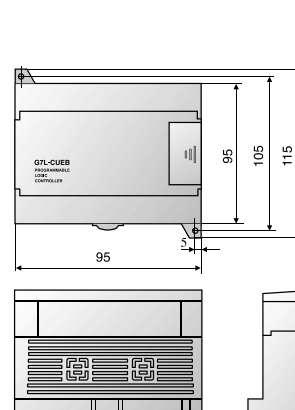
\*\*1) 1 Built-in High speed counter : 1 phase 16Kpps, 2 phases 8Kpps

Dimensions

1. Main modules



2. Expansion modules



(Unit : mm)

|            | A   | B   |
|------------|-----|-----|
| G7M-D**10A | 85  | 95  |
| G7M-D**20A | 135 | 145 |
| G7M-D**30A | 135 | 145 |
| G7M-D**40A | 135 | 175 |
| G7M-D**60A | 165 | 225 |
| G7E-DR10A  | 85  | 95  |
| G7F-ADHA   |     |     |
| G7F-AT2A   |     |     |
| G7L-CUEB/C |     |     |

# GLOFA GM7

Programmable Logic Controller



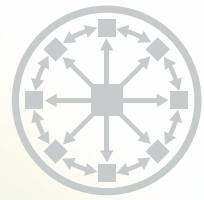
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## Network

### Two built-in RS-232C channels with one port

Each of channels can be connected to a programming tool, Operator interfaces or HMI software.

- No need to disconnect your operator interface to monitor or edit your program.
- Ch1 is fixed at 38,400 baud rate and Ch2 has selective baud rates from 1,200~57,600 baud rates.

Ch2 supports Modbus Master/Slave protocol, UDP(User Defined Protocol) for other devices (like Temperature controllers) as well as LG dedicated protocol at speeds up to 57,600 baud rate.

TM/TC Wide Area Network supported for modem connection (option).

Device-level Networking enables quick and simple connection of sensors and actuators with Standard interfaces - DeviceNet, Profibus-DP, Fnet Master/Slave, etc.

Built-in User Defined Protocol allows user to edit any protocols for other Devices.



## Programming

### Powerful but simple programming

Windows based programming tool(Windows3.1, 95, 98 & NT)-GMWIN.

IEC61131-3 international standard language offers compatibility and reliability for any complex applications.

IL, LD, SFC language supported.

Simulation function in your computer without connection to PLC.

- Analog & Digital I/O simulation can save your time for field test and debugging.

Programming in RUN mode allows changing program without connection of the PLC.

UDFB(User Defined Function Block) enables to make your own language like Object function.



# ALL in ONE, All for your needs



## Functions

### ALL in ONE, ALL for your needs

Single High-speed Counter(1phase 16kHz, 2phase 8kHz) and Pulse output(2kHz, 1ch for TR type) allow user to use GM7 PLC for motion and high-speed machine control applications.

No limit PID loops with auto-tuning function, PLC can process PID loops directly in the CPU and can be set in GMWIN programming tool.

Eight pulse catch inputs allow GM7 CPU to detect pulse width as small as 0.2ms that cannot normally be detected in normal inputs.

Input filters can be used to reduce the possibility of abnormal inputs caused by noise.

Eight external interrupt inputs are useful in applications that have a high-priority event which requires special operations to be performed.



## Performance

### High Performance

Five independent product ranges by 10 I/O points allow users more flexibility (10/20/30/40/60 I/O).

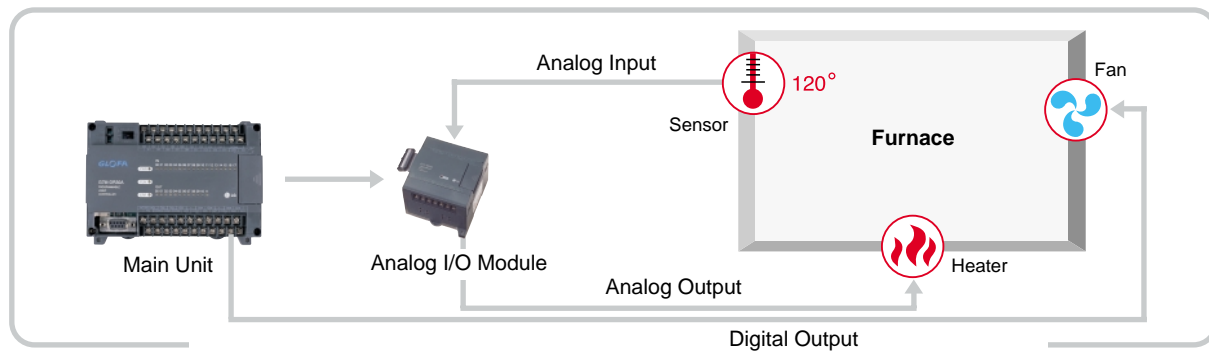
MPU(Main Process Unit) chip set designed only for LG PLC enables to realize high performance and reliability.

- Processing Speed : 0.5μs/step
- Program Capacity : 68k bytes
- IEC61131-3 standard languages even for Micro PLC

# Applications

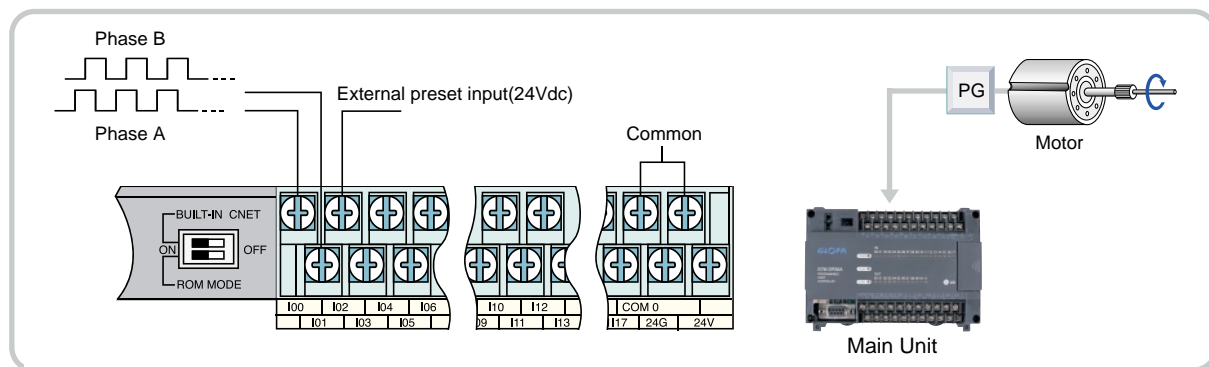
## No limit PID loops with auto tuning (built-in)

It can be applied for temperature control, Pressure control, Flow control in the fields such as Chemical and process Industries, Glass and ceramics, Wood and paper industry, Food & Drink industry and Furnace, etc.



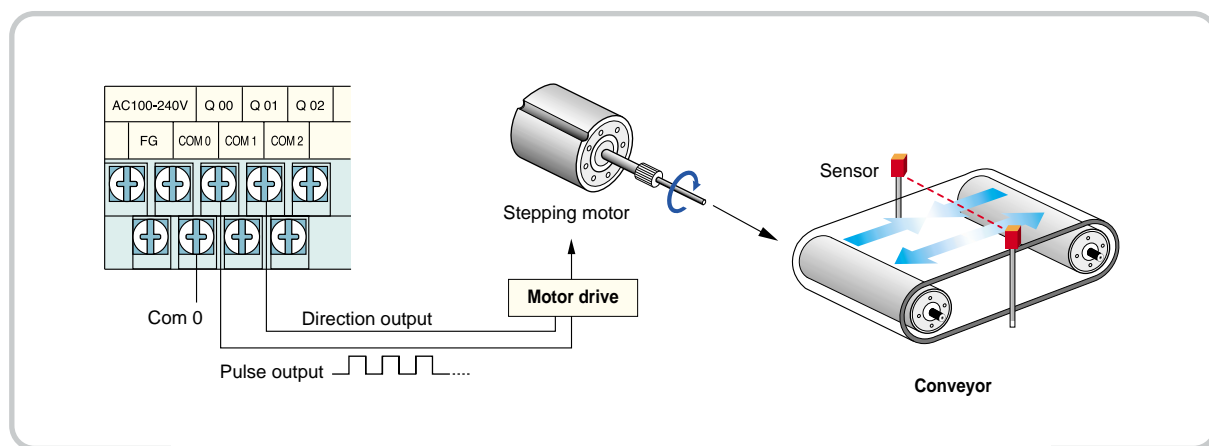
## Single High Speed Up/Down Counter (built-in)

Single high speed counter up to 16kHz enables and resets input, as up/down counter for connecting incremental encoders or high speed pulse generator. This counter is independent of the CPU ladder logic execution, so counting is not affected (16kHz for 1phase, 8kHz for 2phases, 24bits) by the scan time.



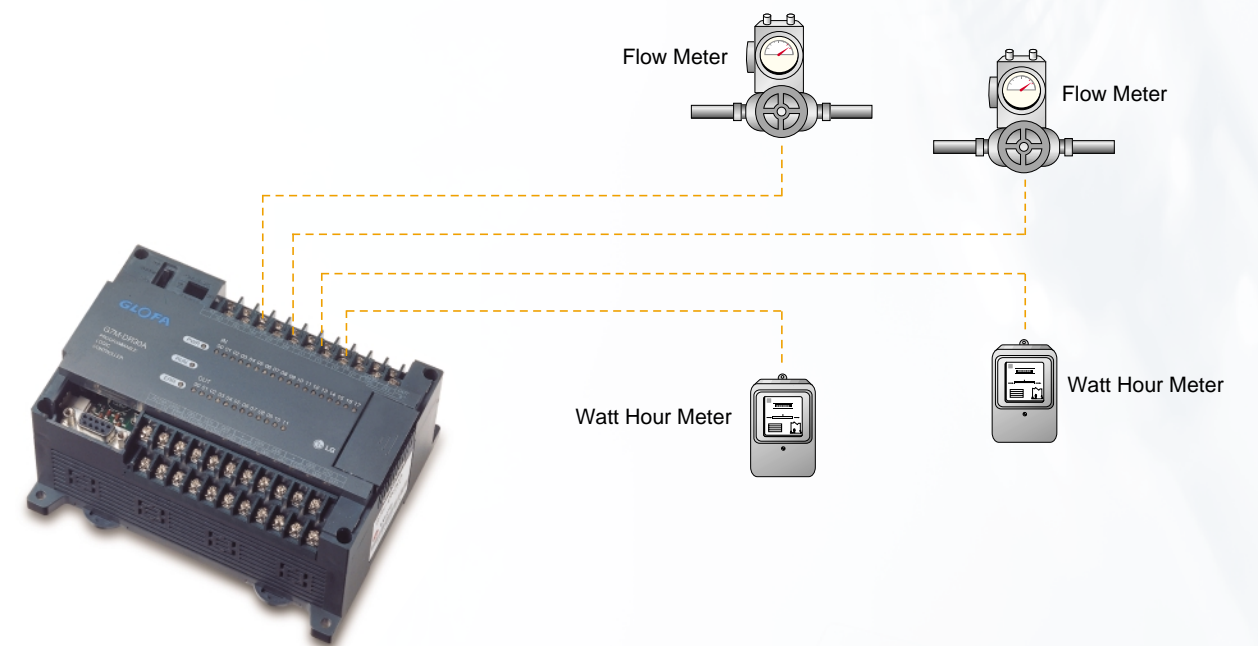
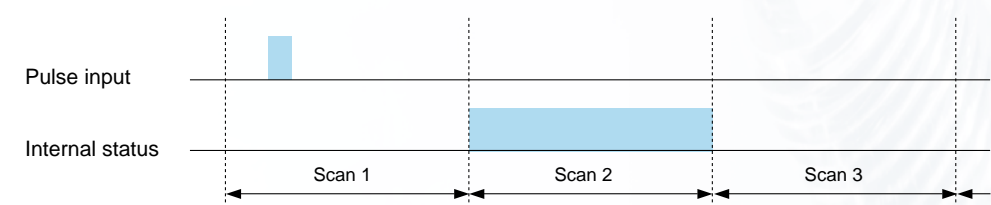
## Pulse Output (built-in, TR type)

One high-frequency pulse output (max. 2kpps) enables to build stepping motor and simple positioning control systems.



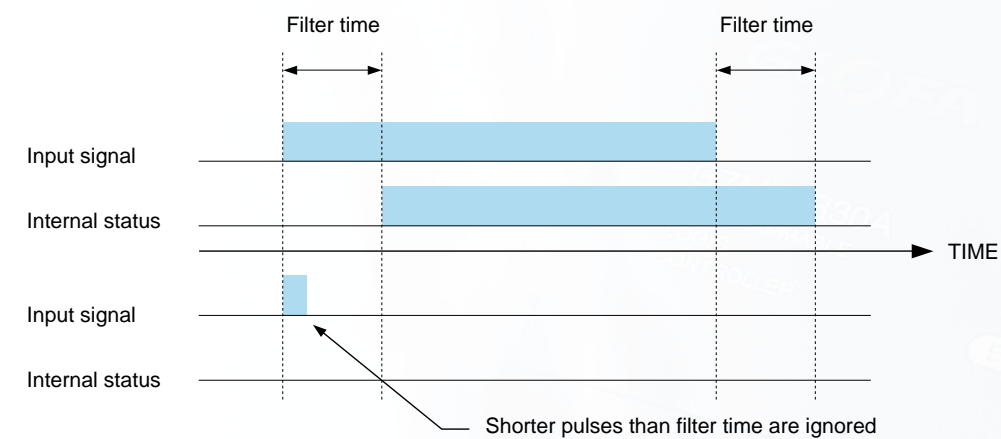
## Eight Pulse catch Inputs (built-in)

Pulse catch inputs can capture fast pulse inputs that cannot normally be detected during the normal input cycling. Max. 8 different pulse catch inputs (%IX0.0.0 ~ %IX0.0.7) are available and pulses with width as small as 0.2ms can be captured. You can configure these inputs in the basic parameter setting of GMWIN.



## Discrete inputs with filters (built-in)

Inputs with filters prevent the CPU from reading abnormal inputs and reduce the possibility of input malfunction. The filter time can be programmed from 0 to 15ms in 1ms increments.



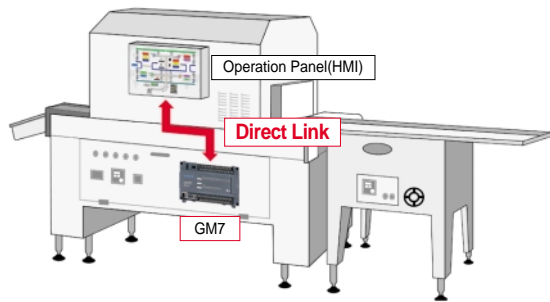
# Communications

## 1:1 Direct Link

### Application Example

Packaging Machine using Operation Panel

- Provides Additional RS232C Ch. via Loader Port.
- Direct Connection with Display Unit or HMI machine, etc.
- Can use Both Loader & Operation Panel
- Convenient initial test Operation.
- 1:N Link available using RS232-422 Converter

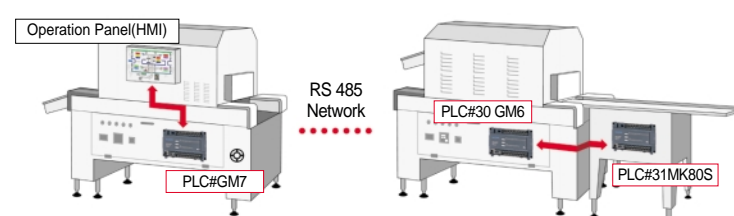


## 1:N Local Area Monitor & Control

### Application Example

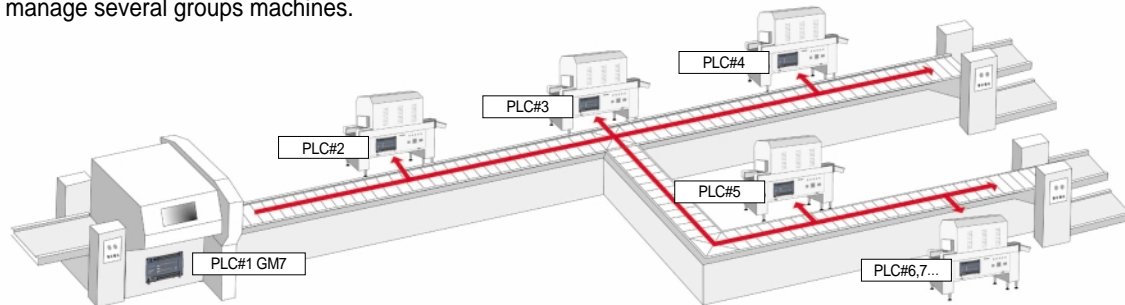
Complex Packaging Machine using Operation Panel & PLCs

- Provides 1:N Communications using RS485 Interface.
- Possible to manage a group of machines.



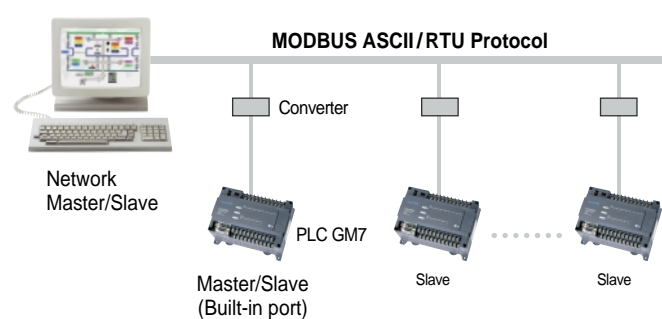
## N:N Distributed Control

- Provides N:N Communications using RS485 Interface without any Host.
- Possible to manage several groups machines.



## MODBUS Network Interface

- GM7 Provides Industrial Standard Protocol like Modbus & User defined Protocol made by User.
- User can edit Link Characteristics & Protocol using User Defined Protocol (Stop Bit, Parity, Data length...)
- Frames to be sent or received can be created as required by user.

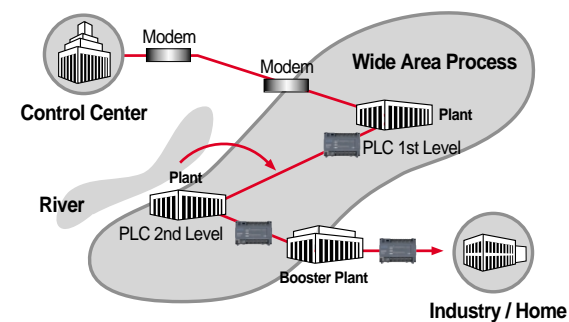


## Modem Communication

### Application Example

Water Treatment System in wide and long distance Area

- Modem enables Remote programming up to 100km
- Possible to program and monitor the PLCs via 2nd Level Link
- Low Cost TeleMetering & TeleControl System available



# Programming Software

## Overview

- GMWIN software is full-featured 32-bit Windows based programming package that supports all LG GLOFA-GM series
- GMWIN software meets international standard for IEC1131-3.
- IL(instruction List), LD(Ladder Diagram) & SFC(Sequential Function Chart) languages are supported.
- Selectable upload function reduces downloading time and secures source program.
- Program simulation function is available without a PLC.

## On-line Operation

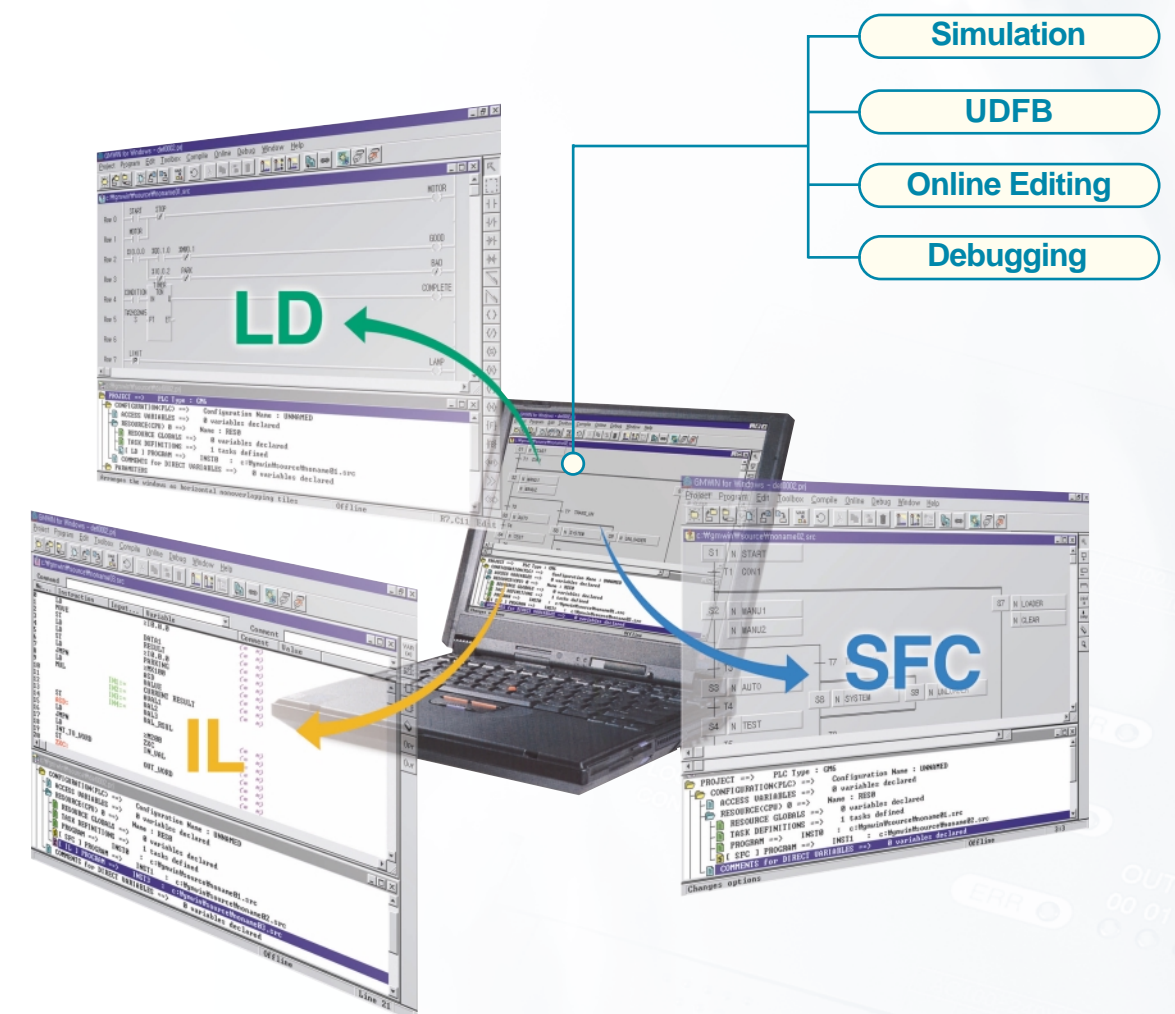
- You can customize frequently used or specialized programs using UDFB(User Defined Function Block).
- You can manage all necessary components such as resource, parameters, variables, libraries and other important data in a project window with a program.
- You don't need to worry about I/O allocation. Indirect variables enable to allocate program memory automatically.
- User friendly GUI including all Windows specific benefits can show simple.

## Debugging & Maintenance

- Step run : executes each step one by one at execution signal.
- Break point run : executes steps to the designated point up to 8points can be designated at a time.
- Data status break : executes at the time of designated data access or data equality.
- Scan break : executes designated times of scan.

## Display & Monitoring

- Monitor multiple programs at the same time, error history, PLC & System information, date & time information, etc.
- Link information for communication modules.
- I/O modules, link parameters, time chart and variables.



# Specification

## General Specification

| Item                       | Specifications   |  |  |
|----------------------------|--|--|--|
| Program control method     | Cyclic operation of stored program, interrupt task operation   |  |  |
| I/O control method         | Refresh method, Direct I/O method  |  |  |
| Programming languages      | <ul style="list-style-type: none"> <li>IL: Instruction List</li> <li>LD: Ladder Diagram</li> <li>SFC: Sequential Function Chart</li> </ul> |  |  |
| No. of instructions        | Operator   | LD: 13 / IL: 21  |  |
|                            | Basic function   | 194  |  |
|                            | Basic function block   | 11   |  |
| Special function block     | Special function block   | Each special modules have their own special function blocks  |  |
|                            | Processing speed   | Operator   | 0.5μs/step   |
| Processing speed           | Basic function and function block  | 0.5μs/step   |  |
|                            | Program memory   | ROM mode operation with built-in flash memory(128K bytes)  |  |
| Program capacity           | 68K bytes  |  |  |
| I/O points                 | 10 Pts: 6 DC Input, 4 Relay Output   |  |  |
|                            | 20 Pts: 12 DC Input, 8 Relay Output  |  |  |
|                            | 30 Pts: 18 DC Input, 12 Relay Output   |  |  |
|                            | 40 Pts: 24 DC Input, 16 Relay Output   |  |  |
|                            | 60 Pts: 36 DC Input, 24 Relay Output   |  |  |
| Data memory                | Direct variable  | 2 ~ 8K bytes(set by parameter)   |  |
|                            | Symbolic variable  | 32K bytes-(direct variable area)   |  |
| Timer                      | <ul style="list-style-type: none"> <li>Number of timer: unlimited</li> <li>Timing range: 0.001 ~ 4,294,967,295sec</li> </ul>               |  |  |
| Counter                    | <ul style="list-style-type: none"> <li>Number of timer: unlimited</li> <li>Counting range: -32,768 ~ +32,767</li> </ul>                    |  |  |
| Operation mode             | RUN, STOP, PAUSE, DEBUG  |  |  |
| Data back-up               | Set as a retained variable when defines it   |  |  |
| No. of program block       | 128  |  |  |
| Program types              | Scan   | 100  |  |
|                            | Time driven task   | 8  | Total numbers of tasks: Max. 8   |
|                            | External interrupt task  | 8  |  |
|                            | Internal interrupt task  | 8  |  |
|                            | Initialization task  | 1(_INIT)   |  |
| Self-diagnosis functions   | Watch Dog Timer, Memory error detection, I/O error detection, Battery error detection, Power supply error detection, etc.                  |  |  |
| Restart mode               | Cold / warm restart  |  |  |
| Built-in special functions | PID control  | Control by function block<br>Auto tuning, Forward/reverse action<br>Forced output, Operation scan time setup |  |
|                            | Cnet I/F Function  | LG GLOFA protocol<br>MODBUS protocol, RS-232C 1 port<br>User-defined protocol                                |  |
|                            | High speed counter   | Counting speed   | 1-phase: 16kHz(1 channel) or<br>2-phase: 8kHz(1 channel)   |
|                            |  | Counting modes   | <ul style="list-style-type: none"> <li>3 counting modes</li> <li>- 1 phase, Up/down count with program input</li> <li>- 1 phase, Up/down count with B phase input</li> <li>- 2 phase, Up/down count with phase difference</li> </ul> |
|                            |  | Multiplication   | select one of 1, 2, or 4   |
|                            |  | Date comparison  | Executes a task program when a current value reaches preset value  |
|                            | Pulse chath input  | Pulse width: 0.2 ms, 8 points  |  |
|                            | Pulse output   | 1x 2 kHz   |  |
|                            | External interrupt   | 8 points, 0.4ms  |  |
|                            | Input filter   | 0 ~ 15ms   |  |
| RTC (Real Time Clock)      | Year, Month, Date, Hour, Minute, Second, Day   |  |  |



## Input

| Item                   | Type   | G7M-DR10A(DC)                            | G7M-DR20A(DC) | G7M-DR30A(DC) | G7M-DR40A(DC) | G7M-DR60A(DC) | G7E-DR10A |
|------------------------|--------|--|---------------|---------------|---------------|---------------|-----------|
|                        |        | G7M-DT10A                                | G7M-DT20A     | G7M-DT30A     | G7M-DT40A     | G7M-DT60A     | -         |
| Input Point            |        | 6  | 12            | 18            | 24            | 36            | 6         |
| Insulation Device      |        | Photo coupler                            |               |               |               |               |           |
| Rated Input Voltage    |        | DC12~24V                                 |               |               |               |               |           |
| Rated Input Current    |        | DC12V 4.5mA, DC24V 9mA                   |               |               |               |               |           |
| Operation Voltage      |        | DC10.2~28.8V (Ripple : 5% or less)       |               |               |               |               |           |
| Max. Simultaneously On |        | 100% Simultaneously on                   |               |               |               |               |           |
| On Voltage / Current   |        | More than DC9.5V/3.5mA (I00~I02 : 6.3mA) |               |               |               |               |           |
| Off Voltage / Current  |        | Less than DC5V/1.8mA (I00~I02 : 3.3mA)   |               |               |               |               |           |
| Input Impedance        |        | About 2.7kΩ (I0~I2 : 1.5kΩ)              |               |               |               |               |           |
| Response Time          | Off On | 1~15ms                                   |               |               |               |               |           |
|                        | On Off | 1~15ms                                   |               |               |               |               |           |
| Operation Indicator    |        | LED                                      |               |               |               |               |           |
| External wiring        |        | Terminal block (M3 x 6 screw)            |               |               |               |               |           |

‡ G7M-DR10A/DC, DR20A/DC, DR30A/DC, DR40A/DC, DR60A/DC : DC 12~24V powered.

‡ G7M-DR10A(DC), G7M-DR10A : not available for Cnet I/F modules

## Output(Relay)

| Item                       | Type       | 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         |
| Switching Device           |            | Relay   |               |               |               |               |           |
| Insulation Device          |            | Relay   |               |               |               |               |           |
| Rated Load Voltage/Current |            | DC24V / 2A (Resistive load), AC220V / 2A (COS =1) 1 Point<br>2A/1 Point/com, 4A/2 Points/com, 4A/4 Points/com |               |               |               |               |           |
| Minimum Input              |            | DC5V/1mA  |               |               |               |               |           |
| Max. Load Voltage          |            | AC250V DC110V   |               |               |               |               |           |
| Max. Switching Frequency   |            | 1,200 Times/Hour  |               |               |               |               |           |
| Surge Killer               |            | None  |               |               |               |               |           |
| Lifetime of Relay          | Mechanical | Over 0.1 million times  |               |               |               |               |           |
|                            | Electrical | Over 20 million times   |               |               |               |               |           |
| Response Time              | Off On     | Within 10ms   |               |               |               |               |           |
|                            | On Off     | Within 12ms   |               |               |               |               |           |
| Operation Indicator        |            | LED   |               |               |               |               |           |
| External wiring            |            | Terminal block (M3 x 6 screw)   |               |               |               |               |           |

## Output(Transistor)

| Item                       | Type   | G7M-DT10A                  | G7M-DT20A | G7M-DT30A | G7M-DT40A | G7M-DT60A | - |
|----------------------------|--------|----------------------------|-----------|-----------|-----------|-----------|---|
| Output Point               |        | 4                          | 8         | 12        | 16        | 24        | - |
| Rated Load Voltage         |        | DC 12/24                   |           |           |           |           |   |
| Rated Load Current         |        | 0.5A/1 Point, 3A/1com      |           |           |           |           |   |
| Response Time              | Off On | Less than 2ms              |           |           |           |           |   |
|                            | On Off | Less than 2ms              |           |           |           |           |   |
| Common Method              |        | 8 Points / 1com, Sink type |           |           |           |           |   |
| Operation Indicator        |        | LED                        |           |           |           |           |   |
| Insulation Device          |        | Photo coupler              |           |           |           |           |   |
| Surge Killer               |        | Clamp diode                |           |           |           |           |   |
| Internal Power Consumption |        | 170mA                      |           |           |           |           |   |

# Option module

# Wiring Diagrams

## Option Module

Analog I/O module (G7F-ADHA)



Analog Potentiometer Module (G7F-AT2A)



Chat I / F Module (G7L-CUEB, G7L-CUBC)



| Items                     |  | Specification   |                                  |
|---------------------------|--|---|----------------------------------|
| A / D Part                | Analog Input   | Voltage   | DC0-10V                          |
|                           |  | Current   | DC0-20mA or 4-20mA               |
|                           | Digital Output Resolution  |   | 12bit (0-4,000)                  |
|                           | Voltage/Current Selection  | Selected by dip switch · Short V and I terminal for current Input |                                  |
| Analog Input Channels     |  | 2channels/Module  |                                  |
| D / A Part                | Absolute Maximum Input   | Voltage   | DC+12V                           |
|                           |  | Current   | DC+25mA                          |
|                           | Digital Output Resolution  |   | 12bit (0-4,000)                  |
|                           | Analog Output  | Voltage   | DC0-10V (Load impedance 2kΩ-1MΩ) |
|                           | Current  | DC0-20mA (Load impedance 560 Ω)                                   |                                  |
| Voltage/Current Selection |  | Separated terminal  |                                  |
| Analog Input Channels     |  | 1channels/Module  |                                  |
| Absolute Maximum Input    | Voltage  | DC+12V  |                                  |
|                           | Current  | DC+24mA   |                                  |
| Max. Resolution           | DC0-10V  | 2.5mV (1/4,000)   |                                  |
|                           | DC0-20mA   | 5μA (1/4,000)   |                                  |
| Accuracy                  | ± 0.5% or less (Full scale)  |   |                                  |
| Conversion Time           | Scan time+1.5ms/Channels   |   |                                  |
| Insulation Device         | Photo coupler between Input terminal and ground (No insulation between channels) |   |                                  |
| External Wiring           | 14 Points terminal block   |   |                                  |
| Power Supply              | DC24V, 80mA  |   |                                  |
| Current Consumption       | DC5V, 10mA   |   |                                  |
| Weight                    | 240g   |   |                                  |

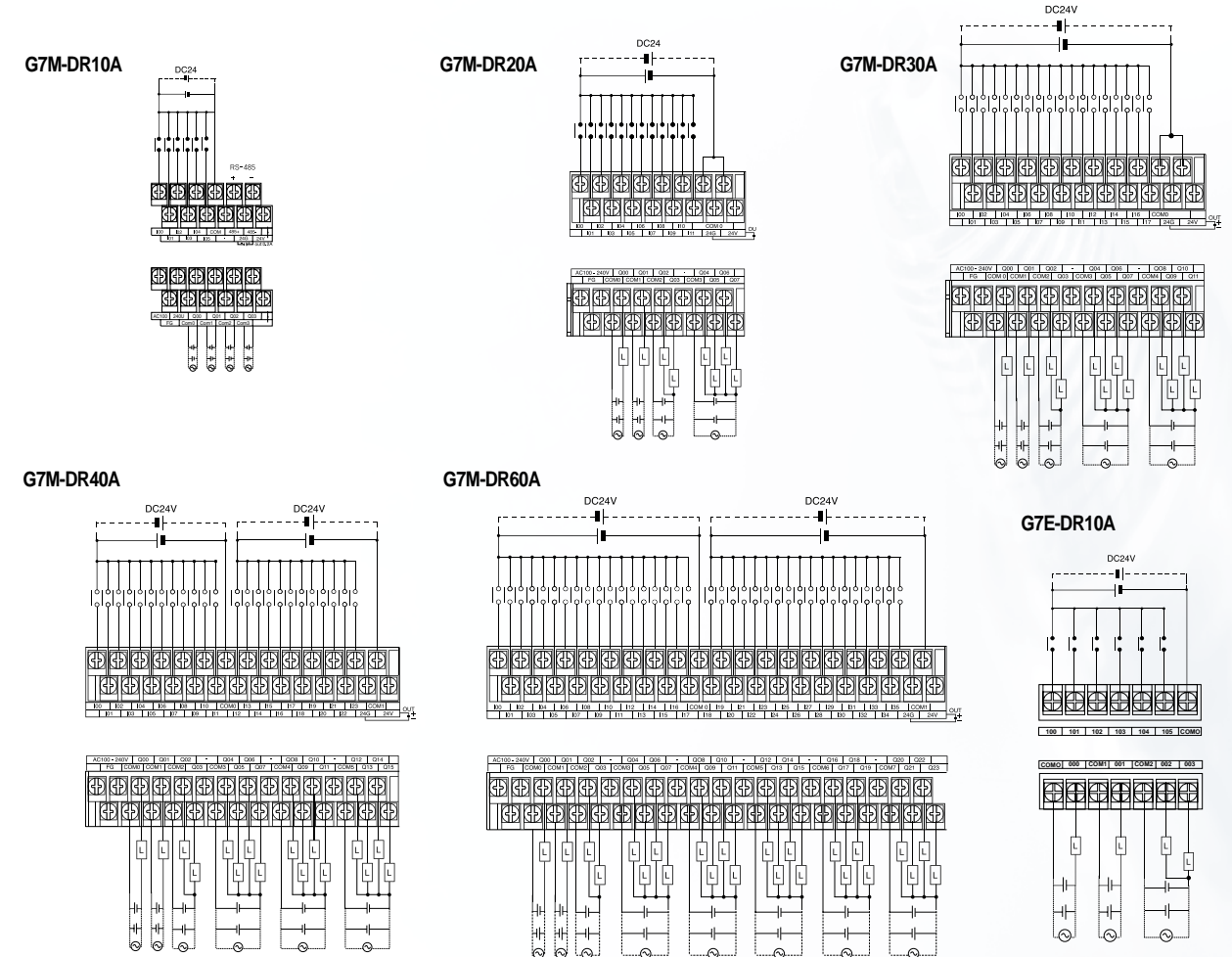
| Items                |                                 | Specification |  |
|----------------------|---------------------------------|---------------|--|
| No. of Timers        | 4 Points                        |               |  |
| Digital Output Range | (8bit) 0-200                    |               |  |
| Timers Setting       | Set by adjustable volume switch |               |  |
| Accuracy Of Timer    | ± 2.0% (Full scale)             |               |  |
| Current Consumption  | 50mA                            |               |  |
| Weight               | 200g                            |               |  |

| Items              |   | Specification   |  |
|--------------------|---|---|--|
| Interface          |   | RS-422, Modem (RS-232C)   |  |
| Mode               | Dedicated Mode  | Supports multidrop/1:1 communication via LG dedicated protocol Supports high speed link service |  |
|                    | GMWIN Mode  | Supports remote control via GLOFA PLC protocol  |  |
|                    | Modbus Mode   | Supports master and slave function with MODBUS Protocol (ASCII, RTU)                            |  |
|                    | User Mode   | Operated with user-defined protocol   |  |
| Date Structure     | Date Bit  | 7 or 8  |  |
|                    | Stop Bit  | 1 or 2  |  |
|                    | Start Bit   | 1 or 2  |  |
|                    | Parity  | Even/Odd/None   |  |
| Synchronization    | Asynchronous method                                   |   |  |
| Transmission Speed | 9,600/19,200/38,400/56,000/76,800/115,200/128,000 bps |   |  |
| Setting Method     | Parameter setting with GMWIN software                 |   |  |
| Max. Cable Length  | 500m  |   |  |
| Weight             | 180g  |   |  |

## Power Specification

| Items |                      | Specification                         |                                       |
|-------|----------------------|---------------------------------------|---------------------------------------|
| Input | Type                 | AC Powered                            | DC Powered                            |
|       | Rated Voltage        | AC100-240 (Free voltage)              | DC12-24V (Free Voltage)               |
|       | Input Voltage Range  | AC85-264V                             | DC10.2-28.8V                          |
|       | Frequency            | 47-63Hz                               | -                                     |
|       | Inrush Current       | 30A (When the power turns on)         | -                                     |
|       | Leakage Current      | 3mA or less (AC264V, 63Hz)            | -                                     |
|       | Fuse                 | 250VAC 2A, UL Listed (Slow Blow Type) | 250VAC 5A, UL Listed (Slow Blow Type) |
|       | Dropout Tolerance    | 20ms or less                          | 2ms or less                           |
|       | Output Current       | 0.2A (Isolated from DC5V)             | -                                     |
|       | DC24V Output         | Output Voltage                        | 24V ± 10% (21.6-26.4V)                |
|       | Ripple Noise         | 400mVp-p                              | -                                     |
|       | Over-Current Voltage | 0.22-1.5A                             | -                                     |

## Wiring Diagram



## System Configuration

