3. Connection with PLC

1) Up to 4 FX2N-3A units can connect to the FX3U series PLC, up to 5 for FX3U, up to 8 for FX3U or, up to 4 for an FX2NC series PLC, all with powered extension units.

However the following limitation exists when the undermentioned special function blocks are connected:

FX3U: Main unit and powered extension units of 32 I/O points or less. Consumption current available for undermentioned special function blocks ≤ 300mA

FX2N-2DA: Up to 4 undermentioned special function blocks can be connected regardless of the system I/O.

Up to 2 undermentioned special function blocks can be connected regardless of the system I/O.

2) FX2N-3A consums 5V DC by 30mA. The total 5V consumption of all special function blocks should be below the voltage source capacity of the system.

2. Installation notes and Usage

4.1 General and Environmental Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>General specifications (ex. withstand voltage)</th>
<th>Same as those for the main unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>Approx. 0.2kg (0.44lbs)</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm (inches)</td>
<td>35mm (1.38) x 35mm (1.38)</td>
</tr>
<tr>
<td>Terminals</td>
<td>M3 (0.12)</td>
<td>terminal screws</td>
</tr>
</tbody>
</table>

4.2 Performance Specifications

**Voltage input** and **Current output**

At shipment, 0 to 250 range selected for 0 to 10V DC input.

When using an FX2N-3A for current input or differing voltage inputs except 0 to 10V DC, it is necessary to readjust the offset and gain.

The module does not allow different input characteristics for two channels.

**Analog input range**

0 to 10V, 0 to 5V, 0 to 10V/0 to 250mA

**Digital resolution**

8 bits

**Smallest input signal resolution**

40mV: 0 to 10V/0 to 250mA (At shipment) |

Change depending on the input characteristic.

64µA: 4 to 20mA 0 to 250 Change depending on the input characteristic.

**Overall accuracy**

± 0.1V ± 0.16mA

**Processing time**

1.0 instruction processing time x 3

5. Allocation of Buffer Memories (BFM)

When the BFNM(E050E2) and BFNM(E064E2) are used with FX2N (V3.00 or more) or FX2NC (V3.00 or more), the allocation of the buffer memory (BFM) need not be considered.

<table>
<thead>
<tr>
<th>BFM No.</th>
<th>0</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>b15-b0</td>
<td>^b1</td>
<td>^b2</td>
<td>b2</td>
</tr>
</tbody>
</table>

6. Diagnostics

6.1 Preliminary Checks

a) Check whether the input/output wiring and/or expansion cables are properly connected.

b) Check that the system configuration rules for the host PLC have not been broken.

c) Ensure that the correct operating range has been selected for the application.

d) As the status of the PLC changes (RUN, STOP, etc.), the analog output status will change.

Status change of the host PLC:

- RUN = STOP: The last operational value used by the analog output channel during RUN operation is retained during STOP mode.
- STOP = RUN: The host PLC switches back into RUN mode after the analog output reacts as normal to the program controlled, digital values.

PLC power shutdown: The analog output signal ceases operation.

e) Remember that only 8 bit digital values (0 to 255) are valid for use with the analog output of the FX2N-3A.

* BFM 17:
  b0 = 0 analog input channel 1 is selected
  b0 = 1 analog input channel 2 is selected
  b1 = 1 = 0, the A/D conversion process is started
  b2 = 0, the D/A conversion process is started

* Note: These buffer memory devices are stored/located within the FX2N-3A.
3. Connection with PLC

1) Up to 4 FX-0N-3A units can connect to the FX in series PLC, up to 5 for FX in, up to 8 for FX in or, up to 4 for an FX in series PLC, all with powered extension units.

2) FX in: Main unit and powered extension units of 32 I/O points or less. Consumption current available for undermentioned special function blocks ≤ 100mA

FX in: Main unit and powered extension units of 48 I/O points or more. Consumption current available for undermentioned special function blocks ≤ 300mA

FX in: Up to 4 undermentioned special function blocks can be connected regardless of the system I/O.

FX in: Main unit and powered extension units. Up to 2 undermentioned special function blocks can be connected regardless of the system I/O.

Consumption current of 24V DC for one unit.

FX in-2AD 50mA
FX in-2DA 85mA
FX in-3A 90mA

The consumption current of the above units is to be supported from the power supply unit of the PLC.

2) FX in-3A consumes 5V DC by 30mA. The total 5V consumption of all special function blocks connected to either the FX in or FX in main unit or an FX in extension unit must not exceed the 5V voltage source capacity of the system.

3) The FX in-3A and main unit are connected by a cable on the right of the main unit.

4. Installation notes and Usage

4.1 General and Environmental Usage

- Voltages

- Analog specifications

- 24V DC with 10%, 90mA (internal power supply from main unit)

- Digital specifications

- 5V DC, 30mA (internal power supply from main unit)

- Isolation

- Photo/coupler isolation between analog and digital circuit.

- Number of occupied I/O points

- 8 I/O points from expansion bus (either input or output)

4.2 Performance Specifications

- Voltage input

- Current input

- Analog input range: 0 to 10V, 0 to 5V DC input. When using an FX in-3A for current input or differing voltage inputs except 0 to 10V DC, it is necessary to readjust the offset and gain. The module does not allow different input characteristics for two channels.

- Digital resolution

- 8 bits

- Smallest input signal resolution

- 40mV: 0 to 10V/0 to 250(At shipment)

- Change depending on the input characteristics.

- Overall accuracy

- ± 0.1V

- Processing time: TO instruction processing time x 3

5. Allocation of Buffer Memories (BFM)

When FFNC176RD (32A) and FFNC177W (32A) are used with FX in, FX in, FX in or FX in series of Programmable Controllers (Hereafter referred to as PLC),

- Digital output devices are 8-bit memories (BFM).

- Analog input devices are 8-bit memories (BFM).

- The allocation of buffer memories (BFM) need not be considered.

6. Diagnostics

6.1 Preliminary Checks

- Check whether the input/output wiring and/or expansion cables are properly connected.

- Check that the system configuration rules for the host PLC have not been broken.

- Ensure that the correct operating range has been selected for the application.

- As the status of the PLC changes (RUN → STOP, STOP → RUN, etc.), the analog output status will operate in the following manner.

- Status change of the host PLC:

  - RUN → STOP: The last operational value used by the analog output channel during RUN operation is retained during STOP mode.

  - STOP → RUN: Once the host PLC is switched back into RUN mode the analog output reacts as normal to the program controlled, digital values.

- PLC power shutoff: The analog output signal ceases operation.

- Remember that only 8-bit digital values (0 to 255) are valid for use with the analog output of the FX in-3A.
3. Connection with PLC

1) Up to 4 FX2N-3A units can connect to the FX3U series PLC, up to 5 for FX3U, up to 8 for FX1N or, up to 4 for an FXC1-series PLC, all with powered extension units.

2) FX2N Main unit and powered extension units of 0 I/O points or less. Consumption current available for undermentioned special function blocks is ≤100mA

3) FX2N Main unit and powered extension units of 48 I/O points or more. Consumption current available for undermentioned special function blocks is ≤300mA

The consumption current of the above units is to be subtracted from the spare power supply of the host PLC.

When using an FX0N-3A for current input or differing voltage inputs except 0 to 10V DC, it is necessary to readjust the offset and gain.

However the following limitation exists when the undermentioned special function blocks are connected.

4. Performance Specifications

Analog input range

<table>
<thead>
<tr>
<th>Voltage input</th>
<th>Current input</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10V DC</td>
<td>≤ 10mA</td>
</tr>
<tr>
<td>0 to 5V DC</td>
<td>≤ 5mA</td>
</tr>
</tbody>
</table>

Digital resolution

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 bits</td>
<td>8 bits</td>
</tr>
</tbody>
</table>

Smallest input signal resolution

40mA: 0 to 10V/0 to 250 (At shipment) Change depending on the input characteristic.
64mA: 4 to 20mA: 0 to 250 Change depending on the input characteristic.

Overall accuracy

± 0.1V

Processing time

TO instruction processing time x 3

The module does not allow different input characteristics for two channels.

4.1 General and Environmental Specifications

Item

<table>
<thead>
<tr>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>General specifications (ex. withstand voltage)</td>
</tr>
<tr>
<td>Withstand voltage</td>
</tr>
<tr>
<td>Analog circuit power requirement</td>
</tr>
<tr>
<td>Digital circuit power requirement</td>
</tr>
</tbody>
</table>

Isolation

Photo-coupler isolation between analog and digital circuit.

Number of occupied I/O points

8 I/O points from expansion bus. (Either input or output)

5. Allocation of Buffer Memories (BFM)

When FCN176(R3DA) and FCN177(W3RA) are used with FX3U,FX0N (V3.00 or more) or FX2NC (V3.00 or more), the allocation of the buffer memory (BFM) need not be considered.

6. Diagnostics

6.1 Preliminary Checks

a) Check whether the input/output wiring and/or expansion cables are properly connected.
b) Check that the system configuration rules for the host PLC have not been broken.
c) Ensure that the correct operating range has been selected for the application.
d) Check the voltage output of the analog output channel during RUN operation is held during STOP mode.

Status change of the host PLC:

- RUN → STOP: The last operational value used by the analog output channel during RUN operation is held during STOP mode.
- STOP → RUN: Once the host PLC is switched back into RUN mode the analog output reacts as normal to the program controlled, digital values.
- PLC power shutdown: The analog output signal ceases operation.

e) Remember that only 8 bit digital values (0 to 255) are valid for use with the analog output of the FX2N-3A.
7. Method of Calibration (D/A)

Use the following program and the appropriate wiring configuration to calibrate the output channel of the FX3W-3A.

8. Program example

8.1 Using Analog Inputs

The buffer memories (BFM) of the FX3W-3A are written TO or read FROM by the host PLC. The following program reads the analog input from channel 1 of the FX3W-3A when M0 is ON, and the analog input data of channel 2 when M1 is ON.

The time TAD required to read an analog input channel is calculated as follows:

TAD = (TO instruction processing time) x 3

Note: The 3 (TO) instruction format shown above should always be used when reading data from the FX3W-3A's analog input channels.

Guidelines for the safety of the user and protection of the FX3W-3A Special function block:

- This manual has been written to be used by trained and competent personnel. This is defined by the European directives for machinery and EMC.
- In doubt as to its suitability for your specific application.
- Mitsubishi Electric will accept no responsibility for any consequential damage that may arise as a result of the installation or use of this equipment.
- Owing to the very great variety in possible application of this equipment, you must satisfy yourself as to its suitability for your specific application.

Specifications are subject to change without notice.
7.1 Change in input/output characteristic

At shipment, 0 to 250 range selected for 0 to 10V DC input/output.

When using an FX-3A for current input/output or differing voltage input/output, it is necessary to readjust the offset and gain. The module does not allow different input characteristics for two channels.

Range of allowance of input/output characteristic

<table>
<thead>
<tr>
<th>Voltage input (0 to 10V DC)</th>
<th>Current input (0 to 4mA)</th>
<th>Voltage output (0V to 4V)</th>
<th>Current output (20mA to 4mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10V</td>
<td>0 to 4mA</td>
<td>0V</td>
<td>4V</td>
</tr>
<tr>
<td>Analog value when digital value is 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog value when digital value is 250</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resolution changes depending on the setting when the input/output characteristic is selected. Example: Resolution becomes (5 to 0V)/250=(0.002V) at voltage input 0 to 5V to 250.

Overall accuracy does not change. (Voltage input: 0.1% Current input: ±0.1mA)

7.2 Method of Calibration (A/D)

Both analog input channels share the "same" setup and configuration. Hence only one channel needs to be selected to perform the calibration for both analog input channels.

Use the following program and the appropriate wiring configuration to calibrate input channel 1 (and indirectly channel 2) of the FX-3A.

Gain calibration value 10.000V 5.000V 20.000mA

7.3 Method of Calibration (D/A)

Use the following program and the appropriate wiring configuration to calibrate the output channel of the FX-3A.

Gain calibration value 10.000V 5.000V 20.000mA

8. Program example

8.1 Using Analog Inputs

The buffer memories (BFM) of the FX-3A are written TO or read FROM by the host PLC. The following program reads the analog input from channel 1 of the FX-3A when M0 is ON, and the analog input data of channel 2 when M1 is ON.

Gain calibration value 10.000V 5.000V 20.000mA

The time TAD required to read an analog input channel is calculated as follows:

TAD = (TO instruction processing time) + 2 x (FROM instruction processing time)

Note: The 3 (TO) instruction format shown above should always be used when reading data from the FX-3A's analog input channels.

8.2 Using Analog Outputs

The buffer memories (BFM) of the FX-3A are written TO, or read FROM by the host PLC. In the following program, when M0 is turned ON the D/A conversion process is executed and an analog signal equivalent to the digital value stored in this example, is output to register D00.

The contents of D00 are written to BFM16. This will be converted to an analog output (H00) and written to BFM17 to start the D/A conversion process.

8.3 Using FX1N, FX3N (V3.00 or more) or FX3NC (V3.00 or more) Series PLC's

Please use FNC 176 (0DA) and FNC 177 (WPSA) refer to FX series Programming Manual I for guidance.
7. Change and adjustment method of input/output characteristic

7.1 Change in input/output characteristic

At shipment, 0 to 250 range selected for 0 to 10V DC input/output. When using an FX-3A for current input/output or differing voltage input/output except 0 to 10V DC, it is necessary to readjust the offset and gain. The module does not allow different input characteristics for two channels.

7.2 Method of Calibration(A/D)

Both analog input channels share the same "set up" and configuration. Hence only one channel needs to be selected to perform the calibration for both analog input channels.

Use the following program and the appropriate wiring configuration to calibrate input channel 1 (and indirectly channel 2) of the FX-3A.

7.3 Method of Calibration(D/A)

Use the following program and the appropriate wiring configuration to calibrate the output channel of the FX-3A.

Resolution changes depending on the set value when the input/output characteristic is changed:

Example: Resolution becomes (5 to 0V)/250mV at voltage input 0 to 5V/0 to 250.

Overall accuracy does not change. (Voltage input 0.1V, Current input: 0.16mA)

± Offset calibration value 0.040V 0.020V 4.064mA

Gain calibration value 10.000V 5.000V 20.000mA

7.3.1 Output Calibration Program

Voltage input channel 1 (when M1 is ON) the D/A conversion process is executed and an analog signal equivalent to the digital value stored in this example, is output to register D02.

The contents of D2 are written to BFM#16. This will be converted to 0-5V DC.

7.3.2 Calibrating the Offset

1) Run the previously detailed program. Ensure X00 is ON and X01 is OFF.
2) Adjust the D/A OFFSET potentiometer (‘pot’) until the selected meter displays the appropriate offset voltage/current (in accordance with the analog operation range selected, see table below).

Note: Turn the ‘pot’ clockwise and the analog output signal will increase. The ‘pot’ requires 18 revolutions to move between the minimum and maximum settings.

Analog input range
0-10V DC
0-5V DC
4-20mA DC
Offset calibration value
0.040V
0.020V
4.064mA

7.3.3 Calibrating the Gain

1) Run the previously detailed program. Ensure X00 is OFF and X01 is ON.
2) Adjust the D/A GAIN potentiometer (‘pot’) until selected meter displays the appropriate gain voltage/current (in accordance with the analog operation range selected, see table below).

Note: Turn the ‘pot’ clockwise and the analog output signal will increase. The ‘pot’ requires 18 revolutions to move between the minimum and maximum settings.

Analog input range
0-10V DC
0-5V DC
4-20mA DC
Gain calibration value
10.000V
5.000V
20.000mA

8. Program example

8.1 Using Analog Inputs

The buffer memories (BFM) of the FX-3A are written TO or read FROM by the host PLC. In the following program, when M0 is turned ON the D/A conversion process is executed and an analog signal equivalent to the digital value stored in this example, is output to register D02.

The contents of D2 are written to BFM#16. This will be converted to 0-5V DC.

The time TAO required to read an analog input channel is calculated as follows:

TAO = (TD instruction processing time) x 2 + (FROM instruction processing time)

Note: The 3 (TO) instruction format shown above should always be used when reading data from the FX-3A’s analog output channels.

Guidelines for the safety of the user and protection of the FX-3A Special function block

• This manual has been written to be used by trained and competent personnel. This is defined by the European directives for machinery and EMC.
• If in doubt at any stage during the installation of the FX-3A always consult a professional electrical engineer who is qualified and trained to the local and national standards. If in doubt about the operation or use of the FX-3A please consult the nearest Mitsubishi Electric distributor.
• Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
• All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to give instruction. Mitsubishi Electric will accept no responsibility for actual use of the product based on illustrative examples.
• Owing to the very great variety in possible application of this equipment, you must satisfy yourself as to its suitability for your specific application.
**3. Connection with PLC**

1. Up to 4 FX0n-3A units can connect to the FXon series PLC, up to 5 for FXn or up to 4 for an FXnc series PLC, all with powered extension units. However, the following limitation exists when the undermentioned special function blocks are connected.

2. FXn:
   - Main unit and powered extension units of 32 I/O points or less. Consumption current available for undermentioned special function blocks ≤ 100mA
   - Main unit and powered extension units of 48 I/O points or more. Consumption current available for undermentioned special function blocks ≤ 300mA

3. FXnc:
   - Up to 4 undermentioned special function blocks can be connected regardless of the system I/O.
   - Main unit and powered extension units. Up to 2 undermentioned special function blocks can be connected regardless of the system I/O.

**4. Installation notes and Usage**

**4.1 General and Environmental Usage**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>General specifications (ex. withstand voltage)</td>
<td>Same as those for the main unit</td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>500V AC 50Hz for 1 minute (between ground and all other terminals)</td>
</tr>
<tr>
<td>Analog circuit power requirement</td>
<td>24V DC +/- 10%, 90mA (internal power supply from main unit)</td>
</tr>
<tr>
<td>Digital circuit power requirement</td>
<td>5V DC, 30mA (internal power supply from main unit)</td>
</tr>
<tr>
<td>Isolation</td>
<td>Photo-coupler isolation between analog and digital circuit. No isolation between analog channels.</td>
</tr>
<tr>
<td>Number of occupied I/O points</td>
<td>8 I/O points from expansion bus. (either input or output)</td>
</tr>
</tbody>
</table>

**4.2 Performance Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Voltage input</th>
<th>Current input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input range</td>
<td>At shipment, 0 to 250 range selected for 0 to 10V DC input. When using an FXp3A for current input or differing voltage inputs except 0 to 10V DC, it is necessary to readjust the offset and gain. The module does not allow different input characteristics for two channels.</td>
<td></td>
</tr>
<tr>
<td>Analog input range</td>
<td>0 to ±10V or 0 to 5V DC, resistance 200kΩ. Warning: this unit may be damaged by input voltages in excess of -0.9V, +15V.</td>
<td></td>
</tr>
<tr>
<td>Digital resolution</td>
<td>8 bits</td>
<td></td>
</tr>
<tr>
<td>Smallest input signal resolution</td>
<td>40mV: 0 to 10V/0 to 250A (at shipment) Change depending on the input characteristic.</td>
<td></td>
</tr>
<tr>
<td>Overall accuracy</td>
<td>± 0.1V</td>
<td></td>
</tr>
<tr>
<td>Processing time</td>
<td>TO instruction processing time x 2 + FRDM instruction processing time</td>
<td></td>
</tr>
</tbody>
</table>

**5. Allocation of Buffer Memories (BFM)**

When FCN176(R3A5) and FCN177(WR3A) are used with FXon series (V3.00 or more) or FXnc series (V3.00 or more), the allocation of the buffer memory (BFM) need not be considered.

<table>
<thead>
<tr>
<th>BFM No.</th>
<th>b1b0</th>
<th>b1b0</th>
<th>b1b0</th>
<th>b1b0</th>
<th>b1b0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
<td>Current input data (stored in 8 bits) of the A/D channel selected by 0 or 1 of BFM17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Reserved</td>
<td>Current output data on D/A channel (stored in 8 bits)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Reserved</td>
<td>D/A start</td>
<td>A/D start</td>
<td>A/D channel</td>
<td></td>
</tr>
<tr>
<td>1-5, 10-31</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **BFM 17**:
  - b0 = 0 analog input channel 1 is selected
  - b0 = 1 analog input channel 2 is selected
  - b1 = 0 analog input channel 3 is selected
  - b1 = 1 analog input channel 4 is selected
  - 0, the A/D conversion process is started
  - 1, the A/D conversion process is started
- **Note**: These buffer memory devices are stored/located within the FX0n-3A.

**6. Diagnostics**

**6.1 Preliminary Checks**

a) Check whether the input/output wiring and/or expansion cables are properly connected.

b) Check that the system configuration rules for the host PLC have not been broken.

c) Ensure that the correct operating range has been selected for the application.

d) As the status of the PLC changes (RUN ⇒ STOP, STOP ⇒ RUN, etc.), the analog output status will operate in the following manner.

- **Status change of the host PLC**:
  - RUN ⇒ STOP: The last operational value used by the analog output channel during RUN operation is retained during STOP mode.
  - STOP ⇒ RUN: Once the host PLC is switched back into RUN mode the analog output reacts as normal to the program controlled, digital values.

- **PLC power shutdown**: The analog output signal ceases operation.

e) Remember that only 8 bit digital values (0 to 255) are valid for use with the analog output of the FX0n-3A.
7 Change in input/output characteristic

At shipment, 0 to 250 range selected for 0 to 10V DC input/output. When using an FX2N-3A for current input/output or differing voltage input/output except 0 to 10V DC, it is necessary to readjust the offset and gain. The module does not allow different input characteristics for two channels. Set analog values from 0 to 250 digital equivalent within the range specified in the table below when changing the input/output characteristic.

Range of allowance of input/output characteristic

<table>
<thead>
<tr>
<th>Voltage input</th>
<th>Current input</th>
<th>Voltage output</th>
<th>Current output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1V</td>
<td>0 to 4mA</td>
<td>0V</td>
<td>4mA</td>
</tr>
<tr>
<td>5 to 10V</td>
<td>20mA</td>
<td>5 to 20V</td>
<td>20mA</td>
</tr>
</tbody>
</table>

Resolution changes depending on the setting when the input/output characteristic is changed. Example: Resolution becomes (5 to 0V)/250=20mV at voltage input 0 to 5V/0 to 250. Overall accuracy does not change. (Voltage input: 3.1V, Current input: 3.16mA)

7.2 Method of Calibration (A/D)

Both analog input channels share the same setup and configuration. Hence only one channel needs to be selected to perform the calibration for both analog input channels. Use the following program and the appropriate wiring configuration to calibrate the output channel of the FX2N-3A.

Gain calibration meter value 10.000V 5.000V 20.000mA

7.3 Method of Calibration (D/A)

Use the following program and the appropriate wiring configuration to calibrate the output channel of the FX2N-3A.

Gain calibration meter value 10.000V 5.000V 20.000mA

7.4 Using Analog Outputs

The buffer memories (BFM) of the FX2N-3A are written TO, or read FROM by the host PLC. In the following program, when M0 is turned ON the D/A conversion process is executed and an analog signal equivalent to the digital value stored in this example, is output to register D02 TO channel 1 (H04).

The contents of D2 are written to BFM16. This will be converted to an analog output (H04) is written to BFM17 to start the D/A conversion process.

The time TAO required to write an analog input channel is calculated as follows: TAO = (TO instruction processing time) + 3

Note: The 3 (TO) instruction format shown above should always be used when writing data to the FX2N-3A’s analog output channel.

Details on both the FROM and TO instructions (functions 78 and 79 respectively) can be found in the "FX series Programming Manual (I)".

8 Program example

8.1 Using Analog Inputs

The buffer memories (BFM) of the FX2N-3A are written TO or read FROM by the host PLC. In the following program reads the analog input from channel 1 of the FX2N-3A when M0 is ON, and the analog input data of channel 2 when M1 is ON.

Gain calibration value 10.000V 5.000V 20.000mA

Gain calibration value 10.000V 5.000V 20.000mA

Gain calibration value 10.000V 5.000V 20.000mA

Gain calibration value 10.000V 5.000V 20.000mA