MITSUBISHI ELECTRIC

PROGRAMMABLE CONTROLLERS
MELSEC-F

FX2N
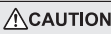
FX2N-20GM

USER'S GUIDE

JY992D77601H

This manual only describes the specifications for FX2N-20GM positioning controller.
For complete operation, wiring, mounting and programming instructions please refer to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL, FX PROGRAMMING MANUAL and FX SERIES HARDWARE MANUAL.
These manuals should be read and understood before attempting to install or use the unit.
And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

Safety Precaution (Read these precautions before use.)

This manual classifies the safety precautions into two categories: ⚠WARNING and ⚠CAUTION .

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Depending on the circumstances, procedures indicated by ⚠CAUTION may also cause severe injury.
It is important to follow all precautions for personal safety

DESIGN PRECAUTIONS	⚠WARNING

- Install a safety circuit outside the PLC so that the entire system conservatively operates even if an abnormality occurs in the external power supply or a failure occurs in the PLC.
  If the safety circuit is installed inside the PLC, malfunction and erroneous output may cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS	⚠WARNING

- Do not touch any terminal while the FX2N-20GM positioning controller's power is on.
  Doing so may cause electric shock or malfunctions.

- Before cleaning or retightening terminals externally cut off all phases of the power supply.
  Failure to do so may cause electric shock.

- Use the battery for memory backup correctly in conformance to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL.

  - Use the battery only for the specified purpose.

  - Connect the battery correctly.

  - Do not charge, disassemble, heat, put in fire, short-circuit, connect reversely, weld, swallow or burn the battery, or apply excessive forces (vibration, impact, drop, etc.) to the battery.

  - Do not store or use the battery at high temperatures or expose to direct sunlight.

  - Do not expose to water, bring near fire or touch liquid leakage or other contents directly.

  - Incorrect handling of the battery may cause heat excessive generation, bursting, ignition, liquid leakage or deformation, and lead to injury, fire or failures and malfunctions of facilities and other equipment.

- Thoroughly read the manual, sufficiently confirming safety, then perform returning to the zero point in the MANU/AUTO mode, jog operation, step operation or automatic operation.
  An operation error may damage the machinery or cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS	⚠ CAUTION

- Turn off the power to the FX2N-20GM positioning controller before attaching or detaching the memory board. If the memory board is attached or detached while the FX2N-20GM positioning controller's power is on, the data in the memory may be destroyed, or the memory board may be damaged.

- Do not disassemble or modify the FX2N-20GM positioning controller.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric distributor.

- Turn off the power to the FX2N-20GM positioning controller before connecting or disconnecting any extension cable.
  Failure to do so may cause equipment failures or malfunctions.

- Turn off the power to the FX2N-20GM positioning controller before attaching or detaching the following devices.
  Failure to do so may cause equipment failures or malfunctions.

    - Peripheral devices, extension blocks, FX Series terminal blocks, Battery and memory board

DISPOSAL PRECAUTIONS	⚠ CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.
  When disposing of batteries, separate them from other waste according to local regulations.
  (For details of the Battery Directive in EU countries, refer to FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL)

TRANSPORT AND STORAGE PRECAUTIONS	⚠ CAUTION

- When transporting the FX2N-20GM positioning controller incorporating the optional battery, turn on the FX2N-20GM positioning controller before shipment, the BATT LED is OFF, and check the battery life.
  If the FX2N-20GM positioning controller is transported with the BATT LED on or the battery exhausted, the battery-backed data may be unstable during transportation.

- FX2N-20GM positioning controller is a precision instrument. During transportation, avoid impacts larger than those specified in Section 5.2. Failure to do so may cause failures in the FX2N-20GM positioning controller.
  After transportation, verify the operations of the FX2N-20GM positioning controller.

- When transporting lithium batteries, follow required transportation regulations.(For details of the regulated products, refer to FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL)

1. Reference manual

Refer to the under mentioned manual for details about product installation, operation and programming.

1) FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL
   The installation, wiring and the instructions of the FX2N-10GM and FX2N-20GM units are explained.

2) E-20TP OPERATION MANUAL
   The operation of the input of the program which uses E-20TP and the monitor and the test is explained.

3) FX-PCS-VPS/WIN-E SOFTWARE MANUAL
   The operation program is input using the FX-PCS-VPS/WIN-E software. This manual explains the operation of the monitor and test functions.

4) FX-PCS-KIT-GM-EE SOFTWARE MANUAL
   The program is input via the FX-PCS-KIT-GM-EE. The manual explains the operation of the monitor and test functions.
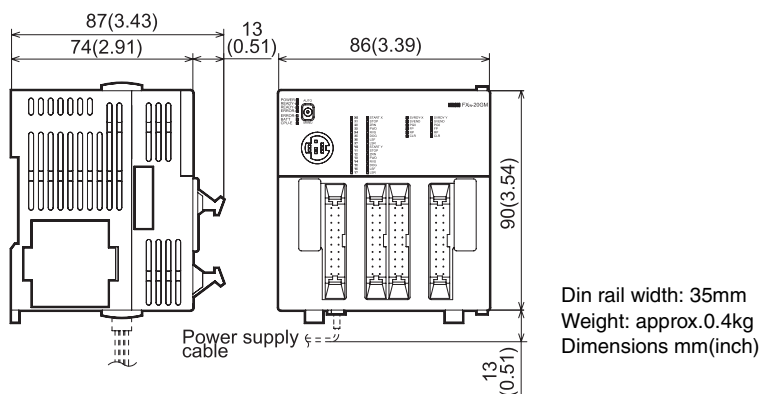
   The manual in 1) is not included with the product. Please request from the shop where the unit was purchased if required.
   The manuals in 2) and 3) and 4) are included with the product.

2. Outline of the unit

The FX2N-20GM positioning controller (hereinafter call FX2N-20GM or 20GM) is a pulse chain output unit that enables the positioning control of a stepping motor or a servo motor via the drive unit.

- One FX2N-20GM can control 2 axes. (Linear interpolation and circular interpolation are available.)

- Both dedicated positioning language (cod instructions) and sequence language (basic instructions and application instructions) are available.

- A pulse generator can be connected to each axis or one pulse generator can be connected to both axes and switched as required. The manual pulse generators must be an open collector output type.

- The zero return operation at each start can be omitted with a servo amplifier with the absolute position (ABS) detection function.

- The FX2N-20GM can be used alone.
  When an FX2N-20GM is connected with an FX2N/FX2NC/FX3U/FX3UC series Programmable controller (hereafter call PLC), reading and writing the positioning data can be done.
  When connecting to an FX2NC PLC, the FX2NC-CNV-IF must be used.
  When connecting to an FX3UC PLC, the FX2NC-CNV-IF or FX3UC-1PS-5V must be used.
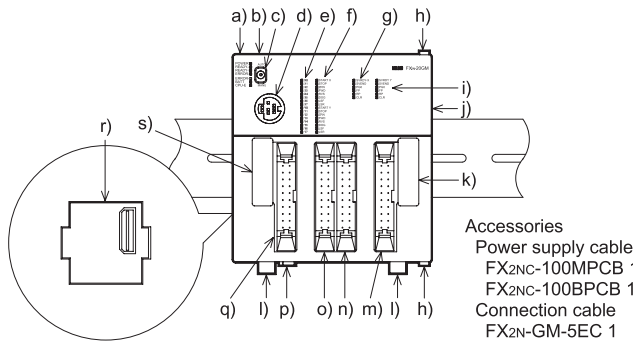
3. External dimensions

Din rail width: 35mm
Weight: approx.0.4kg
Dimensions mm(inch)

4. Product composition

4.1 Each part name

The name and description of each part of the FX2N-20GM are explained below.

Accessories
Power supply cable
FX2NC-100MPCB 1
FX2NC-100BPCB 1
Connection cable
FX2N-GM-5EC 1

a) Battery
b) Operation indicator LED
c) MANU/AUTO switch
d) Connector for programming tool
e) General-purpose I/O display
f) Display for equipment inputs
g) x axis status display
h) Lock to fix extension block of FX2N-20GM
i) y axis status display
j) Connector for FX2N-20GM extension block

k) Connector for PLC extension block
l) Hook for DIN rail installation
m) Connector for y axis motor amplifier: CON4
n) Connector for x axis motor amplifier: CON3
o) Connector for input equipment: CON2
p) Connector for power supply
q) Connector for general-purpose I/O: CON1
r) Connector for memory board
s) Connector for PLC

4.2 Operation display

The state of FX2N-20GM is displayed by LED.

Name of LED	Content
POWER	LED lights when power is supplied. If LED is not lit, check power supply voltage and current.
READY-X	LED lights when accepting an x-axis instruction. During pulse output or when an error occurs, the LED is off.
READY-Y	LED lights when accepting a y-axis drive instruction. During pulse output or when an error occurs, the LED is off.
ERROR-X	LED is lit or blinks when an error occurs in the positioning drive of x axis.
ERROR-Y	LED is lit or blinks when an error occurs in the positioning drive of y axis.
BATT	LED lights when the buttery voltage drops. (Turn Power Supply On)
CPU-E	CPU error. Incompatible system configuration, excess noise, etc.

4.3 I/O connector

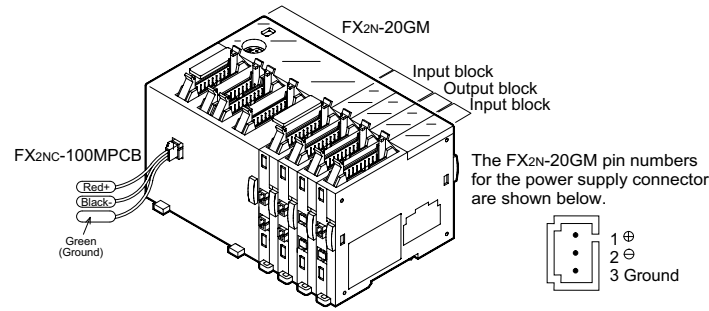The pin array of the I/O connector is as follows.

All terminals with identical names are shorted internally (Ex. COM1-COM1, VIN-VIN, etc.).
Do not wire "•" terminals.
Refer to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL for wiring information.

4.4 Power supply connector

The power to the FX2N-20GM is supplied with the special power supply cable attached to the product. The ground of the FX2N-20GM and the servo amplifier is a common ground. Refer to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL for detailed wiring instructions.
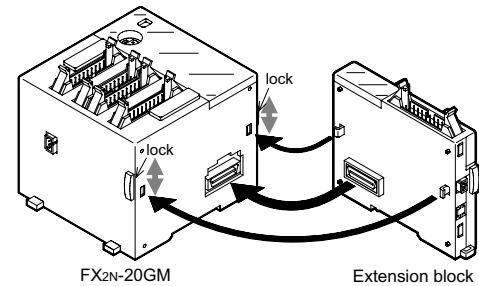
FX2N-20GM

Input block
Output block
Input block

FX2NC-100MPCB

Red+
Black-

Green
(Ground)

The FX2N-20GM pin numbers for the power supply connector are shown below.

1 ⊕
2 ⊖
3 Ground

Install a safety circuit outside of FX2N-20GM so that the entire system may work safety when the external power supply fails.

4.5 I/O extension connector

The FX2N-20GM can connect the following extension block.

1) FX2NC series extension block
   - FX2NC-16EX-DS   - FX2NC-16EYT-DSS   - FX2NC-32EX-DS   - FX2NC-32EYT-DSS
   - FX2NC-16EX-T-DS   - FX2NC-16EX-D/UL   - FX2NC-16EYT-D/UL
   - FX2NC-32EX-D/UL   - FX2NC-32EYT-D/UL

2) FX2N series extension block (FX2NC-CNV-IF needs to be used)
   - FX2N-16EX-ES/UL   - FX2N-16EYT-ESS/UL

The increase point is 48 points or less. Assume the turning on rate to be 50% or less simultaneously. 48 points may be added to the system if 50% or less are used simultaneously.
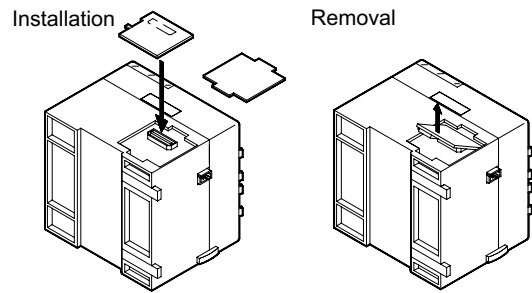
lock

lock

FX2N-20GM

Extension block

1. Detach the extension cover on the right side of the FX2N-20GM.

2. Insert the hooks of the extension blocks into the lock holes, and gently press the units together.

3. lower the lock to fix the units in place.

4. Attach other extension blocks in the same manner.

4.6 Connection with PLC

Refer to the FX2N-10GM and the FX2N-20GM HARDWARE PROGRAMMING MANUAL for details concerning the system configuration.

4.7 Detaching the memory board

7.8k step of RAM is built into the FX2N-20GM. In addition, the optional memory board (FX2NC-EEPROM-16) can be used. (Program capacity is 7.8k steps)

Installation   Removal

1) Turn off the power supply to the FX2N-20GM.

2) Remove the cover of the memory board.

3) Install the memory board in the connector.

4) Replace the cover before turning on the power supply.

5) When detaching the memory board, begin by carefully detaching it from the bottom side.

4.8 Procedure of battery exchange

1) The power supply of FX2N-20GM is turned off.

2) Remove side cover from the FX2N-20GM.

3) Remove battery from holder-disconnect and replace. (This must be carried out within 30 sec if the current data held in the FX2N-20GM's RAM is to be saved.)

4) Refit battery and cover.

FX2NC-32BL
lithium battery

5. Specification

5.1 Power supply specification

Item	Contents
Power supply	24V DC +10%, -15%
Allowance power failure time	The operation is continued to the momentary power failure is 5ms or less.
Power consumption	10W
Fuse	125V 1A

5.2 General specification

Item	Contents
Ambient temperature	0 to 55°C (operation). -20 to 70°C (storage).
Surrounding humidity	35 to 85% (No condensation) ..... operation
Vibration resistance	Frequency 10 to 57Hz: Half 0.035mm amplitude, Frequency 57 to 150Hz: 4.9 m/s² Acceleration Sweep count for X,Y, Z: 10 times (80 min in each direction).
Shock resistance	147m/s² acceleration, Action time: 11ms. 3 times in each direction X, Y, Z.
Noise immunity	1,000Vp-p, 1μs. 30 to 100Hz, tested by noise simulator.
Dielectric withstand voltage	500V AC > 1 min, tested between all points, terminal and ground.
Insulation resistance	5MΩ > 500V DC, tested between all points, terminal and ground
Ground	Class D grounding (100Ω or less)
Use atmosphere	Ambient conditions to be free of corrosive gases. Dust should be minimal.
Working altitude	<2000m*1

*1 Do not use the PLC under pressure higher than the atmospheric pressure. Doing so may damage the PLC.

5.3 Performance specification

Item	Contents
Number of control axes	Two axes (two axes or two independent axes simultaneously)
Interpolation function	There is a straight line interpolation and a circular arc interpolation (two axes simultaneously).
Applicable PLC	Bus connection with FX2N/FX2NC/FX3U/FX3UC series PLC. The number of I/O points occoupied is 8 points. When connecting to an FX2NC PLC, the FX2NC-CNV-IF must be used. When connecting to an FX3UC PLC, the FX2NC-CNV-IF or FX3UC-1PS-5V must be used.
Program memory	Built-in RAM, FX2NC-EEPROM-16 (optional memory board): 7.8k steps. Memory board with clock function cannot be used.
Battery	Built-in FX2NC-32BL type lithium battery. Longevity: about three years.
Positioning unit	Command units: mm, deg, inch, pls, (relativity/absolutely) Max command value ± 999,999 (32 bits when indirectly specifying)
Accumulation address	-2,147,483,648 to 2,147,483,647pulses
Speed instruction	200kHz max., 153,000cm/min (200kHz or less). Automatic trapezoidal pattern acceleration/deceleration (The interpolation drive is 100kHz or less).
Zero return	Manual operation or automatic operation. The DOG type machine zero return (The DOG search function is provided). An automatic electric zero return is possible by the electric starting point setting.
Absolute position detection	The absolute position detection is possible with MR-J2(S), MR-H, MR-J3 and the MR-J4 type servo motors with the ABS detection function.
Control inputs	Operation system: FWD (manual forwarding), RVS (manual reversal) ZRN (machine zero return), START (automatic start), STOP, Manual pulse generator (2kHz max), Single-step operation input (Depends upon the parameter setting). Mechanical system: DOG (near-point signal), LSF (forward rotation limit), LSR (reverse rotation limit), Interrupt: 4 points Servo system: SVRDY (servo ready), SVEND (servo end), PG0 (zero-point signal)
	General purpose: The main body has X0 to X7. X10 to X67 can be input by using the extension block. (max I/O point: 48 points)
Control outputs	Servo system: FP (forward rotation pulse). RP (reverse rotation pulse), CLR (counter clear).
	General purpose: The main body has Y0 to Y7. Y10 to Y67 can be output by using the extension block. (max I/O point: 48 points)

5.4 Input specifications

Item		Input from general-purpose equipment	Input from drive unit
Input sig-nal name	Group 1	START, STOP, ZRN, FWD, RVS, LSF, LSR	SVRDY, SVEND
	Group 2	DOG	PG0
	Group 3	General-purpose input X00 to X07	-
	Group 4	Manual pulse generator, interruption input	-
Circuit insulation		By photocoupler	By photocoupler
Operation indication		LED is lit while input is ON	LED is lit while input is ON
Signal voltage		24V DC ± 10% (internal power supply)	5 to 24V DC ± 10%
Input current		7mA/24V DC	7mA/24V DC (PG0 11.5mA/24V DC)
Input ON current		4.5mA or more	0.7mA or more (PG0 1.5mA or more)
Input OFF current		1.5mA or less	0.3mA or less (PG0 0.5mA or less)
Signal format		Contact input or NPN open collector transistor input.	
Response-time	Group 1	Approx. 3msec	Approx. 3msec
	Group 2	Approx. 0.5msec	Approx. 16μs
	Group 3	Approx. 3msec[1]	-
	Group 4	Approx. 0.1ms[1]	-
Turning ON rate of I/O simultaneously		50% or less	

[1]: The selection of general purpose inputs, manual pulse generator inputs or interrupt inputs in the parameter settings automatically adjusts the input filters.

5.5 Output specification

Item	General-purpose output	Output to drive unit
Signal name	Y00 to Y07	FP, RP, CLR
Circuit isolation	By photocoupler	By photocoupler
Operation indication	LED is lit while output is ON	LED is lit while output is ON
External power sup-ply	5 to 24V DC ± 10%	5 to 24V DC ± 10%
Load current	50mA or less	20mA or less
Open circuit leak cur-rent	0.1mA/24V DC or less	0.1mA/24V DC or less
Output ON voltage	0.5V max	0.5V max (CLR is 1.5V max.)
Response time	0.2ms max. for both OFF → ON and ON → OFF.	Pulse output FP RP is 200kHz max. Pulse output width of the CLR signal: Approx. 20msec.
Turning ON rate of I/O simultaneously	50% or less	

Warranty
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

MITSUBISHI ELECTRIC CORPORATION
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JY992D77601H

Effective April 2015
Specifications are subject to change without notice.

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MELSEC-F

FX2N

FX2N-20GM

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- Turn off the power to the FX2N-20GM positioning controller before attaching or detaching the following devices.
  Failure to do so may cause equipment failures or malfunctions.
  - Peripheral devices, extension blocks, FX Series terminal blocks, Battery and memory board

DISPOSAL PRECAUTIONS ⚠CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.
  When disposing of batteries, separate them from other waste according to local regulations.
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TRANSPORT AND STORAGE PRECAUTIONS ⚠CAUTION

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  After transportation, verify the operations of the FX2N-20GM positioning controller.
- When transporting lithium batteries, follow required transportation regulations.(For details of the regulated products, refer to FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL)

1. Reference manual

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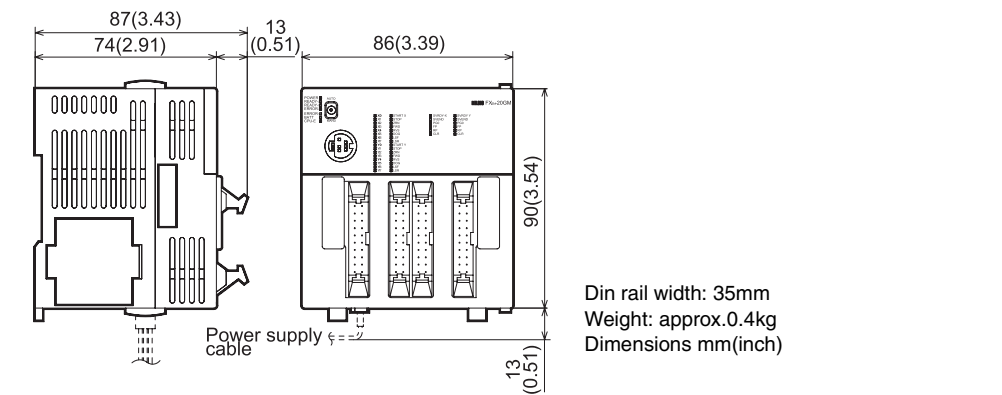
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   The operation of the input of the program which uses E-20TP and the monitor and the test is explained.

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4) FX-PCS-KIT-GM-EE SOFTWARE MANUAL
   The program is input via the FX-PCS-KIT-GM-EE. The manual explains the operation of the monitor and test functions.

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2. Outline of the unit

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- One FX2N-20GM can control 2 axes. (Linear interpolation and circular interpolation are available.)
- Both dedicated positioning language (cod instructions) and sequence language (basic instructions and application instructions) are available.
- A pulse generator can be connected to each axis or one pulse generator can be connected to both axes and switched as required. The manual pulse generators must be an open collector output type.
- The zero return operation at each start can be omitted with a servo amplifier with the absolute position (ABS) detection function.
- The FX2N-20GM can be used alone.
  When an FX2N-20GM is connected with an FX2N/FX2NC/FX3U/FX3UC series Programmable controller (hereafter call PLC), reading and writing the positioning data can be done.
  When connecting to an FX2NC PLC, the FX2NC-CNV-IF must be used.
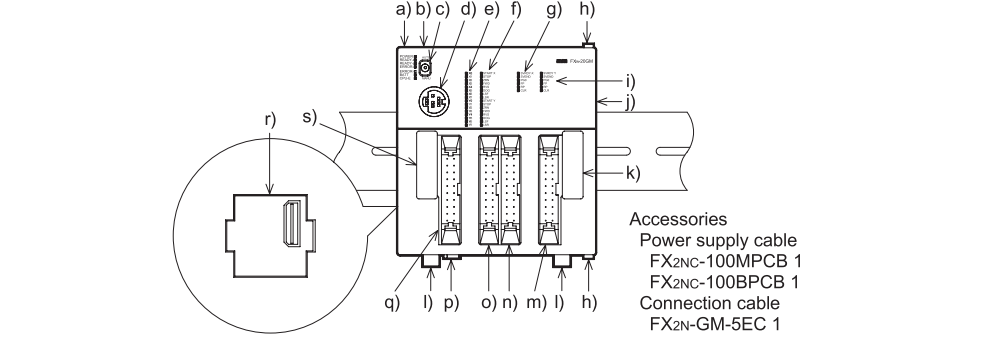 When connecting to an FX3UC PLC, the FX2NC-CNV-IF or FX3UC-1PS-5V must be used.

3. External dimensions

87(3.43)
74(2.91)
13 (0.51)
86(3.39)
90(3.54)
13 (0.51)

Power supply cable

Din rail width: 35mm
Weight: approx.0.4kg
Dimensions mm(inch)

4. Product composition

4.1 Each part name

The name and description of each part of the FX2N-20GM are explained below.

a) b) c) d) e) f) g) h)
i)
j)
k)
r) s)
q) l) p) o) n) m) l) h)

Accessories
Power supply cable
FX2NC-100MPCB 1
FX2NC-100BPCB 1
Connection cable
FX2N-GM-5EC 1

a) Battery
b) Operation indicator LED
c) MANU/AUTO switch
d) Connector for programming tool
e) General-purpose I/O display
f) Display for equipment inputs
g) x axis status display
h) Lock to fix extension block of FX2N-20GM
i) y axis status display
j) Connector for FX2N-20GM extension block

k) Connector for PLC extension block
l) Hook for DIN rail installation
m) Connector for y axis motor amplifier: CON4
n) Connector for x axis motor amplifier: CON3
o) Connector for input equipment: CON2
p) Connector for power supply
q) Connector for general-purpose I/O: CON1
r) Connector for memory board
s) Connector for PLC

4.2 Operation display

The state of FX2N-20GM is displayed by LED.

Name of LED	Content
POWER	LED lights when power is supplied. If LED is not lit, check power supply voltage and current.
READY-X	LED lights when accepting an x-axis instruction. During pulse output or when an error occurs, the LED is off.
READY-Y	LED lights when accepting a y-axis drive instruction. During pulse output or when an error occurs, the LED is off.
ERROR-X	LED is lit or blinks when an error occurs in the positioning drive of x axis.
ERROR-Y	LED is lit or blinks when an error occurs in the positioning drive of y axis.
BATT	LED lights when the buttery voltage drops. (Turn Power Supply On)
CPU-E	CPU error. Incompatible system configuration, excess noise, etc.

4.3 I/O connector

The pin array of the I/O connector is as follows.

CON1
Y00 X00
Y01 X01
Y02 X02
Y03 X03
Y04 X04
Y05 X05
Y06 X06
Y07 X07
COM1 COM1

CON2
Y(axis) X(axis)
START START
STOP STOP
ZRN ZRN
FWD FWD
RVS RVS
DOG DOG
LSF LSF
LSR LSR
COM1 COM1

CON3
X(axis)
SVRDY
COM2
COM3
·
FP RP
VIN
VIN
COM5
ST1

CON4
X(axis) Y(axis)
SVRDY SVEND
COM2 COM6
PG0 CLR
COM4 COM7
· ·
FP RP FP RP
VIN VIN
VIN VIN
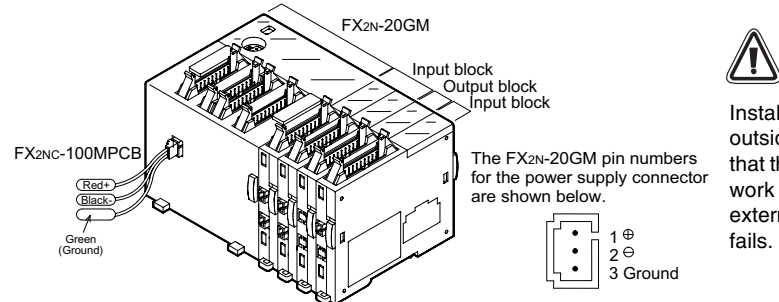COM5 COM9
ST2 ST3

SVEND
COM6
PG0
COM8
·
RP
VIN
VIN
COM9
ST4

All terminals with identical names are shorted internally (Ex. COM1-COM1, VIN-VIN, etc.).
Do not wire "•" terminals.
Refer to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL for wiring information.

4.4 Power supply connector

The power to the FX2N-20GM is supplied with the special power supply cable attached to the product. The ground of the FX2N-20GM and the servo amplifier is a common ground. Refer to the FX2N-10GM, FX2N-20GM HARDWARE PROGRAMMING MANUAL for detailed wiring instructions.
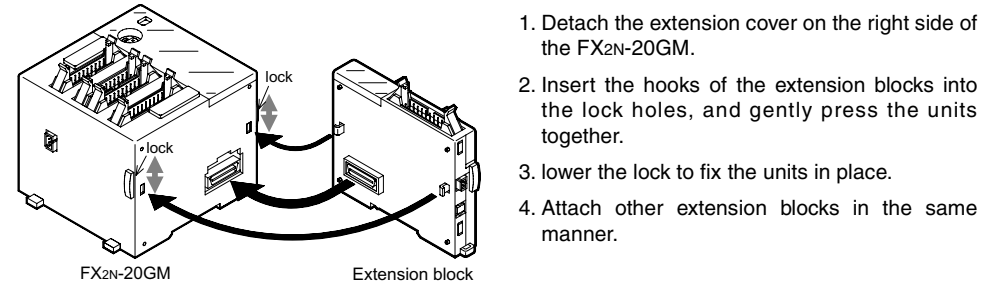

FX2N-20GM
Input block
Output block
Input block
FX2NC-100MPCB
Red+
Black+
Green (Ground)

The FX2N-20GM pin numbers for the power supply connector are shown below.

1 ⊕
2 ⊖
3 Ground

Install a safety circuit outside of FX2N-20GM so that the entire system may work safely when the external power supply fails.

4.5 I/O extension connector

The FX2N-20GM can connect the following extension block.

1) FX2NC series extension block
   - FX2NC-16EX-DS   - FX2NC-16EYT-DSS   - FX2NC-32EX-DS   - FX2NC-32EYT-DSS
   - FX2NC-16EX-T-DS   - FX2NC-16EX-D/UL   - FX2NC-16EYT-D/UL
   - FX2NC-32EX-D/UL   - FX2NC-32EYT-D/UL

2) FX2N series extension block (FX2NC-CNV-IF needs to be used)
   - FX2N-16EX-ES/UL   - FX2N-16EYT-ESS/UL

The increase point is 48 points or less. Assume the turning on rate to be 50% or less simultaneously. 48 points may be added to the system if 50% or less are used simultaneously.
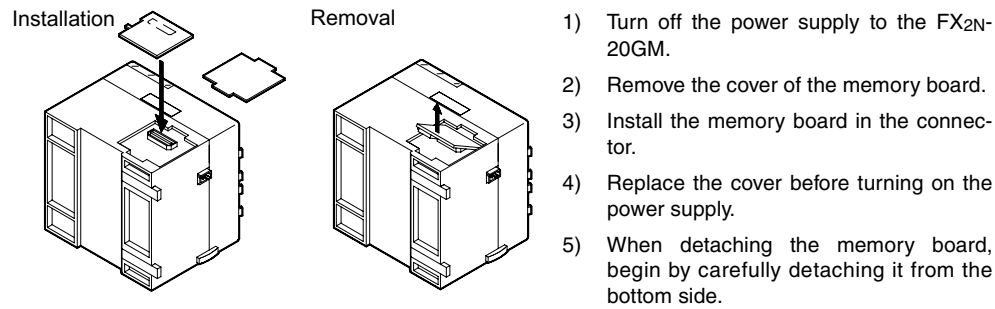

lock
lock
FX2N-20GM
Extension block

1. Detach the extension cover on the right side of the FX2N-20GM.

2. Insert the hooks of the extension blocks into the lock holes, and gently press the units together.

3. lower the lock to fix the units in place.

4. Attach other extension blocks in the same manner.

4.6 Connection with PLC

Refer to the FX2N-10GM and the FX2N-20GM HARDWARE PROGRAMMING MANUAL for details concerning the system configuration.
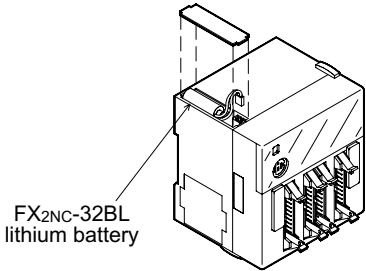
4.7 Detaching the memory board

7.8k step of RAM is built into the FX2N-20GM. In addition, the optional memory board (FX2NC-EEPROM-16) can be used. (Program capacity is 7.8k steps)

Installation   Removal

1) Turn off the power supply to the FX2N-20GM.

2) Remove the cover of the memory board.

3) Install the memory board in the connector.

4) Replace the cover before turning on the power supply.

5) When detaching the memory board, begin by carefully detaching it from the bottom side.

4.8 Procedure of battery exchange

1) The power supply of FX2N-20GM is turned off.

2) Remove side cover from the FX2N-20GM.

3) Remove battery from holder-disconnect and replace. (This must be carried out within 30 sec if the current data held in the FX2N-20GM's RAM is to be saved.)

4) Refit battery and cover.

FX2NC-32BL
lithium battery

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5. Specification

5.1 Power supply specification

Item	Contents
Power supply	24V DC +10%, -15%
Allowance power failure time	The operation is continued to the momentary power failure is 5ms or less.
Power consumption	10W
Fuse	125V 1A

5.2 General specification

Item	Contents
Ambient temperature	0 to 55°C (operation). -20 to 70°C (storage).
Surrounding humidity	35 to 85% (No condensation) ..... operation
Vibration resistance	Frequency 10 to 57Hz: Half 0.035mm amplitude, Frequency 57 to 150Hz: 4.9 m/s^2 Acceleration Sweep count for X,Y, Z: 10 times (80 min in each direction).
Shock resistance	147m/s^2 acceleration, Action time: 11ms. 3 times in each direction X, Y, Z.
Noise immunity	1,000Vp-p, 1μs. 30 to 100Hz, tested by noise simulator.
Dielectric withstand voltage	500V AC > 1 min, tested between all points, terminal and ground.
Insulation resistance	5MΩ > 500V DC, tested between all points, terminal and ground
Ground	Class D grounding (100Ω or less)
Use atmosphere	Ambient conditions to be free of corrosive gases. Dust should be minimal.
Working altitude	<2000m*1

*1 Do not use the PLC under pressure higher than the atmospheric pressure. Doing so may damage the PLC.

5.3 Performance specification

Item	Contents
Number of control axes	Two axes (two axes or two independent axes simultaneously)
Interpolation function	There is a straight line interpolation and a circular arc interpolation (two axes simultaneously).
Applicable PLC	Bus connection with FX2N/FX2NC/FX3U/FX3UC series PLC. The number of I/O points occupied is 8 points. When connecting to an FX2NC PLC, the FX2NC-CNV-IF must be used. When connecting to an FX3UC PLC, the FX2NC-CNV-IF or FX3UC-1PS-5V must be used.
Program memory	Built-in RAM, FX2NC-EEPROM-16 (optional memory board): 7.8k steps. Memory board with clock function cannot be used.
Battery	Built-in FX2NC-32BL type lithium battery. Longevity: about three years.
Positioning unit	Command units: mm, deg, inch, pls, (relativity/absolutely) Max command value ± 999,999 (32 bits when indirectly specifying)
Accumulation address	-2,147,483,648 to 2,147,483,647pulses
Speed instruction	200kHz max., 153,000cm/min (200kHz or less). Automatic trapezoidal pattern acceleration/deceleration (The interpolation drive is 100kHz or less).
Zero return	Manual operation or automatic operation. The DOG type machine zero return (The DOG search function is provided). An automatic electric zero return is possible by the electric starting point setting.
Absolute position detection	The absolute position detection is possible with MR-J2(S), MR-H, MR-J3 and the MR-J4 type servo motors with the ABS detection function.
Control inputs	Operation system: FWD (manual forwarding), RVS (manual reversal) ZRN (machine zero return), START (automatic start), STOP, Manual pulse generator (2kHz max), Single-step operation input (Depends upon the parameter setting). Mechanical system: DOG (near-point signal), LSF (forward rotation limit), LSR (reverse rotation limit), Interrupt: 4 points Servo system: SVRDY (servo ready), SVEND (servo end), PG0 (zero-point signal)
	General purpose: The main body has X0 to X7. X10 to X67 can be input by using the extension block. (max I/O point: 48 points)
Control outputs	Servo system: FP (forward rotation pulse). RP (reverse rotation pulse), CLR (counter clear).
	General purpose: The main body has Y0 to Y7. Y10 to Y67 can be output by using the extension block. (max I/O point: 48 points)

5.4 Input specifications

Item		Input from general-purpose equipment	Input from drive unit
Input signal name	Group 1	START, STOP, ZRN, FWD, RVS, LSF, LSR	SVRDY, SVEND
	Group 2	DOG	PG0
	Group 3	General-purpose input X00 to X07	-
	Group 4	Manual pulse generator, interruption input	-
Circuit insulation		By photocoupler	By photocoupler
Operation indication		LED is lit while input is ON	LED is lit while input is ON
Signal voltage		24V DC ± 10% (internal power supply)	5 to 24V DC ± 10%
Input current		7mA/24V DC	7mA/24V DC (PG0 11.5mA/24V DC)
Input ON current		4.5mA or more	0.7mA or more (PG0 1.5mA or more)
Input OFF current		1.5mA or less	0.3mA or less (PG0 0.5mA or less)
Signal format		Contact input or NPN open collector transistor input.	
Response-time	Group 1	Approx. 3msec	Approx. 3msec
	Group 2	Approx. 0.5msec	Approx. 16μs
	Group 3	Approx. 3msec*1	-
	Group 4	Approx. 0.1ms*1	-
Turning ON rate of I/O simultaneously		50% or less	

*1: The selection of general purpose inputs, manual pulse generator inputs or interrupt inputs in the parameter settings automatically adjusts the input filters.

5.5 Output specification

Item	General-purpose output	Output to drive unit
Signal name	Y00 to Y07	FP, RP, CLR
Circuit isolation	By photocoupler	By photocoupler
Operation indication	LED is lit while output is ON	LED is lit while output is ON
External power supply	5 to 24V DC ± 10%	5 to 24V DC ± 10%
Load current	50mA or less	20mA or less
Open circuit leak current	0.1mA/24V DC or less	0.1mA/24V DC or less
Output ON voltage	0.5V max	0.5V max (CLR is 1.5V max.)
Response time	0.2ms max. for both OFF → ON and ON → OFF.	Pulse output FP RP is 200kHz max. Pulse output width of the CLR signal: Approx. 20msec.
Turning ON rate of I/O simultaneously	50% or less	

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⚠ For safe use

• This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
• Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
• This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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Specifications are subject to change without notice.