



# WECON

# LX3V-2ADV2DAV-BD

# Module



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# 1. Installation Instructions

Before installation, ensure to cut off the electricity of the PLC host and the related equipment of the BD terminal connection board. Connect the female header of the BD module to the pin header on the top cover of the PLC. That is installation by aligning the two small channels of the board with the raised rib strip on the top cover of the PLC host. Then tighten the four standard screws to the bottom and the torque shall not be too big. If the environment has lots of dust, the left half part of the BD module can be covered by the square cover of the host. After installation complete, turn on the electricity and the system can be used. During the disassembly, electricity of the PLC host and the related equipment of the BD terminal connection board must be also cut off before any operation. Hot plug of the BD module is forbidden.

## Notes:

- 1) When using the voltage output, ensure the external load resistance is no less than 2KΩ. If the external load resistance is less than 2KΩ, the output voltage will be lower than the normal value.
- 2) Firm the installation of the function extension board, and fix it onto the PLC. Poor contact might cause malfunction.
- 3) The fastening torque is 0.3-0.6N.m. Firmly screw down to prevent malfunctions.

## Warnings:

- Cut off the electricity before installation/disassembly of the unit or connection of wires onto the unit, to prevent electric shock or product damage.
- After installation and wiring, replace the PLC top cover before turning on the electricity.

# 2. Features of LX3V-2ADV2DAV-BD

- 1) It could use LX3V-2ADV2DAV-BD to add 2 analog input points and 2 analog output points. it is internally installed in the top of PLC, thus it is not necessary to change the PLC's installation area.
- 2) The digital analog conversion of the LX3V-2ADV2DAV-BD module is the voltage inputs(-10V~10V), and the data of all the channels after conversion are stored inside a special digital memory, but the converted characteristics of the analog data cannot be adjusted. The allocation of the relevant channel addresses is in the following table.

Table 2-1

Address	Instructions	
M8112	CH1:flag of the input mode OFF: Voltage input mode(-10V~10V:-2000~2000)	ON: Turn off
M8113	CH2: flag of the input mode OFF: Voltage input mode (-10V~10V:-2000~2000)	

M8114	CH3: Flag of the output mode OFF: Voltage output mode (-10V~10V:-2000~2000)	ON : Reserved
M8115	CH4: flag of the output mode OFF: Voltage output mode (-10V~10V:-2000~2000)	
D8112	flag of CH1	
D8113	Flag of CH2	
D8114	Flag of CH 3	
D8115	Flag of CH4	

### 3. Dimension

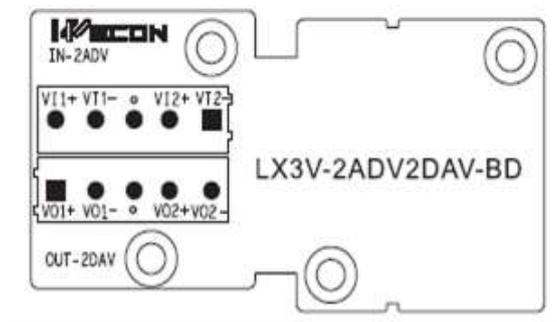


Figure 1

Table 3-1

IN-2ADV Part Input voltage ranges: -10V~10V		OUT-2DAV Part Output voltage ranges: -10V~10V	
VI1+	the anode of the first channel voltage input	VO1+	the anode of the first channel voltage output
VI1-	The cathode of the first channel voltage input	VO1-	The cathode of the first channel voltage output
▪	Disconnect	▪	Disconnect
VI2+	the anode of the second channel voltage input	VO2+	the anode of the second channel voltage output
VI2-	The cathode of the second channel voltage input	VO2-	The cathode of the second channel voltage output

The PLC main unit of the LX3V can only use one BD board. Don't try to use two or more BD boards (these BD boards will not work).

### 4. Specifications

- 1) **General specification:** The same as the PLC main unit. (Please refer to the attached instructions

supplied with the main unit of the PLC.)

2) **Power specification:** Powered from inside of the programmable controller.

3) **Performance specifications**

Item	Specification	
	Input	Output
Analog input range	DC-10V~10V (input resistance 150KΩ). Note: If the input voltage exceeds $\pm 15V$ , the unit will be damaged.	DC-10V~10V (the external load resistance is no less than 2KΩ)
Digital output	12 bit binary	12 bit binary
Resolution	5mV[10V default scope 1/2000]	5mV[10V default scope 1/2000]
Comprehensive precision	Full scale $\pm 1\%$	Full scale $\pm 1\%$
A/D conversion time	1 scan cycle (The analog digital conversion is completed by the END order)	1 scan time (The analog digital conversion is completed by the END order)
Input characteristics		
Isolation	There is no isolation among all the channels	
Occupied points	0 point (Because the operation is through a data memory, therefore, the 2ADV is not impacted by the standard maximal controlled points.)	0 point (Because the operation is through a data memory, therefore, the 2DAV is not impacted by the standard maximal controlled points.)

## 5. Wire Connection

### Warning:

Make sure cut off the electricity before installation/disassembly, to prevent electric shock or product damages.

**Notes:**

- 1) Please keep the signal cable from the high-voltage cable at least 100mm.
- 2) The shielding wire cable shall be grounded. But their grounding point can be the same with high-voltage lines.
- 3) Welding is forbidden at the end of any cable. Ensure the number of connected cables does not exceed the designed number of the unit.
- 4) Never connect cable with forbidden size.
- 5) Fix the cable, so that the stress does not act on the terminal board or the cable connection area.
- 6) The screwing torque of the terminal is from 0.5 to 0.6N.m. Fasten tight to prevent malfunction.
- 7) Keep the redundant terminals empty.

### 5.1 Applicable Cables

Use AWG25-16 to connect the output equipment

The maximal screwing torque is from 0.5 to 0.6N.m

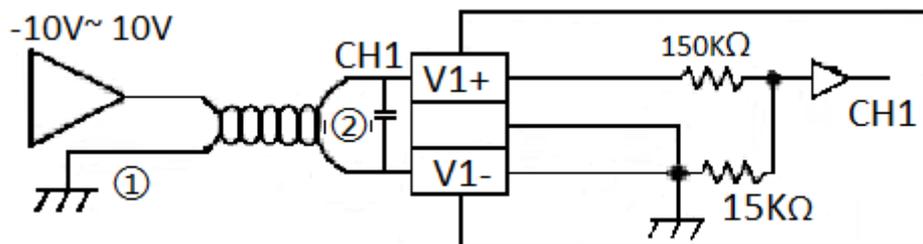
The use of different types of cables might cause poor contact between the terminals. It is better to use pressed terminals.

Table 5-1

Line type	Cross sectional area(mm <sup>2</sup> )	End-of-pipe treatment	
AWG26	0.1288	Stranded cable: stripped jacket, rub Conductor, then connect the cable.	
.....	.....		
AWG16	1.309	Single-core cable: stripped jacket, Then connect the cable.	

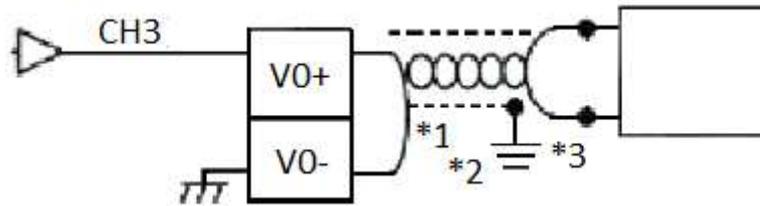
### 5.2 Input and Output mode

1) Voltage Input Mode



- It is necessary to use shielded cable to transfer analog input. The cable shall be far away from the power line or other electrical wires that might cause electrical disturbance.
- If there is voltage ripple in the input or electrical disturbance outside, then a smoothing capacitor can be added. (0.1uF~0.47uF, 25V)

## 2) Voltage Output Mode



- Use twisted pair shielded cable for the analog output. The cable shall be far away from the power line or other electrical wires that might cause electrical disturbance.
- Use single point grounding at the load side of the output cable. (3 Class grounding: no bigger than 100Ω)
- If it has electrical noise or voltage ripple input, please connect a smoothing capacitor (0.1uF~0.47uF, 25V)

# 6. Program Examples

The input analog of all channels (-10V~10V) is stored inside the data memory (D8112, D8113) in the form of data. Values will be automatically stored when the “END” order is sent out. The value is calculated by the designated analog data conversion characteristics of the special auxiliary relays M8112 and M8113.

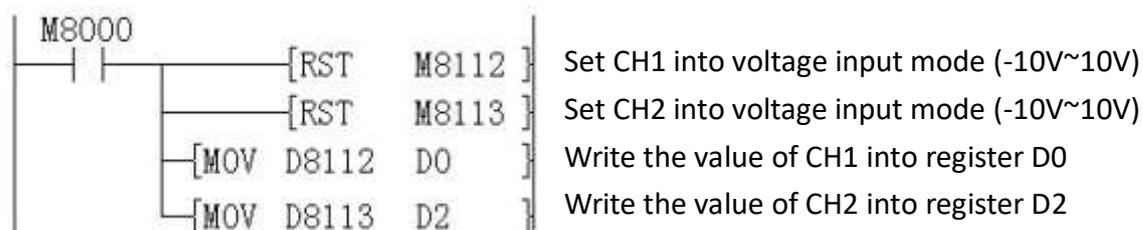
For the output, when each “END” order is sent out, the values (D8114, D8115) are converted into analog output by the designated simulated figure conversion characteristics of the special auxiliary relays M8114 and M8115.

## 6.1 Basic Program Examples

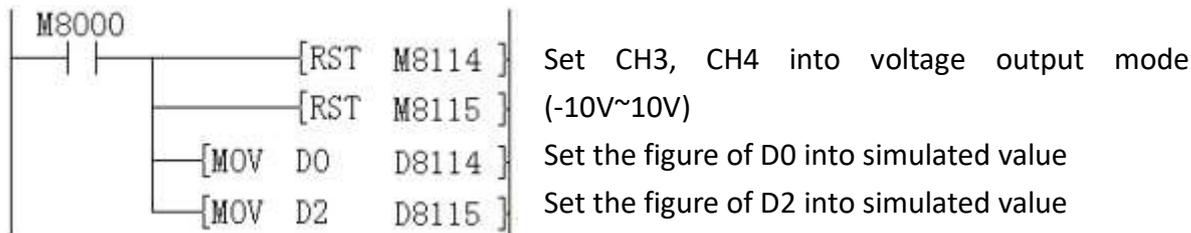
### Notes:

- 1) Start M8112 and M8113; designate the analog data conversion characteristics of CH1 and CH2.
- 2) After execution of analog data conversion, do not change the values of D8112 or D8113 through operator program, programming tools or graphic operating terminal.

The following program can set CH1 and CH2 into voltage input mode. After ADV conversion, values of all channels are stored into D0 and D2.



The following program will be set into voltage output mode, and the data of D0 and D2 will be converted into analog value.



If the data are not stored into D0 or D2, then D8112, D8113 and D8114, D8115 can be simultaneously used on setting values and other orders, such as timer/counter.

## 6.2 Examples of Applications

Since the LX3V-2ADV2DAV-BD does not have offset and gain functions, if it needs for the values out of the standard specifications, Additional programming orders will be needed to multiply or divide the converted value.

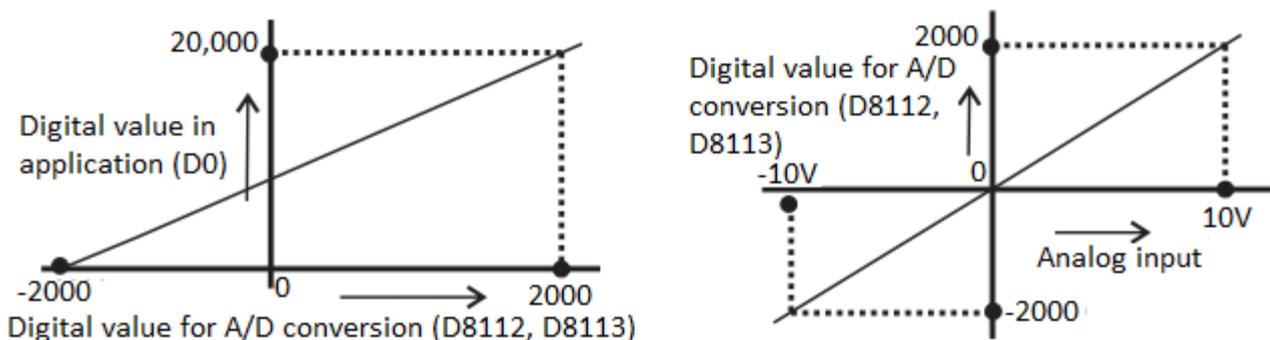
### Notes:

- Since the use of additional programming orders, the converted precision and resolution of the analog value are different with the specifications.
- The original range of the analog output does not change.

### 1) Voltage Input Mode

Under the voltage input mode, the 2ADV will convert the analog value -10V~10V into data output -2000~2000. If the data range used in the application is 0-20000, then the range -2000~2000 must be converted into 0-20000, as is shown in the following program examples. The data converted from the analog values are stored in D8112 or D8113.

Since the data range is converted from -2000~2000 into 0-20000, therefore the resolution of the analog input is no longer just 8uA.



If the data range used in D0 is (0-20000), please refer to the following text: digital value in applications:  
 $D0 = 5 * (D8112 \text{ or } D8113) + 10000$ .

Use an example as follows based on the program of the above mentioned analog (under the situation of CH1)

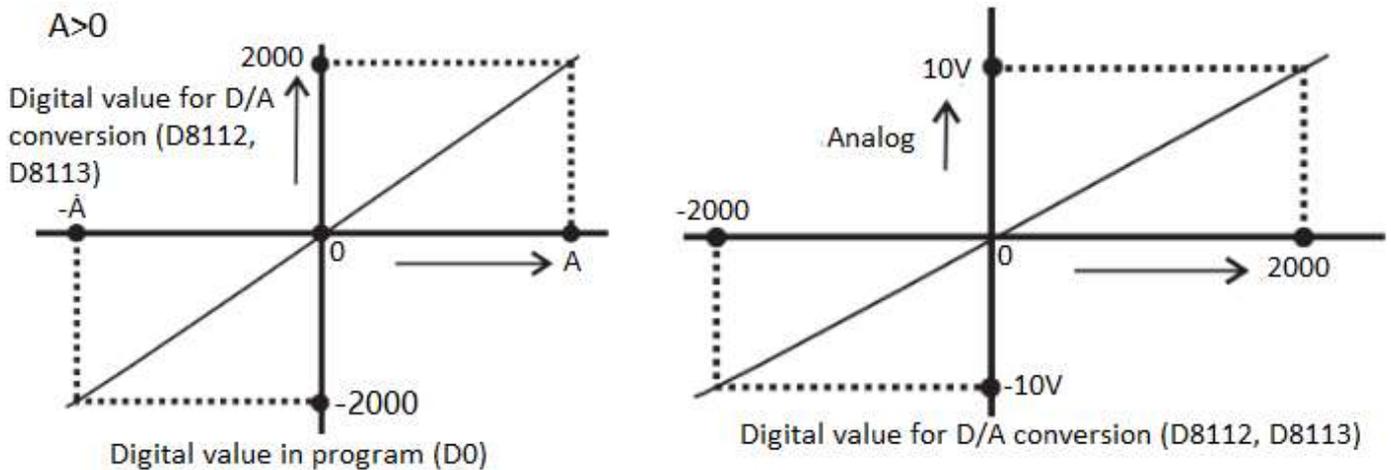
```

M8000
├── [RST M8112]
├── [MUL K5 D8112 D2]
└── [ADD D2 K10000 D0]
    
```

**2) Voltage Output Mode**

Under the voltage output mode, the 2DAV will convert the figures -2000~2000 into analog output -10V~10V. If the figure data used in the application is -A~A, then the range must be converted into -2000~2000, as is shown in the following program examples. The figures converted from the analog values are stored in D8114.

Since the data range is converted from -A~A into -2000~2000, therefore the precision of the analog output is no longer just 5mV.



If the figure range used in D0 is -A~A, then the data used in the user's applications are:

$$\begin{aligned}
 D8114 &= 2000 \times D0 \div A \\
 &= 2000 \times D0 \div 10000 \text{ (when } A=10000) \\
 &= D0 \div 5
 \end{aligned}$$

```

M8000
├── [RST M8114]
├── [DIV D0 K5 D2]
└── [MOV D2 D8114]
    
```