

LG Programmable Logic Controller  
A/D · D/A Combination Module  
G7F-ADHB



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.

◦ 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-ADHB 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**

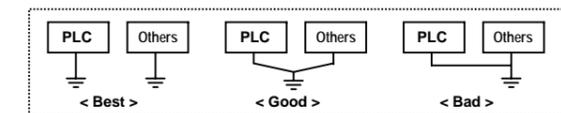
- ▶ Do not contact the terminals while the power is applied.  
Risk of electric shock and malfunction
- ▶ Protect the product from being gone into by foreign metallic matter.  
Risk of fire, electric shock and malfunction.

**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-K120S User's manual	10310000381

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

1. Introduction

The G7F-ADHB is A/D · D/A Combination 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 signed Binary digital value, and convert digital internal data to analog value (Voltage or Current)

2. General Specifications

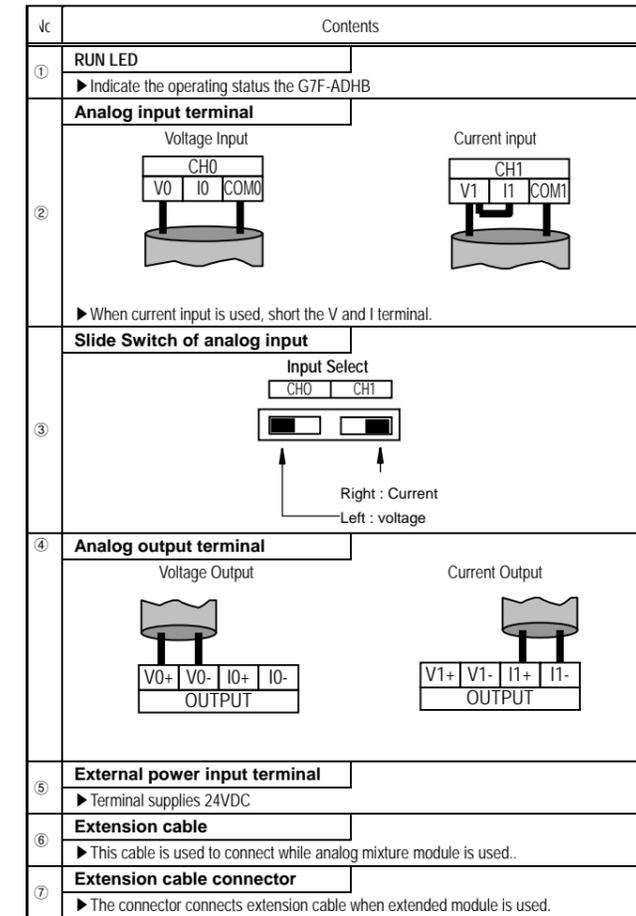
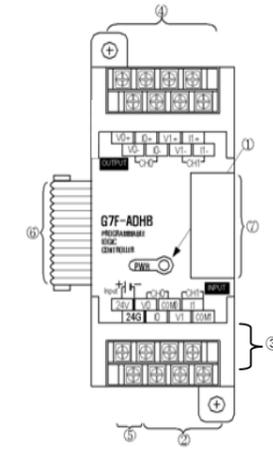
No	Item	Specifications	Standard		
1	Operating temperature	0 ~ 55 °C			
2	Storage temperature	-25 ~ 75 °C			
3	Operating Humidity	5 ~ 95%RH, non-condensing			
4	Storage humidity	5 ~ 95%RH, non-condensing			
5	Vibration	Occasional vibration		IEC 61131-2	
		Frequency	Acceleration		Amplitude
		10 ≤ f ≤ 57 Hz	-		0.075 mm
		57 ≤ f ≤ 150 Hz	9.8m/s² (1G)		-
		Continuous vibration			Sweep count
Frequency	Acceleration	Amplitude	10 times in each direction for X, Y, Z		
10 ≤ f ≤ 57 Hz	-	0.035 mm			
57 ≤ f ≤ 150 Hz	4.9m/s² (0.5G)	-			
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 )	IEC 61131-2		
7	Noise immunity	Square wave impulse noise	±1,500 V		
		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	Digital I/Os (Ue < 24 V) Analog I/Os communication I/Os	IEC 61131-2 IEC 1000-4-4
		All power modules	2 kV		
		Digital I/Os (Ue ≥ 24 V)	1 kV		
		Digital I/Os communication I/Os	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	Input Range	
	Voltage	DC 0 ~ 10V (input resistance more than 1MΩ)
	Current	DC 0 ~ 20mA (input resistance 250Ω) Classified by parameter
Analog Input	Digital Output	12Bit( 0~4000)
	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
	No. of Channel	2Channels
Analog Output	Absolute max. input	Voltage DC +12V Current DC +24mA
	Output Range	Voltage DC 0 ~ 10V (External load resistance 2kΩ ~ 1kΩ) Current DC 0 ~ 20mA (External load resistance 510Ω) Classified by parameter
	Digital Input	12Bit( 0~4047)
Analog Output	Voltage/Current Selection	Separated from terminal
	No. of Channel	2Channels
	Absolute max. Output	Voltage DC +12V Current DC +24mA
Common	Max. resolution	Voltage DC0 ~ 10V 2.5mV (1/4000) Current DC0 ~ 20mA 5μA (1/4000) DC4 ~ 20mA 6.25μA (1/3200)
	Accuracy	± 0.2% [Full scale]
	Max. conversion speed	2ms/CH + scan time
Common	Isolation	Photo coupler insulation between I/O terminals and PLC power supply (No isolation between channels)
	Connect terminals	8 Points 2 terminals
	Internal current Consumption	20 mA
Common	External power supply	DC21.6 ~ 26.4V, 95 mA
	Weight(g)	180g

- Remark
1. Offset/gain value can't be changed, it is fixed.
  2. Analog inputting is set the current since this is manufactured.
  3. Extend to use max. 3 Modules

4. Names of parts and functions



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

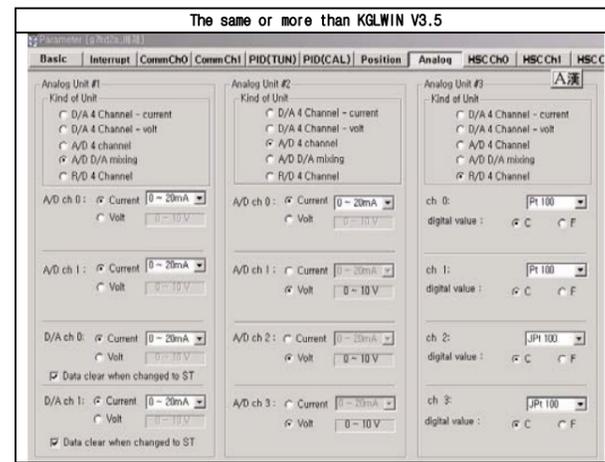
10310000443

## 5. Special data register

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

Special data register	Explanation	remark
D4980	A/D conversion value of channel 1 stores	Expansion A/D module #1
D4981	A/D conversion value of channel 2 stores	
D4982	CH0 D/A conversion value set	
D4983	CH1 D/A conversion value set	
D4984	A/D conversion value of channel 1 stores	Expansion A/D module #2
D4985	A/D conversion value of channel 2 stores	
D4986	CH0 D/A conversion value set	
D4987	CH1 D/A conversion value set	
D4988	A/D conversion value of channel 1 stores	Expansion A/D module #3
D4989	A/D conversion value of channel 2 stores	
D4990	CH0 D/A conversion value set	
D4991	CH1 D/A conversion value set	

## 6. Parameter Setting



## 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.

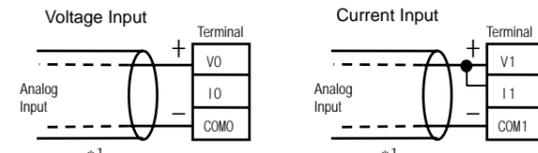
## 8. Wiring

### 8.1 Caution for wiring

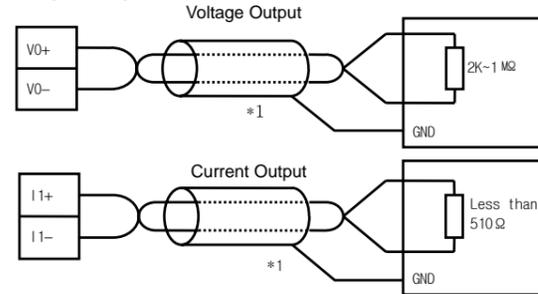
- ▶ Make sure that external input signal of the mixture module of AC and analog I/O is not affected by induction noise or occurs from the AC through using another cable.
- ▶ Wire is adopted with consideration about peripheral temperature and electric current allowance. Thicker than Max. size of wire AWG22 (0.3mm) 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.

## 8.2 Wiring

### 1) Wiring of voltage/current input



### 2) Wiring of voltage/current output

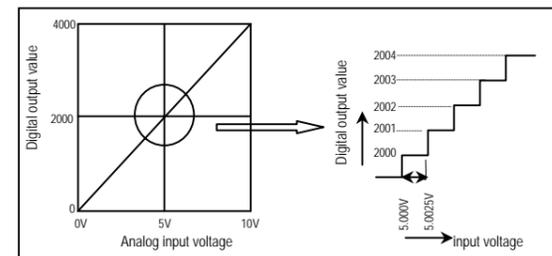


\*1: Be sure to use two-core twisted shield wire.

## 9. I/O conversion characteristics

### 9.1 Analog input characteristics

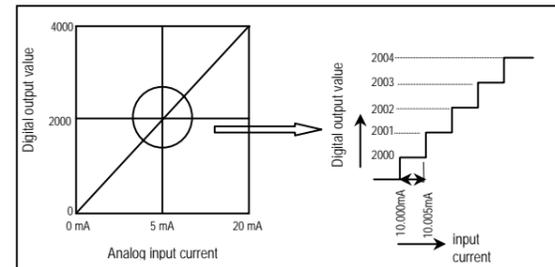
#### 1) Voltage Input



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

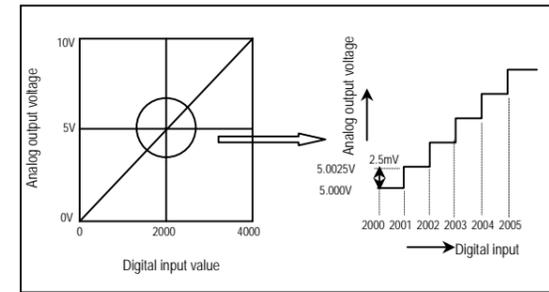


A/D conversion characteristics (Current input)

Current input 0mA becomes output 0, 10mA does 2000 and 20mA does 4000. therefore input 5 μA equals to digital amount 1, but value less than 5 μA can't be converted. So abandon it.

## 9.2 Analog Output characteristics

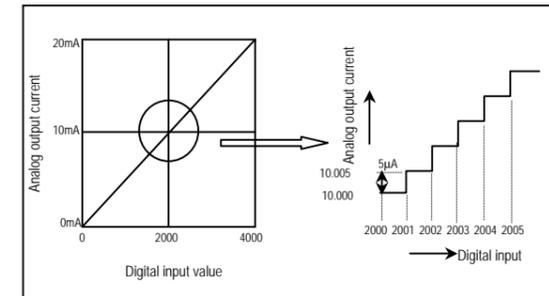
### 1) Voltage Output



D/A conversion characteristics (voltage output)

Input of digital amount 0 outputs analog amount 0V, 4000 does 10V. Digital input 1 equals to 2.5mV of analog amount.

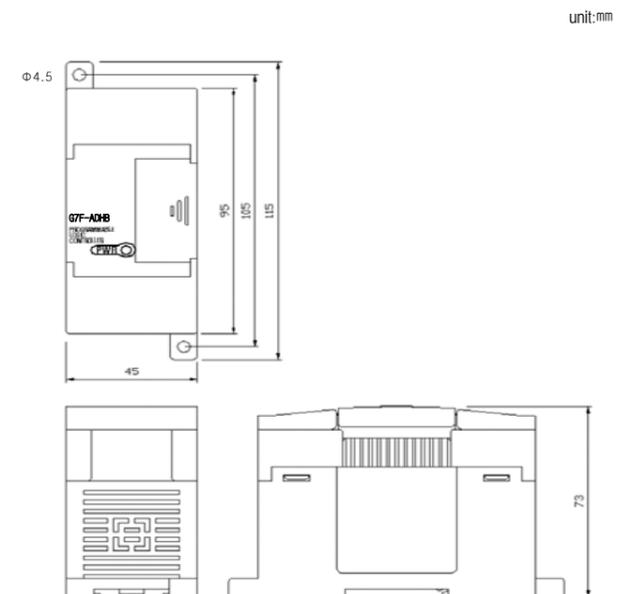
### 2) Current Output



D/A conversion characteristics (Current output)

In current output, digital amount 0 exchanges to 0mA, and 4,000 does 20mA. Analog amount of digital input 1 equals to 5 μA.

## 10. Dimension (unit : mm)



## 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.