Thank you very much for purchasing this product.

Please ensure that the following points are followed.

- This product is designed for use in industrial applications.
- This manual should be used by trained and competent personnel.
- The general specifications are equivalent to those of the main unit. (For 5. Specifications)
- The term ‘completed equipment’ refers to a third party constructed equipment.
- The status of BFM #0, #5, and #21, will be written to EEPROM, therefore the BFM must be used.
- The identification code for the FX2NC-4DA unit is K3020. The information is not used, you can operate the FX2NC-4DA using the following instruction. The identification code for the FX2NC-4DA unit is K3020.

**1. Introduction**

The FX2NC analog output block (hereafter referred to as “FX2NC-4DA”) converts 4 digital values (from the main unit) into analog output values (voltage or current). The FX2NC-4DA can be connected to the FX2NC/FX3UC PLC Series main unit, extension unit or I/O module and used as a 4-channel analog output. The analog output channel can be configured as voltage output, current output, or special function block and used by selecting the I/O index and the appropriate connection method. When an error occurs, use the FROM/TO command to read out the details of error.

**2. External Dimensions and Part Name**

- CH1: terminal at the same channel
- CH2: terminal at the next channel
- CH3: terminal at the next channel
- CH4: terminal at the next channel

**3. PLC Connection**

When connecting the FX2NC-4DA to the FX2NC/FX3UC PLC Series main unit, extension unit or I/O module, the terminal connector must be used. The FX2NC-4DA has two connection modes: the terminal connector and the terminal strip. The terminal connector is standard equipment. The terminal strip is optional equipment.

**4. Wiring**

4.1 Power supply wiring

Supply power to the FX2NC-4DA in the power supply connector or the power supply terminal.

- *When using the power supply, the following power cables are available.*

4.2 Output wiring

For terminal arrangement, refer to Chapter 2 of this manual.

5. Specifications

5.1 General specifications

The general specifications are equivalent to those of the main unit. (For 6.1.1. Buffer Memories (BFM))

5.2 Power supply specifications

- - -

6. Buffer Memory (BFM)

The FX2NC-4DA has a data PL and the buffer memory addresses (19.6) are in the FX2NC-4DA. Items #1 to #4, #5 and #6 can be written to the PLC through the selection command (BFM #10 to BFM #16). The data will be the same as the data that is written to the PLC through the selection command (BFM #10 to BFM #16). The data will be the same as the data that is written to the PLC through the selection command (BFM #10 to BFM #16).

7. Operation and Program Examples

If the PLC power is ON, the buffer memories of the FX2NC-4DA will be refreshed. If the PLC power is OFF, the data will be retained until the PLC power is ON. If the PLC power is OFF, the data will be retained until the PLC power is ON. If the PLC power is OFF, the data will be retained until the PLC power is ON. If the PLC power is OFF, the data will be retained until the PLC power is ON. If the PLC power is OFF, the data will be retained until the PLC power is ON.
FX2NC-4DA Analog output block

Thank you very much for purchasing the product.

Please read this manual thoroughly in order to handle the product properly.

For further information about the FX2NC-4DA, refer to the following manuals.

3. PLC Connection

1) Connection example with the power supply through the extension connector of the FX2NC-4DA output block

2) Connection example to the power supply through the power supply connection

3) Connection example to the power supply through the power supply terminal

---

**Table of Further Information Manuals**

<table>
<thead>
<tr>
<th>Manual Name</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>FX2NC-4DA Programming Manual</td>
<td>Programming and operation specifications of the FX2NC-4DA, programming methods and specifications of the FX2NC-4DA's series main unit or extension block, etc.</td>
</tr>
<tr>
<td>FX2NC-4DA Application Manual</td>
<td>Application examples, etc.</td>
</tr>
</tbody>
</table>

---

1. Introduction

The FX2NC-4DA analog output block (hereafter referred to as “FX2NC-4DA”) converts 5 mV (10 V) digital input values into analog output values (voltage or current). The FX2NC-4DA can be connected to the FX2NC/FX3UC Series PLC.

1) Each analog output channel can be configured for voltage output, or current output, by setting the input mode in the BFM parameter. The FX2NC-4DA analog output block can be used in such a way that the analog value is input from another device and the corresponding analog value is output.

2) The voltage output ranges from -10 V to 10 V. The current output ranges from 4 mA to 20 mA. The output characteristic can be adjusted for each channel.

3) The resolution is 5 mV (10 V).

4) Data transfer with the PLC is performed via the buffer memories of the FX2NC-4DA to FX2NC-4DA modules.

2. External Dimensions and Part Name

<table>
<thead>
<tr>
<th>Accessory/Functional block name list</th>
<th>Description</th>
</tr>
</thead>
</table>
| #1 Power cable | - Power cable for the FX2NC-4DA analog output block |}

---

5. Specifications

5.1 General specifications

The general specifications are common to those of the main unit. For details, see the PLC main unit manual.

5.2 Power supply specifications

- DC 24 V supply, 50 mA
- AC 220 V supply, 90 mA
- Power crossover cable

---

6. Buffer Memory (BFM)

The FX2NC-4DA has a data PLC with the buffer memory addresses (19 63) in the FX2NC-4DA.

- BFM #2: Output data of CH2 (Initial value: 0)
- BFM #3: Output data of CH3 (Initial value: 0)
- BFM #4: Output data of CH4 (Initial value: 0)

---

7. Operation and Program Examples

If the buffer memory (BFM) has been changed and the status information is not used, you can operate the FX2NC-4DA using the following simple program. For the FX2NC-4DA PLC function Manual (3), refer to the FX2 Programming Manual (4), Digital I/O or PLC Extension Manual (5) for further details.

---

**BFM (Error) status**

When an error occurs, use the BFM command to read out the details of the error.

---

**BFM (Identification)**

The identification code for the FX2NC-4DA is 9704GF. The identification code is set to “9704GF” when the FX2NC-4DA is turned ON at the factory. For details, refer to the PLC main unit manual.
9. Adjustment of the I/O Characteristics

9.1 I/O characteristics

The standard characteristics factory default are shown by the solid line in the figure below. These characteristics can be adjusted to suit the user’s application.

Standard characteristics of voltage output

- Gain value: Analog output value when the digital input is 0
- Offset value: Analog output value when the digital input is 0
- Offset and gain can be set independently or together. Possible offset changes are ±1 mA, ±5 mA, ±10 mA or 0 to 20 mA.
- Offset and gain can only be set for positive values.

9.2 Adjustment of I/O Characteristics

An example program for adjustment is shown below. The example shows that for channel CH1 of FX2NC-4DA block No.1, the offset value is changed to 7 mA and the gain value to 20 mA. Note that for CH2, CH3, and CH4, the standard voltage output characteristics are set.

9.3 Program Examples

[Program code for adjusting I/O characteristics]

10. Troubleshooting

If the FX2NC-4DA does not operate properly, check the following items.

1) Check the connection to the power supply. Refer to section 6.4 of this manual.
2) Check the status of the POWER indicator lamp (LED) of the FX2NC-4DA.
3) Check the status of the 24 V power indicator lamp (LED) of the FX2NC-4DA.
4) If the FX2NC-4DA does not operate properly, check the following items:
   - Check that the external load resistance connected to each analog output terminal does not exceed the capacity of the FX2NC-4DA (voltage output). Due to 1 MΩ current output, 50 mA to 30 mA can be output.
   - Check the output voltage or current value using a voltmeter or ammeter, and confirm that the output meets the I/O characteristics. If the output does not meet the I/O characteristics, adjust the offset and gain again. Refer to section 9.2.

Note

To test the withstand voltage of the FX2NC-4DA, connect all the terminals to the ground terminal.
4) When the PLC is STOP, the offset values can also be output. For a detailed description, refer to Section 6.4.

7.2 Program example
In the example shown below, CH1 and CH2 in the FX2NC-4DA, connected to the special function block No. 5, are handled as the voltage output, CH3 is handled as the current output (4 to 20 mA), CH4 is handled as the current output (0 to 20 mA), and these outputs are tested when the PLC is RUN. If the status shown below, the block characteristics are visible.

8. Caution Regarding Operation
1) Check whether the output wiring and/or the FX2NC-4DA is properly connected to the PLC main unit.
2) The FX2NC-4DA uses 30mA (5V) supplied from the main unit or external power supply.*1

9. Adjustment of the I/O Characteristics
9.1 I/O characteristics
The standard characteristics (factory default) are shown by the solid lines in the figure below. These characteristics can be adjusted to suit the user’s application.

9.2 Adjustment of I/O Characteristics
An example program for adjustment is shown below. The example shows that for channel CH1 of FX2NC-4DA block No. 1, the offset value is changed to 7 mA and the gain value to 30 mA. Note that for CH1, CH3, and CH4, the standard voltage output characteristics are set.

10. Troubleshooting
If the FX2NC-4DA does not operate properly, check the following items:
1) Check the external wiring. Refer to section 4 of this manual. Check status of the POWER indicator lamp (LED) of the FX2NC-4DA.
2) Check status of the 24 V power indicator lamp (LED) of the FX2NC-4DA. The special function block is properly connected.
3) Check status of the special function block. Also check the 24 V power supply capacity.

Note: The resolution (minimum possible change of analog output) of the FX2NC-4DA is fixed. Slight changes to the digital input will not always change the analog output. When the slope of the I/O characteristic line is steep, adjust the offset and gain values to 20 mA. Note that for CH1, CH3, and CH4, the standard voltage output characteristics are set.

Note: If the FX2NC-4DA does not operate properly, check the following items. The special function block is properly connected.

Note: When the special function block is not connected, the connection of the special function block can be made if the 24 V power supply capacity is sufficient. Also check the 24 V power supply capacity.
FXnc-4DA Analog output block

Thank you very much for purchasing the product.

1. Introduction

The FXnc-4DA analog output block (hereafter referred to as "FXnc-4DA") converts digital values (from the main unit) into analog output values (voltage or current).

The FXnc-4DA can be connected to the FXnc-Series PLC.

1) Each analog output channel can be configured at "Program" in the GX Works2 software.
2) Actual output values can be displayed using the "DIAGNOSTIC" function in the GX Works2 software.
3) Different analog output channels can be selected.
4) The voltage output range is from 0 V to 10 V (at full scale of 20V).
5) The input or output hardware malfunction (data setting error) occurs.

2. PLC connection and external dimensions and part name

For further information concerning the FX series, refer to the following manuals.

3. PLC connection

When connecting the FXnc-4DA to the FXnc-Series PLC, be sure to check the following:

1) Close the "#5" after the FXnc-4DA is turned ON.
2) Switching the output mode resets the I/O characteristics to the factory-default mode.

4. Wiring

4.1 Power supply wiring

Supply power (24V DC) to the FXnc-4DA to either the power supply connector 3), 3) or the terminal at the same time.

5. Specifications

5.1 General specifications

The general specifications are equivalent to those of the main unit.

5.2 Power supply specifications

The power supply specifications are equivalent to those of the main unit.

6. Buffer Memory (BFM)

The buffer memory (BFM) contains the PLC data in the FXnc-4DA. The buffer memory addresses (16-bit data) in the FXnc-4DA. The BFM is used at any time to switch the output values to the buffer memory.

7. Operation and Program Examples

If the buffer memory (BFM) is selected and the status information is not used, you can operate the FXnc-4DA using the following simple programs.

8. Appendix

The following information is for the FXnc-4DA.

For more information, refer to the FX Series Programming Manual (3).

9. Customer service

For more information on customer service, refer to the FX Series Programming Manual (3).

10. Glossary

For more information on the glossary, refer to the FX Series Programming Manual (3).
9. Adjustment of the I/O Characteristics

9.1 I/O characteristics

The standard characteristics for each output (CH1, CH2, CH3, CH4) are shown in the table below. These characteristics can be adjusted to suit the user’s application.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Characteristics</th>
<th>Gain Value</th>
<th>Offset Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1</td>
<td>0 to 20 mA</td>
<td>0 mV</td>
<td>0 mV</td>
</tr>
<tr>
<td>CH2</td>
<td>0 to 20 mA</td>
<td>0 mV</td>
<td>0 mV</td>
</tr>
<tr>
<td>CH3</td>
<td>0 to 20 mA</td>
<td>0 mV</td>
<td>0 mV</td>
</tr>
<tr>
<td>CH4</td>
<td>0 to 20 mA</td>
<td>0 mV</td>
<td>0 mV</td>
</tr>
</tbody>
</table>

Gain value: Analog output value when the digital input is 0
Offset value: Analog output value when the digital input is 1,000

9.2 Adjustment of I/O Characteristics

An example program for adjustment is shown below. The example shows that gain and offset can be adjusted from software in the main unit.

```
M10 to M25
BFM #29 (b15 to b0) -> BFM #3 (CH3 output)
BFM #2 (CH2 output)
BFM #1 (CH1 output)
BFM #0 (unit No. 0) 
Transferred to D4.
```

9.3 Program Examples

```
K0
K1
D2
D2
D2
D2
D2
G20
G73
G70
G69
G61
G6C
G79

-5V to 5V or -20mA to 20mA, and gain value - offset value =1V to 15V or 4mA to 15mA.
```

10. Troubleshooting

If the FX2NC-4DA does not operate properly, check the following items:

1) Check the external wiring. Refer to section 4 of this manual.
2) Check the status of the D/A conversion indicator lamp (LED) of the FX2NC-4DA.

ON : The special function block is properly connected.
OFF or flash : Check the connection of the special function block. Also check the power supply capacity.
3) Check the status of the DC conversion indicator lamp (LED) of the FX2NC-4DA.

ON or OFF : The ambient conditions are not suitable for the FX2NC-4DA, or the FX2NC-4DA is defective.
4) Check that the external load resistance connected to each analog output terminal does not exceed the capability of the FX2NC-4DA (analog output: 2kΩ to 100kΩ).
5) Check that the output voltage or current value using a voltmeter or ammeter, and confirm that the output meets the I/O characteristics. If the output does not meet the I/O characteristics, adjust the offset and gain again. Refer to section 9.

Note: To test the withstand voltage of the FX2NC-4DA, connect all the terminals to the grounding terminal.