DATA SHEET

LG Programmable Logic Controller
RTD Conversion Module
G7F-RD2A

LG Industrial Systems

- **When using LGIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.**
- **Store this datasheet in a safe place so that you can take it out and read it whenever necessary.**

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LG constantly endeavors to improve our products so that information in this datasheet is subjected to change without notice.

10310000436

∘ Safety Precautions

- Safety Precautions is for using the product safe and correct in order to prevent the accidents and danger, so please go by them.
- The precautions explained here only apply to the G7F-RD2A module. For safety precautions on the PLC system, refer to the MASTER-K120S User's manual.
- The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.

⚠ Warning If violated instructions, it can cause death, fatal injury or considerable loss of property.

⚠ Caution If violated instructions, it can cause a slight injury or slight loss of products

- The symbols which are indicated in the PLC and User's Manual mean as follows

⚠ This symbol means paying attention because of danger of injury, fire, or malfunction.

⚠ This symbol means paying attention because of danger of electrical shock.

- Store this datasheet in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

⚠ Warning

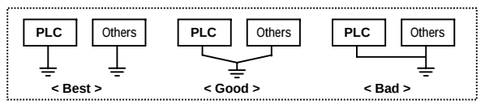
- Do not contact the terminals while the power is applied.
  Risk of electric shock and malfunction
- Protect the product from being gone into by foreign metallic matter.
  Risk of fire, electric shock and malfunction.

⚠ Caution

- Be sure to check the rated voltage and terminal arrangement for the module before wiring work.
  Risk of electric shock, fire and malfunction
- Tighten the screw of terminal block with the specified torque range.
  If the terminal screw looses, it can cause fire and electric shock.
- Use the PLC in an environment that meets the general specifications contained in this datasheet.
  Risk of electrical shock, fire, erroneous operation and deterioration of the PLC.
- Be sure that external load does not exceed the rating of output module.
  Risk of fire and erroneous operation.
- Do not use the PLC in the environment of direct vibration
  Risk of electrical shock, fire and erroneous operation.
- Do not disassemble, repair or modify the PLC.
  Risk of electrical shock, fire and erroneous operation.
- When disposing of PLC and battery, treat it as industrial waste.
  Risk of poisonous pollution or explosion.

Precautions for use

- Do not Install other places except PLC controlled place.
- Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC



- Connect expansion connector correctly when expansion module are needed,
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off power when attaching or detaching module.
- Cellular phone or walkie-talkie should be farther than 30cm from the PLC
- Input signal and communication line should be farther than minimum 100mm from a high-tension line and a power line in order not to be affected by noise and magnetic field.

Before handling the product

Before using the product, read the datasheet and the User's manual through to the end carefully in order to use the product efficiently.

Materials for MASTER-K

Name	Code
KGL-WIN (Programming software)	10310000345
MASTER-K (Instruction & Programming)	10310000346
MASTER-K80S User's manual	10310000373

When using the G7F-RD2A module, Be sure to check KGL-WIN version.3.5

1. Introduction

The G7F-RD2A is a RTD input module for use with MASTER-K120S series. The RTD input module is a module that converts the temperature data(℃) input by the Pt(Pt100 or JPt100) into a signed 14 bit digital binary data and outputs it.

2. General Specifications

No	Item	Specifications				Standard
1	Operating temperature	0 ~ 55℃				
2	Storage temperature	-25 ~ 75℃				
3	Operating Humidity	5 ~ 95%RH, non-condensing				
4	Storage humidity	5 ~ 95%RH, non-condensing				
5	Vibration	Occasional vibration				IEC 61131-2
		Frequency	Acceleration	Amplitude	Sweep count	
		10≤f＜57 Hz	-	0.075 mm	10 times in each direction for X, Y, Z	
		57 ≤f≤ 150 Hz	9.8㎨ {1G}	-		
		Continuous 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 61131-2
7	Noise immunity	Square wave impulse noise	±1,500 V			LGIS Standard
		Electrostatic discharge	Voltage :4kV(contact discharge)			IEC 61131-2 IEC 1000-4-2
		Radiated electromagnetic field	27 ~ 500 MHz, 10 V/m			IEC 61131-2 IEC 1000-4-3
		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 61131-2 IEC 1000-4-4
			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		Specifications
Connectable RTD		Pt 100 (JIS C1640-1989, DIN 43760-1980) JPt100 (KS C1603-1991, JIS C1604-1981)
Temperature input range		Pt100 : -200.0°C to 600°C (18.48 to 313.59Ω)
		JPt100 : -200.0°C to 600°C (17.14 to 317.28Ω)
Digital output		Digital conversion value : 0 to 4,000 Detected temperature value : -2000 to 6000 (one digit after point ×10)
Burn-out Detection Function		Each of three wires at every channel has detection function.
Accuracy		±0.2% [Full scale]
Max. conversion speed		40Scan / Module
Max. absolute input		Voltage : ±15V, Current : ±25㎃
Number of analog input point		4channels/module
Isolation		Between Input terminals and PLC power supply : Photo coupler isolation (No isolation between channels)
Terminal connected		8 Points 2 terminals
Internal current consumption		25㎃
External power supply	Voltage	21.6 ~ 26.4VDC
	Current consumption	70㎃
Weight		170g

Remark

1) Extend to use max. 3 Modules

4. Names of parts and functions

No.	Contents
①	**RUN LED** Indicate the operating status the G7F-RD2A
②	**RTD input terminal** Connect Pt to RTD input module
③	**External power input terminal** ▶External voltage 24VDC needs to this terminal.
④	**Extension cable** ▶This cable is used to connect while analog input module is used..
⑤	**Extension cable connector** ▶The connector connects extension cable when extended module is used.

5. Special data register

5.1 Conversion value

1) Digital Conversion Value

(1) A temperature value that is input through the RTD connected to the terminal block of a channel is represented as a value between -2000 to 6000 and then the converted value is stored. The converted value stored is called digital conversion value.

(2) A digital conversion value that has been converted into a value between 0 to 4000 can be directly used as a process value of the PID Function.

(3) The digital conversion value and the detected temperature value have the following arithmetic relation.

Digital conversion value = (Detected temperature value + 2000) / 2

2)Detected Temperature Value

This area performs sampling processing of the temperature value that is input through the RTD connected to the terminal block of a channel and stores the value of 10 times of the real temperature value.

3)Detected Temperature Value

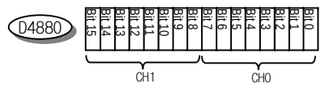
REMARK

If a real temperature is 123.4°C the stored value is 1234.

Channel	Detected temperature value (Celti,F	Digital conversion value	Error code	Remark
0	D4980	D4780	D4880	Expansion RTD module #1
1	D4981	D4781		
2	D4982	D4782	D4881	
3	D4983	D4783		
0	D4984	D4784	D4882	Expansion RTD module #2
1	D4985	D4785		
2	D4986	D4786	D4883	
3	D4987	D4787		
0	D4988	D4788	D4884	Expansion RTD module #2
1	D4989	D4789		
2	D4990	D4790	D4885	
3	D4991	D4791		

5.2 Error code (D4880 ~ D4885)

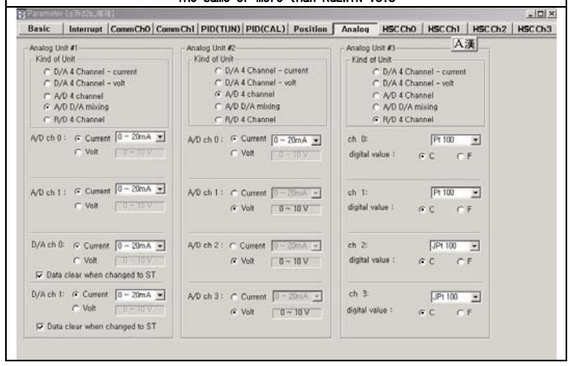
Disconnection that can occur between the RTD and the RTD input module is detected by its type, and also error information is stored divide into two bytes when the detected temperature is outside range(-200.0 to 600.0°C)



Error No.	Contents	Corrective Action
0	Normal run status	–
16(10h)	A disconnection detected	Fix the A disconnection between RTD input module and RTD.
17(11h)	B disconnection detected	Fix the A disconnection between RTD input module and RTD
18(12h)	b disconnection detected, A and B disconnection Simultaneously detected.	Fix the A disconnection between RTD input module and RTD. Or, Fix the A and B disconnection.
19(13h)	Outside the input Range (-200~600.0℃)	Correctly specify the type of the RTD, or use the temperature within the range (-200.0°C ~ 600.0°C)

6. Parameter Setting

The same or more than KGLWIN V3.5



7. Handling Precautions

From unpacking to installation, be sure to check the following:

1) Do not drop it off, and make sure that strong impacts should not be applied.

2) Do not dismount printed circuit boards from the case. It can cause malfunctions.

3) During wiring, be sure to check any foreign matter like wire scraps should not enter into the upper side of the PLC, and in the event that foreign matter entered into it, always eliminate it.

4) Be sure to disconnect electrical power before mounting or dismounting the module.

8. Wiring

8.1 Wiring Precaution

1) Separate AC and external input signal of RTD module wiring not to be affected by surge or induced noise in the AC.

2) External wiring has to be at least AWG22(0.3 ㎟) and be selected in consideration of operating ambiance and/or allowable current.

3) Separate wiring from devices and/or substances generating intense heat, and oil not to make short-circuit which leads to damage and/or mis-operation.

4) Identify the polarity of terminal block before external power supply is made connected.

5) Separate external wiring sufficiently from high voltage and power supply cable not to cause induced failure and/or malfunction.

8.2 Wiring example

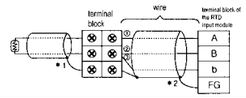
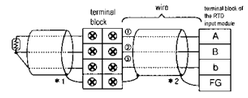
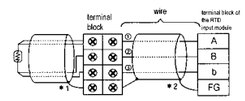
1) Number of method of connection between Pt and RTD input module are three, that is, 2-wired type, 3-wired type and 4-wired type.

2)The resistance of the wires used to connect Pt to RTD input module should be 10 Ω or less per wire.

The same wire (in thickness, length, and kind, etc.) should be used for each channel.

REMARK

□ The difference between the resistance values of the wires used should be 1 Ω or less, or the accuracy could not be satisfied.

Connection Method	Connection Example	Wire Conditions
2-wired type		① wire resistance ≤ 10Ω ② wire resistance ≤ 10Ω ③ wire resistance ≤ 10Ω
3-wired type		The difference between the resistance values of the wires ① and ② : 1Ω or less The difference between the resistance values of the wires ② and ③ : 1Ω or less The difference between the resistance values of the wires ③ and ① : 1Ω or less
4-wired type		

*1: RTD (Pt100 or JPt1000)

*2: Shielded wire
The shields of the RTD and shields of wire should be connected to the FG of the master-K120S Unit.

9. Fahrenheit temperature value

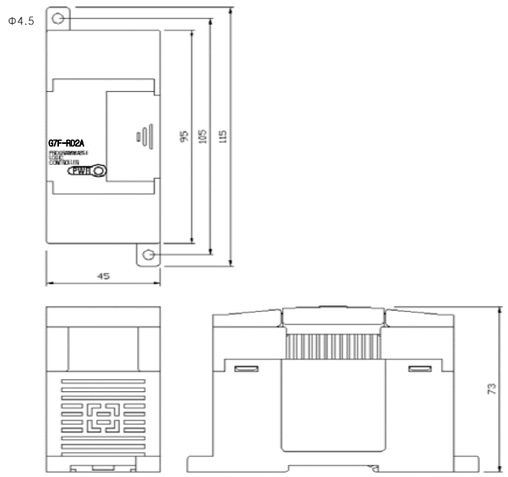
1) Fahrenheit temperature setting range in KGL-WIN parameter is -328~1112°F.

2) Centigrade temperature value can be coverted to Fahrenheit temperature value as follows.

-. Fahrenheit temperature value(F) = 9/5 X Centigrade temperature value(℃)+32

10. Dimension

Unit : ㎜



11. Warranty

1. Warranty period

LGIS provides an 18-month-warranty from the date of the production.

2. Warranty conditions

For troubles within the warranty period, LGIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.

(1) The troubles caused by improper condition, environment or treatment except the instructions of LGIS.

(2) The troubles caused by external devices.

(3) The troubles caused by remodeling or repairing based on the user's own discretion.

(4) The troubles caused by improper usage of the product.

(5) The troubles caused by the reason which exceeded the expectation from science and technology level when LGIS manufactured the product.

(6) The troubles caused by natural disaster.

3. This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.