Data Sheet

LG Programmable Logic Controller
FieldBus Network Module
***GLOFA-GM* G6L-FUEA**

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702005649

Before handling the product

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Materials for GLOFA GM

Name	Code
GLOFA GMWIN (Programming software)	702005047
GLOFA GM (Instruction & Programming)	702005058
GLOFA GM6 (User's manual)	702005581
GLOFA GM Fnet/Mnet (User's manual)	702005070

Name	GLOFA-GM G6L-FUEA Data Sheet
Code	702005649

❑ Safety Precautions

Be sure to read carefully the safety precautions given in data sheet and user's manual before operating the module and follow them.
The precautions explained here only apply to the GLOFA G6L-FUEA module.
For safety precautions on the PLC system, please see the GLOFA GM6 user's manual.
A precaution is given with a hazard alert triangular symbol to call your attention, and precautions are represented as follows according to the degree of hazard.

⚠WARNING	If not provided with proper prevention, it can cause death, fatal injury or considerable loss or property
⚠CAUTION	If not properly observed, it can cause a hazard situation to result in severe or slight injury or a loss of property.

However, a precaution followed with ⚠ **CAUTION** can also result in serious condition. Both of two symbols indicate that an important content is mentioned, therefore, be sure to observe it.
Keep this manual handy for your quick reference in necessary.

❑ Design Precaution

⚠ CAUTION

- Do not run I/O signal lines near to high voltage line or power line. Separate them as 100mm or more as possible. Otherwise, noise can cause module malfunction

❑ Installation Precaution

⚠ CAUTION

- Operate the PLC in the environment conditions given in the general specifications
- If the PLC is operated in other environment not specified in the general specification, it can cause an electric shock, a fire, malfunction or damage or degradation of the module.
- Make sure the module fixing projections is inserted into the module fixing hole and fixed.
- Improper installation of the module can cause malfunction, disorder or falling.

❑ Wiring Precautions

⚠ CAUTION

- Drive the terminal screws firmly to the defined torque. If loosely driven, it can cause short circuit, fire or malfunction.
- Be careful that any foreign matter like wire scraps should not enter into the module. It can cause a fire, disorder or malfunction.

❑ Test RUN and Maintenance Precautions

⚠ WARNING

- Do not contact the terminals while the power is applied. It can cause malfunction.
- When cleaning or driving terminal screws, perform them after the power has been turned off.
- Do not perform works while the power is applied. It can cause disorder or malfunction.

⚠ CAUTION

- Do not separate the PCB from the case of module, or do not remodel the module. They can cause disorder, malfunction, damage of the module or a fire.

❑ Waste Disposal Precautions

⚠ CAUTION

- When disposing the module, do it as an industrial waste.

1. Introduction

This data sheet contains the brief information about the characteristics, configurations, and operating of GLOFA PLC Fnet (G6L-FUEA) module.

2. General Specifications

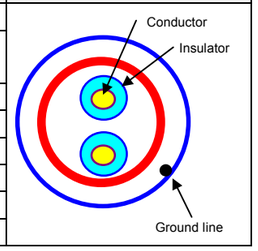
No.	Item	Specification				Standard
1	**Operating temperature**	**0 ~ 55℃**				
2	**Storage temperature**	**-25 ~ 70℃**				
3	**Operating Humidity**	**5 ~ 95%RH, non-condensing**				
4	**Storage humidity**	**5 ~ 95%RH, non-condensing**				
5	**Vibration**	**Occasional vibration**				**IEC 1131-2**
		Frequency	Acceleration	Amplitude	Sweep count	IEC 1131-2
		10≦ f ∠ 57 Hz	-	0.075 mm	**10 times in each direction for** X, Y, Z	
		57 ≦ f≦ 150 Hz	9.8 ㎨ {1G}	-		
		Continuos vibration				
		Frequency	Acceleration	Amplitude		
		10≦ f ∠ 57 Hz	-	0.035 mm		
		57≦ f≦ 150 Hz	4.9 ㎨{0.5G}	-		
6	Shocks	*Maximum shock acceleration: 147 ㎨ {15G} *Duration time :11 ms *Pulse wave: half sine wave pulse(3 times in each of X, Y and Z directions)				IEC 1131-2
7	Noise immunity	Square wave impulse noise	± 1,500 V			
		Electrostatic discharge	Voltage :4kV(contact discharge)			IEC 1131-2 IEC 801-2
		Radiated electromagnetic field	27 ~ 500 MHz, 10 V/m			IEC 1131-2 IEC 801-3
		Fast transient burst noise	Severity Level	All power modules	Digital I/Os (Ue ≥ 24 V)	Digital I/Os (Ue < 24 V) Analog I/Os communication I/Os	IEC 1131-2 IEC 801-4
			Voltage	2 kV	1 kV	0.25 kV	
8	Atmosphere	Free from corrosive gases and excessive dust				
9	Altitude for use	Up to 2,000m				
10	Pollution degree	2 or lower				
11	Cooling method	Self-cooling				

3. Performance Specifications

Item \ Model	G6L-FUEA
Dropout Tolerance	20ms
Transfer rate	1Mbps
Comm. Method	Half duplex bit serial method
Synchronization	Frame synchronous method
Transmission method	Bus type
Max. cable length	750m
No. of station	Up to 64 stations
Modulation	Manchester Biphase-L
Error detect	CRC-CCITT and Time Over
Connector type	9-pin plug type
Cable type	Twisted pair cable
Max. link points	3,840 Word
Max. transfer points	1,920 Word
Max. No. of block	64 blocks
Max. points per 1 block	60 Word
Current consumption	182 mA
Weight	102 g

4. Cable Specifications

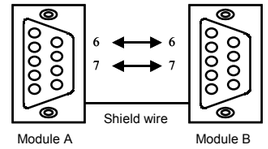
Twisted pair cable

Type	LIREV-AMESB 2*1.0mm 18AWG	Structure
Manufacturer	LG Cable	
Cable type	Twisted pair shielded cable	
Impedance	21.8Ω /㎞	
Withstanding voltage	500 V/Min (DC)	
Insulation resistance	1,000 ㏁/㎞ or more	
Capacity	45 ㎊/m or less (1 ㎑)	
Characteristic impedance	120± 12Ω (10 ㎒)	
Core	2 Cores	

5. Connection of Communication Cable

Cable for electric network connection uses only No. 6 and No.7 of the connector pins. They should be connected with the pin has the same pin number. Each body of connector should be connected with shield wire.

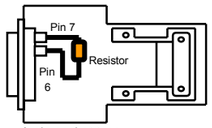
Twisted pair cable



6. Terminal Resistance

- Resistor : 110Ω, 1/2W
- Connection : Pin 6 and 7

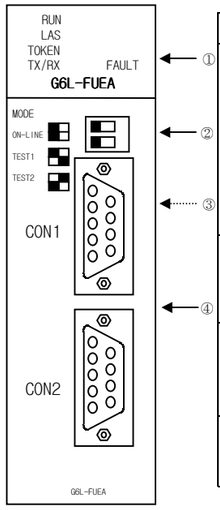
① Attach 110Ω, 1/2W resistor of spare parts to the connectors of both end of network.
② Connector case should not be connected with resistor.



9-pin socket type

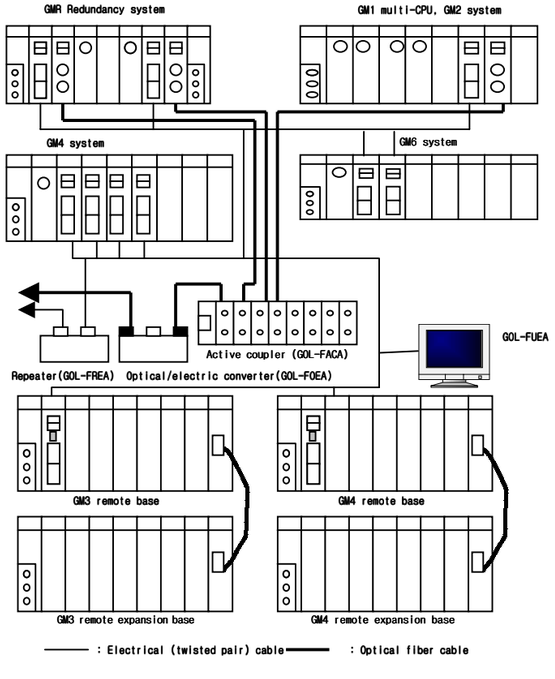
7. Parts Name and Description

G6L-FUEA



Item	Description
① LED	RUN : Indicates the status of communication of PLC (Normal : ON) LAS : Turn on when the module is performing LAS function. TOKEN : Turn on when the module has token. TX/RX : Turn on when the module is transmitting/receiving FAULT : Flickers when comm. error occurred.
② Mode setting	0 : ON-LINE normal communication 1 : Communication test mode 1 2 : Communication test mode 2
③ Station No. setting (Inside of module)	Station number (0~63), Set in decimal Example) X10 = 4, X1 = 7 4 X10 + 7 X1 = Station No. 47
④ Connector	CON1/2 : FieldBus cable connector (9-pin plug type)

8. Fnet System Configuration



9. LED Indication for Error Status

Error type	LED Status	Description
During Power is On	● ○ ○ ○ ○	Self diagnosis of internal memory 1
	○ ● ○ ○ ○	Self diagnosis of internal memory 2
	○ ○ ● ○ ○	Self diagnosis of communication
	○ ○ ○ ● ○	Diagnosis of interface with CPU
Normal Communication	● ○ ◉ ◉ ○	Module is not LAS
	● ● ◉ ◉ ○	Module is LAS
Hardware Error	● ○ ○ ○ ◐	Error in self diagnosis of internal memory 1
	○ ○ ○ ● ◐	Error in self diagnosis of internal memory 2
	○ ○ ● ○ ◐	Error in self diagnosis of communication
	○ ○ ● ● ◐	Error in diagnosis of interface chip
	○ ● ○ ○ ◐	Error in diagnosis of interface RAM
	○ ● ○ ● ◐	Error 1 in diagnosis of CPU interface
	○ ● ● ○ ◐	Error 2 in diagnosis of CPU interface
	○ ● ● ● ◐	Error 3 in diagnosis of CPU interface
System Operation Error	● ○ ○ ○ ◐	System error during operation
	● ○ ○ ● ◐	
Abnormal Communi-cation	● ● ○ ○ ⊖	Error in network configuration status
	● ● ○ ◉ ⊖	Duplicated station No, abnormal terminal resistor
	● ● ◉ ◉ ⊖	Cable cut off or short
	● ● ○ ◉ ⊖	Specified length of cable is not proper or hardware error of the module
	● ○ ◉ ◉ ⊖	
	● ○ ○ ○ ⊖	Error of network configuration
Interface Error	○ ● ◉ ◉ ○	Interface error (stopped) of LAS
	○ ○ ◉ ◉ ○	Interface error (stopped) of non LAS
Unrecoverable Error	● ● ● ● ●	Hardware error of communication module
	● ○ ○ ○ ○	
	○ ○ ○ ○ ○	
	○ ○ ○ ○ ●	

※ LED position follows the sequence of RUN, LAS, TOKEN, TX/RX, and FAULT from left side.

● LED On
○ LED off
◐ Flickering with 1 second interval
⊖ Flickering with irregular interval or LED off
◉ Flickering with irregular interval

10. Status Code of Function Block (Error List)

① Error received from the communication module

Error No. (Decimal)	Description
0	Normal (No error)
1	Physical layer error of link side (Tx/Rx is impossible) - Self-station error, other station's power off, station No. error, etc.
4	Data type mismatch
8	Access denied to remote object
10	Response waiting time over(Time out error)
11	Structure error
12	Abort (disconnected by serious error)
13	Reject (type mismatch with MMS or error caused by noise)
33	Variable identifier is not found (Access variable setting error)
34	Address error
50	Response error (response is different with required format or other station's CPU error

② Status values indicated by CPU

Error No. (Decimal)	Description
16	Position error of communication module
17	Initialization error of communication module mounted in SLOT_NO
18	Input parameter setting error
19	Variable length error
20	Improper response is received from other station
21	No response during specified waiting time (Time our error)

11. Maintenance

Perform routine check and regular check to maintain the best status of the communication module.

① Daily check

Check Item		Contents	Decision Criteria
Cable connection		Release of cable	No released cable
Module connection		Release of screw	No released screw
LED	RUN LED	Flicker check	Flickering (Off means interface with CPU is cut off)
	LAS LED	Light on check	LED of only one module among modules of entire network should be lighted. (It means abnormal configuration of network that two or more LED is on.)
	TOKEN LED	Flicker check	Light off means abnormal (Duplicated station or cable error)
	TX/RX LED	Flicker check	Light off means abnormal (Hardware error of module)
	FAULT LED	Light off check	Regular flickering : system error Irregular flickering : communication error

② Regular check

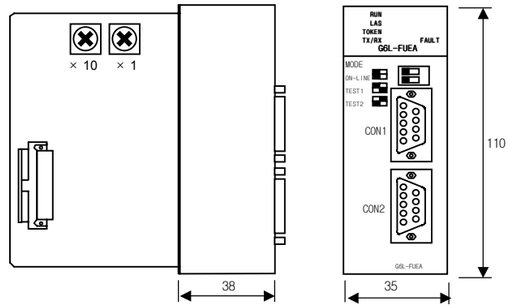
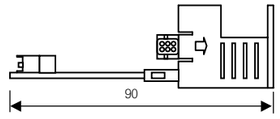
Check following items once or twice per six months, and perform relevant action.

Check Item		How to check	Decision Criteria
Ambient environment	Temperature	Thermometer/Hydrometer	0 ~ 55 °C
	Humidity		5 ~ 95 %RH
	Atmosphere	Check corrosive gas	No corrosive gas
Module status	Release	Shake the module	No release
	Dust or foreign matter	Visual inspection	No dust of foreign matter
Connection status	Release of screw	Tighten with a driver	No release
	Compression terminals	Visual inspection	Proper gap
	Connector	Visual inspection	No release
Power voltage check		Check voltage between terminals	AC 85 ~ 132 [V] AC 170 ~ 264 [V]

12. Handling Instructions

1) Including self-station, all modules in the whole network must have different *high speed link* station number. If there is any duplicated station number, normal communication is impossible.
2) Set mode switch at 'On-Line' mode during normal communication. If turn on the module with 'Test 1' mode while other stations of network are communicating, it can cause serious problem on communication.
3) Use cable complied with specification of this data sheet. Otherwise, it can cause serious communication error.
4) Make sure that communication cable connector fastened firmly. Otherwise, it can cause serious communication error.
5) Improper cable connection (snarled cable, redundant connection, etc) can cause communication error.
6) Do not place communication cable near power cable or inductive noise source.
7) Make sure that shield wire is connected to the metal case of 9-pin connector.
8) Do not mount or dismount module while power is applied to the module. Therefore, turn off the module before repairing or replacement.
9) Change of station number or mode switch setting will not take effect before power is re-applied.

13. Dimension

G6L-FUEA

unit : mm