DATA SHEET

LG Programmable Logic Controller Analog to Digital Conversion Module
G7F-AD2B

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.**

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

**10310000459**

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-AD2B unit. 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

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| PLC | | Others |        | PLC | | Others |        | PLC | | Others |
    ⏚       ⏚                    ⏚                       ⏚
   < Best >                   < Good >                  < Bad >
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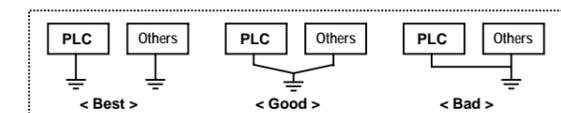
- Connect expansion connector correctly when expansion module are needed,
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off power when attaching or detaching module.
- Cellular phone or walkie-talkie should be farther than 30cm from the PLC
- Input signal and communication 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-K120S

Name	Code
KGL-WIN (Programming software)	10310000345
MASTER-K (Instruction & Programming)	10310000347
MASTER-120S User's manual	10310000381

When using the G7F-AD2B module, be sure to check KGL-WIN version.3.5

1. Introduction

The G7F-AD2B is Analog to Digital conversion module for use with the MASTER-K120S series. This module is to convert an analog input signal (voltage or current) from external sensors into a 12-bit Binary digital value.

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
Analog Input	Voltage	DC 0～10V (input resistance more than 1㏁)
	Current	DC 0～20㎃ (input resistance less than 250Ω)
		DC 4～20㎃ (input resistance less than 250Ω)
	Voltage/Current Selection	1.Setting by slide switch for V/I selection on side part of product (Left: voltage, Right: Current) 2. Voltage/current selected by the program 3. When current input is used, short the V and I terminal
Digital output		12bit binary (0~4000)
Max. resolution	0~10VDC	2.5㎷ (1/4000)
	DC 0～20㎃	5㎂ (1/4000)
	DC 4～20㎃	6.25㎂ (1/4000)
Accuracy		±0.5% [Full scale]
Max. conversion speed		2㎳/CH + scan time
Max. absolute input		Voltage : ±15V, Current : ±25㎃
Number of analog input point		4channels/module
Isolation		Photo coupler insulation between Input terminals and PLC power supply (No isolation between channels)
Terminal connected		8 points terminal block 2EA
Internal current consumption	+5V	25㎃
External power supply	Voltage	21.6 ~ 26.4VDC
	Current consumption	85㎃
Weight(g)		170g

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4. Names of parts and functions
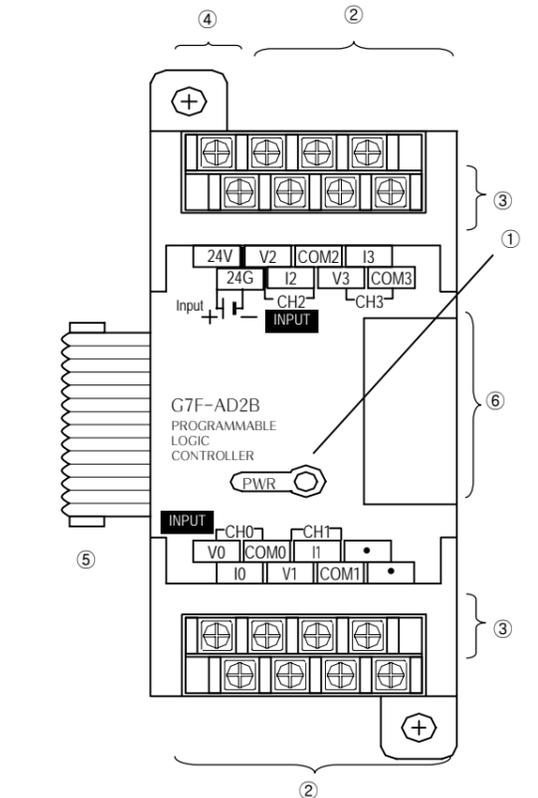
No	Contents
①	**Power led** ▶ Indicate the external voltage 24VDC status of the G7F-AD2B
②	**Analog input terminal** ▶ When current input is used, short the V and I terminal.
③	**Slide switch of analog input** Input Select (CH0 CH1) / Input Select (CH2 CH3) Right : Current Left : voltage
④	**External power input terminal** ▶ External voltage 24VDC needs to this terminal.
⑤	**Extension cable** ▶ This cable is used to connect while analog input module is used..
⑥	**Extension cable connector** ▶The connector connects extension cable when extended module is used.

5. Special data register (only MASTER-K120S series)

A/D conversion value stores special data register as following.

Special data register	Explanation	Remark
D4980	A/D conversion value of channel 0 stores	
D4981	A/D conversion value of channel 1 stores	Expansion A/D module #1
D4982	A/D conversion value of channel 2 stores	
D4983	A/D conversion value of channel 3 stores	
D4984	A/D conversion value of channel 0 stores	
D4985	A/D conversion value of channel 1 stores	Expansion A/D module #2
D4986	A/D conversion value of channel 2 stores	
D4987	A/D conversion value of channel 3 stores	
D4988	A/D conversion value of channel 0 stores	
D4989	A/D conversion value of channel 1 stores	Expansion A/D module #3
D4990	A/D conversion value of channel 2 stores	
D4991	A/D conversion value of channel 3 stores	

Parameter Setting
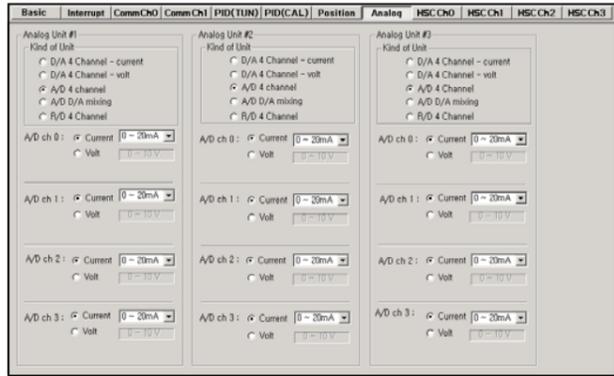
6. Handling Precautions

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.

7. Wiring

7.1 Caution for wiring

▶ Make sure that external input signal of the mixture module of AC and analog I/O is not affected by induction noise or occurs from the AC through using another cable.

▶ Wire is adopted with consideration about peripheral temperature and electric current allowance. Thicker than Max. size of wire AWG22 (0.3㎜²) is better.

▶ If wire is put near to high temp. radiated device or contacted with oil for a long time, it may cause of electric leakage so that it gets broken or miss-operation during wiring.

▶ Be sure to connect with care of polarity while connecting to external 24V DC power supply.

▶ In case of wiring with high voltage line or generation line, it makes induction failure so then it may cause of miss-operation and out of order.

7.2 Wiring
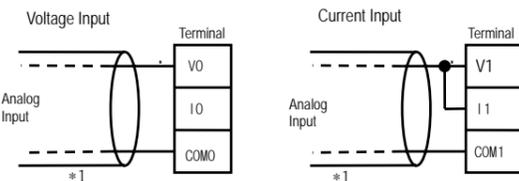
*1: Be sure to use two-core twisted shield wire.

8. I/O conversion characteristics

1) Voltage Input
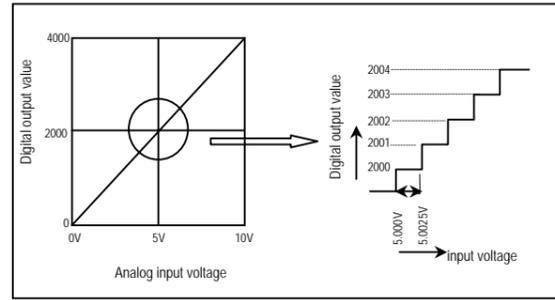
A/D conversion characteristics (voltage input)

In voltage input, digital amount 0 is output by 0V input and 4,000 is output by 10V input. Therefore input 2.5mV equals to digital amount 1, but value less than 2.5mV can't be converted.

2) Current Input
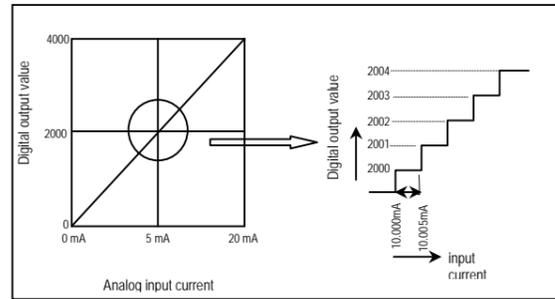
A/D conversion characteristics (Current input)

In current input, digital amount 0 is output by 0mA input and 4,000 is output by 20mA input. Therefore input 5 μA equals to digital amount 1, but value less than 5 μA can't be converted.

9. Dimension (unit : mm)
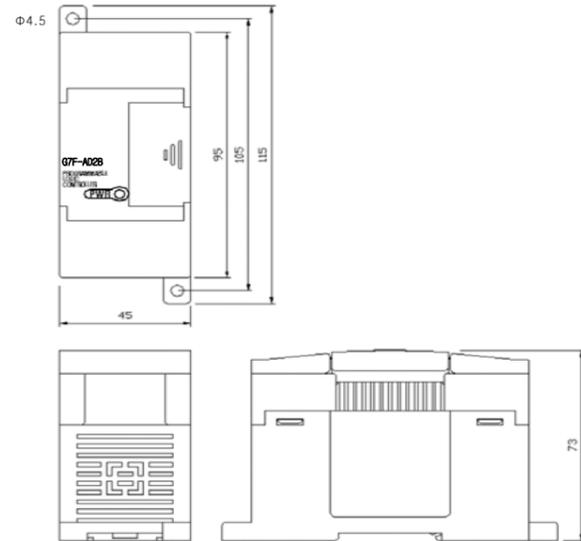
10. Warranty

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.