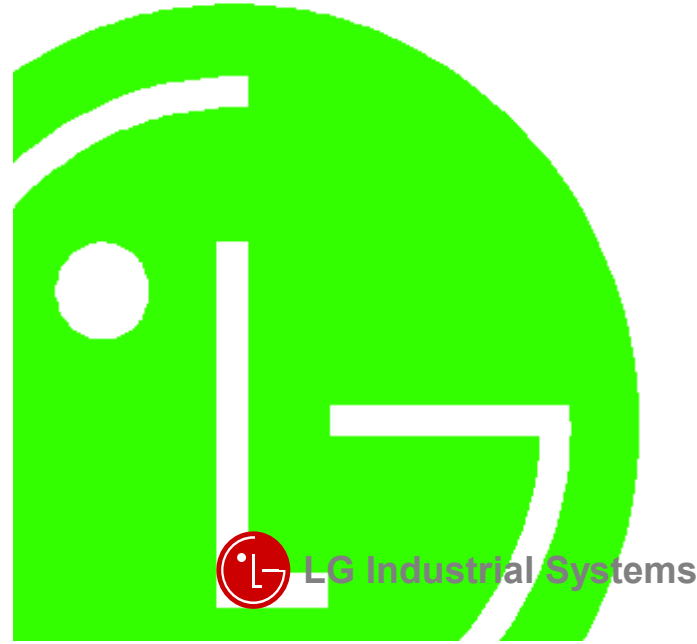


DATA SHEET

LG Programmable Logic Controller FieldBus Network Module MASTER-K K3F-FUEA



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702006200

Before handling the product

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

Materials for MASTER-K

Name	Code
MASTER-K KGL-WIN (Programming software)	702005036
MASTER-K (Instructions & Programming)	702006539
MASTER-K CPU User's Manual	702006391
MASTER-K K7F-FUEA/K4F-FUEA/K3F-FUEA Manual	702006415

Name	Code
MASTER-K K3F-FUEA Data Sheet	702006200

□ 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 MASTER-K K3F-FUEA module.

For safety precautions on the PLC system, please see the MASTER-K CPU 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 MASTER-K PLC Fnet (K3F-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
		10: f _c 57 Hz	-	0.075 mm	-
		57 ≤ f ≤ 150 Hz	9.8 m/s ² (1G)	-	10 times in each direction for X, Y, Z
		Continuous vibration			
		Frequency	Acceleration	Amplitude	
10: f _c 57 Hz	-	0.035 mm			
57: f _c 150 Hz	4.9 m/s ² (0.5G)	-			
6	Shocks	*Maximum shock acceleration: 147 m/s ² (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 (U _e ≥ 24 V) Digital I/Os (U _e < 24 V) Analog I/Os communication I/Os	2 kV 1 kV 0.25 kV	IEC 1131-2 IEC 801-4
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	K3F-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

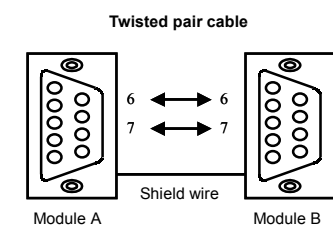
4. Cable Specifications

Twisted pair cable

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

5. Connection of Communication Cable

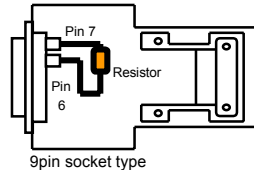
Cable for electric network connection uses only No. 6 and No.7 of the connector pins. They should be connected with the pin has the same pin number. Each body of connector should be connected with shield wire.



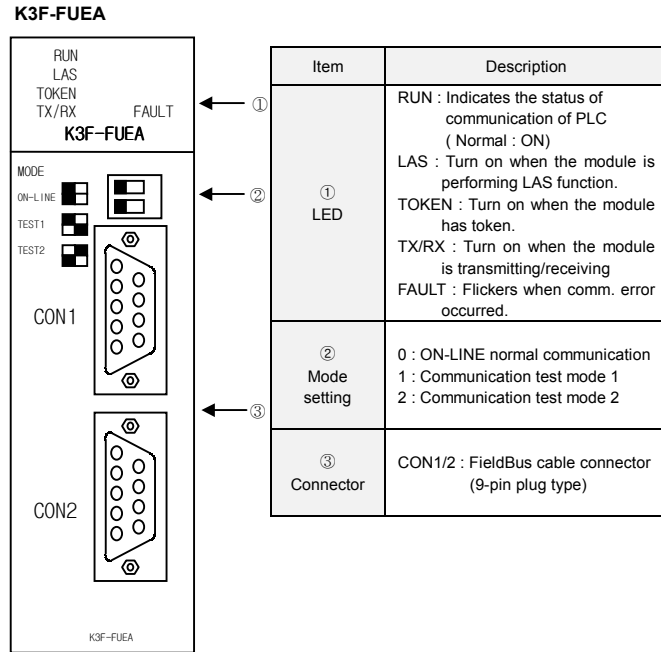
6. Terminal Resistance

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

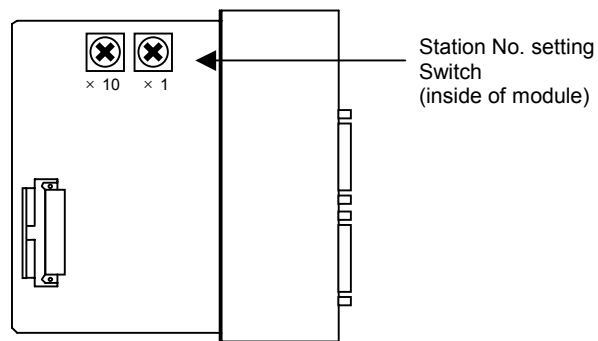
- Attach 110Ω, 1/2W resistor of spare parts to the connectors of both end of network.
- Connector case should not be connected with resistor.



7. Parts Name and Description



8. Station No. setting of Fnet



Station No. setting switch	Description
× 10	(1) Station number (0-63), Set in decimal (2) Station No. setting
× 1	Setting 10 unit of station No.
× 1	Setting 1 unit of station No.

8. 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
System Operation Error	○ ● ○ ● ○	Error 2 in diagnosis of CPU interface
	○ ● ○ ● ○	Error 3 in diagnosis of CPU interface
	● ○ ○ ○ ○	System error during operation
Abnormal Communication	● ● ○ ○ ○	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
Interface Error	○ ● ● ● ○	Error of network configuration
	○ ● ● ● ○	Interface error (stopped) of LAS
Unrecoverable Error	○ ● ● ● ○	Interface error (stopped) of non LAS
	○ ○ ○ ○ ○	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

9. 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 out error)

10. 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]	

11. Handling Instructions

- 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.
- 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.
- Use cable complied with specification of this data sheet. Otherwise, it can cause serious communication error.
- Make sure that communication cable connector fastened firmly. Otherwise, it can cause serious communication error.

- Improper cable connection (snarled cable, redundant connection, etc) can cause communication error.
- Do not place communication cable near power cable or inductive noise source.
- Make sure that shield wire is connected to the metal case of 9-pin connector.
- Do not mount or dismount module while power is applied to the module. Therefore, turn off the module before repairing or replacement.
- Change of station number or mode switch setting will not take effect before power is re-applied.

12. Dimension

