Honeywell

DATASHEET

MasterLogic-200

AD Conver.

2MLF-AV8A

2MLF-AC8A

10310000612 Printed in Korea

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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 always follow the instructions.
- The precautions explained here only apply to the 2MLF-AV8A and 2MLF-AC8A unit. For safety precautions on the PLC system, refer to the MasterLogic-200 CPU 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 may cause death, fatal injury or considerable loss of property.

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

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

⚠ **Gives warnings and cautions to prevent from risk of injury, fire, or malfunction.**

⚠ **Gives warnings and cautions to prevent from risk of electrical shock.**

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

⚠ Warning

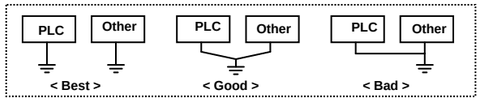
- **Do not contact the terminals while the power is applied.**
  Risk of electric shock and malfunction.
- **Do not drop or insert any metallic object into the product.**
  Risk of fire, electric shock and malfunction.
- **Do not charge, heat, short, solder and break up the battery.**
  Risk of injury and fire by explosion and ignition.

⚠ Caution

- **Before wiring the PLC, ensure to check the rated voltage and terminal arrangement for the module and observe them correctly.**
  Risk of electric shock, fire and malfunction.
- **Tighten up the terminal screw firmly to defined torque when to wire the PLC.**
  Risk of fire and electric shock if the terminal screw looses.
- **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 in any places other than PLC controlled place.
- Ensure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it may cause disorder or malfunction of PLC



- Connect expansion connector correctly when expansion modules are needed.
- Do not detach PCB from the case of the module and do not modify the module.
- Turn off the 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.

MasterLogic-200 User's Manual

Name	Code
2MLK-CPUH/CPUS User's manual	10310000648
MasterLogic-200 Basic instruction manual	10310000649
MasterLogic-200 Software manual	10310000650
2MLF-AV8A/AC8A User's manual	10310000616

1. Introduction

A/D conversion module designed for MasterLogic-200 series is used to convert analog signal(voltage or current input) to the digital value of signed 16-bit binary data (data: 14 bits) specified in MasterLogic-200 CPU modules

2. General Specifications

General specifications of MasterLogic-200 series are as specified in Table

No	Item	Specification				Related specifications
1	Operating temp.	0℃ ~ +55℃				
2	Storage temp.	-25℃ ~ +70℃				
3	Operating humidity	5 ~ 95%RH (Non-condensing)				
4	Storage humidity	5 ~ 95%RH (Non-condensing)				
5	Vibration	For discontinuous vibration				
		Frequency	Acceleration	Amplitude	Number	IEC61131-2
		10≤f< 57Hz	-	0.075mm	Each 10 times in X,Y,Z directions	
		57≤f≤150Hz	9.8m/s2(1G)	-		
		For continuous vibration				
		Frequency	Acceleration	Amplitude		
		10≤f< 57Hz	-	0.035mm		
		57≤f≤150Hz	4.9m/s2(0.5G)	-		
6	Shocks	* Max. impact acceleration:147㎨(15G) * Authorized time :11㎳ * Pulse wave : Sign half-wave pulse (Each 3 times in X,Y,Z directions)				IEC61131-2
7	Noise	Square wave impulse noise			±1,500V	-
		Electrostatic discharging			Voltage : 4kV(contact discharging)	IEC61131-2 IEC61000-4-2
		Radiated electromagnetic field noise			27 ~ 500MHz, 10 V/m	IEC61131-2, IEC61000-4-3
		Fast Transient /burst noise	Class	Power module	Digital/Analog I/O communication interface	IEC61131-2 IEC61000-4-4
			Voltage	2kV	1 kV	
8	Ambient conditions	No corrosive gas or dust				
9	Operating height	2000m or less				
10	Pollution degree	2 or less				
11	Cooling method	Self-cooling				

3. Performance Specifications

Performance specifications of A/D conversion module are as specified in Table

Item	Specification	
	2MLF-AV8A (Voltage Type)	2MLF-AC8A (Current Type)
Analog input	DC 1 ~ 5 V DC 0 ~ 5 V DC 0 ~ 10 V DC -10 ~ 10 V (Input Resistance: 1 MΩ min.)	DC 4 ~ 20 ma DC 0 ~ 20 ma (Input Resistance 250 Ω
Analog input range setting	▶ Analog input range can be selected through user program or Software package. ▶ Respective input ranges can be set based on channels.	
Digital output	(1) Voltage Type	
	Analog input / Digital output: 1 ~ 5 V / 0 ~ 5 V / 0 ~ 10 V / -10 ~ 10 V	
	Unsigned Value: 0 ~ 16000	
	Signed Value: -8000 ~ 8000	
	Precise Value: 1000 ~ 5000 / 0 ~ 5000 / 0 ~ 10000 / -10000 ~ 10000	
	Percentile Value: 0 ~ 10000	
	(2) Current Type	
	Analog input / Digital output: 4 ~ 20 mA / 0 ~ 20 mA	
	Unsigned Value: 0 ~ 16000	
	Signed Value: -8000 ~ 8000	
	Precise Value: 4000 ~ 20000 / 0 ~ 20000	
	Percentile Value: 0 ~ 10000	
	▶ 16-bit binary value (data: 14 bits) ▶ Format of digital output data can be set through user program or S/W package respectively based on channels.	
The max. resolution	Analog input range: 1 ~ 5 V / Resolution (1/16000): 0.250 mV	Analog input range: 4 ~ 20 mA / Resolution (1/16000): 1.0 μA
	0 ~ 5 V / 0.3125 mV	
	0 ~ 10 V / 0.625 mV	0 ~ 20 mA / 1.25 μA
	-10 ~ 10 V / 1.250 mV	
Accuracy	±0.2% or less (when ambient temperature is 25 ℃ ±5 ℃) ±0.3% or less (when ambient temperature is 0 ℃ ~ 55 ℃)	
Max. conversion speed	250 μs/ channel	
Absolute max. input	±15 V	±30 mA
Analog input points	8 channels/1 module	
Insulation method	Photo-coupler insulation between input terminal and PLC power (no insulation between channels)	
Terminal connected	18-point terminal	
I/O points occupied	Fixed point assignment: 64 , Variable point assignment : 16	
Internal-consumed current	DC 5 V: 420㎃	
Weight	140g	

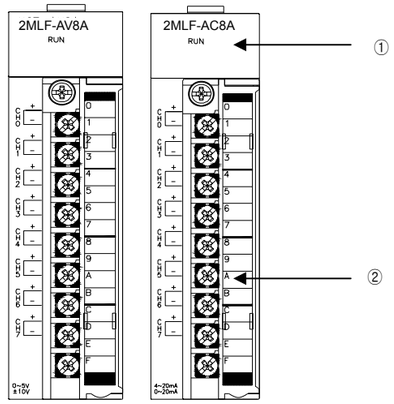
Notes

1) When A/D conversion module is released from the factory, Offset/Gain value is adjusted for respective analog input ranges, which is unavailable for user to change.
2) Offset Value: Analog input value when digitalized value is 0 in case that the range of digitalized value is 0~16000.
3) Gain Value: Analog input value when digitalized value is 16000 in case that the range of digitalized value is 0~16000.

4. Respective Designations and Functions

Respective designations of the parts are as described below

1) 2MLF-AV8A/2MLF-AC8A



No	Name	Description
①	RUN LED	▶ Displays the operation status of 2MLF-AV8A/AC8A On: Operation normal Blinks: Error occurs (Refer to 7.1 for more details) Off: DC 5V disconnected, 2MLF-AV8A/AC8A module error
②	Terminal	▶ Analog input terminal, whose respective channels can be connected with external devices.

5. Precautions for Handling

1) Do not drop or give impact on the product.
2) Do not detach PCB from the case, it may cause malfunction.
3) During wiring or other work, do not allow any wire chips get inside the product.
4) Switch off the external power before mounting or removing the module and the cable.

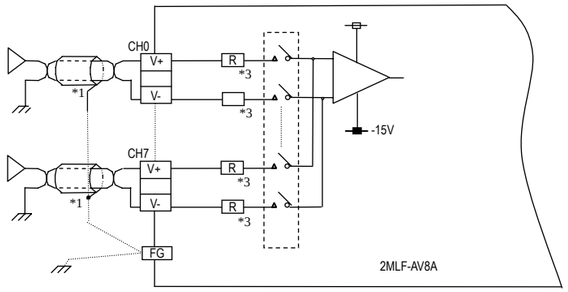
6. Wiring

6.1 Precautions for wiring

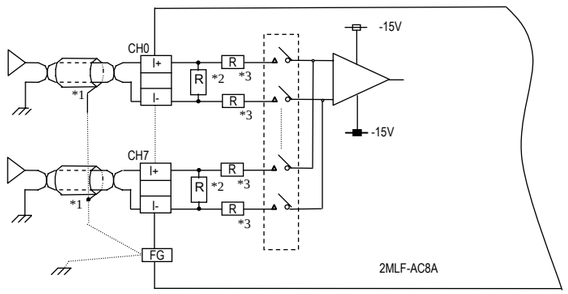
1) Do not place AC power line near to A/D conversion module's external input sign line. With an enough distance kept away between, it will be free from surge or inductive noise.
2) Cable shall be selected in due consideration of ambient temperature and allowable current, whose size is not less than the max. cable standard of AWG22 (0.3㎟).
3) Do not place the cable too close to hot device and material or in direct contact with oil for long, which will cause damage or abnormal operation due to short-circuit.
4) Check the polarity when wiring the terminal.
5) Wiring with high-voltage line or power line may produce inductive hindrance causing abnormal operation or defect.

6.2 Wiring Example

1) 2MLF-AV8A



2) 2MLF-AC8A



*1) Use the cable of 2-core twisted shield. AWG 22 is recommended for the cable standard.
*2) 2MLF-AC8A's input resistance is 250 Ω (typ.).
*3) 2MLF-AV8A's input resistance is 1 MΩ (min.).

7. Configuration of internal memory

7.1 I/O area of A/D converted data

Device assigned	Details	R/W	Sign direction
UXY.00.0 UXY.00.F	Module ERROR flag Module READY flag	R	A/D → CPU
UXY.01.0 UXY.01.1 UXY.01.2 UXY.01.3 UXY.01.4 UXY.01.5 UXY.01.6 UXY.01.7	CH0 Run flag CH1 Run flag CH2 Run flag CH3 Run flag CH4 Run flag CH5 Run flag CH6 Run flag CH7 Run flag	R	A/D → CPU
UXY.02	CH0 digital output value	R	A/D → CPU
UXY.03	CH1 digital output value	R	
UXY.04	CH2 digital output value	R	
UXY.05	CH3 digital output value	R	
UXY.06	CH4 digital output value	R	
UXY.07	CH5 digital output value	R	
UXY.08	CH6 digital output value	R	
UXY.09	CH7 digital output value	R	
UXY.10.0 UXY.10.1 UXY.10.2 UXY.10.3 UXY.10.4 UXY.10.5 UXY.10.6 UXY.10.7	Flag to detect CH0 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH1 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH2 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH3 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH4 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH5 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH6 disconnection (1 ~ 5 V or 4 ~ 20 mA) Flag to detect CH7 disconnection (1 ~ 5 V or 4 ~ 20 mA)	R	A/D → CPU
UXY.11.0	Flag to request error clear	W	CPU → A/D

7.2 A/D Setting area of Run parameters

Memory address		Details	R/W	Remarks
Hex	Dec			
0_H	0	Specify channel to use	R/W	PUT
1_H	1	Specify range of input voltage/current	R/W	PUT
2_H	2	Specify range of output data	R/W	PUT
3_H	3	Specify filter process	R/W	PUT
4_H	4	Specify CH0 filter constant	R/W	PUT
5_H	5	Specify CH1 filter constant		
6_H	6	Specify CH2 filter constant		
7_H	7	Specify CH3 filter constant		
8_H	8	Specify CH4 filter constant		
9_H	9	Specify CH5 filter constant		
A_H	10	Specify CH6 filter constant		
B_H	11	Specify CH7 filter constant		
C_H	12	Specify average process	R/W	PUT
D_H	13	Specify average processing method	R/W	PUT
E_H	14	Specify CH0 average value	R/W	PUT
F_H	15	Specify CH1 average value		
10_H	16	Specify CH2 average value		
11_H	17	Specify CH3 average value		
12_H	18	Specify CH4 average value		
13_H	19	Specify CH5 average value		
14_H	20	Specify CH6 average value		
15_H	21	Specify CH7 average value		
16_H	22	Error code	R/W	GET

8. External Dimensions

1) 2MLF-AV8A/AC8A

FFFFF

Unit : mm