

DATA SHEET

LG Programmable Logic Controller Analog to Digital Conversion Module G6F-AD2A



- 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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◦ 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 G6F-AD2A unit. For safety precautions on the PLC system, refer to the GLOFA-GM6 or MASTER-K200S 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

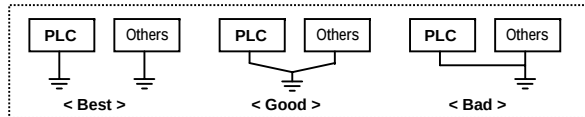
- ▶ Do not contact the terminals while the power is applied.
Risk of electric shock and malfunction
- ▶ Protect the product from being gone into by foreign metallic matter.
Risk of fire, electric shock and malfunction.

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 loosens, 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 GLOFA-GM

Name	Code
GMWIN (Programming software)	10310000376
GLOFA-GM (Instruction & Programming)	10310000377
GLOFA-GM6 User's manual	10310000344

Materials for MASTER-K

Name	Code
KGL-WIN (Programming software)	10310000345
MASTER-K (Instruction & Programming)	10310000346
MASTER-K200/300/1000S User's manual	10310000347

1. Introduction

The G6F-AD2A is analog/digital conversion module for use with the GLOFA PLC GM6 series CPU module and MASTER-K200S series CPU module. The A/D conversion module is to convert an analog input signal (voltage or current) from external sensors into a 12-bit signed Binary digital value.

2. General Specifications

No	Item	Specifications	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 Frequency Acceleration Amplitude Sweep count 10 ≤ f ≤ 57 Hz - 0.075 mm 57 ≤ f ≤ 150 Hz 9.8m/s² {1G} - Continuous vibration Frequency Acceleration Amplitude 10 ≤ f ≤ 57 Hz - 0.035 mm 57 ≤ f ≤ 150 Hz 4.9m/s² {0.5G} - 10 times in each direction for X, Y, Z	IEC61131-2
6	Shocks	*Maximum shock acceleration: 147m/s² {15G} *Duration time :11 ms *Pulse wave: half sine wave pulse(3 times in each of X, Y and Z directions)	IEC61131-2
7	Noise immunity	Square wave impulse noise ± 1,500 V Electrostatic discharge Voltage :4kV(contact discharge) Radiated electromagnetic field 27 ~ 500 MHz, 10 V/m 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 Voltage 2 kV 1 kV 0.25 kV	LGIS Standard IEC61131-2 IEC1000-4-2 IEC61131-2 IEC1000-4-3 IEC61131-2 IEC1000-4-4
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	

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

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3. Performance Specifications

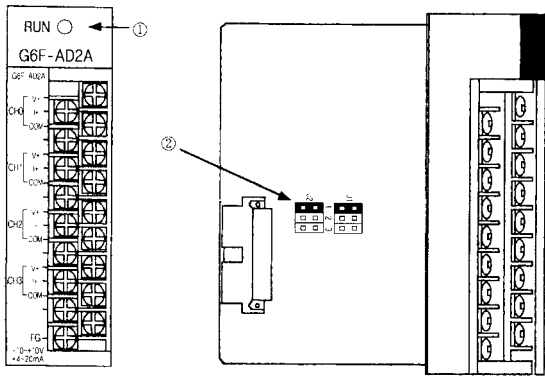
Items		Specifications
Analog input	Voltage	1 ~ 5 VDC (input resistance 1M Ω) 0 ~ 10VDC (input resistance 1M Ω) -10 ~ 10 VDC (input resistance 1M Ω)
		DC 4 ~ 20 mA (input resistance 250 Ω)
	Voltage/Current selection	*. Selection by Terminal Wiring (It has to be connected between V and I terminal to select current) *. Selection of voltage range by switch on the side of module
	Digital output	
Maximum resolution	1 ~ 5 VDC	1 mV (1/4000)
	0 ~ 10VDC	2.5mV(1/4000)
	-10 ~ 10 VDC	5 mV (1/4000)
	DC 4 ~ 20 mA	4 μ A (1/4000)
Overall Accuracy(%)		± 0.5% or lower (accuracy to full scale)
Maximum conversion speed (ms/channel)		5.0ms/1 channel
Maximum absolute input		Voltage(V):15, Current (mA):25
Number of analog input point		4 channels/module
Isolation		Between input terminals and PLC: Photo coupler isolation (Between channels : Non-isolated)
Terminals connected		18-point terminal block
Internal current consumption(A)	+5VDC	40mA
	+15VDC	50mA
	-15VDC	20mA
Weight (g)		200g

Caution

- ▶ The output range of GM6-PAFB is 0.5A with +15VDC and 0.2A with -15VDC. Make sure there total current consumption of A/D and D/A conversion modules
- ▶ Do not exceed the output range capacity of power supply module(GM6-PAFB).
- ▶ The offset/gain value of A/D conversion modue is fixed.
- ▶ The factory setting of output type is current output.

4. Parts Name and Functions

This following shows the names of parts and functions of G6F-AD2A module.



Vo	Descriptions	
①	RUN LED	Indicates the operating status of the G6F-AD2A.
②	Selection Switch of Voltage/Current	
Voltage	1 ~ 5VDC	J1
		J2
	0 ~ 5VDC	J1
	-10 ~ 10VDC	J2
Current	DC4 ~ 20mA	J1
		J2

5. 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.

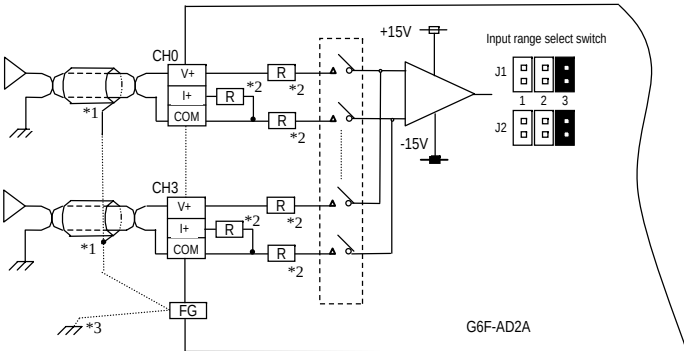
6. Wiring

6.1 Wiring Precaution

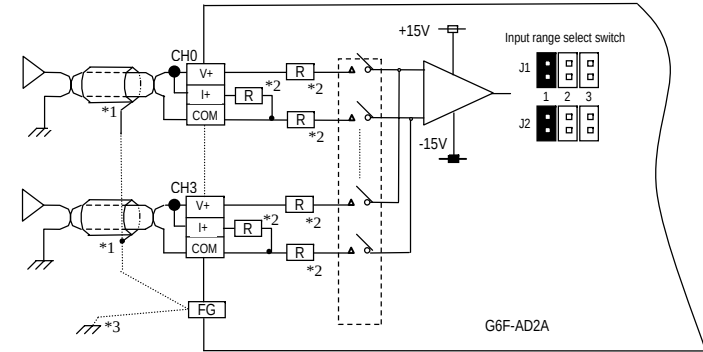
- 1) Separate AC and external input signal of A/D conversion module wiring not to be affected by surge or induced noise in the AC.
- 2) External wiring has to be at least AWG22(0.3 mm²) and be selected in consideration of operating ambience and/or allowable current.
- 3) Separate wiring from devices 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.

6.2 Wiring example

- 1) Voltage Input(DC:10~10V)



- 2) Current Input(DC4~20 mA)



*1 For the cable, use a two-core twisted shielded wire.

*2 Input resistance has been shown.

*3 When there is much noise, FG of the power supply module must be grounded.

7. Function Block (only GLOFA series)

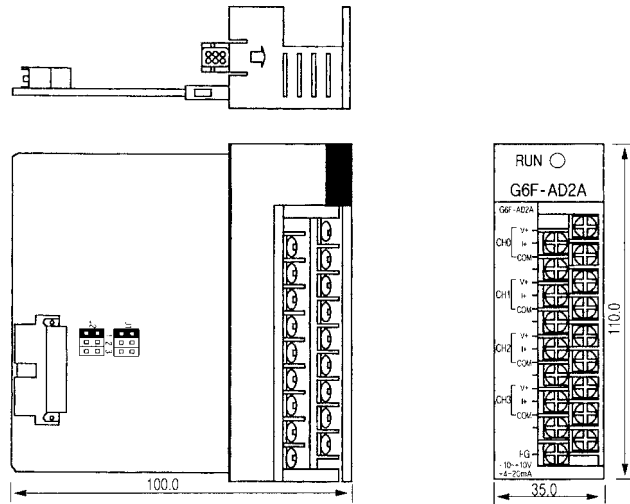
Function Block		Function
Local	Remote	
AD2INI	ADR62INI	Initial module
AD2ARD	ADR62RD	Read conversion value(array type)
AD2RD	-	Read conversion value(single type)

8. Buffer memory (only MASTER-K series)

Address (decimal)	Name	Detail descriptions
0	Available channel specification	Bit On(1):channel enable, Bit Off(0):channel disable
1	Output data range specification	Bit On(1) : -2048 ~ 2047, Bit Off(0) : -48 ~ 4047
2	Average count processing enable	Bit On(1):average count processing enable, Bit Off(0):sampling processing enable
3	Avg. count of Ch0	Assign the count of Avg. processing of Ch0(2~255)
4	Avg. count of Ch1	Assign the count of Avg. processing of Ch1(2~255)
5	Avg. count of Ch2	Assign the count of Avg. processing of Ch2(2~255)
6	Avg. count of Ch3	Assign the count of Avg. processing of Ch3(2~255)
7	Data enable	Make enable the new setting of buffer 0~6("0" bit)
8	Ch0 digital output value	Digital output value of channel 0
9	Ch1 digital output value	Digital output value of channel 1
10	Ch2 digital output value	Digital output value of channel 2
11	Ch3 digital output value	Digital output value of channel 3
12	Channel status	Indicate run/stop of each channel(Bit On:run, Bit Off:stop)
13	Ch0 error code	Shows error code when an error occurred on channel 0
14	Ch1 error code	Shows error code when an error occurred on channel 1
15	Ch2 error code	Shows error code when an error occurred on channel 2
16	Ch3 error code	Shows error code when an error occurred on channel 3

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.