LX3V-2ADV2DAV-BD

User manual

Website: http://www.we-con.com.cn/en
Technical Support: support@we-con.com.cn
Skype: fcwkkj
Phone: 86-591-87868869
QQ Group: 465230233
Technical forum: http://wecon.freeforums.net/

1. Installation Instructions

Before installation, it is necessary to ensure that the associated equipment of the PLC host and the terminal of the BD module are reliably powered off.

This module comes with two standard terminals; please plug the terminals into the module terminals after wiring. Confirm the installation of host, module and wiring are correct and then power on.

Caution：

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) The input must not exceed the absolute maximum (-15V/+15V) or cause the module to be damaged;
3) The fastening torque is 0.3-0.6N.m. Firmly screw down to prevent malfunctions;
4) 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);
5) This BD module only supports the following firmware versions or later. Users can check the PLC firmware version in D8001.
   - LX3VP:25103;
   - LX3VE: 25201;
   - LX3V-A2:25014;
   - LX3V-A1: 22006;

   When mounting module to PLC, all the lights are blinking after power ON PLC, it means this PLC can't support it, please purchase new PLC.

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.

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: Disabled
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)	
M8115	CH4: flag of the output mode OFF: Voltage output mode（-10V~10V:-2000~2000)	
D8112	Digital value of CH1	
D8113	Digital value of CH2	
D8114	Digital value of CH3	
D8115	Digital value of CH4	

3. Dimension

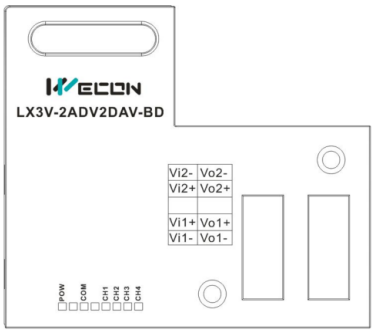


Figure 3-1

Table 3-1

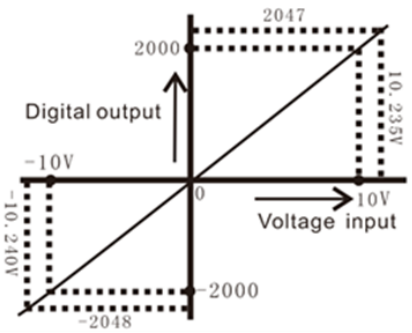
IN-2ADV Part Input voltage ranges: -10V~10V		OUT-2DAV Part Output voltage ranges: -10V~10V	
VI1+	The anode of CH1 voltage input	VO1+	The anode of the CH1 voltage output
VI1-	The cathode of CH1 voltage input	VO1-	The cathode of the CH1 voltage output
▪	Disconnect	▪	Disconnect
VI2+	The anode of CH2 voltage input	VO2+	The anode of the CH2 voltage output
VI2-	The cathode of CH2 voltage input	VO2-	The cathode of the CH2 voltage output

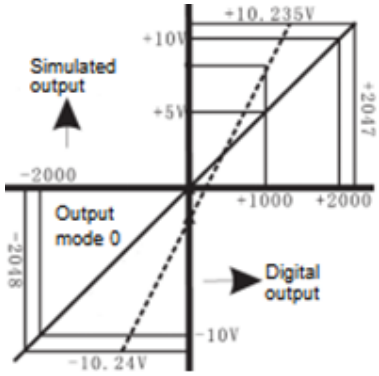
LED lights indicating:

- POW LED: Constantly ON when PLC power ON;
- COM LED: Lit when communicating PLC, OFF when timeout;
- CH1 LED: LED for CH1, constantly ON when analog signal in range, lit when analog signal out of range (-10V~10V). OFF when M8112 turns ON.
- CH2 LED: LED for CH2, constantly ON when analog signal in range, lit when analog signal out of range (-10V~10V). OFF when M8113 turns ON.
- CH3 LED: LED for CH3, constantly ON when M8114 turns OFF, OFF when M8114 turns ON.
- CH4 LED: LED for CH4, constantly ON when M8115 turns OFF. OFF when M8115 turns ON.

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
Power supply	24VDC±10%, 50mA; 5VDC±10%, 70mA (Powered by PLC host)
Analog input (ADV)	
Analog input range	DC-10V~10V (input resistance 160KΩ). Note: If the input voltage exceeds ±15V, the unit will be damaged.
Rated range	-10V~10V: -2000~2000
The maximum display range	-2048~2048
Resolution	5mV[10V default scope 1/2000]
Precision	±0.5% of full scale
AD conversion time	One PLC scanning cycle
Input characteristics	
Insulation	No insulation in each PLC channel

Occupied points	None
Analog output (DAV)	
Rated range	-10V~10V: -2000~2000
Analog output	DC-10V~10V (the external load resistance is no less than 2KΩ)
Digital output	12 bit binary
Resolution	5mV[10V default scope 1/2000]
Precision	±0.5% of full scale
AD conversion time	One PLC scanning cycle
Input characteristics	
Insulation	No insulation in each PLC channel
Occupied points	None

5. Wire Connection

Warning:

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

Caution:

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

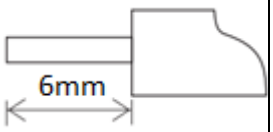
5.1 Applicable Cables

Use AWG25-16 to connect the output equipment

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

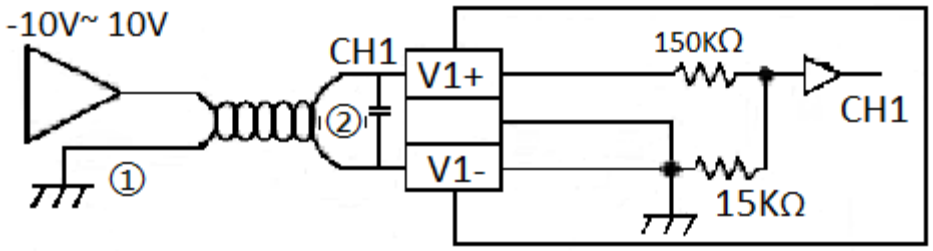
The use of different types of cables might cause poor contact between the terminals. It is better to use pressed terminals.

Table 5-1

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

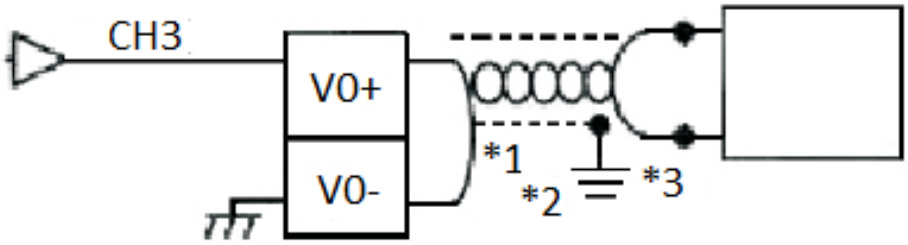
5.2 Input and Output mode

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.

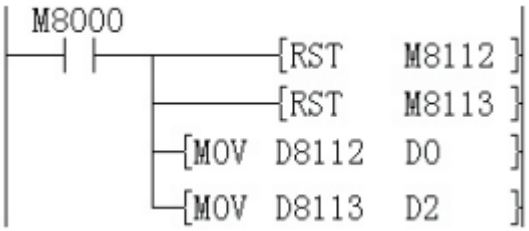
For the output, when each "END" order is sent out, the values (D8114, D8115) are converted into analog output by the designated simulated figure conversion characteristics of the special auxiliary relays M8114 and M8115.

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.

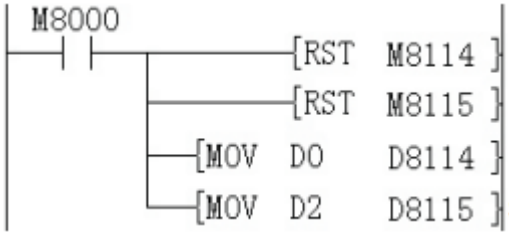
The following program can set CH1 and CH2 into voltage input mode. After ADV conversion, values of all channels are stored into D0 and D2.



Set CH1 into voltage input mode (-10V~10V)
Set CH2 into voltage input mode (-10V~10V)
Write the value of CH1 into register D0
Write the value of CH2 into register 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.



Set CH3, CH4 into voltage output mode (-10V~10V)
Set the figure of D0 into simulated value
Set the figure of D2 into simulated value

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.

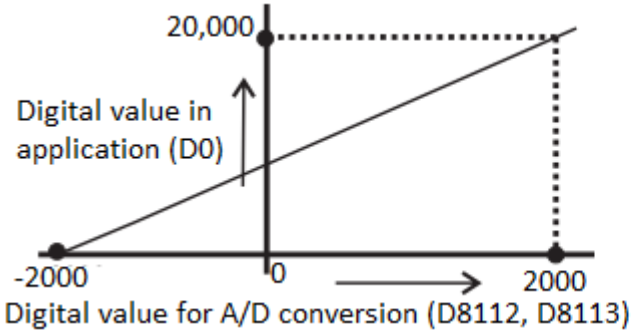
Caution:

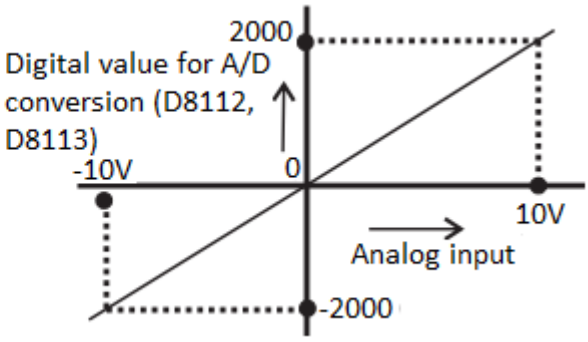
- Since the use of additional programming orders, the converted precision and resolution of the analog value are different with the specifications.
- The original range of the analog output does not change.

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.

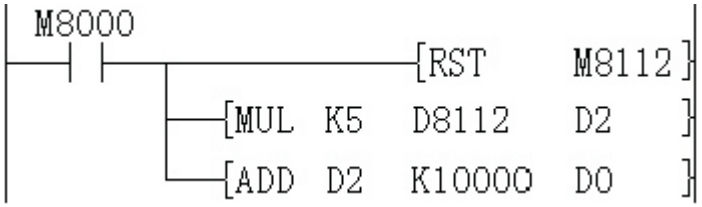




If the data range used in D0 is (0-20000), please refer to the following text: digital value in applications: D0=5*(D8112 or D8113) +10000.

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

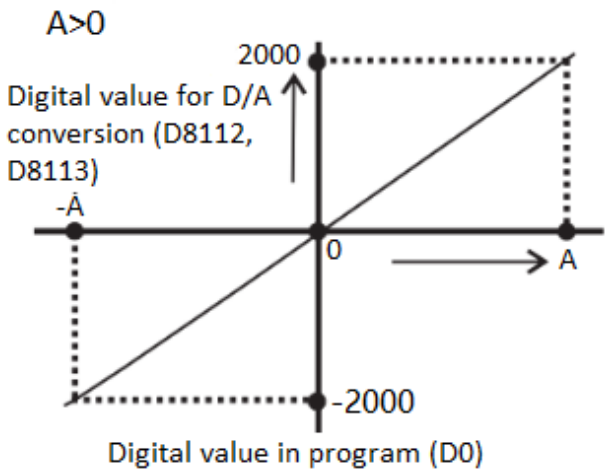
situation of CH1)

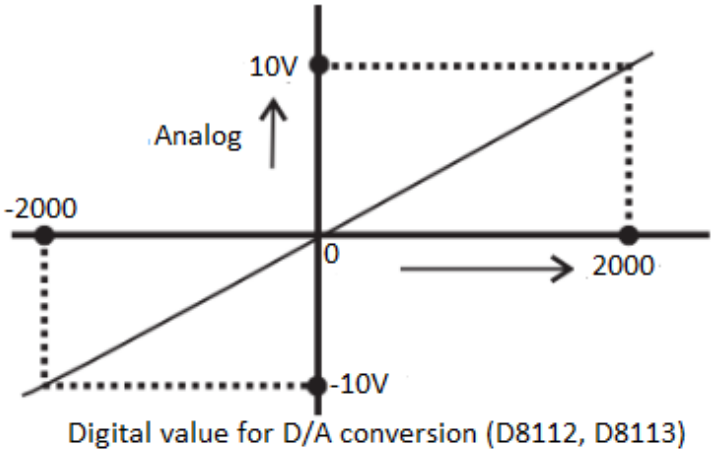


2) Voltage Output Mode

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.



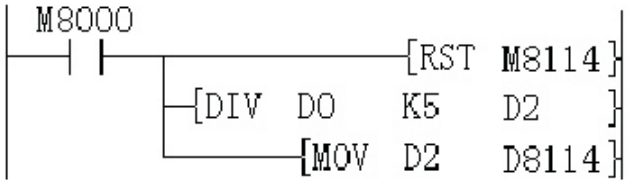


If the figure range used in D0 is -A~A, then the data used in the user's applications are：

D8114=2000×D0÷A

=2000×D0÷10000 (when A=10000)

= D0÷5



Version: V1.0.1

Date: Jan 2018