

MasterLogic-200

Analog Output Module (Isolated type)

2MLF-DV4S

2MLF-DC4S

10310000715 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-DV4S(Analog voltage output module) and 2MLF-DC4S(Analog current output module). 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 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

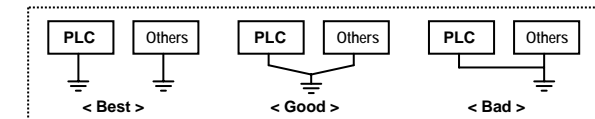
- ▶ Do not contact the terminals while the power is applied.
Risk of electric shock and malfunction.
- ▶ Protect the product from being gone into by foreign metallic matter.
Risk of fire, electric shock and malfunction.

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.

MasterLogic-200 Series User's Manual

Name	Code
MasterLogic-200 User's manual(Programming software)	10310000512
MasterLogic-200 Basic Instruction & Programming User's manual	10310000510

1. Introduction

Analog output module designed for MasterLogic-200 series is used to convert the digital value of signed 16 bit binary data to analog signal.

2. General Specifications

No	Item	Specifications	Standard		
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		Each 10 times in X,Y,Z directions IEC61131-2	
		Frequency	Acceleration		Amplitude
		10s< 57 Hz	-		0.075mm
		57s< 150 Hz	9.8m/s2(1G)		-
		For continuous vibration			
		Frequency	Acceleration		Amplitude
10s< 57 Hz	-	0.035mm			
57s< 150 Hz	4.9m/s2(0.5G)	-			
6	Shocks	* Max. impact acceleration:147 ms ² (15G)		IEC61131-2	
		* Authorized time :11 ms			
7	Noise	* Pulse wave : Sign half-wave pulse (Each 3 times in X,Y,Z directions)		IEC61131-2, IEC61000-4-3	
		Square wave impulse noise			
		±1,500V			
		Electrostatic discharging			
		Voltage : 4kV (contact discharging)			
Radiated electromagnetic field noise		27 ~ 500MHz, 10 V/m			
8	Ambient conditions	No corrosive gas or dust			
		Operating height			
		2000m or less			
9	Operating height	2000m or less			
10	Pollution degree	2 or less			
11	Cooling method	Self-cooling			

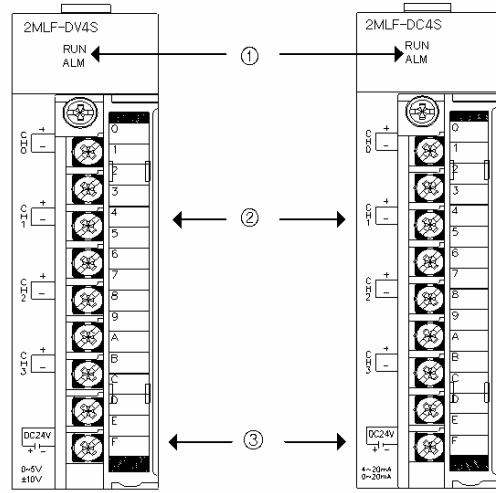
3. Performance Specifications

Item	Specifications				
	2MLF-DV4S		2MLF-DC4S		
Analog output	Type	Voltage		Current	
	Range	DC 1 ~ 5V , DC 0 ~ 5V		DC 4 ~ 20 mA	
		DC 0 ~ 10V , DC -10 ~ 10V		DC 0 ~ 20 mA	
Load resistance	1kΩ or more		600Ω or less		
Digital input	Signed 16 bit binary data(Data: 14 bit)				
	(1) 2MLF-DV4S				
		1 ~ 5 V	0 ~ 5 V	0 ~ 10 V	-10 ~ 10V
	Unsigned value	0 ~ 16000			
	Singed Value	-8000 ~ 8000			
	Precise Value	1000 ~ 5000	0 ~ 5000	0 ~ 10000	-10000 ~ 10000
	Percentile Value	0 ~ 10000			
	(2) 2MLF-DC4S				
		4 ~ 20mA	0 ~ 20mA		
	Unsigned value	0 ~ 16000			
Singed Value	-8000 ~ 8000				
Precise Value	4000 ~ 20000	0 ~ 20000			
Percentile Value	0 ~ 10000				
Resolution	1~5V	0.250 mV	4~20 mA	1.0 μA	
	0~5V	0.3125 mV			
	0~10V	0.625 mV	0~20 mA	1.25 μA	
	-10~10V	1.250 mV			
Accuracy	Standard	±0.1% or less (when ambient temperature is 25 ℃)			
	Temperature coefficient	±80ppm/℃ (±0.008%/℃)			
Max. conversion speed	10 ms/4Channel				
Absolute max. output	DC ±15V		DC ±30 mA		
Output channel	4 Channel				
Insulation	Between channels	Isolation(Trans)			
	Between terminal to PLC power supply	Isolation(Photo coupler)			
	Voltage	500V AC, 50/60Hz, 1 Minutes, Leakage current 10 mA or less			
Resistance	500V DC, 1 MΩ or more				
Terminal connected	18 Point terminal				
I/O occupied points	Fixed point assignment: 64 Point Variable point assignment: 16 Point				
Consumed current	Internal(DC 5V)	200 mA		200 mA	
	External(DC24V)	140 mA		220 mA	
Weight	150g				

Remark

- ▶ Format of input data can be set through applicable program or parameters for respective channels.
- ▶ When Analog output module is released from the factory, Offset/Gain value is adjusted for respective analog output ranges, which is unavailable for user to change.

4. Part names of functions



No.	Description
①	RUN LED Displays the operation status On: Operation normal Blink(0.2s): Error occurs Off: DC 5V disconnected, Module error
	ALM LED Displays the alarm status On: Alarm occurs(Process of manufacture, Change rate) Off: Operation normal
②	Analog output(voltage, current) terminal
	Analog output(voltage, current) terminal for connecting with external devices
③	External power input terminal
	External power input terminal supplied DC 24V for analog output(voltage, current)

5. Handling precaution

- Do not drop or impact the product.
- Do not detach PCB from the case, it may cause malfunction.
- During wiring or other work, do not allow any wire chips get inside the product.
- Switch the external power off before mounting or removing the module and the cable.
- Be sure to turn the drive device off for detaching or inserting the cable

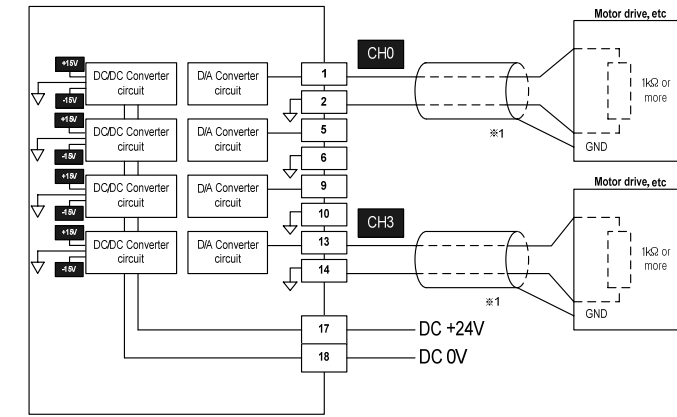
6. Wiring

6.1 Precautions for wiring

- Don't let AC power line near to analog output module's external output signal line. With an enough distance kept away between, it will be free from surge or inductive noise.
- 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 (0.3mm²).
- Don't let 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.
- Check the polarity when wiring the terminal.
- Wiring with high-voltage line or power line may produce inductive hindrance causing abnormal operation or defect.

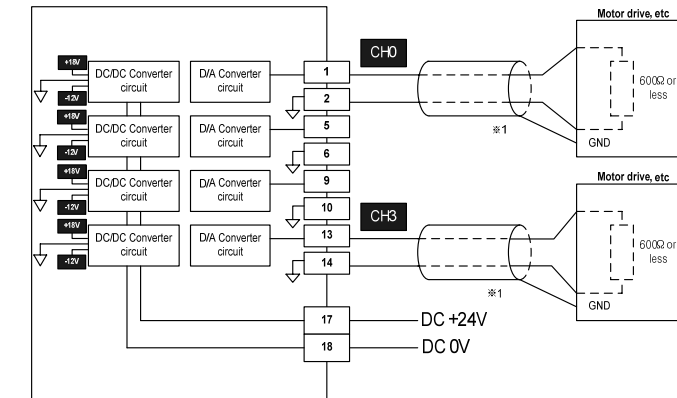
6.2 Wiring example

Analog voltage output module



*1: Use the cable(AWG 22) of 2-core twisted shield.

Analog current output module



*1: Use the cable(AWG 22) of 2-core twisted shield.

7. Configuration of internal memory

7.1 U area of analog output module

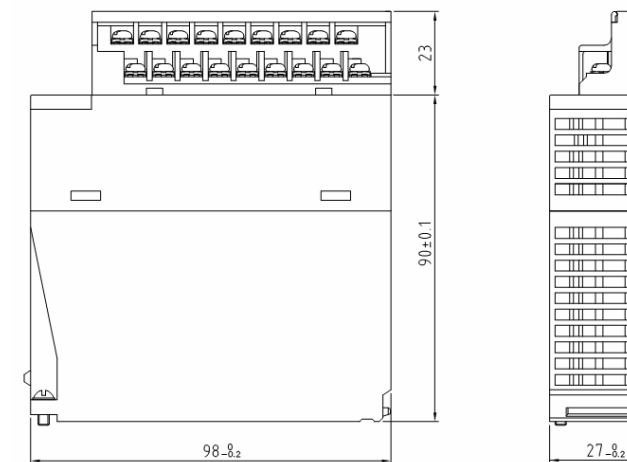
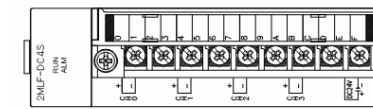
Address	Description	Remark
UXY.00.0	Channel 0 error flag	Read available
UXY.00.1	Channel 1 error flag	
UXY.00.2	Channel 2 error flag	
UXY.00.3	Channel 3 error flag	
UXY.00.F	Module ready flag	
UXY.01.0	Channel 0 active flag	Read available
UXY.01.1	Channel 1 active flag	
UXY.01.2	Channel 2 active flag	
UXY.01.3	Channel 3 active flag	
UXY.02.0	Channel 0 Output status setting	Read/Write available
UXY.02.1	Channel 1 Output status setting	
UXY.02.2	Channel 2 Output status setting	
UXY.02.3	Channel 3 Output status setting	
UXY.03	Ch0 digital input setting	
UXY.04	Ch1 digital input setting	
UXY.05	Ch2 digital input setting	
UXY.06	Ch3 digital input setting	
UXY.07	Unused	
UXY.08	Unused	
UXY.09	Unused	
UXY.0A	Unused	

7.2 Parameter area of analog output module

Address		Description	Remark
HEX	Decimal		
0	0	Specify channel to use	Read/Write available
1	1	Specify voltage/current output range	
2	2	Specify input type	
3	3	Specify Ch0 output type	
4	4	Specify Ch1 output type	
5	5	Specify Ch2 output type	
6	6	Specify Ch3 output type	Read available
7	7	Unused	
8	8	Unused	
9	9	Unused	
A	10	Unused	
B	11	Ch0 setting error	
C	12	Ch1 setting error	
D	13	Ch2 setting error	
E	14	Ch3 setting error	
F	15	Unused	
10	16	Unused	
11	17	Unused	
12	18	Unused	Read/Write available
13	19	Specify output limit of channel	
14	20	Ch0 output high limit	Read available
15	21	Ch0 output low limit	
16	22	Ch1 output high limit	Read available
17	23	Ch1 output low limit	
18	24	Ch2 output high limit	Read available
19	25	Ch2 output low limit	
1A	26	Ch3 output high limit	Read/Write available
1B	27	Ch3 output low limit	
1C	28	Specify change rate of channel	Read available
1D	29	Ch0 increase value of change rate	
1E	30	Ch0 decrease value of change rate	
1F	31	Ch1 increase value of change rate	
20	32	Ch1 decrease value of change rate	
21	33	Ch2 increase value of change rate	
22	34	Ch2 decrease value of change rate	
23	35	Ch3 increase value of change rate	
24	36	Ch3 decrease value of change rate	

8. Dimensions

Unit: mm



External dimension of 2MLF-DV4S is the same as 2MLF-DC4S.