Programmable Logic Controllers
FX Family

■ **Common Peripherals**

FX family products offer unparalleled compatibility. Common peripheral devices such as programming tools, and operator interface products can be used across all of the ranges.

■ **Common Instruction Set**

With a common instruction set of 20 basic instructions and 35 applied instructions (over 100 applied instructions on some product ranges), it is possible to write programs which will operate on any FX programmable controller in applications of varying size and complexity.

■ **Confidence in Quality and Experience**

Mitsubishi Electric has now produced over 5,000,000 micro and nano programmable controllers. In addition, with ISO 9000 systems controlling design, production and distribution, the quality of Mitsubishi products is second to none. The complete FX family of programmable controllers are compliant to the highest industrial standards including; European Standards and Directives (CE), specialist shipping approvals, and North American Industrial Standards as specified by Underwriter's Laboratories (UL and cUL).

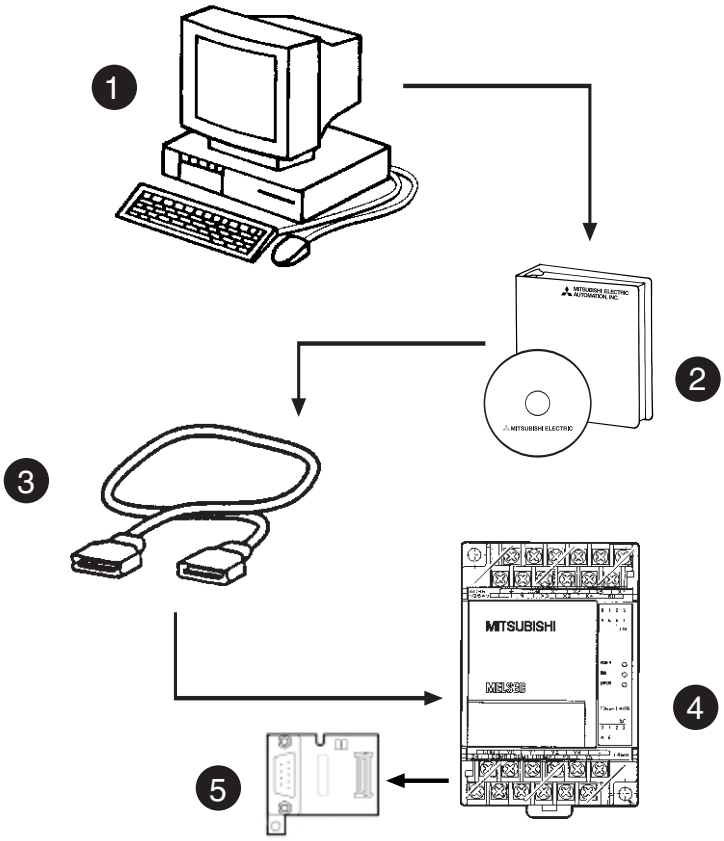
Model		FX1S	FX1N	FX3U	FX2N	FX2NC
Power Supply	AC	✓	✓	✓	✓	N/A
	24 VDC	✓	✓	✓	✓	✓
Input Types	24 VDC	✓	✓	✓	✓	✓
	120 VAC	N/A	(external I/O block)	✓	✓	✓ (external I/O block)
Output Types	Relay	✓	✓	✓	✓	✓ (external I/O block) 16 I/O Base
	Source Transistor	✓	✓	✓	✓	✓ (external I/O block)
	Sink Transistor	✓	✓	✓	✓	✓ (external I/O block)
	Triac	N/A	✓ (external I/O block)	—	✓	✓ (external I/O block)
Expansion Options		Digital I/O Boards Serial Communications	Discrete I/O High Speed Counter Remote I/O Serial Communications Analog RTD Thermocouple	Discrete I/O High Speed Counter Motion Control Programmable Cam Switch Remote I/O Serial Communications Analog RTD Thermocouple	Discrete I/O High Speed Counter Motion Control Programmable Cam Switch Remote I/O Serial Communications Analog RTD Thermocouple	Discrete I/O High Speed Counter Motion Control Programmable Cam Switch Remote I/O Serial Communications Analog RTD Thermocouple
Maximum I/O		30	128	384	256	256
Communication Options		RS-232 RS-485 RS-422	RS-232 RS-485 RS-422	RS-232 • RS-485 RS-422 USB	RS-232 RS-485 RS-422	RS-232 RS-485 RS-422
Open Network Options		N/A	Profibus-DP DeviceNet, AS-i CC-Link	Profibus-DP DeviceNet, AS-i CC-Link, SSCNET III	Profibus-DP DeviceNet, AS-i CC-Link	Profibus-DP DeviceNet, AS-i CC-Link
Mitsubishi Engineered Network Options		Multi-drop Master/slave	Multi-drop I/O Link Master/slave	Multi-drop I/O Link Master/slave	Multi-drop I/O Link Master/slave	Multi-drop I/O Link Master/slave
CPU Functions		High speed counters Pulse train output 32 bit math Serial communications Auto tuning PID, Networking Two axis motion control	High speed counters Pulse train output 32 bit math Serial communications Auto tuning PID, Networking Two axis motion control	High speed counters Two axis motion control 32 bit floating point math Serial communications Networking Auto-tuning PID	High speed counters Two axis motion control 32 bit floating point math Serial communications Networking Auto-tuning PID	HIgh speed counters Two axis motion control 32 bit floating point math Serial communications Networking Auto-tuning PID
Program Memory		4 K (2000 steps)	16 K (8000 steps)	64 K max. (32,000)	32 K max. (16,000 steps)	32 K max. (16,000 steps)
Typical Applications		Relay replacement Stand-alone embedded control Motion Control Process Control	General purpose medium scale machine control Local control for distributed systems	Sophisticated medium scale machine control Complex local control for distributed systems High Speed Communication	Sophisticated medium scale machine control Complex local control for distributed systems	Sophisticated medium scale machine control Complex local control for distributed systems Distributed I/O system

FX Standards Compliance: All FX products are manufactured under ISO 9000 quality assurance and 14001 environmental management standards. In addition, most FX PLC products are certified by internationally recognized standards agencies. The "Ratings" section of the specifications tables lists the approvals for each product. The approval agencies are as follows:

UL, cUL: Underwriter's Laboratories and corresponding Canadian approvals
CE: Complies to the European EMC and LVD directives
DNV: Det Norske Veritas
LR: Lloyd's Register
GL: Germanischer Lloyd
ABS: American Bureau of Shipping
RINA: Registro Italiano Navale
BV: Bureau Veritas
NK: Nippon Kaiji Kyokai

Programmable Logic Controllers • FX1S

The new FX1S SuperMicro Programmable Logic Controllers boasts integrated I/O, power supply and CPU in a "unitized" package. Every model packs an extensive instruction set and abundant user memory. No other controller is better suited to tackle modern automation demands in jobs ranging from the simplest and smallest I/O count, to those demanding the pinnacle of complexity and speed.



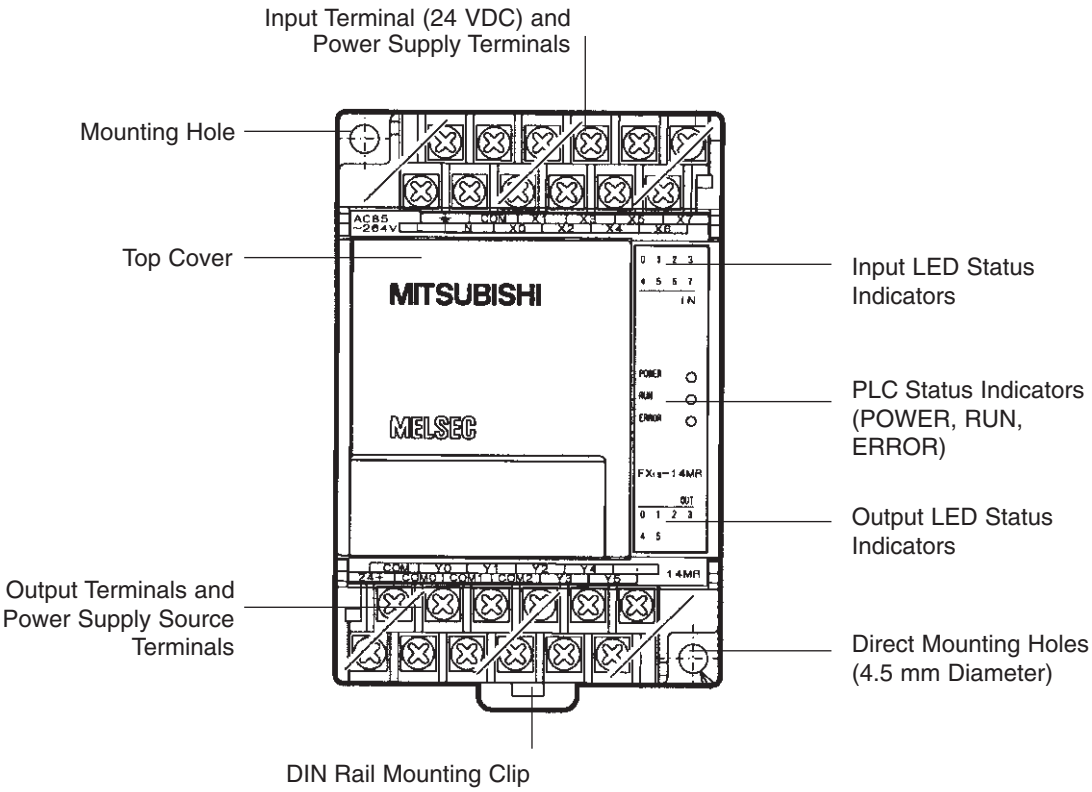
FOR AN OPERATIONAL SYSTEM, SELECT:

1. Personal Computer
2. Programming Software
3. Programming Cable SC09*
4. FX1S Base Unit
5. FX1N Communication Options
   (BD Port or FX0N Series Comms with FX1N-CNV-BD)

* Use the supplied 25-8 pin adapter.
Programming Manual JY992D88101 available separately.

FX1S

- As with all Mitsubishi Electric FX Family controllers, the power supply, CPU, and I/O components of the FX1s are integrated into a single compact unit. This facilitates cost-effective, high volume manufacturing and increased system reliability. The FX1S is the smallest, most cost effective programmable controller manufactured by Mitsubishi Electric.
- As with all controllers in the FX Family, the FX1S uses a wide tolerance power supply. FX1S are so flexible that they can be used almost anywhere in the world, regardless of the local power supply.
- The FX1S has a concealed, built-in Run/Stop switch, allowing quick and easy mode switching. In addition, two analog potentiometers are included which can be used to change the value of data register or timer/counter values.
- The FX1S can be mounted directly to a panel or on a DIN using its built-in DIN rail mounting hardware.
- All AC powered FX1S processors with DC inputs are equipped with a 400 mA, 24 VDC service supply.
- Through the use of EEPROM memory in the FX1S, all retentive data and programs reside in non-volatile, reliable, and maintenance free EEPROM.
- The FX1S is available with sink/source selectable DC inputs providing high speed counting and interrupt capability.
- All relay output models of the FX1s have high current relay outputs. These outputs are rated to switch currents up to 2 Amps, with an off to on time of approximately 10msec.
- Transistor output models of the FX1s are rated to switch 0.5 Amp and have the ability to actuate under 0.2 ms. The maximum frequency of operation tops out at a whopping 100 kHz.
- The FX1S uses 35 application instructions, as well as the familiar standard 20 Basic Instructions that are found on all FX family programmable controllers.
- Real-time clocks are embedded in every unit. All clocks are Y3K compliant.



FX1S Base Unit Hardware Specifications

Specifications		FX1S-10 MR-DS	FX1S-10 MT-ESS/UL	FX1S-10 MR-ES/UL	FX1S-10 MT-DSS	FX1S-10MT	FX1S-14 MR-DS	FX1S-14 MR-ES/UL	FX1S-14 MT-ESS/UL	FX1S-14 MT-DSS	FX1S-14MT
Rating		UL • cUL • CE				UL • cUL	UL • cUL • CE				UL • cUL
Max. Number of Inputs / Outputs		10	10	10	10	10	14	14	14	14	14
Power Supply	AC Range (+10%, -15%)	—	100-240 VAC	100-240 VAC	—	100-240 VAC	—	100-240 VAC	100-240 VAC	—	100-240 VAC
	Frequency at AC Hz	—	50/60	50/60	—	50/60	—	50/60	50/60	—	50/60
	DC Range (+10%, -15%)	24 VDC	—	—	24 VDC	—	24 VDC	—	—	24 VDC	—
Max. Apparent Input Power		6 W	19 W	19 W	6W	19W	6.5 W	19 W	19 W	6.5 W	19 W
Inrush Current at ON	100 VAC (ms)	—	15 A / 5	15 A / 5	—	15 A / 5	—	15 A / 5	15 A / 5	—	15 A / 5
	200 VAC (ms)	—	25 A / 5	25 A / 5	—	25 A / 5	—	25 A / 5	25 A / 5	—	25 A / 5
	24 VDC (ms)	15 A / 0.1	—	—	15A / 0.1	—	15A / 0.1	—	—	15 A / 0.1	—
Allowable Momentary Power Failure Time (ms)		5	10	10	5	10	5	10	10	5	10
External Service Power Supply (24 VDC) mA		—	400	400	—	400	—	400	400	—	400
Integrated Inputs*		6 (24 VDC)	6 (24 VDC)	6 (24 VDC)	6 (24 VDC)	6 (24 VDC)	8 (24 VDC)	8 (24 VDC)	8 (24 VDC)	8 (24 VDC)	8 (24 VDC)
Min. Current for Logical 1 (mA) (x10 – x17)		>4.5 / 3.5									
Max. Current for Logical 0 (mA)		<1.5									
Response Time		For all base units of the FX1S Series; 10 ms (at time of shipping), adjustable from 0 to 15 ms in steps of 1 ms									
Integrated Outputs		4	4	4	4	4	6	6	6	6	6
Output Type		Relay	Source Trans.	Relay	Source Trans.	Sink Trans.	Relay	Relay	Source Trans.	Relay	Sink Trans.
Switching Voltage (Max.) V		For all relay versions: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC									
Max. Output Current	Per Output (A)	2	0.5	2	0.5	0.5	2	2	0.5	0.5	0.5
	Per 4 Outputs (A)	8	0.8	8	0.8	0.8	8	8	0.8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	12W	80 VA	12W	12W	80 VA	80 VA	12 W	12 W	12 W
	Lamp Load (W)	100	0.9	100	0.9	0.9	100	100	0.9	0.9	0.9
Response Time (ms)		10	<0.2	10	<0.2	<0.2	10	10	<0.2	<0.2	<0.2
Life of Relay Contacts (Number of Cycles)		For all relay base units of the FX1S series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,0000 at 80 VA									
Weight (kg)		0.22	0.30	0.30	0.22	0.30	0.22	0.30	0.30	0.22	0.30
Dimensions (W x H x D) mm		60 x 90 x 49	60 x 90 x 75	60 x 90 x 75	60 x 90 x 49	60 x 90 x 75	60 x 90 x 49	60 x 90 x 75	60 x 90 x 75	60 x 90 x 49	60 x 90 x 75
Required Manuals		FX Series Programming Manual II, JY992D88101									

* Sink / Source except for MT units = Sink only.

FX1S Base Unit Hardware Specifications

Specifications		FX1S-20 MR-DS	FX1S-20 MT-ESS/UL	FX1S-20 MR-ES/UL	FX1S-20 MT-DSS	FX1S-20MT	FX1S-30 MR-DS	FX1S-30 MR-ES/UL	FX1S-30 MT-ESS/UL	FX1S-30 MT-DSS	FX1S-30MT
Rating		UL • cUL • CE				UL • cUL	UL • cUL • CE				UL • cUL
Max. Number of Inputs / Outputs		20	20	20	20	20	30	30	30	30	30
Power Supply	AC Range (+10%, -15%)	—	100-240 VAC	100-240 VAC	—	100-240 VAC	—	100-240 VAC	100-240 VAC	—	100-240 VAC
	Frequency at AC Hz	—	50/60	50/60	—	50/60	—	50/60	50/60	—	50/60
	DC Range (+10%, -15%)	24 VDC	—	—	24 VDC	—	24 VDC	—	—	24 VDC	—
Max. Apparent Input Power		7 W	20 W	20 W	7 W	20 W	8 W	21 W	21 W	8 W	21 W
Inrush Current at ON	100 VAC (ms)	—	15 A / 5	15 A / 5	—	15 A / 5	—	15 A / 5	15 A / 5	—	15 A / 5
	200 VAC (ms)	—	25 A / 5	25 A / 5	—	25 A / 5	—	25 A / 5	25 A / 5	—	25 A / 5
	24 VDC (ms)	15 A / 0.1	—	—	15 A / 0.1	—	15 A / 0.1	—	—	15 A / 0.1	—
Allowable Momentary Power Failure Time (ms)		5	10	10	5	10	5	10	10	5	10
External Service Power Supply (24 VDC) mA		—	400	400	—	400	—	400	400	—	400
Integrated Inputs*		12 (24 VDC)	12 (24 VDC)	12 (24 VDC)	12 (24 VDC)	12 (24 VDC)	16 (24 VDC)	16 (24 VDC)	16 (24 VDC)	16 (24 VDC)	16 (24 VDC)
Min. Current for Logical 1 (mA) (x10 – x17)		>4.5 / 3.5									
Max. Current for Logical 0 (mA)		<1.5									
Response Time		For all base units of the FX1S series; 10 ms (at time of shipping), adjustable from 0 to 15 ms in steps of 1 ms									
Integrated Outputs		8	8	8	8	8	14	14	14	14	14
Output Type		Relay	Source Trans.	Relay	Source Trans.	Sink Trans.	Relay	Relay	Source Trans.	Source Trans.	Sink Trans.
Switching Voltage (Max.) V		For all relay versions: < 240 VAC, < 30 VDC: for transistor version: 5 – 30 VDC									
Max. Output Current	Per Output (A)	2	0.5	2	0.5	0.5	2	2	0.5	0.5	0.5
	Per 4 Outputs (A)	8	0.8	8	0.8	0.8	8	8	0.8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	12 W	80 VA	12 W	12 W	80 VA	80 VA	12 W	12 W	12 W
	Lamp Load (W)	100	0.9	100	0.9	0.9	100	100	0.9	0.9	0.9
Response Time (ms)		10	<0.2	10	<0.2	<0.2	10	10	<0.2	<0.2	<0.2
Life of Relay Contacts (Number of Cycles)		For all relay base units of the FX1S series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA									
Weight (kg)		0.30	0.40	0.40	0.30	0.40	0.35	0.45	0.45	0.35	0.45
Dimensions (W x H x D) mm		75 x 90 x 49	75 x 90 x 75	75 x 90 x 75	75 x 90 x 49	75 x 90 x 75	100 x 90 x 49	100 x 90 x 75	100 x 90 x 75	100 x 90 x 49	100 x 90 x 75
Required Manuals		FX Series Programming Manual II, JY992D88101									

* Sink / Source except for MT units = Sink only.

FX1S Performance Specifications

Model Number		FX1S	REMARK
Operation Control Method		Cyclic operation by stored program	
I/O Control Method		Batch processing (takes place after END instruction is executed)	I/O refresh instruction is available
Operation Processing Time		Basic instructions: 0.55 to 0.7 μs Applied instructions: 1.65 to several 100 μs	
Programming Language		Relay symbolic language + step ladder	Step ladder can be used to produce and SFC style program
Program Capacity		2K steps	
Number of Instructions		Sequence (basic) instructions; 20, Stepladder instructions; 2, Applied instructions; 35	Maximum number of 116 applied instructions are available including all variations
I/O Configuration		Max total I/O set by Main Processing Unit	
Auxiliary Relay (M Coils)	General	384 points	M0 to M383
	Latched	128 points	M384 to M511 (saved in EEPROM)
	Special	256 points	From the range M8000 to M8255
State Relays (S Coils)	General	128 points	S0 to S127
	Initial	10 points (subset)	S0 to S9
Timers	100 msec	Range: 0 to 3,276.7 sec. 63 points	T0 to T62
	10 msec	Range: 0 to 327.67 sec 31 points	T23 to T62 when special M coil M8028 is driven ON
	1 msec	Range: 0.001 to 32.767 sec 1 point	T63 (saved in EEPROM)
Counters (C)	General	Range: 1 to 32,767 counts 16 points	C0 to C15 Type: 16 bit up counter
	Latched	C16-C31 (saved in EEPROM)	C16 to C31 Type: 16 bit up counter
High Speed Counters (C)	1 Phase	Range: -2,147,483,648 to +2,147,483,647 FX1S has two Super High Speed Counters that can count up to 100 kHz apiece. The Y0 and Y1 outputs can send pulse train outputs up to 100kHz. Up to six 1-phase counters (10kHz max.) or three 2-phase counters (up to 5 kHz) can be used to count frequencies up to a maximum of 60 kHz for High Speed Counters. 2-phase counter frequencies must be doubled when calculating the total frequency used.	C235 TO C238 (Note C235 is latched) 4 points
	1 Phase C/W Start Stop Input		C241 (latched), C242 and C244 (latched) 3 points
	2 Phase		C246, C247 and C249 (all latched) 3 points
	A/B Phase		C251, C252 and C254 (all latched) 3 points
Data Registers (D)	General	128 points	D0 to D127 Type: 16 bit data storage register, pair for 32 bit device
	Latched	D128-D255 (saved in EEPROM)	D128 to D255 Type: 16 bit data storage register, pair for 32 bit device
	Externally Adjusted	Range: 0 to 255; 2 points	D8013 or D8030 &D8031 Data is entered directly through the external setting potentiometer
	Special	256 points (inclusive of D8013)	From the range D8000 to D8255 Type: 16 bit data storage register
	Index	16 points	V and Z Type: 16 bit data storage register
Pointers (P)	For Use w/ CALL	64 points	P0 to P63
	For Use w/ Interrupts	6 points	100□ to 130□ (rising trigger □ =1, falling trigger □=0)
Nest Levels		8 points for use with MC and MCR	N0 to N7
Numbers	Decimal K	16 bit: -32,768 to +32,767 32 bit: -2,147,483,648 to +2,147,483,647	
	Hexadecimal H	16 bit; 0000 to FFFF 32 bit: 00000000 to FFFFFFFF	
Environmental		AC Powered Units	DC Powered Units
Dielectric Withstand Voltage		1500 VAC for 1 min.	500 VAC for 1 min.
Insulation Resistance		5MΩ or larger by 500 VDC insulation resistance tester	
Noise Durability		Noise voltage: 1000Vp-p, width: 1ms, frequency: 30 to 100Hz, tested by noise simulator	
Grounding		Class 3 grounding (100Ω or less)	
Ambient Operating Temp. / Humidity		0 to 55° C (32 to 131° F), 35 to 85% RH (no condensation), to be free from corrosive gas and dust	
Vibration Resistance		IEC 68-2-6, 10 to 55 Hz, 0.5mm / 0.02 in.(max. 2G, 0.5G if mounted on DIN rail), 80 min. in 3 directions	
Shock Resistance		IEC-68-27, 147 m/s², 3 times in 3 directions	

FX1S Terminal Layouts

Relay Outputs

⏚	S/S	X1	X3	X5	•
L	N	X0	X2	X4	•

FX1S-10MR-ES/UL • FX1S-10MR-DS

0V	Y0	Y1	Y2	Y3	•
24V	COM0	COM1	COM2	COM3	•

⏚	S/S	X1	X3	X5	X7	X11	X13
L	N	X0	X2	X4	X6	X10	X12

FX1S-20MR-ES/UL • FX1S-20MR-DS

0V	Y0	Y1	Y2	Y3	Y4	Y6	•
24V	COM0	COM1	COM2	COM3	COM4	Y5	Y7

⏚	S/S	X1	X3	X5	X7
L	N	X0	X2	X4	X6

FX1S-14MR-ES/UL • FX1S-14MR-DS

0V	Y0	Y1	Y2	Y4	•
24V	COM0	COM1	COM2	Y3	Y5

⏚	S/S	S/S	X1	X3	X5	X7	X11	X13	X15	X17
L	N	S/S	X0	X2	X4	X6	X10	X12	X14	X16

FX1S-30MR-ES/UL • FX1S-30MR-DS

0V	Y0	Y1	Y2	Y4	COM3	Y7	Y11	Y12	Y14
24V	COM0	COM1	COM2	Y3	Y5	Y6	Y10	COM4	Y13	Y15

Note:
FX1S-☐ ☐ MR-DS units have identical terminal layouts, the only difference is the power input terminals which have ⊕ ⊖ in place of L and N.
FX1S-☐ ☐ MT units have identical terminal layouts, the only difference is the S/S input terminal has COM in its place.

Transistor Outputs

⏚	S/S	X1	X3	X5	•
⊕	⊖	X0	X2	X4	•

FX1S-10MT-DSS • FX1S-10MT-ESS/UL

•	Y0	Y1	Y2	Y3	•
•	+V0	+V1	+V2	+V3	•

⏚	S/S	X1	X3	X5	X7	X11	X13
⊕	⊖	X0	X2	X4	X6	X10	X12

FX1S-20MT-DSS • FX1S-20MT-ESS/UL

•	Y0	Y1	Y2	Y3	Y4	Y6	•
•	+V0	+V1	+V2	+V3	+V4	Y5	Y7

⏚	S/S	X1	X3	X5	X7
⊕	⊖	X0	X2	X4	X6

FX1S-14MT-DSS • FX1S-14MT-ESS/UL

•	Y0	Y1	Y2	Y4	•
•	+V0	+V1	+V2	Y3	Y5

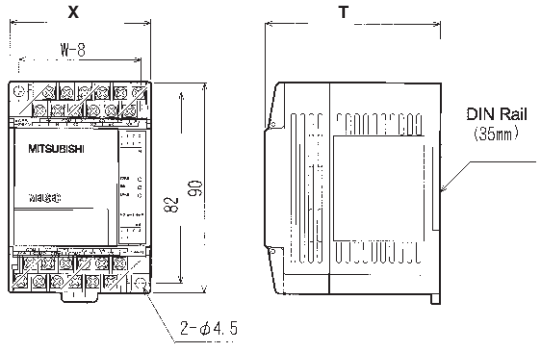
⏚	S/S	S/S	X1	X3	X5	X7	X11	X13	X15	X17
⊕	⊖	S/S	X0	X2	X4	X6	X10	X12	X14	X16

FX1S-30MT-DSS • FX1S-30MT-ESS/UL

•	Y0	Y1	Y2	Y4	+V3	Y7	Y11	Y12	Y14	•
•	+V0	+V1	+V2	Y3	Y5	Y6	Y10	+V4	Y13	Y15

Note:
FX1S-☐ ☐ MT-ESS/UL units have identical terminal layouts, the only difference is the power input terminals which have L and N in place of ⊕ ⊖

Figure 1.1: FX1S Outline Drawing

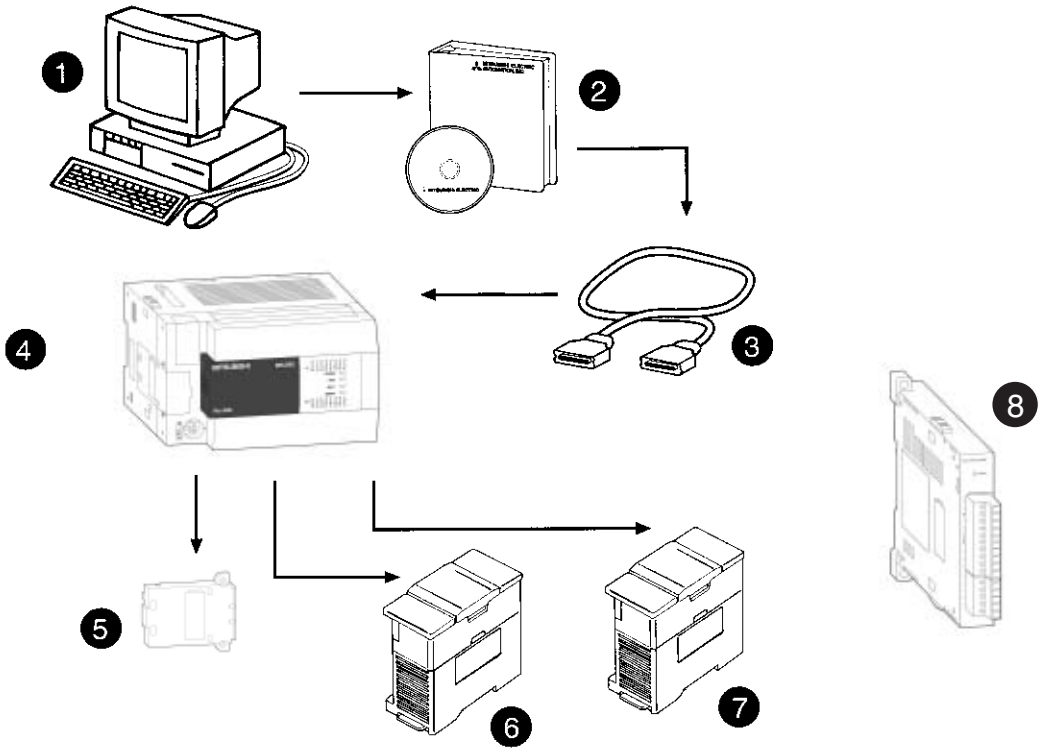


Special Function Block Dimensions

Type	X (mm)	T (mm)
FX1S-10MR-ES/UL	60	75
FX1S-14MR-ES/UL	60	75
FX1S-20MR-ES/UL	75	75
FX1S-30MR-ES/UL	100	75
FX1S-10MR-DS	60	49
FX1S-14MR-DS	60	49
FX1S-20MR-DS	75	49
FX1S-30MR-DS	100	49
FX1S-10MT-DSS	60	49
FX1S-14MT-DSS	60	49
FX1S-20MT-DSS	75	49
FX1S-30MT-DSS	100	49
FX1S-10MT	60	75
FX1S-14MT	60	75
FX1S-20MT	75	75
FX1S-30MT	100	75
FX1S-10MT-ESS/UL	60	75
FX1S-14MT-ESS/UL	60	75
FX1S-20MT-ESS/UL	75	75
FX1S-30MT-ESS/UL	100	75

Programmable Logic Controllers
FX3U SuperMicro™

The FX3U SuperMicro™ brings a new combination of greater flexibility and increased performance to the FX Family. The FX3U sets the industry standard for programming memory, CPU processing speed, motion capabilities, number of instructions, and flexibility in networking.



FOR AN OPERATIONAL SYSTEM, SELECT:

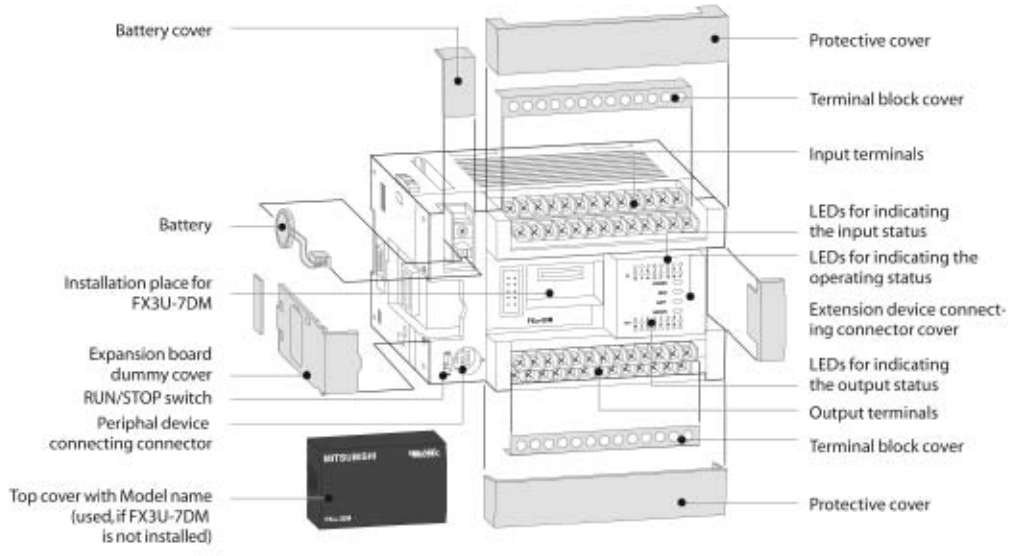
1. Personal Computer
2. Programming Software
3. Programming Cable FX-USB-AW
4. FX3U PLC
5. FX3U Expansion Board (1)
6. FX3U/2N/0N Special Function Blocks
7. FX2N Extension I/O Blocks/Units
8. FX3U Slim Line Adaptors

Note: FX0N and FX2N special function blocks and I/O extension blocks and units are interchangeable.

FX3U - A New Concept for Compact PLCs

Mitsubishi Electric has shipped over 6 million FX series PLCs in the last 25 years. The FX3U continues the tradition leading the industry in technological innovation and providing users with the highest cost/performance ratio in the world. The FX3U SuperMicro is the perfect choice for small to mid-sized applications where speed, programming memory, and two-three axes of machine control are required.

- Windows programming: Ladder, List or SFC languages, with GPP-WIN (in common with FX2N, FX1S & FX1N)
- Easy Migration: Programs and development tools interchange with FX2N, FX1N, and FX1S.
- Operator Interfaces: Selections to match any application
- Unmatched Program Memory: 64K steps
- Massive Data Memory: 42,726 data registers.
- Enhanced Throughput: 65 nanoseconds/step.
- Better Process Control: Improved auto-tuning PID
- Sophisticated High-Speed Processing: 100 kHz counters, 10 ms and 50µs hardware interrupts.
- High-Function Mathematics: 32 bit floating point, Square Root, and Improved Trigonometry (ArcSine, ArcTan, ArcCos)
- Embedded Motion Control: Three 100kHz pulse train outputs, Trapezoidal ramp instructions, new Motion instructions.
- Year 2000 Compliant: Real-time clock/calendar (4-digit year) for scheduling and time stamping.
- Flexible configurations: From 16 to 384 I/O and extensive special function I/O capabilities.
- Cost-Effective Communications: Up to three channels of RS communication is possible (RS-422, RS-232, RS-485) and PLC-PLC networking.
- Open Network Connectivity: Modules for Ethernet, CC-Link Master and Slave, Profibus DP Master and Slave, DeviceNet, and AS-i



FX3U Base Unit Extension Rules

In general, the FX3U PLC system can support extension I/O, special function blocks and still have a reserve of 24VDC power remaining to power sensors, etc. via the service power supply. Tables 1, 2, 3 show you how to calculate how many special function blocks you can add to a FX3U base unit, and how much current the service power supply can provide when extension I/O is added.

Note that once I/O extension units and blocks are connected to the base unit, the I/O numbering of these peripherals continues from the next whole group of 8 I/O from where the I/O on the base unit ends. Extension I/O numbering always repeats in groups of 8 (X000-X007, Y000-Y007, octal numbers), to allow it to be added anywhere in the sequence of I/O points for the system without causing a number conflict. For example, if the system consists of 32 I/O with a 16 I/O base unit, an 8 point input block, and an 8 point output block, the numbering would work as follows.

Base Unit	Inputs: X000-X007
	Outputs: Y000-Y007
8 point input block:	Inputs: X010-X017 (actually numbered X000-X007 on the block)
	Outputs: None
8 point output block:	Inputs: None
	Outputs: Y010-Y017 (actually numbered Y000-Y007 on the block)

Note: From a software point of view, the application program would see a seamless range of physical I/O from X000-X017 and Y000-Y017

Table 1: 5V Bus Supply

The FX3U base unit supplies 5 VDC to special function blocks via its expansion bus. This is used to operate the special function blocks' CPUs. The specifications in this section guide show how much of this 5V supply current each special function block consumes. To insure your configuration falls within the limits of the base unit's supply, total the 5V current consumed by all special function blocks. For a permissible configuration, this should be equal to or less than the total in the table. Note that it is not possible to add extra 5V power to a system by using a powered expansion unit or the FX3U-1PSU-SV.

Table 1

Module	Max. Current on 5V Bus
FX3U-□□M□-ES/UL (ESS/UL)	500 mA

Tables 2 and 3: Service Power Supply

The FX3U base unit has a built-in 24 VDC service power supply intended to power sensors and other peripheral equipment.
The amount of current available from this supply is dependent on the number of extension I/O that has been added to the base unit.

Table 2: 24 VDC Power For 16 – 32 I/O Units

Product	24 VDC Value	Max. Input Extension	Max. Output Extension
FX3U-16M* FX3U-32M*	400mA	32 points	24 points

Table 3: 24 VDC Power For 48 – 128 I/O Units

Product	24 VDC Bus Supply	Max. Input Extension	Max. Output Extension
FX3U-48M* FX3U-64M* FX3U-80M* FX3U-128M*	600mA	64 points	48 points

*Refers to any base PLC or powered extension module

Sample Extension Calculation

See the examples below for sample power calculations.
The current values for the special function blocks can be found in the specifications on the following pages and in the FX3U Hardware Manual.

Module	No.	24 VDC Calculation		5 VDC Calculation	
		Current / Module	Calculation	Current / Module	Total Current
FX3U-80MR/ES	1	+460 mA	+600 mA	+500 mA	+500 mA
FX2N-4AD	3	+50 mA	(-150 mA)	(-30 mA)	(-90 mA)
FX2N-4DA	1	+200 mA	(-200 mA)	(-30 mA)	(-30 mA)
FX2N-232IF	1	+80 mA	(-80 mA)	(-40 mA)	(-40 mA)
			+170 mA		500 – 160 mA
					Result: 340 mA (OK)

Module	No.	Number of I/Os			24 VDC Calculation*		5 VDC Calculation	
		X	Y	X/Y	Total1	Total Current	Current / Module	Total Current
FX3U-48MR/ES	1	24	24	—	+600 mA		+500 mA	+500 mA
FX2N-16EYR-ES/UL	1	—	16	—	(-150 mA)	(-150 mA)	—	0 mA
FX0N-8EX-ES/UL	1	8	—	—	(-50 mA)	(-50 mA)	—	0 mA
FX0N-8EYR-ES/UL	1	—	8	—	(-75 mA)	(-75 mA)	—	0 mA
FX0N-3A	1	—	—	8	(-90 mA)	(-90 mA)	(-30 mA)	(-30 mA)
						+235 mA (OK)		+470 mA (OK)
FX2N-32ER-ES/UL	1	16	16	—	+250 mA	+250 mA	+690 mA	+690 mA
FX2N-16EX-ES/UL*	2	16	—	—	(-100 mA)	(-200 mA)	—	0 mA
FX2N-4AD	1	—	—	8	(-30 mA)	(-30 mA)	(-55 mA)	(-55 mA)
FX2N-1HC	1	—	—	8	0 mA	0 mA	(-90 mA)	(-90 mA)
	Result: 64 + 64 + 24 + = 152 (<256) OK					+20 mA (OK)		+545mA (OK)

*See maximum extension Input and Output tables.

FX3U Performance Specifications

Model Number		FX3U	REMARK
Operation Control Method		Cyclic operation by stored program	
I/O Control Method		Batch processing (takes place after END instruction is executed)	I/O refresh instruction is available
Operation Process Time		Basic instructions: 0.065μs - Applied instructions: 1.52 - several 100μs per instruction	
Programming Language		Relay symbolic language + Stepladder	Stepladder can be used to produce an SFC style program
Program Capacity		64K step standard	
Number of Instructions		Basic sequence instructions: 27 – Step ladder instructions: 2 – Applied instructions: 209	
I/O Configuration		Max hardware I/O config. pts. 384, dependent on user selection (Max. software addressable inputs & outputs 384)	
Auxiliary Relay (M Coils)	General	3072 points	M0 to M3071
	Latched	2572 points (subset)	M500 to M3071 (Battery backed)
	Special	256 points	From the range M8000 to M8255
	Special Type	512 points	From the range M8000 to M8511
State Relays (S Coils)	General	1000 points	S0 to S999
	Latched	500 points (subset)	S500 to S999 (Battery backed)
	Initial	10 points	S0 to S9
	Annunciator	100 points	S900 to S999
	Latched Battery Backed	2097 points	S1000 to S3096
Timers (T)	100 msec	Range: 0 to 3,276.7 sec. 200 points	T0 to T199
	10 msec	Range: 0 to 327.67 sec. 46 points	T200 to T245
	1 msec Retentive	Range: 0 to 32.767 sec. 4 points	T246 to T249 (Battery backed)
	100 msec Retentive	Range: 0 to 3,276.7 sec. 6 points	T250 to T255 (Battery backed)
	1 ms	—	T256 to T511
Counters (C)	General 16 bit	Range: 1 to 32,767 counts 200 points	C0 to C199 Type: 16 bit up counter
	Latched 16 bit	100 points (subset)	C100 to C199 Type: 16 bit up counter (Battery backed)
	General 32 bit	Range:-2,147,483,648 to 2,147,483,647 35 points	C200 to C234 Type: 32 bit up/down counter
	Latched 32 bit	15 points (subset)	C219 to C234 Type: 32 bit up/down counter (Battery backed)
High-Speed Counters (C) A/B Phase	1 Phase	Range:-2,147,483,648 to +2,147,483,647 counts Note: All high speed counters are latched	C235 to C240 6 points (Battery backed)
	1 ph., c/w start/stop Input		C241 to C245 5 points (Battery backed)
	2 Phase		C246 to C250 5 points (Battery backed)
	A/B Phase		C251 to C255 5 points (Battery backed)
Data Registers (D)	General	8000 points	D0 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	Latched	7800 points (subset)	D200 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	File Registers	7000 points (subset)	D1000 to D7999 set by parameter in 14 blocks of 500 program steps: Type: 16 bit data storage register
	Special	256 points	From the range D8000 to D8255 Type: 16 bit data storage register
	Index	16 points	V0 to V7 and Z0 to Z7 Type: 16 bit data storage register
Extension Registers		32768 points	R0 to R32767
Pointers (P)	For Use w/ CALL	4096 points	P0 to P4095
	For Use w/ Interrupts	6 input points, 3 timers, 6 counters	I00☐ to I50☐ and I6P☆ to I8P☆ I010 to I060 (rising trigger p=1, falling trigger p=0, PP= time in msec) (Battery backed)
Nest Levels		8 points for use with MC and MCR	N0 to N7
Numbers	Decimal K	16 bit: -32,768 to +32,767 32 bit: -2,147,483,648 to +2,147,483,647	
	Hexadecimal H	16 bit; 0000 to FFFF 32 bit: 00000000 to FFFFFFFF	
	Floating Point	32 bit: 0, -1.175 x 10-38, -3.403 x 1038	
Environmental			
Ambient Temperature		0-55° C (in operation) -20 ±70° C (in storage)	
Ambient Humidity		35-85% RH, no condensation (in operation)	
Vibration Resistance		Conforms to JIS C0911. 10-55Hz 0.5mm (0.02 in.) (Max. 2G) 2 hours in each of 3 axis directions (0.5G on DIN rail)	
Shock Resistance		Conforms to JIS C0912 (10G 3 times in 3 directions)	
Noise Immunity		1000 Vpp noise voltage, 1 μs pulse width at 30-100Hz	
Dielectric Withstand Voltage		1500 VAC for 1 minute	Between all terminals and ground
Insulation Resistance		5MΩ or larger by 500 VDC insulation resistance tester	Between all terminals and ground
Ground		Class 3 ground, where available. (100Ω or less)	
Operating Environment		Must be free from corrosive gases. Dust should be minimal.	

Battery Backup: Parameters for scope of battery backup adjustable.
Note: Fixed battery backup for M1024-M3071, D512 – D7999.

FX3U Base Unit Hardware Specifications

Specifications		DC Powered Relays					DC Powered Transistors		
		FX3U-□□MR/DS					FX3U-□□MT/DSS		
Integrated Inputs / Outputs		16	32	48	64	80	16	32	48
Rating		UL • cUL • CE					UL • cUL • CE		
Power Supply	AC Range (+10%, -15%)	N/A					N/A		
	Frequency at AC Hz	N/A					N/A		
	DC Range (+20%, -15%)	24V DC					24V DC		
Max. Input Apparent Power		25 W	30 W	35 W	40 W	45 W	25 W	30 W	35 W
Inrush Current		35 A Max for 0.5 ms or less/ 24V DC					35 A Max for 0.5 ms or less/ 24V DC		
Allowable Momentary Power Failure Time (ms)		5 ms or less					5 ms or less		
Service Power Supply (24 VDC) mA		N/A					N/A		
Power Supply Int. Bus (5 VDC) mA		500 mA					500 mA		
Integrated Inputs (24 VDC)		8	16	24	32	40	8	16	24
Min. Current for Logical 1 (mA) (X0 - X7 / X10 onwards)		See Hardware Manual JY997D16501					See Hardware Manual JY997D16501		
Max. Current for Logical 0 (mA)		1.5 mA or less					1.5 mA or less		
Response Time for Inputs (ms)		Approx. 10 ms					Approx. 10 ms		
Integrated Outputs		8	16	24	32	40	8	16	24
Output Type		Relay					Source Transistor		
Max. Output Current	Per Output (A)	2					0.5		
	Per Group* (A)	8					4 outputs/common = 0.8 A		
							8 outputs/common = 1.6 A		
Max Switching Load	Inductive Load	80 VA					12W/24V DC		
Response Time for Outputs (ms)		Approx. 10 ms					Y00-Y02: 5 µs		
							Y03 and higher: 0.2 ms		
Life of Contacts (Switching Times)		For all base units of the MELSEC FX3U series values: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 300,000 at 80 VA					Data Not Provided		
Weight (kg)		0.6	0.65	0.85	1.00	1.20	0.6	0.65	0.85
Dimensions (W x H x D) mm		130 x 90 x 86	150 x 90 x 86	182 x 90 x 86	220 x 90 x 86	285 x 90 x 86	130 x 90 x 86	150 x 90 x 86	182 x 90 x 86
Required Manuals		FX3U Series User's Manual - Hardware Edition - JY997D16501, FX3U Series Hardware Manual - JY997D18801B							

*Note: Sink/Source except for MT & MS units: Sink only. All products UL listed.

FX3U Base Unit Hardware Specifications

Specifications		AC Powered Transistors (Source)			AC Powered Transistors (Sink)					
		FX3U-□□MT/ESS			FX3U-□□MT/ES					
Integrated Inputs / Outputs		64	80	128	16	32	48	64	80	128
Rating		UL • cUL • CE			UL • cUL • CE					
Power Supply	AC Range (+10%, -15%)	100-240 VAC			100-240 VAC					
	Frequency at AC Hz	50/60 Hz			50/60 Hz					
	DC Range (+10%, -15%)	N/A			N/A					
Max. Input Apparent Power		45 W	50 W	65 W	30 W	35 W	40 W	45 W	50 W	65 W
Inrush Current at ON	100 VAC	30 A < 5 ms			30 A < 5 ms					
	200 VAC	65 A < 5 ms			65 A < 5 ms					
Allowable Momentary Power Failure Time (ms)		10 ms or less			10 ms or less					
Service Power Supply (24 VDC) mA		600 mA			400 mA		600 mA			
Power Supply Int. Bus (5 VDC) mA		500 mA			500 mA					
Integrated Inputs		32	40	64	8	16	24	32	40	64
Min. Current for Logical 1 (mA) (X0 - X7 / X10 onwards)		See Hardware Manual JY997D16501			See Hardware Manual JY997D16501					
Max. Current for Logical 0 (mA)		1.5 mA or less			1.5 mA or less					
Response Time for Inputs (ms)		Approx. 10			Approx. 10					
Integrated Outputs		32	40	64	8	16	24	32	40	64
Output Type		Source Transistor			Sink Transistor					
Max. Output Current	Per Output (A)	0.5			0.5					
	Per Group* (A)	4 outputs/common = 0.8 A 8 outputs/common = 1.6 A			4 outputs/common = 0.8 A8 outputs/common = 1.6 A					
Max Switching Load	Inductive Load	12W/24V DC			12W/24V DC					
Response Time for Outputs (ms)		Y00-Y02: 5 µs • Y03 and higher: 0.2 ms			Y00-Y02: 5 µs Y03 and higher: 0.2 ms					
Life of Contacts (Switching Times)		Data not provided			Data not provided					
Weight (kg)		1.00	1.20	1.80	0.6	0.65	0.85	1.00	1.20	1.80
Dimensions (W x H x D) mm		220 x 90 x 86	285 x 90 x 86	300 x 90 x 86	130 x 90 x 86	150 x 90 x 86	182 x 90 x 86	220 x 90 x 86	285 x 90 x 86	300 x 90 x 86
Required Manuals		FX3U Series User's Manual - Hardware Edition - JY997D16501, FX3U Series Hardware Manual - JY997D18801B								

*Note: Sink/Source except for MT & MS units: Sink only. All products UL listed.

FX3U Base Unit Hardware Specifications

Specifications		DC Powered Transistors (Source)		DC Powered Transistors (Sink)				
		FX3U-□□MT/DSS		FX3U-□□MT/DS				
Integrated Inputs / Outputs		64	80	16	32	48	64	80
Rating		UL • UL • CE		UL • cUL • CE				
Power Supply	AC Range (+10%, -15%)	N/A		N/A				
	Frequency at AC Hz	N/A		N/A				
	DC Range (+10%, -15%)	24V DC		24V DC				
Max. Input Apparent Power		40 W	45 W	25 W	30 W	35 W	40 W	45 W
Inrush Current at ON 100 VAC, 200 VAC		35 A Max for 0.5 ms or less/ 24V DC		35 A Max for 0.5 ms or less/ 24V DC				
Allowable Momentary Power Failure Time (ms)		5 ms or less		5 ms or less				
Service Power Supply (24 VDC) mA		N/A		N/A				
Power Supply Int. Bus (5 VDC) mA		500 mA		500 mA				
Integrated Inputs		32	40	8	16	24	32	40
Min. Current for Logical 1 (mA) (X0 – X7 / X10 onwards)		See Hardware Manual JY997D16501		See Hardware Manual JY997D16501				
Max. Current for Logical 0 (mA)		1.5 mA or less		1.5 mA or less				
Response Time for Inputs (ms)		Approx.10		Approx.10				
Integrated Outputs		32	40	8	16	24	32	40
Output Type		Source Transistor		Sink Transistor				
Max. Output Current	Per Output (A)	0.5		0.5				
	Per Group* (A)	4 outputs/common = 0.8 A 8 outputs/common = 1.6 A		4 outputs/common = 0.8 A 8 outputs/common = 1.6 A				
Max Switching Load	Inductive Load	12W/24V DC		12W/24V DC				
Response Time for Outputs (ms)		Y00-Y02: 5 µs Y03 and higher: 0.2 ms		Y00-Y02: 5 µsY03 and higher: 0.2 ms				
Life of Contacts (Switching Times)		Data not provided		Data not provided				
Weight (kg)		1.00	1.20	0.6	0.65	0.85	1.00	1.20
Dimensions (W x H x D) mm		220 x 90 x 86	285 x 90 x 86	130 x 90 x 86	150 x 90 x 86	182 x 90 x 86	220 x 90 x 86	285 x 90 x 86
Required Manuals		FX3U Series User's Manual – Hardware Edition – JY997D16501, FX3U Series Hardware Manual – JY997D18801B						

***Note:** Sink/Source except for MT & MS units: Sink only. All products UL listed.

FX3U Base Unit Hardware Specifications

Specifications		AC Powered Relays						AC Powered Transistors (Source)		
		FX3U-□□MR/ES						FX3U-□□MT/ESS		
Rating		UL• cUL • CE						UL • cUL • CE		
Integrated Inputs / Outputs		16	32	48	64	80	128	16	32	48
Power Supply	AC Range (+10%, -15%)	100-240 VAC						100-240 VAC		
	Frequency at AC Hz	50/60 Hz						50/60 Hz		
	DC Range (+10%, -15%)	N/A						N/A		
Max. Input Apparent Power		30 W	35 W	40 W	45 W	50 W	65 W	30 W	35 W	40 W
Inrush Current at ON	100 VAC	30 A < 5 ms						30 A < 5 ms		
	200 VAC	65 A < 5 ms						65 A < 5 ms		
Allowable Momentary Power Failure Time (ms)		10 ms or less						10 ms or less		
Service Power Supply (24 VDC) mA		400 mA			600 mA			400 mA		600 mA
Power Supply Int. Bus (5 VDC) mA		500 mA						500 mA		
Integrated Inputs* (24 VCD)		8	16	24	32	40	64	8	16	24
Min. Current for Logical 1 (mA) (X0 - X7 / X10 onwards)		See Hardware Manual JY997D16501						See Hardware Manual JY997D16501		
Max. Current for Logical 0 (mA)		1.5 mA or less						1.5 mA or less		
Response Time for Inputs (ms)		Approx. 10 ms						Approx. 10 ms		
Integrated Outputs*		8	16	24	32	40	64	8	16	24
Output Type		Relay						Source Transistor		
Max. Output Current	Per Output (A)	2						0.5		
	Per Group* (A)	8						4 outputs/common = 0.8 A 8 outputs/common = 1.6 A		
Max. Switching Load	Inductive Load	80 VA						12W/24V DC		
Response Time for Outputs (ms)		Approx. 10 ms						Y00-Y02: 5 microseconds Y03 and higher: 0.2 millisecond		
Life of Contacts(Switching Times)		For all base unites of the MELSEC FX3U series values: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 300,000 at 80 VA						Data not provided		
Weight (kg)		0.6	0.65	0.85	1.00	1.20	1.80	0.6	0.65	0.85
Dimensions(W x H x D) mm		130 x 90 x 86	150 x 90 x 86	182 x 90 x 86	220 x 90 x 86	285 x 90 x 86	300 x 90 x 86	130 x 90 x 86	150 x 90 x 86	182 x 90 x 86
Required Manuals		FX3U Series User's Manual - Hardware Edition - JY997D16501, FX3U Series Hardware Manual - JY997D18801B								

***Note:** Sink/Source except for MT & MS units: Sink only. All products UL listed.

FX3U Adapter Cards

Specifications	FX3U-232-BD	FX3U-422-BD	FX3U-485-BD
Rating	CE	CE	CE
Applicable PLCs	FX3U	FX3U	FX3U
Interface	RS-232 with 9 pole D-SUB male connector	RS-422 8 pole mini DIN female connector	RS-485 / RS-422
Power Supply	5 VDC / 20 mA (from base unit)	5 VDC / 20 mA (from base unit)	5 VDC / 40 mA from base unit
Communication Speed (bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200	-	300 - 384000 (Various Settings)
Communication Distance	Max. 15 m (49 ft)	Max. 50 m (164 ft)	Max. 50 m (164 ft)
Communication Mode	Full duplex	Half duplex	Half duplex
Protocols	Freely programmable via PLC / protocol 1 or 4 / No Protocol mode	Freely programmable via PLC/ Use as 2nd prog. port	Computer Link Protocol 1 or 4 / No Protocol mode / Parallel Link / N:N network
Related I/O Points	—	—	—
Weight (kg)	0.02	0.02	0.02
Dimensions (mm)	46 x 63 x 19	46 x 63 x 19	46 x 63 x 19
Function	General purpose RS-232 Communications	Duplicate programming port for HMI/PC connections	Multi-drop network/master/slave general purpose RS-485/422 communications / VFD Communication
Required Manuals	JY997D12901	JY997D13101	JY997D13001

FX3U Adapter Cards

Specifications	FX3U-USB-BD	FX3U-CNV-BD
Rating	CE	CE
Applicable PLCs	FX3U	
Interface	USB Mini B Plug (female)	—
Power Supply	15mA from PLC 30mA from PC	—
Baud Rate	9600/19200/38400/57600/115200	—
Communication Distance (m)	5 m (197 inch)	—
Communication Mode	USB Version 2.0	—
Related I/O Points	—	—
Weight (kg)	0.02	0.01
Dimensions (mm)	46 x 54 x 20	46 x 54 x 20
Function	Program/Monitor FX3U PLC programs and data	Allows connection of FX3U Analog and Communication Adaptors
Required Manuals	JY997D13501	JY997D13601

FX3U Analog Input / Output Special Function Blocks

Specifications		FX3U-4DA	FX3U-4DA-ADP
Rating		CE • UL • cUL	
Applicable PLCs		FX3U	
Power Supply		5 VDC / 120 mA (from base unit), 24 VDC/ 160 mA	5 VDC / 30 mA (from base unit) 24 VDC / 200 mA
Analog I/O	Inputs	—	—
	Outputs	4	4
Analog Input Range		0.20mA	—
Analog Output Range		-10 to 10 VDC, 0.20 mA	0 to 10 VDC, 0.20 mA
Resolution		15 bits + sign	12 bits
Overall Accuracy		± 0.3% at ambient temp	± 0.5% at ambient temp.
		± 0.5% at ambient temp	±1% over full linear range
Conversion Speed	Digital – Analog	—	—
	Analog – Digital	1 ms (not dependent upon the number of channels used)	200 µs (total)
Related I/O Points		8	0
Weight (kg)		0.2	0.1
Dimensions W x H x D (mm)		55 x 90 x 87	17 x 90 x 90
Function		General purpose digital to analog conversion (output)	General purpose digital to analog conversion (output)
Required Manuals		JY997D20801	JY997D14001

FX3U Analog Input Special Function Block

Specifications		FX3U-4AD	FX3U-4AD-ADP
Rating		CE • UL • cUL	
Applicable PLCs		FX3U	
Power Supply		5 VDC / 110 mA (from base unit), 24 VDC / 90 MA	5 VDC /15 mA (from base unit); 24 VDC / 150 mA
Analog Points	Inputs	4	4
	Outputs	—	—
Analog Ranges	Voltage	± 10 VDC	0-10 VDC
	Current	± 20 mA	4-20 mA
Resolution		15 bit + sign	12 bit
Overall Accuracy		± 0.3% at ambient ± 0.5% full scall	± 0.5% at ambient temp ± 1.0% at full range
Conversion Speed	Analog – Digital	500 µs per channel	200 µs (total)
	Digital – Analog	—	—
Related I/O Points		8	0
Weight (kg)		0.2	0.1
Dimensions W x H x D (mm)		55 x 90 x 87	18 x 90 x 90
Function		General purpose multi analog to digital conversion (input)	
Required Manuals		JY997D20701	JY997D13901

FX3U Temperature Sensing Adaptor Modules

Specifications	FX3U-4AD-TC-ADP	FX3U-4AD-PT-ADP
Rating	CE • UL • cUL	CE • UL • cUL
Applicable PLCs	FX3U	
Power Supply	5 VDC / 15 mA (from base unit); 24 VDC / 50 mA	
Analog Inputs	4 (K or J type)	4 (Pt 100 sensors)
Compensated Temperature Range	-100 to +600° C (J type) / -100 to +1000° C (K type)	-50 to +250° C
Digital Outputs	-1000 to +6000 (J type) / -1000 to +10000 (K type)	-500 to +2500
Resolution	0.3° C (J type) / 0.4° C (K type)	0.1° C
Overall Accuracy	±0.5% full scale +1°C	± 0.5% at ambient temp.
		±1% over full linear range
Conversion Speed	200 µseconds	
Related I/O Points	0	0
Weight (kg)	0.1	0.1
Dimensions W x H x D (mm)	18 x 90 x 74	18 x 90 x 74
Function	Thermocouple input	PT100 RTD input
Required Manuals	JY997D14801	JY997D14701

FX3U High Speed Adaptor Modules

Specifications		FX3U-4HSX-ADP	FX3U-2HSY-ADP
Rating		CE • UL • cUL	
Applicable PLCs		FX3U	
Power Supply		30 mA @ 5 VDC; 30 mA @ 24 VDC both supplied from base unit	30 mA @ 5 VDC; 60 mA @ 24 VDC both supplied from base unit
Counter Inputs		4 (1 phase) or 2 (2 phase)	—
Max. Counting Frequency (kHz)		1 phase 200kHz 2 phase 100kHz	—
Type of Counter		Up/down counter, ring counter	—
Accessible Axes		—	1
Input Format (Bit)		16, 32	—
Output Frequency		-	200K max
Counting Range	16 Bit	0 - 65535	—
	32 Bit	-2147483648 to +2147483647	—
Output Type		—	4 transistor (0.5 A, 24 VDC)
Related I/O Points		0	0
Weight (kg)		0.1	0.1
Dimensions W x H x D (mm)		18 x 90 x 90	18 x 90 x 90
Function		High speed pulse / encoder pulse counters	Servo / stepper pulse control
Required Manuals		JY997D16301	JY997D16401

FX3U Profibus Master Module

Enables the FX3U series PLC to act as the master on a Profibus-DP network.

Specifications		FX3U-64DP-M
Rating		CE • UL • cUL
Applicable PLCs		FX3U
Max. I/O Per Node		256
Power Supply 24 VDC		155 mA @ 24 VDC (from main unit)
Interface		Profibus-DP Ver 1.0
Communication Speed	Distances	
	1200 m	9.6 / 19.2 / 93.75 kbit/s
	1000 m	187.5 kbit/s
	200 m	1.5 M
	100 m	3 M, 6 M, 12 M
Maximum Number of Slaves		64
Communication Cable		Standard Profibus-DP cable with 9-pin DSUB connector
Related I/O Points		8
Dimensions W x H x D (mm)		43 x 80 x 87
Function		Profibus-DP master module (for I/O and special function modules)
Required Manuals		JY997D19201 Users Manual • JY997D19901 Installation Manual

FX3U Ethernet Module

Enables the FX3U to connect via Ethernet to a PC or another FX Series PLC.

Specifications	FX3U-ENET
Rating	UL • cUL
Applicable PLCs	FX3U
Max. Data Transmission	1023 words x 8
Power Supply 24 VDC	24 VDC / 240 mA (from base unit)
Communication Cable	Ethernet with RJ45 connector
Communication Protocol	TCP / IP / UDP
Related I/O Points	8
Communication with Mail Server	SMTP / POP3
Maximum Transfer Rate	100 Mbits / 10 Mbits
Maximum Segment length	100 m
Dimensions W x H x D (mm)	55 x 90 x 87
Function	Ethernet connection module
Required Manuals	JY997D15901

FX3U Power Supply

Specifications			FX3U-1PSU-5V
Rating			CE • UL • cUL
Applicable PLC			FX3U
General Specifications			Please see installation manual
Input	Input		85-264 VAC
	Frequency		50/60 Hz
	Rush Current	100 VAC	30 A max for 5 ms or less
		200 VAC	69 A for 5 ms or less
Output Current		24 VDC	300 mA *
		5 VDC	1.0 A *
I/O Points			—
Weight (kg)			0.3
Dimensions W x H x D (mm)			55 x 90 x 87
Required Manual			JY997D22501

*Note: At temperatures of 40°C or higher, available current is reduced.

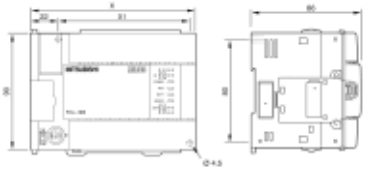
FX3U SSCNET Motion Module

Coordinate two axes of servo option via SSCNETIII per module. Axes can be controlled independently or by linear or circular interpolation.

Specifications	FX3U-20SSC-H
Rating	CE • UL • cUL
General Specifications	Please see Installation Manual
Applicable PLCs	FX3U
Applicable Servo Amplifier	MELSERVO MR-J3-B Series
Power Supply	5 VDC / 100 mA (from base unit)
	24V DC / 260 mA
Servo Bus	SSCNET III
Interpolation Functions	2-Axes Linear or Circular
Data Table Points	300
Scan Cycle	1.77ms
Control Input	Interrupt Input: 2 / Axis
	DOG: 1 / Axis
	START Input: 1 / Axis
	Manual Pulse Generator: 1 / Axis (A/B phase)
Related I/O Points	8
Weight (kg)	0.3
Dimensions W x H x D (mm)	55 x 90 x 87
Function	High Speed Fiber Optic Servo Control
Required Manuals	JY997D21101 (Installation Manual)
	JY997D12301 (Users Manual)

Base Units

Type	X (mm)	X1 (mm)
FX3U-16M	130	103
FX3U-32M	150	123
FX3U-48M	182	155
FX3U-64M	220	193
FX3U-80M	285	258



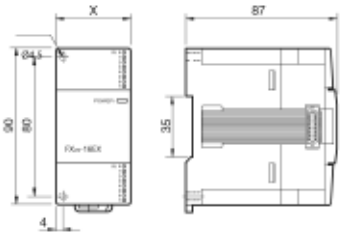
I/O Extension Units

Type	X (mm)
FX2N-32E	150
FX2N-48E	182

I/O Extension Blocks

Type	X (mm)
FX2N-16E	40

Note: All extension I/O units and blocks of same I/O count are the same length regardless of type



Special Function Blocks

Type	X (mm)	Image
FX2N-2AD	43	A
FX2N-2DA	43	A
FX2N-4AD	55	A
FX2N-4DA	55	A
FX2N-4AD-PT	55	A
FX2N-4AD-TC	55	A
FX2N-1HC	55	A
FX2N-1PG-E	43	A
FX2N-32CCL	43	A
FX2N-32ASI-M	55	A
FX2N-16LNK-M	43	A
FX2N-232IF	55	A
FX2N-64DNET	43	A
FX2N-8AD	67	A
FX2N-8AD-SE	67	A
FX2N-16CCL-M	85	A
FX2N-32CCL-NP	85	A
FX2N-2LC	55	A
FX2N-10PG	43	A
FX2N-5A	55	A
FX3U-20SSC-H	55	A
FX3U-ENET	55	A
FX3U-64DP-M	43	A
FX3U-4DA	55	A
FX3U-4AD	55	A
FX3U-1PSU-5V	55	A
FX3U-4HSX-ADP	17.6	B
FX3U-2HSY-ADP	17.6	B
FX3U-4AD-ADP	17.6	B
FX3U-4DA-ADP	17.6	B
FX3U-4AD-PT-ADP	17.6	B
FX3U-4AD-TC-ADP	17.6	B
FX3U-232ADP	17.6	B
FX3U-485ADP	17.6	B

Note: FX2N-32DP-IF and FX2N-1RM-E-SET have a different form factor. Please refer to specification tables for dimensions.

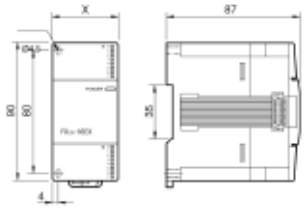


Image A

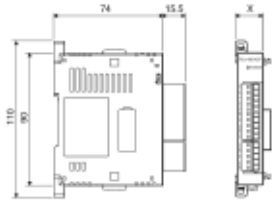
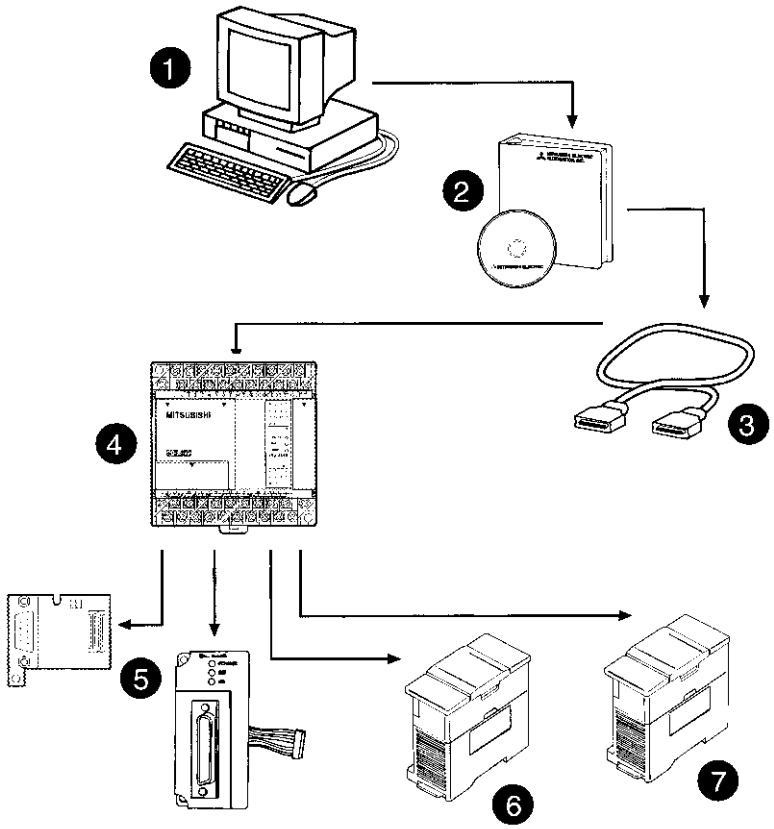


Image B

Note: See FX2N Section for Terminal Layouts.

Programmable Logic Controllers • FX1N

The FX1N takes the technology of the FX1S and applies it in a micro PLC with expansion capabilities. Extend your FX1N system up to 128 I/O, and add communications and analog I/O. In keeping with the FX1S, a wide variety of I/O options are available.



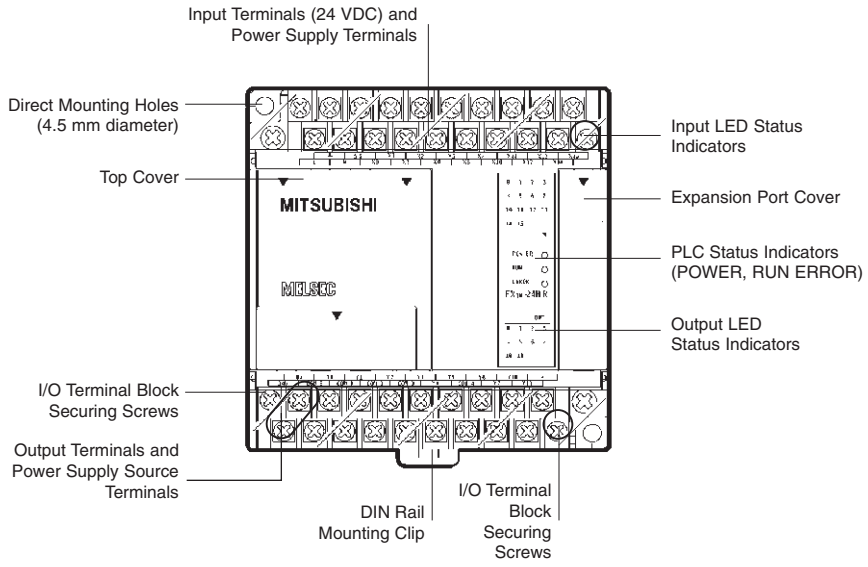
FOR AN OPERATIONAL SYSTEM, SELECT:

1. Personal Computer
2. Programming Software
3. Programming Cable SC09*
4. FX1N Base Unit
5. FX1N Communication Options
6. FX0N/2N Special Function Blocks
7. FX0N/2N Extension I/O Blocks/Units

NOTE: FX0N and FX2N special function blocks and I/O extension blocks and units are interchangeable with regard to PLC compatibility. The terminal layout is not the same.
* Use the supplied 25-8 pin adapter.
Programming Manual JY99D88101 available separately.

FX1N

- The FX1N combines the flexibility of an expandable programmable controller with the size of a micro-PLC. Expandable to 128 I/O and with the optional analog I/O communications and other options, the FX1N is suitable for a variety of applications.
- Wide tolerance power supply means that the FX1N can be used anywhere in the world, regardless of the local power supply.
- All AC powered FX1N processors are equipped with a 400 mA, 24 VDC service supply.
- The FX1N can be mounted directly to a panel, or on a DIN rail using its built-in DIN rail mounting hardware. This is also the case for expansion I/O. Removable terminal strips make maintenance easy.
- In addition to using the built-in EEPROM memory for storing up to a 16KB (8000 steps) application program, FX1N processors can also use removable Memory Cassettes which are excellent for Program storage and remote upgrades.
- Real-time clocks are embedded into every unit. All clocks are Y3K compliant.
- In addition to digital I/O, special function I/O modules can be added to the FX1N to increase system capabilities. Interchange FX2N and FX0N modules for maximum flexibility.
- The FX1N has a supplemented FX1S instruction set. Online programming, the ability to change your application program without stopping the PLC, is supported by the FX1N.
- The FX1N has a built-in Run/Stop switch as well as two analog potentiometers for on-the-fly adjustments and maintenance.

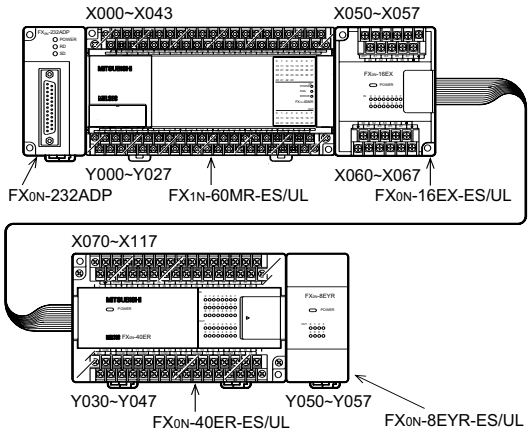


FX1N Base Unit Extension Rules

The FX1N Series can be expanded by 2 special function blocks or up to 32 points of I/O when used on its own. It can also be expanded by 4 special function blocks when used in conjunction with an FX0N extension unit (2+2), or expanded by 8 special function blocks when used in conjunction with an FX2N extension unit (2+6).

The maximum for an FX1N system is 128 points of I/O and 8 special function blocks.

Base Unit	Inputs:	X000-X015 (14 inputs)
	Outputs:	Y000-Y011 (10 outputs)
8 point input block:	Inputs:	X020-X027 (actually numbered X000-X007 on the block)
	Outputs:	None
8 point output block:	Inputs:	None
	Outputs:	Y020-Y027 (actually numbered Y000-Y007 on the block)



FX1N Base Unit Hardware Specifications

Specifications		FX1N-14 MR-DS	FX1N-14 MR-ES/UL	FX1N-14 MT-ESS/UL	FX1N-14 MT-DSS	FX1N-24 MR-DS	FX1N-24 MR-ES/UL	FX1N-24 MT-ESS/UL	FX1N-24 MT-DSS	FX1N-24MT
Rating		UL • cUL • CE								UL • cUL
Max. Number of Inputs / Outputs		14	14	14	14	24	24	24	24	24
Power Supply	AC Range (+10%, -15%)	—	100–240 VAC	100–240 VAC	—	—	100–240 VAC	100–240 VAC	—	100–240 VAC
	Frequency at AC Hz	—	50/60	50/60	—	—	50/60	50/60	—	50/60
	DC Range (+10%, -15%)	12–24 VDC	—	—	12–24 VDC	12–24 VDC	—	—	12–24 VDC	—
Max. Apparent Input Power		13 W	29 W	29 W	13 W	15 W	30 W	30 W	15 W	30 W
Inrush Current at ON	100 VAC (ms)	—	30A (5ms)	30A (5ms)	—	—	30A (5ms)	30A (5ms)	—	30A (5ms)
	200 VAC (ms)	—	50A (5ms)	50A (5ms)	—	—	50A (5ms)	50A (5ms)	—	50A (5ms)
	24 VDC (ms)	—	—	—	—	25A (1ms)	—	—	25A (1ms)	—
Allowable Momentary Power Failure Time (ms)		5	10	10	5	5	10	10	5	10
External Service Power Supply (24 VDC) mA		—	400	400	—	—	400	400	—	400
Integrated Inputs*		8 (24 VDC)	8 (24 VDC)	8 (24 VDC)	8 (24 VDC)	14 (24 VDC)	14 (24 VDC)	14 (24 VDC)	14 (24 VDC)	14 (24 VDC)
Min. Current for Logical 1 (mA)		> 4.5 / 3.5								
Max. Current for Logical 0 (mA) (X0-X7 / X10 onwards)		< 1.5								
Response Time		For all base units of the FX1N series; 10 ms (at time of shipping), adjustable from 0 to 15 ms in steps of 1 ms								
Integrated Outputs		6	6	6	6	10	10	10	10	10
Output Type		Relay	Relay	Source Trans.	Source Trans.	Relay	Relay	Source Trans.	Source Trans.	Sink Trans.
Switching Voltage (Max.) V		For relay version: < 240 VAC, < 30 VDC: for transistor version: 5 – 30 VDC								
Max. Output Current	Per Output (A)	2	2	0.5	0.5	2	2	0.5	0.5	0.5
	Per 4 Outputs (A)	8	8	0.8	0.8	8	8	0.8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	12W	12 W	80 VA	80 VA	12W	12W	12W
	Lamp Load (W)	100	100	1.5	1.5	100	100	1.5	1.5	1.5
Response Time (ms)		10	10	<0.2	<0.2	10	10	<0.2	<0.2	<0.2
Life of Relay Contacts (Number of Cycles)		For all base units of the FX1N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA								
Weight (kg)		0.45	0.45	0.45	0.45	0.45	0.6	0.6	0.45	0.45
Dimensions (W x H x D) mm		90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75	90 x 90 x 75
Required Manuals		FX Series Programming Manual II, JY992D88101								

* Sink / Source except for MT units = Sink only.

FX1N Base Unit Hardware Specifications

Specifications		FX1N-40 MR-DS	FX1N-40 MR-ES/UL	FX1N-40 MT-ESS/UL	FX1N-40 MT-DSS	FX1N-40MT	FX1N-60 MR-DS	FX1N-60 MR-ES/UL	FX1N-60 MT-ESS/UL	FX1N-60 MT-DSS	FX1N-60MT
Rating		UL • cUL • CE				UL • cUL	UL • cUL • CE				UL • cUL
Max. Number of Inputs / Outputs		40	40	40	40	40	60	60	60	60	60
Power Supply	AC Range (+10%, -15%)	—	100–240 VAC	100–240 VAC	—	100–240 VAC	—	100–240 VAC	100–240 VAC	—	100-240 VAC
	Frequency at AC Hz	—	50/60	50/60	—	50/60	—	50/60	50/60	—	50/60
	DC Range (+10%, -15%)	12–24 VDC	—	—	12–24 VDC	—	12 – 24 VDC	—	—	12 – 24 VDC	—
Max. Apparent Input Power		18 W	32 W	32 W	18 W	32 W	20 W	35 W	35 W	20 W	35 W
Inrush Current at ON	100 VAC (ms)	—	30A (5ms)	30A (5ms)	—	30A (5ms)	—	15 A / 5	15 A / 5	—	15 A / 5
	200 VAC (ms)	—	50A (5ms)	50A (5ms)	—	50A (5ms)	—	25 A / 5	25 A / 5	—	25 A / 5
	24 VDC (ms)	25A (1ms)	—	—	25A (1ms)	—	60 A / 50	—	—	60 A / 50	—
Allowable Momentary Power Failure Time (ms)		5	10	10	5	10	5	10	10	5	10
External Service Power Supply (24 VDC) mA		—	400	400	—	400	—	400	400	—	400
Integrated Inputs*		24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	36 (24 VDC)	36 (24 VDC)	36 (24 VDC)	36 (24 VDC)	36 (24 VDC)
Min. Current for Logical 1 (mA)		> 4.5 / 3.5									
Max. Current for Logical 0 (mA) (X0-X7 / X10 onwards)		< 1.5									
Response Time		For all base units of the FX1N series; 10 ms (at time of shipping), adjustable from 0 to 15 ms in steps of 1 ms									
Integrated Outputs		16	16	16	16	16	24	24	24	24	24
Output Type		Relay	Relay	Source Trans.	Source Trans.	Sink Trans.	Relay	Relay	Source Trans.	Source Trans.	Sink Trans.
Switching Voltage (Max.) V		For relay version: < 240 VAC, < 30 VDC: for transistor version: 5 – 30 VDC									
Max. Output Current	Per Output (A)	2	2	0.5	0.5	0.5	2	2	0.5	0.5	0.5
	Per 4 Outputs (A)	8	8	0.8	0.8	0.8	8	8	0.8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	12W	12W	12W	80 VA	80 VA	12 W	12 W	12 W
	Lamp Load (W)	100	100	1.5	1.5	1.5	100	100	1.5	1.5	1.5
Response Time (ms)		10	10	<0.2	<0.2	<0.2	10	10	<0.2	<0.2	< 0.2
Life of Relay Contacts (Number of Cycles)		For all base units of the FX1N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA									
Weight (kg)		0.75	0.75	0.75	0.75	0.75	0.8	0.8	0.8	0.8	0.8
Dimensions (W x H x D) mm		130 x 90 x 75	130 x 90 x 75	130 x 90 x 75	130 x 90 x 75	130 x 90 x 75	175 x 90 x 75	175 x 90 x 75	175 x 90 x 75	175 x 90 x 75	175 x 90 x 75
Required Manuals		FX Series Programming Manual II, JY992D88101									

* Sink / Source except for MT units = Sink only.

FX0N I/O Powered Extension Unit Hardware Specifications

Specifications		FX0N-40ER-ES/UL	FX0N-40ER-DS	FX0N-40ET-DSS
Rating		UL • cUL • CE • DNV • NK	CE • RINA	CE • RINA
Integrated Inputs / Outputs		40	40	40
Power Supply	AC Range (+10%, -15%)	100–240 V	—	—
	Frequency at AC Hz	50/60	—	—
	DC Range (+10%, -15%)	—	DC 24 V	DC 24 V
Max. Apparent Input Power		40VA	20 W	20 W
Inrush Current at ON	100 VAC	30 A / 5 ms	—	—
	200 VAC	50 A / 5 ms	—	—
	24 VDC	—	60 A / 50 µs	60 A / 50 µs
Allowable Momentary Power Failure Time (ms)		10	10	10
External Service Power Supply (24 VDC) mA		200	—	—
Integrated Inputs*		24 (24 VDC)	24 (24 VDC)	24 (24 VDC)
Min. Current for Logical 1 (mA)		3.5	3.5	3.5
Max. Current for Logical 0 (mA)		1.5	1.5	1.5
Response Time (ms)		10	10	10
Integrated Outputs		16	16	16
Output Type		Relay	Relay	Source Transistor
Switching Voltage (Max.) V		For relay version: < 240 VAC, < 30 VDC: for transistor version: 5 – 30 VDC Source		
Max. Output Current	Per Output (A)	2	2	0.5
	Per 4 Outputs (A)	8	8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	12 W
	Lamp Load (W)	100	100	1.5
Response Time (ms)		10	10	< 0.2
Life of Relay Contacts (Number of Cycles)		For all extension units of the FX0N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA		
Weight (kg)		0.6	0.6	0.6
Dimensions (W x H x D) mm		150 x 90 x 87	150 x 90 x 87	150 x 90 x 87
Required Manuals		FX Series Programming Manual II, JY992D88101		

* Sink / Source inputs

Note: FX0N and FX2N special function blocks and I/O extension blocks and units are interchangeable.

FX2N I/O Extension Block Hardware Specifications

Specifications		FX2N-8 ER-ES/UL	FX2N-8 EX-ES/UL	FX2N-8 EX-UA1/UL	FX2N-8 EYR-ES/UL	FX2N-8EYT	FX2N-8 EYT-ESS/UL	FX2N-8 EYT-H	FX2N-16 EX-ES/UL	FX2N-16 EYR-ES/UL	FX2N-16 EYT-ESS/UL
Rating		UL•cUL• CE DNK•NK	UL•cUL• CE DNK•NK	UL•cUL DNV	UL•cUL•CE DNV•NK	—	UL•cUL•CE DNV	—	UL•cUL•CE DNV•NK	UL•cUL•CE DNV•NK	UL•cUL•CE DNV
Integrated Inputs / Outputs		8	8	8	8	8	8	8	16	16	16
Power Supply		All modular extension units are powered by the base unit									
Integrated Inputs*		4 (24 VDC)	8 (24 VDC)	8 (120 VAC)	—	—	—	—	16 (24 VDC)	—	—
Min. Current for Logical 1 (mA)		3.5	3.5	3.8	—	—	—	—	3.5	—	—
Max. Current for Logical 0 (mA)		1.5	1.5	1.7	—	—	—	—	1.5	—	—
Response Time (ms)		10	10	25	—	—	—	—	10	—	—
Integrated Outputs		4	—	—	8	8	8	8	—	16	16
Output Type		Relay	—	—	Relay	Sink Trans.	Source Trans.	Sink Trans.	—	Relay	Source Trans.
Max. Switching Voltage		For relay version: < 264 VAC, < 30 VDC: for transistor version: 5 – 30 VDC Source									
Max. Output Current	Per Output (A)	2	—	—	2	0.5	0.5	1	—	2	0.5
	Per 4 Outputs (A)	8	—	—	8	0.8	0.8	2	—	8	0.8
Max Switching Load	Inductive Load	80 VA	—	—	80 VA	12 W	12 W	24 W	—	80 VA	12 W
	Lamp Load (W)	100	—	—	100	1.5	1.5	3W	—	100	1.5
Response Time (ms)		10	10	—	10	< 0.2	< 0.2	0.4 ON-OFF 0.2 OFF-ON	10	10	< 0.2
Life of Relay Contacts (Number of Cycles)		For all extension blocks of the FX0N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA									
5 VDC Current Consumption (mA)		25	25	25	30	30	30	30	45	40	180
Weight (kg)		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Dimensions (W x H x D) mm		43 x 90 x 87	43 x 90 x 87	43 x 90 x 87	43 x 90 x 87	43 x 90 x 87	43 x 90 x 87	43 x 90 x 87	70 x 90 x 87	70 x 90 x 87	70 x 90 x 87

* Sink / Source inputs

Note: FX0N and FX2N special function blocks and I/O extension blocks and units are interchangeable.

FX1N Performance Specifications

Model Number		FX1N	REMARK
Operation Control Method		Cyclic operation by stored program	
I/O Control Method		Batch processing (takes place after END instruction is executed)	I/O refresh instruction is available
Operation Processing Time		Basic instructions: 0.55 to 0.7 μs. Applied instructions: 1.65 to several 100 μs	
Programming Language		Relay symbolic language + step ladder	Step ladder can be used to produce an SFC style program
Program Capacity		8K steps Provided by built in EEPROM memory	
Number of Instructions		Sequence (basic) instructions: 29; Stepladder instructions: 2 Applied instructions: 89	Maximum number of 120 applied instructions are available including all variations
I/O Configuration		Max. hardware I/O configuration points 128, dependent on user selection. (Max. software addressable 128 inputs, 128 Outputs)	
Auxiliary Relay (M Coils)	General	384 points	M0 to M383
	Latched	M384~M511	20 years, EEPROM backed
	Special	M512~M1535	10 Days, capacitor backed
State Relays (S Coils)	Latched	S0~S127	20 years, EEPROM backed
	Initial	S128~S999	10 Days, capacitor backed
Timers	100 msec	Range: 0 to 3,276.7 sec; 200 points	T0 to T199
	10 msec	Range: 0 to 327.67 sec; 46 points	T200 to T245
	1 msec Retentive	Range: 0 to 32.767 sec; 4 points	T246 to T249, 10 days, capacitor backed
	100 msec Retentive	Range: 0 to 3,276.7 sec; 6 points	T250 to T255, 10 days, capacitor backed
Counters (C)	General	Range: 1 to 32,767 counts; 16 points	C0 to C15 Type: 16 bit up counter
	Latched (EEPROM)	C16~C31	C16 to C199 Type: EEPROM backed
	Latched (Capacitor)	C32~C199	10 Days, capacitor backed
	General	Range: 1 to 32,767 counts; 20 points	C200 to C219 Type: 32 bit bi-directional counter
	Latched	15 points (subset)	C220 to C234 Type: 32 bit bi-directional counter
High Speed Counters (C)	1 Phase	Range: -2,147,483,648 to +2,147,483,647	C235 to C238 4 points
	1 Phase C/W Start Stop Input	FX1N has two Super High Speed Counters that can count up to 100 kHz apiece. The Y0 and Y1 outputs can send pulse train outputs up to 100kHz. Up to six 1-phase counters (10kHz max.) or three 2-phase counters (up to 5 kHz) can be used to count frequencies up to a maximum of 60 kHz for High Speed Counters. 2-phase counters must be doubled when calculating the total frequency used.	C241, C242 and C244 3 points
	2 Phase		C246, C247 and C249 3 points
	A/B Phase		C251, C252 and C254 3 points
Data Registers (D)	General	7128 points	D0 to D127 & D1000 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	Latched (EEPROM)	D128~D255	20 years, EEPROM backed
	Latched (Capacitor)	D1000~D7999	10 days, Capacitor backed*
	Externally Adjusted	Range: 0 to 255 2 points	Data is moved from external setting potentiometers to registers D8030 and D8031
	Special	256 points (inclusive of D8013, D8030 and D8031)	From the range D8000 to D8255 Type: 16 bit data storage register
	Index	16 points	V and Z Type: 16 bit data storage register
Pointers (P)	For Use w/ CALL	128 points	P0 to P127
	For Use w/ Interrupts	6 points	100□ to 130□ (rising trigger □ =1, falling trigger □=0)
Nest Levels		8 points for use with MC and MCR	N0 to N7
Constants	Decimal K	16 bit: -32,768 to +32,767 32 bit: -2,147,483,648 to +2,147,483,647	
	Hexadecimal H	16 bit; 0000 to FFFF 32 bit: 00000000 to FFFFFFFF	
Environmental		AC Powered Units	DC Powered Units
Dielectric Withstand Voltage		1500 VAC for 1 min.	500 VAC for 1 min.
Insulation Resistance		5MΩ or larger by 500 VDC insulation resistance tester	
Noise Durability		Noise voltage: 1000Vp-p, width: 1ms, frequency: 30 to 100Hz, tested by noise simulator	
Grounding		Class 3 grounding (100Ω or less)	
Ambient Operating Temp. / Humidity		0 to 55° C (32 to 131° F), 35 to 85% RH (no condensation), to be free from corrosive gas and dust	
Vibration Resistance		JIS C0911, 10 to 55 Hz, 0.5mm / 0.02 in.(max. 2G, 0.5G if mounted on DIN rail), 2 hrs. in 3 directions	
Shock Resistance		JIS C0912, 10G, 3 times in 3 directions	

* Capacitor backed memory will change to random values after 10 days. Please use the FX1N-BAT for external battery backup.

FX0N RS-232 Communications Interface

Specifications	FX0N-232ADP
Rating	CE (EMC only)
General Specifications	See page 192 for Environmental Specifications
Applicable PLCs	FX1S / FX1N / FX2N / FX2NC / FX0N. PLCs other than the FX2NC require a function expansion board or special adapter connection
Interface	RS-232 with 25 pole D-SUB compact plug (Photocoupler isolated)
Power Supply	5 VDC / 200 mA (from base unit)
Communications Speed (Bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200
Communications Distance (m)	Max. 15
Communications Cable	Shielded cable
Communication Mode	Half duplex
Protocols	Defined under program control
Format	7 or 8 bits, parity 1 or 0, 1 or 2 stop bit
Related I/O Points	—
Weight (kg)	0.2
Dimensions (W x H x D) mm	43 x 90 x 87
Required Manuals	FX Communication Manual • JY992D69901 FX0N-232ADP User's Manual • JY992D51301

The optional RS-232C interface FX0N-232ADP permits serial communication between the PLC and surrounding RS-232C peripherals.

Use the FX0N-232ADP to transmit and receive data. The module is suitable for the connection of printers, bar code readers, PCs and other PLC systems. The communication is handled by the PLC program using the RS instruction. Note that operator interfaces should not be connected via this module.

The connection is to the communications bus on the left side of the controller. Use of the FX0N-232ADP does not affect use of the programming port. In the FX1N systems, you can continue to use ADP modules by adding the Communications Adapter FX1N-CNV-BD.

FX0N RS-485/422 Communications Interface

Specifications	FX0N-485ADP
Rating	CE (EMC only)
Applicable PLCs	FX1S / FX1N / FX2N / FX2NC / FX0N. PLCs other than the FX2NC require a function expansion board or special adapter connection
General Specifications	See page 192 for Environmental Specifications
Dielectric Withstand Voltage	500 VAC for 1 minute
Power Supply	5 VDC / max.30 mA (from base unit), 24 VDC / 50 mA
Interface	RS-485/422 with screw terminals
Communications Speed (Bit/s)	300 — 19200
Communications Distance (m)	Max. 500
Communications Cable	Shielded cable
Communication Mode	Half duplex
Protocols	Protocol 1 and 4 of AJ71UC24
Related I/O Points	—
Weight (kg)	0.3
Dimensions (W x H x D) mm	43 x 90 x 87
Required Manuals	FX Communication Manual • JY992D69901 FX0N-485ADP User's Guide • JY992D53201

The FX0N-485ADP communications module enables the configuration of master/slave multidrop and parallel link networks using RS-485 interface or 422.

In FX0N systems the module is connected directly to the communications bus on the left hand side of the FX0N base unit. In the FX1N systems, you can continue to use ADP modules by adding the Communications Adapter FX1N-CNV-BD. The FX2N-CNV-BD communications adapter is required for connection to the FX2N base unit.

FX0N Combination Analog Input/Output Special Function Block

Specifications		FX0N-3A
Rating		CE (EMC only)
Applicable PLCs		FX0N / FX1N / FX2N / FX2NC
General Specifications		See page 192 for Environmental Specifications
Dielectric Withstand Voltage		500 VAC for 1 minute
Power Supply		24 VDC / 90 mA (from base unit), 5 VDC / 30 mA
Number of Analog Points	Input	2
	Outputs	1
Analog Data	Voltage (VDC)	0 – 10 / 0 – 5
	Current (mA DC)	4 – 20
I/O Resolution		20 mV / 64 µA (8 bit)
Total Accuracy		± 1%
Conversion Time (A ∅ D/ D∅A ms)		0.1 / point
Occupied I/O Points		8
Weight (kg)		0.2
Dimensions (W x H x D) mm		43 x 90 x 87
Required Manual		FX0N-3A User's Guide • JY992D49001

The analog input module FX0N-3A provides the user with 2 analog inputs and 1 analog output. They serve for conversion of analog process signals into digital values, and vice versa.

The analog module is connected to the base unit via a protected flat cable. The connection is to the extension bus on the right side of the controller.

The FX0N-3A may also be used with other expandable controllers (FX1N/2N/2NC).

FX0N Profibus DP Slave Special Function Block

Specifications		FX0N-32NT-DP
Rating		CE (EMC only)
Applicable PLCs		FX0N / FX2N / FX2NC
General Specifications		See page 192 for Environmental Specifications
Dielectric Withstand Voltage		500 VAC for 1 minute
Power Supply		5 VDC / max. 170 mA (from base unit), 24 VDC / 60 mA
Interface		Profibus DP
Communication Speed	Distances:	
	1200 m (kbit/s)	9.6 / 19.2 / 93.75
	1000 m (kbit/s)	187.5
	100 m (kbit/s)	1500
	200 m (kbit/s)	3000 / 6000 / 12000
Communication Distance (m)		Max. 1200 (depends on communication speed)
Communication Cable		PROFIBUS cable with 9-pin D-SUB plug
Related I/O Points		8
Weight (kg)		0.3
Dimensions (W x H x D) mm		43 x 90 x 87
Required Manuals		FX0N-32NT-DP Profibus Interface Unit • JY992D61401

The FX0N-32NT-DP Profibus module enables you to integrate a MELSEC FX0N/1N/2N/2NC system in an existing Profibus DP network. This interface module provides your Supermicro CPU with an intelligent Profibus DP link for the implementation of decentralized control tasks. It links the system to the master PLC in the Profibus DP network for efficient and trouble-free data exchange.

FX1N Communication Adapter Cards

Specifications	FX1N-232-BD	FX1N-422-BD	FX1N-485-BD
Rating	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Applicable PLCs	FX1S / 1N	FX1S / 1N	FX1S / 1N
General Specifications	See page 192 for Environmental Specifications		
Interface	RS-232 with 9 pole D-SUB connector	RS-422 8 pole mini DIN connector	RS-485 / RS-422
Power Supply	5 VDC / 20 mA (from base unit)	5 VDC / 60 mA (from base unit)	5 VDC / 60 mA from base unit
Communication Speed (bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200	—	300 – 38,4000
Communication Distance (m)	Max. 15	Max. 50 m	Max. 50
Communication Mode	Half duplex	Half duplex, B Directional	—
Protocols	Freely programmable via PLC / protocol 1 or 4	Freely programmable via PLC/ Use as 2nd prog. port	Protocol 1 or 4 of AJ71UC24 / no protocol / parallel link / master+slave
Related I/O points	—	—	—
Weight (kg)	0.08	0.08	0.08
Dimensions (mm)	38.5 x 43	38.5 x 43	38.5 x 43
Function	General purpose RS-232 Communications	Duplicate programming port for HMI/PC connections	Multidrop network/master/slave general purpose RS-485/422 communications
Required Manuals	JY992D84401	JY992D84101	JY992D84201

*Adapter Cards can be used with the FX1S base units.

FX1N Adapter Cards

Specifications	FX1N-4EX-BD	FX1N-2EYT-BD	FX1N-2AD-BD	FX1N-1DA-BD
Rating	UL • cUL • CE			
Applicable PLCs	FX1S / 1N			
General Specifications	See page 192 for Environmental Specifications			
Interface	—			
Power Supply	5 VDC / 60 mA (from base unit)			
Resolution	—	—	2.5 mV (10/4000) 8µA (4-20/2000)	2.5 mV (10/4000) 4µA (4-20/4000)
Overall Accuracy	—	—	± 1% full scale	± 1% full scale
Analog Input	—	—	0-10 VDC, 4-20mA	—
Analog Output	—	—	—	0-10 VDC, 4-20mA
Conversion Speed	—	—	1 scan time	1 scan time
Related I/O Points	0	0	0	0
Weight (kg)	0.08	0.08	0.08	0.08
Dimensions (mm)	38.5 x 43	38.5 x 43	38.5 x 43	38.5 x 43
Function	4 points general purpose DC input	2 points general purpose transistor outputs	2 channel general purpose analog to digital conversion (input)	1 channel general purpose digital to analog conversion (output)
Required Manuals	JY992D95001	JY992D95201	JY992D96201	JY992D96401

FX1N Adapter Cards

Specifications	FX1N-8AV-BD	FX1N-CNV-BD
Rating	CE • UL • cUL	
Applicable PLCs	FX1S / 1N	FX1S / 1N
General Specifications	See page 192 for Environmental Specifications	
Interface	—	—
Power Supply	From base unit	Not necessary
Resolution	8 bit	—
Communication Speed (bit/s)	—	—
Communication Distance (m)	—	—
Communication Mode	—	—
Related I/O Points	0	0
Weight (kg)	0.08	0.15
Dimensions (mm)	38.5 x 43	38.5 x 43
Function	Analog manually adjustable potentiometers	For connection for FX0N-□□□ADP Units
Required Manual	JY992D84601	JY992D84701

*Adaptor Cards can be used with the FX1S base units.

FX1N Memory Cassettes

Specifications	FX1N-EEPROM-8L
Rating	UL • cUL • CE
Applicable PLCs	FX1S / 1N
General Specifications	See page 192 for Environmental Specifications
Capacity	FX1N=16 KB (8,000 steps) / FX1S=4 KB (2,000 steps)
Function	Serves as removable memory
Required Manual	JY992D85001

*EEPROM Cassette can be used with the FX1S base units.

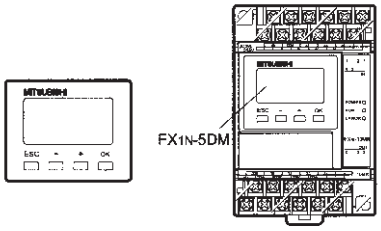
FX1N Battery BD Board

Specifications	FX1N-BAT
Compatibility	FX1N
Life	2 years @ 25°C
Devices Backed by the Battery	D1000~D7999, M512~M1535, S128~S999, T246~T255, C32~C199, C220~C234, and the Real Time clock

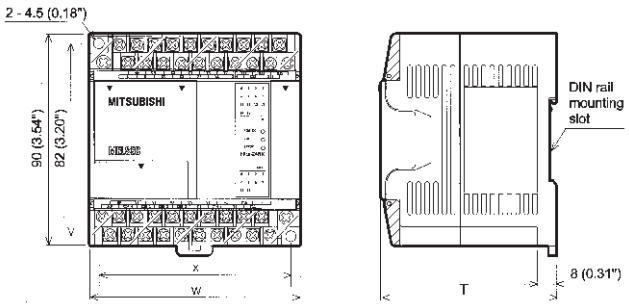
FX1N Simple Display

Specifications	FX1N-5DM
Rating	UL • cUL • CE
Applicable PLCs	FX1S / 1N
General Specifications	See page 192 for Environmental Specs.
Interface	—
Power Supply	Taken from base 5 VDC 110 mA
Weight	20 g
Dimensions	40 x 32 x 17
Function	Micro display, X, Y, M, S, T, C, D to monitor/test
Required Manual	JY992D84901

*Micro display can be used with the FX1S base units.



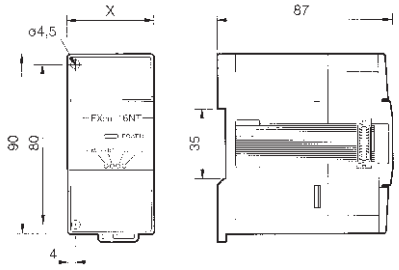
FX1N Base Units and I/O Extension Units Dimensions



Dimensional Data

Type	X (mm)	T (mm)
FX1N-14MR-ES/UL	90	75
FX1N-24MR-ES/UL	90	75
FX1N-40MR-ES/UL	130	75
FX1N-60MR-ES/UL	175	75
FX1N-14MR-DS	90	75
FX1N-24MR-DS	90	75
FX1N-40MR-DS	130	75
FX1N-60MR-DS	175	75
FX1N-14MT-DSS	90	75
FX1N-24MT-DSS	90	75
FX1N-40MT-DSS	130	75
FX1N-60MT-DSS	175	75
FX1N-14MT	90	75
FX1N-24MT	90	75
FX1N-40MT	130	75
FX1N-60MT	175	75
FX1N-14MT-ESS/UL	90	75
FX1N-24MT-ESS/UL	90	75
FX1N-40MT-ESS/UL	130	75
FX1N-60MT-ESS/UL	175	75

FX0N I/O Extension Blocks and Special Function Blocks Dimensions



Dimensional Data

Type	X (mm)
FX0N-40ER-ES/UL	150
FX0N-40ER-DS	150
FX0N-40ET-DSS	150
FX2N-8ER-ES/UL	43
FX2N-8EX-ES/UL	43
FX2N-8EX-UA1/UL	43
FX2N-8EYR-ES/UL	43
FX2N-8EYT	43
FX2N-8EYT-H	43
FX2N-8EYT-ESS/UL	43
FX2N-16EX-ES/UL	70
FX2N-16EYR-ES/UL	70
FX2N-16EYT-ES/UL	70
FX0N-232ADP	43
FX0N-485ADP	43
FX0N-3A	43
FX0N-32NT-DP	43

FX1N Base Unit Terminal Layouts

⏚	S/S	X1	X3	X5	X7	•	•	•
L	N	X0	X2	X4	X6	•	•	•

FX1N-14MR-ES/UL • FX1N-14MR-DS

⏚	Y0	Y1	Y2	Y3	Y4	Y5	•	•
24V	COM0	COM1	COM2	COM3	COM4	COM5	•	•

⏚	COM	X1	X3	X5	X7	•	•	•
⊕	⊖	X0	X2	X4	X6	•	•	•

FX1N-14MT-DSS • FX1N-14MT-ESS/UL

0V	Y0	Y1	Y2	Y3	Y4	Y5	•	•
24V	+V0	+V1	+V2	+V3	+V4	+V5	•	•

⏚	S/S	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27
L	N	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26

FX1N-40MR-ES/UL • FX1N-40MR-DS

0V	Y0	Y1	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
24V	COM0	COM1	COM2	Y3	COM3	Y5	Y7	COM4	Y11	Y13	COM5	Y15	Y17

⏚	S/S	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27
⊕	⊖	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26

FX1N-40MT-DSS • FX1N-40MT-ESS/UL

0V	Y0	Y1	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
24V	+V0	+V1	+V2	Y3	+V3	Y5	Y7	+V4	Y11	Y13	+V5	Y15	Y17

⏚	S/S	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37	X41	X43
L	N	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	X40	X42

FX1N-60MR-ES/UL • FX1N-60MR-DS

0V	Y0	Y1	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•	Y20	Y22	•	Y24	Y26	•
24V	COM0	COM1	COM2	Y3	COM3	Y5	Y7	COM4	Y11	Y13	COM5	Y15	Y17	COM6	Y21	Y23	COM7	Y25	Y27

⏚	S/S	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37	X41	X43
⊕	⊖	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	X40	X42

FX1N-60MT-DSS • FX1N-60MT-ESS/UL

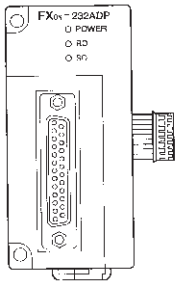
0V	Y0	Y1	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•	Y20	Y22	•	Y24	Y26	•
24V	+V0	+V1	+V2	Y3	+V3	Y5	Y7	+V4	Y11	Y13	+V5	Y15	Y17	+V6	Y21	Y23	+V7	Y25	Y27

*FX1N-☐ ☐ MT-ESS/UL units have identical terminal layouts, the only difference is the power input terminals which have L and N in place of ⊕ ⊖

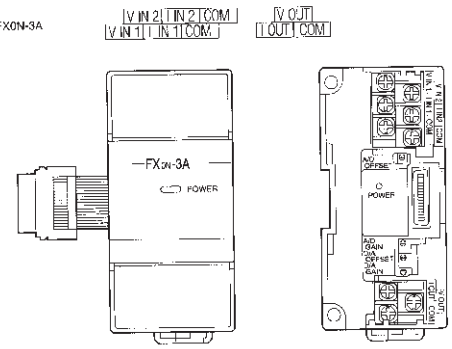
*FX1N-☐ ☐ MT units have identical terminal layouts to the FX1N-☐ ☐ MR-ES/UL units, the only difference is the S/S input terminal has COM in its place.

FX1N Special Function Modules Terminal Layouts

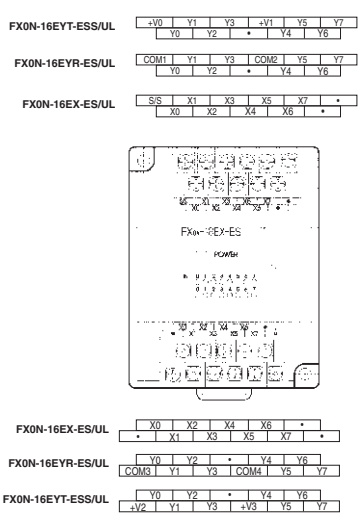
FX0N-232ADP

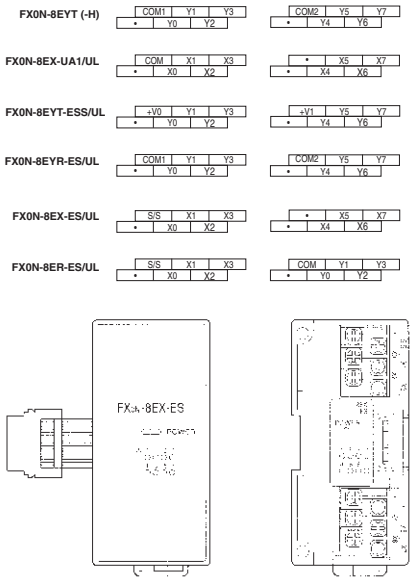


FX0N-3A

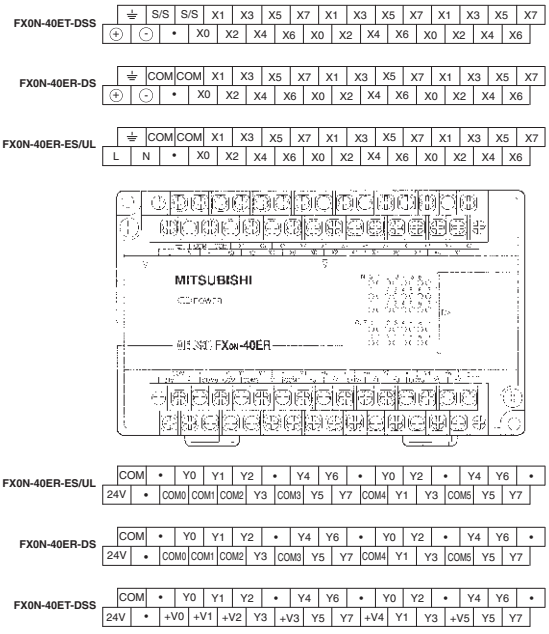


FX0N I/O Extension Blocks Terminal Layouts



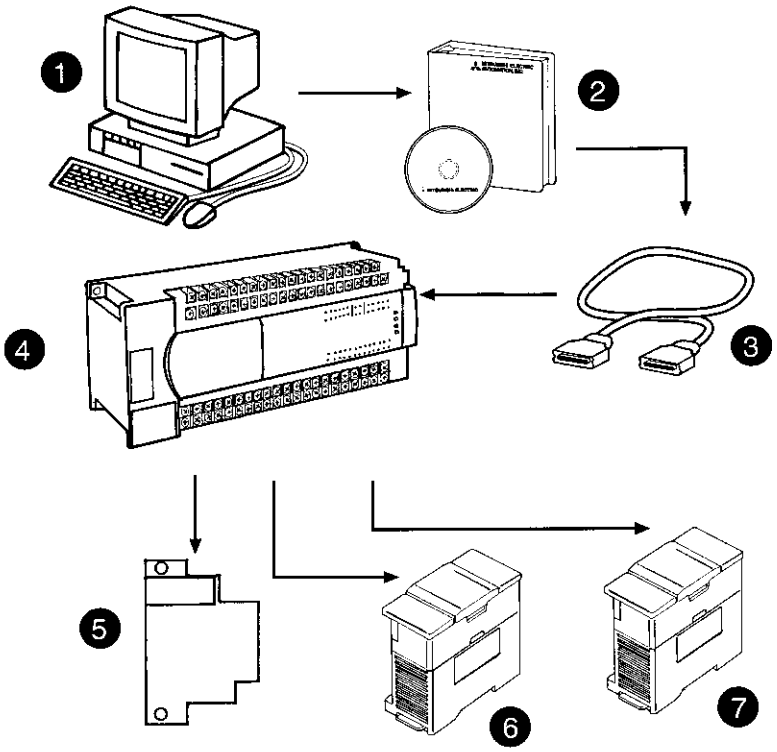


FX0N I/O Extension Unit Terminal Layouts



Programmable Logic Controllers • FX2N SuperMicro™

The FX2N SuperMicro™ marks a new era in micro PLC performance. The FX2N offers powerful capabilities such as our largest standard memory, unprecedented data storage, autotuning PID, networking and flexible serial communications, all executed at speeds faster than any FX PLC has ever offered before.



FOR AN OPERATIONAL SYSTEM, SELECT:

1. Personal Computer
2. Programming Software
3. Programming Cable SC09*
4. FX2N PLC
5. FX2N Adapter Card (1)—fits under top cover
6. FX2N/FX0N Special Function Blocks—fits on RHS of PLC
7. FX2N/FX0N Extension I/O Blocks/Units—fits on RHS of PLC

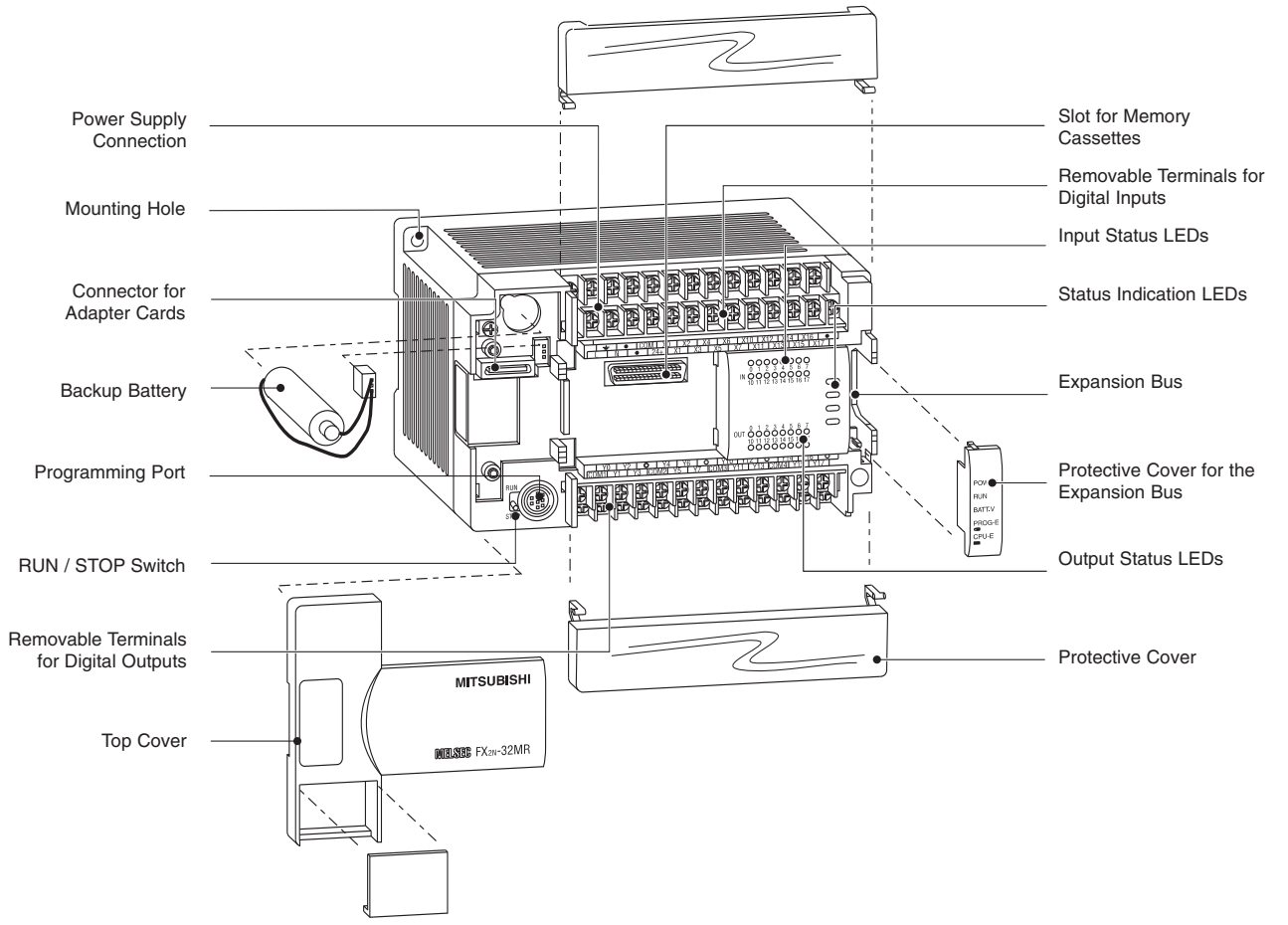
NOTE: FX0N and FX2N special function blocks and I/O extension blocks and units are interchangeable.
* Use the supplied 25-8 pin adapter.
(1) Use FX2N-CNV-BD to connect FX0N-□□□ADP Adapters. Fits under cover of PLC.
Programming Manual JY992D88101 available separately.

FX2N

When you look for a micro PLC, there are many choices, so why choose Mitsubishi Electric? Mitsubishi Electric is the leader in micro PLCs. We invented the first micro, and have shipped close to 3 million of them over the last 20 years. Our wealth of experience and heritage of building the best micro PLCs in the business has lead us to create what can only be described as a SUPERMICRO; the FX2N.

The FX2N SuperMicro leads the way in performance, features and value, making it the perfect choice for small and mid-sized applications. It remains price competitive in lower performance applications and truly stands apart when used on the most demanding projects.

- Windows programming: Ladder, List or SFC languages, with GPP-WIN (in common with FX0S, FX0N, FX1S & FX1N)
- Easy Migration: Programs and development tools interchange with FX, FX0S, FX0N, FX1N, and FX1S.
- Operator Interfaces: Selections to match any application.
- Unmatched Program Memory: 16/32K (8,000/16,000 steps).
- Massive Data Memory: 8,000 data registers.
- Enhanced Throughput: 80 nanoseconds/step.
- Better Process Control: New, auto-tuning PID.
- Sophisticated High-Speed Processing: 60 kHz counters, 10 ms timed and 50µs hardware interrupts.
- High-Function Mathematics: 32 bit floating point, Square Root and Trigonometry.
- Embedded Motion Control: Two 20 kHz pulse trains, Trapezoidal ramp instructions.
- Year 2000 Compliant: Real-time clock/calendar (4-digit year) for scheduling and time stamping.
- Flexible configurations: From 16 to 256 I/O and extensive special function I/O capabilities.
- Cost-Effective Communications: Built-in 2nd port (RS-232/RS-422/ RS-485) and PLC-PLC networking.
- Open Network Connectivity: Modules for Profibus DP, Profibus DP I/O, DeviceNet, AS-i and CC-Link.



FX2N Base Unit Extension Rules

In general, the FX2N PLC system can support extension I/O, special function blocks and still have a reserve of 24VDC power remaining to power sensors, etc. via the service power supply. The tables on this page show you how to calculate how many special function blocks you can add to a FX2N base unit, and how much current the service power supply can provide when extension I/O is added.

Note that once I/O extension units and blocks are connected to the base unit, the I/O numbering of these peripherals continues from the next whole group of 8 I/O from where the I/O on the base unit ends. Extension I/O numbering always repeats in groups of 8 (X000-X007, Y000-Y007, octal numbers), to allow it to be added anywhere in the sequence of I/O points for the system without causing a number conflict. For example, if the system consists of 32 I/O with a 16 I/O base unit, an 8 point input block, and an 8 point output block, the numbering would work as follows.

Base Unit	Inputs:	X000-X007
	Outputs:	Y000-Y007
8 point input block:	Inputs:	X010-X017 (actually numbered X000-X007 on the block)
	Outputs:	None
8 point output block:	Inputs:	None
	Outputs:	Y010-Y017 (actually numbered Y000-Y007 on the block)

Note: From a software point of view, the application program would see a seamless range of physical I/O from X000-X017 and Y000-Y017.

Table 1: 5V Bus Supply
The FX2N base unit supplies 5 VDC to special function blocks via its expansion bus. This is used to operate the special function blocks' CPUs. The specifications in this section guide show how much of this 5V supply current each special function block consumes. To insure your configuration falls within the limits of the base unit's supply, total the 5V current consumed by all special function blocks. For a permissible configuration, this should be equal to or less than the total in the table. Note that it is not possible to add extra 5V power to a system without using a powered expansion unit.

Table 1

Module	Max. Current on 5V bus
FX2N-□□M□-ES/UL (ESS/UL)	290 mA
FX2N-□□E□-ES/UL (ESS/UL)	690 mA

Tables 2 and 3: Service Power Supply
The FX2N base unit has a built-in 24 VDC service power supply intended to power sensors and other peripheral equipment. The amount of current available from this supply is dependent on the number of extension I/O that has been added to the base unit.

Table 2: 24 VDC Power For 16 – 32 I/O Units

Product	24 VDC Value	Max. Input Extension	Max. Output Extension
FX2N-16M* FX2N-32M* FX2N-32E*	250mA	32 points	24 points

Table 3: 24 VDC Power For 48 – 128 I/O Units

Product	24 VDC Bus Supply	Max. Input Extension	Max. Output Extension
FX2N-48M* FX2N-64M* FX2N-80M* FX2N-128M* FX2N-48E*	460mA	64 points	48 points

*Refers to any base PLC or powered extension module.

FX2N Sample Power Calculation

The current values for the special function blocks can be found in the specifications on the following pages and in the FX2N Hardware Manual.

Module	No.	24 VDC Calculation		5 VDC Calculation	
		Current / Module	Calculation	Current / Module	Total Current
FX2N-80MR-ES	1	+460 mA	+460 mA	+290 mA	+290 mA
FX2N-4AD	3	+50 mA	(-150 mA)	(-30 mA)	(-90 mA)
FX2N-4DA	1	+200 mA	(-200 mA)	(-30 mA)	(-30 mA)
FX2N-232IF	1	+80 mA	(-80 mA)	(-40 mA)	(-40 mA)
			+30 mA		**290 - 160 mA**
					Result: 130 mA (OK)

Module	No.	Number of I/Os			24 VDC Calculation*		5 VDC Calculation	
		X	Y	X/Y	Total[1]	Total Current	Current / Module	Total Current
FX2N-48MR-ES/UL	1	24	24	—	+460 mA		+290 mA	+290 mA
FX2N-16EYR-ES/UL	1	—	16	—	(-150 mA)	(-150 mA)	—	0 mA
FX0N-8EX-ES/UL	1	8	—	—	(-50 mA)	(-50 mA)	—	0 mA
FX0N-8EYR-ES/UL	1	—	8	—	(-75 mA)	(-75 mA)	—	0 mA
FX0N-3A	1	—	—	8	(-90 mA)	(-90 mA)	(-30 mA)	(-30 mA)
						+95 mA (OK)		**+260 mA (OK)**
FX2N-32ER-ES/UL	1	16	16	—	+250 mA	+250 mA	+690 mA	+690 mA
FX2N-16EX-ES/UL*	2	16	—	—	(-100 mA)	(-200 mA)	—	0 mA
FX2N-4AD	1	—	—	8	(-30 mA)	(-30 mA)	(-55 mA)	(-55 mA)
FX2N-1HC	1	—	—	8	0 mA	0 mA	(-90 mA)	(-90 mA)
	Result:	**64 + 64 + 24 + = 152 (<256) OK**				**+20 mA (OK)**		**+545mA (OK)**

Note: 1. See Maximum Extension Input and Output tables on previous page.

FX2N Performance Specifications

Model Number		FX2N	REMARK
Operation Control Method		Cyclic operation by stored program	
I/O Control Method		Batch processing (takes place after END instruction is executed)	I/O refresh instruction is available
Operation Process Time		Basic instructions: 0.08μs — Applied instructions: 1.52 - several 100μs per instruction	
Programming Language		Relay symbolic language + Stepladder	Stepladder can be used to produce an SFC style program
Program Capacity		16K (8000 step) standard	Expandable to 32K (16000 steps) using addl. memory cassette
Number of Instructions		Basic sequence instructions: 27 — Step ladder instructions: 2 — Applied instructions: 125	
I/O Configuration		Max hardware I/O config. pts. 256, dependent on user selection (Max. software addressable inputs & outputs 256)	
Auxiliary Relay (M Coils)	General	3072 points	M0 to M3071
	Latched	2572 points (subset)	M500 to M3071 (Battery backed)
	Special	256 points	From the range M8000 to M8255
State Relays (S Coils)	General	1000 points	S0 to S999
	Latched	500 points (subset)	S500 to S999 (Battery backed)
	Initial	10 points	S0 to S9
	Annunciator	100 points	S900 to S999
Timers (T)	100 msec	Range: 0 to 3,276.7 sec. 200 points	T0 to T199
	10 msec	Range: 0 to 327.67 sec. 46 points	T200 to T245
	1 msec Retentive	Range: 0 to 32.767 sec. 4 points	T246 to T249 (Battery backed)
	100 msec Retentive	Range: 0 to 3,276.7 sec. 6 points	T250 to T255 (Battery backed)
Counters (C)	General 16 bit	Range: 1 to 32,767 counts 200 points	C0 to C199 Type: 16 bit up counter
	Latched 16 bit	100 points (subset)	C100 to C199 Type: 16 bit up counter (Battery backed)
	General 32 bit	Range:-2,147,483,648 to 2,147,483,647 35 points	C200 to C234 Type: 32 bit up/down counter
	Latched 32 bit	15 points (subset)	C219 to C234 Type: 32 bit up/down counter (Battery backed)
High-Speed Counters (C)	1 Phase	Range:-2,147,483,648 to +2,147,483,647 counts Note: All high speed counters are latched	C235 to C240 6 points (Battery backed)
	1 ph., c/w start/stop input		C241 to C245 5 points (Battery backed)
	2 phase		C246 to C250 5 points (Battery backed)
	A/B phase		C251 to C255 5 points (Battery backed)
Data Registers (D)	General	8000 points	D0 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	Latched	7800 points (subset)	D200 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	File Registers	7000 points (subset)	D1000 to D7999 set by parameter in 14 blocks of 500 program steps: Type: 16 bit data storage register
	Special	256 points	From the range D8000 to D8255 Type: 16 bit data storage register
	Index	16 points	V0 to V7 and Z0 to Z7 Type: 16 bit data storage register
Pointers (P)	For Use w/ CALL	128 points	P0 to P127
	For Use w/ Interrupts	6 input points, 3 timers, 6 counters	I00□ to I50□ and I6☆☆ to I8☆☆ I010 to I060 (rising trigger □=1, falling trigger □=0, ☆☆= time in msec) (Battery backed)
Nest Levels		8 points for use with MC and MCR	N0 to N7
Numbers	Decimal K	16 bit: -32,768 to +32,767 32 bit: -2,147,483,648 to +2,147,483,647	
	Hexadecimal H	16 bit; 0000 to FFFF 32 bit: 00000000 to FFFFFFFF	
	Floating Point	32 bit: 0, -1.175×10^{-38}, -3.403×10^{38}	
Environmental			
Ambient Temperature		0–55° C (in operation) –20 ±70° C (in storage)	
Ambient Humidity		35–85% RH, no condensation (in operation)	
Vibration Resistance		Conforms to JIS C0911. 10–55Hz 0.5mm (0.02 in.) (Max. 2G) 2 hours in each of 3 axis directions (0.5G on DIN rail)	
Shock Resistance		Conforms to JIS C0912 (10G 3 times in 3 directions)	
Noise Immunity		1000 Vpp noise voltage, 1 μs pulse width at 30–100Hz	
Dielectric Withstand Voltage		1500 VAC for 1 minute	Between all terminals and ground
Insulation Resistance		5MΩ or larger by 500 VDC insulation resistance tester	Between all terminals and ground
Ground		Class 3 ground, where available. (100Ω or less)	
Operating Environment		Must be free from corrosive gases. Dust should be minimal.	

Battery backup: Parameters for scope of battery backup adjustable.
Note: Fixed battery backup for M1024-M3071, D512-D7999.

FX2N Base Unit Hardware Specifications

Specifications		FX2N-16 MR-ES/UL	FX2N-16 MR-UA1/UL	FX2N-16 MT-ESS/UL	FX2N-32 MR-DS (2)	FX2N-32 MR-ES/UL	FX2N-32 MR-UA1/UL	FX2N-32 MT-DSS (2)	FX2N-32 MT-ESS/UL
Rating		UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE DNV•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	CE•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE DNV•ABS	CE•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV
Integrated Inputs / Outputs		16	16	16	32	32	32	32	32
Power Supply	AC Range (+10%, -15%)	100–240 VAC	100–240 VAC	100–240 VAC	—	100–240 VAC	100–240 VAC	—	100–240 VAC
	Frequency at AC Hz	50/60 (±10%)	50/60 (±10%)	50/60 (±10%)	—	50/60 (±10%)	50/60 (±10%)	—	50/60 (±10%)
	DC Range (+10%, -15%)	—	—	—	24 VDC	—	—	24 VDC	—
Max. Input Apparent Power		30 VA	30 VA	30 VA	25 W	40 VA	40 VA	25 W	40 VA
Inrush Current at ON	100 VAC	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	—	40 A < 5 ms	40 A < 5 ms	—	40 A < 5 ms
	200 VAC	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	—	60 A < 5 ms	60 A < 5 ms	—	60 A < 5 ms
Allowable Momentary Power Failure Time (ms)		10	10	10	5	10	10	5	10
External Service Power Supply (24 VDC) mA		250	N/A	250	—	250	N/A	—	250
Power Supply Int. Bus (5 VDC) mA		290	290	290	290	290	290	290	290
Integrated Inputs *		8 (24 VDC)	8 (120 VAC)	8 (24 VDC)	16 (24 VDC)	16 (24 VDC)	16 (120 VAC)	16 (24 VDC)	16 (24 VDC)
Min. Current for Logical 1 (mA) (X0 - X7 / X10 onwards)		4.5 / 3.5	3.8	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	3.8	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5	1.7	1.5	1.5	1.5	1.7	1.5	1.5
Response Time (ms)		0-15	25	0-15	0-15	0-15	25	0-15	0-15
Integrated Outputs*		8	8	8	16	16	16	16	16
Output Type		Relay	Relay	Source Transistor	Relay	Relay	Relay	Source Transistor	Source Transistor
ON Voltage (Max.) V		Generally for relay version: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC							
Max. Output Current	Per Output (A)	2	2	0.5	2	2	2	0.5	0.5
	Per Group* (A)	8	8	0.8	8	8	8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	12 W	80 VA	80 VA	80 VA	12 W	12 W
	Lamp Load (W)	100	100	1.5	100	100	100	1.5	1.5
Response Time (ms)		10	10	< 0.2	10	< 0.2	10	< 0.2	< 0.2
Life of Contacts (Switching Times)		For all base units of the MELSEC FX2N series values: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA							
Weight (kg)		0.6	0.6	0.60	0.65	0.65	0.65	0.65	0.65
Dimensions (W x H x D) mm		130 x 90 x 87	130 x 90 x 87	150 x 90 x 87	150 x 90 x 87	150 x 90 x 87	182 x 90 x 87	150 x 90 x 87	150 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101							

* Sink / Source except for MT & MS units: Sink only.

FX2N Base Unit Hardware Specifications

Specifications		FX2N-48 MR-DS (2)	FX2N-48 MR-ES/UL	FX2N-48MR-UA1/UL	FX2N-48 MT-ESS/UL (2)	FX2N-48 MT-DSS (2)	FX2N-64 MR-DS (2)	FX2N-64 MR-ES/UL	FX2N-64 MR-UA1/UL	FX2N-64 MT-DSS (2)	FX2N-64 MT-ESS/UL
Rating		CE•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE DNV•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	CE•ABS	CE•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE DNV•ABS	CE•ABS	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV
Integrated Inputs / Outputs		48	48	48	48	48	64	64	64	64	64
Power Supply	AC Range (+10%, -15%)	—	100–240 VAC	100–240 VAC	100–240 VAC	—	—	100–240 VAC	100–240 VAC	—	100–240 VAC
	Frequency at AC Hz	—	50/60 (±10%)	50/60 (±10%)	50/60 (±10%)	—	—	50/60 (±10%)	50/60 (±10%)	—	50/60 (±10%)
	DC Range (+10%, -15%)	24 VDC	—	—	—	24 VDC	24 VDC	—	—	24 VDC	—
Max. Input Apparent Power		30 W	50 VA	50 VA	50 VA	30 W	35 W	60 VA	60 VA	35 W	60 VA
Inrush Current at ON	100 VAC	—	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	—	—	40 A < 5 ms	40 A < 5 ms	—	40 A < 5 ms
	200 VAC	—	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	—	—	60 A < 5 ms	60 A < 5 ms	—	60 A < 5 ms
Allowable Momentary Power Failure Time (ms)		5	10	10	10	5	5	10	10	5	10
External Service Power Supply (24 VDC) mA		—	460	N/A	460	—	—	460	N/A	—	460
Power Supply Int. Bus (5 VDC) mA		290	290	290	290	290	290	290	—	290	290
Integrated Inputs*		24 (24 VDC)	24 (24 VDC)	24 (120 VAC)	24 (24 VDC)	24 (24 VDC)	32 (24 VDC)	32 (24 VDC)	32 (120 VAC)	32 (24 VDC)	32 (24 VDC)
Min. Current for Logical 1 (mA) (X0 - X7 / X10 onwards)		4.5 / 3.5	4.5 / 3.5	3.8	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	3.8	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5	1.5	1.7	1.5	1.5	1.5	1.5	1.7	1.5	1.5
Response Time		0-15	0-15	25	0-15	0-15	0-15	0-15	25	0-15	0-15
Integrated Outputs*		24	24	24	24	24	32	32	32	32	32
Output Type		Relay	Relay	Relay	Source Transistor	Source Transistor	Relay	Relay	Relay	Source Transistor	Source Transistor
ON Voltage (Max.) V		Generally for relay version: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC									
Max. Output Current	Per Output (A)	2	2	2	0.5	0.5	2	2	2	0.5	0.5
	Per Group* (A)	8	8	8	0.8	0.8	8	8	8	0.8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	80 VA	12 W	12 W	80 VA	80 VA	80 VA	12 W	12 W
	Lamp Load (W)	100	100	100	1.5	1.5	100	1.5	100	1.5	1.5
Response Time (ms)		10	10	10	< 0.2	<0.2	10	10	10	< 0.2	< 0.2
Life of Contacts (Switching Times)		For all base units of the MELSEC FX2N series values: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA									
Weight (kg)		0.85	0.85	0.85	0.85	0.85	1.0	1.0	1.0	1.0	1.0
Dimensions (W x H x D) mm		182 x 90 x 87	182 x 90 x 87	220 x 90 x 87	182 x 90 x 87	182 x 90 x 87	220 x 90 x 87	220 x 90 x 87	285 x 90 x 87	220 x 90 x 87	220 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101									

* Sink / Source except for MT & MS units: Sink only.

FX2N Base Unit Hardware Specifications

Specifications		FX2N-80MR-DS	FX2N-80 MR-ES/UL	FX2N-80 MT-ESS/UL	FX2N-80 MT-DSS (2)	FX2N-128 MR-ES/UL	FX2N-128 MT-ESS/UL
Rating		CE•ABS	UL•cUL•CE•DNV•LR GL•ABS•RINA•BV	UL•cUL•CE•DNV•LR GL•ABS•RINA•BV	CE•ABS	UL•cUL•CE•DNV•LR GL•ABS•RINA•BV	UL•cUL•CE•DNV•LR GL•ABS•RINA•BV
Integrated Inputs / Outputs		80	80	80	80	128	128
Power Supply	AC Range (+10%, -15%)	—	100–240 VAC	100–240 VAC	—	100–240 VAC	100–240 VAC
	Frequency at AC Hz	—	50/60 (±10%)	50/60 (±10%)	—	50/60 (±10%)	50/60 (±10%)
	DC Range (+10%, -15%)	24 VDC	—	—	24 VDC	—	—
Max. Input Apparent Power		40 W	70 VA	70 VA	40 W	100 VA	100 VA
Inrush Current at ON	100 VAC	—	40 A < 5 ms	40 A < 5 ms	—	50 A < 7 ms	50 A < 7 ms
	200 VAC	—	60 A < 5 ms	60 A < 5 ms	—	70 A < 7ms	70 A < 7 ms
Allowable Momentary Power Failure Time (ms)		5	10	10	5	10	10
External Service Power Supply (24 VDC) mA		—	460	460	—	460	460
Power Supply Int. Bus (5 VDC)		290	290	290	290	290	290
Integrated Inputs*		40 (24 VDC)	40 (24 VDC)	40 (24 VDC)	40 (24 VDC)	64 (24 VDC)	64 (24 VDC)
Min. Current for Logical 1 (mA) (X0-X7/X10 onwards)		4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5	1.5	1.5	1.5	1.5	1.5
Response Time		0-15	0-15	0-15	0-15	0-15	0-15
Integrated Outputs*		40	40	40	40	64	64
Output Type		Relay	Relay	Source Transistor	Source Transistor	Relay	Source Transistor
ON Voltage (Max.) V		Generally for relay version: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC					
Max. Output Current	Per Output (A)	2	2	0.5	0.5	2	0.5
	Per 4 Outputs (A)	8	8	0.8	0.8	8	0.8
Max Switching Load	Inductive Load	80 VA	80 VA	12 W	12 W	80 VA	12 W
	Lamp Load (W)	100	100	1.5	1.5	100	1.5
Response Time (ms)		10	10	< 0.2	< 0.2	10	< 0.2
Life of Contacts (Switching Times)		For all base units of the MELSEC FX2N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA					
Weight (kg)		1.2	1.2	1.2	1.2	1.8	1.8
Dimensions (W x H x D) mm		285 x 90 x 87	285 x 90 x 87	285 x 90 x 87	285 x 90 x 87	350 x 90 x 87	350 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101					

* Sink / Source except for MT & MS units: Sink only.

FX2N Base Unit Hardware Specifications (Sink Transistor Units)

Specifications		FX2N-16MT-E/UL	FX2N-32MT-E/UL	FX2N-48MT-E/UL	FX2N-64MT	FX2N-80MT	FX2N-128MT
Rating		UL	UL	UL	—	—	—
Integrated Inputs / Outputs		16	32	48	64	80	128
Power Supply	AC Range (+10%, -15%)	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC
	Frequency at AC Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	DC Range (+10%, -15%)	—	—	—	—	—	—
Max. Input Apparent Power		35 VA	40 VA	50 VA	60 VA	70 VA	100 VA
Inrush Current at ON	100 VAC	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms
	200 VAC	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms
Allowable Momentary Power Failure Time (ms)		10	10	10	10	10	10
External Service Power Supply (24 VDC) mA		250	250	460	460	460	460
Power Supply Int. Bus (5 VDC) mA		290	290	290	290	290	290
Integrated Inputs*		8 (24 VDC)	16 (24 VDC)	24 (24 VDC)	32 (24 VDC)	40 (24 VDC)	64 (24 VDC)
Min. Current for Logical 1 (mA) (X0-X7/X10 onwards)		4.5 / 3.5	4.3 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5	1.5	1.5	1.5	1.5	1.5
Response Time		0-15	0-15	0-15	0-15	0-15	0-15
Integrated Outputs*		8	16	24	32	40	64
Output Type		Sink Transistor	Sink Transistor	Sink Transistor	Sink Transistor	Sink Transistor	Sink Transistor
ON Voltage (Max.) V		Generally for relay version: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC					
Max. Output Current	Per Output (A)	0.5	0.5	0.5	0.5	0.5	0.5
	Per 4 Outputs (A)	0.8	0.8	0.8	0.8	0.8	0.8
Max Switching Load	Inductive Load	12 W	12 W	12 W	12 W	12 W	12 W
	Lamp load (W)	1.5	1.5	1.5	1.5	1.5	1.5
Response Time (ms)		—	—	—	—	—	—
Life of Contacts (Switching Times)		—	—	—	—	—	—
Weight (kg)		0.6	0.65	0.85	1	1.2	1.8
Dimensions (W x H x D) mm		130 x 90 x 87	150 x 90 x 87	182 x 90 x 87	220 x 90 x 87	285 x 90 x 87	350 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101					

* Sink / Source except for MT & MS units: Sink only.

FX2N Base Unit Hardware Specifications (Triac Output Units)

Specifications		FX2N-16MS	FX2N-32MS-E/UL	FX2N-48MS-E/UL	FX2N-64MS	FX2N-80MS
Rating		UL	UL	—	—	—
Integrated Inputs / Outputs		16	32	48	64	80
Power Supply	AC Range (+10%, -15%)	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC
	Frequency at AC Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	DC Range (+10%, -15%)	—	—	—	—	—
Max. Input Apparent Power		35 VA	40 VA	50 VA	60 VA	70 VA
Inrush Current at ON	100 VAC	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms
	200 VAC	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms
Allowable Momentary Power Failure Time (ms)		10	10	10	10	10
External Service Power Supply (24 VDC) mA		250	250	460	460	460
Power Supply Int. Bus (5 VDC) mA		290	290	290	290	290
Integrated Inputs*		8 (24 VDC)	16 (24 VDC)	24 (24 VDC)	32 (24 VDC)	40 (24 VDC)
Min. Current for Logical 1 (mA) (X0-X7/X10 onwards)		4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5	1.5	1.5	1.5	1.51.5
Response Time		0-15	0-15	0-15	0-15	0-15
Integrated Outputs*		8	16	24	32	40
Output Type		Triac (SSR)	Triac (SSR)	Triac (SSR)	Triac (SSR)	Triac (SSR)
ON Voltage (Max.)		242 VAC	242 VAC	242 VAC	242 VAC	242 VAC
Max. Output Current	Per Output (A)	0.3	0.3	0.3	0.3	0.3
	Per 4 Outputs (A)	0.8	0.8	0.8	0.8	0.8
Max Switching Load	Inductive Load	36 VA	36 VA	36 VA	36 VA	36 VA
	Lamp Load (W)	30 W	30 W	30 W	30 W	30 W
Response Time (ms)		ON:1ms/OFF:10ms	ON:1ms/OFF:10ms	ON:1ms/OFF:10ms	ON:1ms/OFF:10ms	ON:1ms/OFF:10ms
Life of Contacts (Switching Times)		—	—	—	—	—
Weight (kg)		0.6	0.65	0.85	1	1.2
Dimensions (W x H x D) mm		130 x 90 x 87	150 x 90 x 87	182 x 90 x 87	220 x 90 x 87	285 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101				

* Sink / Source except for MT & MS units: Sink only.

FX2N I/O Powered Extension Unit Hardware Specifications

Specifications		FX2N-32 ER-ES/UL	FX2N-32ES	FX2N-32ET	FX2N-32ET-ESS/UL	FX2N-48ER-DS	FX2N-48ER-ES/UL	FX2N-48ET	FX2N-48 ET-DSS	FX2N-48ET-ESS/UL	FX2N-48ER-UA1/UL
Rating		UL• cUL•CE•DNV LR•GL•ABS•RINA•BV	—	—	UL• cUL•CE•DNV LR•GL•ABS•RINA•BV	CE•ABS	UL• cUL•CE•DNV LR•GL•ABS•RINA•BV	—	CE•ABS	UL• cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE DNV•ABS
Integrated Inputs / Outputs		32		32	32	48	48	48	48	48	16
Power Supply	AC Range (+10%, -15%)	100–240 VAC	100–240 VAC	100–240 VAC	100–240 VAC	—	100–240 VAC	100–240 VAC	—	100–240 VAC	100–240 VAC
	Frequency at AC Hz	50/60 (±10%)	50/60	50/60	50/60 (±10%)	—	50/60 (±10%)	50/60	—	50/60 (±10%)	—
	DC Range (+10%, -15%)	—	—	—	—	24 VDC	—	—	24 VDC	—	—
Max. Input Apparent Power		35 VA	35 VA	35 VA	35 VA	30 W	45 VA	50VA	30 W	45 VA	45 VA
Inrush Current at ON	100 VAC	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	—	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms	40 A < 5 ms
	200 VAC	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	—	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms	60 A < 5 ms
Allowable Momentary Power Failure Time (ms)		10	10	10	10	10	10	10	10	10	10
External Service Power Supply (24 VDC) mA		250	250	250	250	—	250	460	—	460	460
Power Supply Int. Bus (5 VDC) mA		690	690	690	690	690	690	690	690	690	690
Integrated Inputs*		16 (24 VDC)	16 (24 VDC)	16 (24 VDC)	16 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (24 VDC)	24 (120 VDC)
Min. Current for Logical 1 (mA) (X0-X7/X10 onwards)		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.8
Max. Current for Logical 0 (mA)		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.7
Response Time		10 ms	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms	25 ms
Integrated Outputs*		16	16	16	16	24	24	24	24	24	24
Output Type		Relay	Triac (SSR)	Sink Trans.	Source Trans.	Relay	Relay	Sink Trans.	Source Trans.	Source Trans.	Relay
ON Voltage (Max.) V		Generally for relay version: <240 VAC, <30 VDC: for transistor version: 5 – 30 VDC									
Max. Output Current	Per Output (A)	2	0.3	0.5	0.5	2	2	0.5	0.5	0.5	2
	Per 4 Outputs (A)	8	0.8	0.8	0.8	8	8	0.8	0.8	0.8	8
Max Switching Load	Inductive Load	80 VA	36 VA	12 W	12 W	80 VA	80 VA	12 W	12 W	12 W	80 VA
	Lamp Load (W)	100	30	1.5	1.5	100	100	1.5	1.5	1.5	100
Response Time (ms)		10	ON:1ms/OFF:10ms	0.2	< 0.2	10	10	0.2	< 0.2	< 0.2	10
Life of Contacts (Switching Times)		For all base units of the MELSEC FX2N series: 3,000,000 at 20 VA: 1,000,000 at 35 VA; 200,000 at 80 VA									
Weight (kg)		0.65	0.65	0.65	0.65	0.85	0.85	0.85	0.85	0.85	0.85
Dimensions (W x H x D) mm		150 x 90 x 87	150 x 90 x 87	150 x 90 x 87	150 x 90 x 87	182 x 90 x 87	182 x 90 x 87	182 x 90 x 87	182 x 90 x 87	182 x 90 x 87	182 x 90 x 87
Required Manuals		FX2N Hardware Manual • JY992D76401, FX Programming Manual II • JY992D88101									

* Sink / Source except for ET & ES units: Sink only.

FX2N I/O Extension Block Hardware Specifications

Specifications		FX2N-16EX	FX2N-16EX-ES/UL	FX2N-16EYR-ES/UL	FX2N-16EYS	FX2N-16EYT	FX2N-16EYT-ESS/UL
Rating		—	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV	UL • cUL	—	UL•cUL•CE•DNV LR•GL•ABS•RINA•BV
Applicable PLCs		FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)					
Integrated Inputs / Outputs		16	16	16	16	16	16
Power Supply		All modular extension blocks are supplied by the base unit					
Integrated Inputs		16	16	—	—	—	—
Min. Current for Logical 1 (mA)		3.5	3.5	—	—	—	—
Max. Current for Logical 0 (mA)		1.5	1.5	—	—	—	—
Response Time (ms)		10	10	—	—	—	—
Integrated Outputs		—	—	16	16	16	16
Output Type		—	—	Relay	Triac (SSR)	Sink Transistor	Source Transistor
ON Voltage (max.) V		—	—	<240 VAC <30 VDC	242 VDC	30 VDC	30 VDC
Max. Output Current	Per Output (A)	—	—	2	0.3	0.5	0.5
	Per 4 Outputs (A)	—	—	—	0.8	0.8	0.8
Max Switching Current	Inductive Load	—	—	80 VA	30 VA	12 W	12 W
	Lamp Load (W)	—	—	100	30 W	1.5 W	1.5
Response Time (ms)		—	—	10	ON:1ms/OFF:10ms	< 0.2	< 0.2
Life of Contacts (Switching Times)		—	—	Same as base unit	—	—	—
5 VDC Current Consumption (mA)		40	45	40	160	180	180
Weight (kg)		0.3	0.3	0.3	0.3	0.3	0.3
Dimensions (W x H x D) mm		40 x 90 x 87	40 x 90 x 87	40 x 90 x 87	40 x 90 x 87	40 x 90 x 87	40 x 90 x 87

* Sink/source except for EX: Sink only

FX2N Adapter Cards

Specifications	FX2N-232-BD	FX2N-422-BD	FX2N-485-BD
Rating	CE • ABS	CE • ABS	CE • ABS
Applicable PLCs	FX2N	FX2N	FX2N
General Specifications	Same as Environmental Specifications on page 202.		
Interface	RS-232 with 9 pole D-SUB connector	RS-422 8 pole mini DIN connector	RS-485 / RS-422
Power Supply	5 VDC / 60 mA (from base unit)	5 VDC / 60 mA (from base unit)	5 VDC / 60 mA from base unit
Communication Speed (bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200	—	300 – 19200
Communication Distance (m)	Max. 15	Max. 50	Max. 50
Communication Mode	Half duplex	Half duplex	—
Protocols	Freely programmable via PLC / protocol 1 or 4	Freely programmable via PLC/ Use as 2nd prog. port	Protocol 1 or 4 of AJ71UC24 / no protocol / parallel link / master+slave
Related I/O Points	—	—	—
Weight (kg)	0.08	0.08	0.08
Dimensions (mm)	35 x 54 x 22	35 x 54 x 22	35 x 54 x 22
Function	General purpose RS-232 Communications	Duplicate programming port for HMI/PC connections	Multidrop network/master/slave general purpose RS-485/422 communications
Required Manuals	JY992D66001	JY992D84101	JY992D66201

FX2N Adapter Cards

Specifications	FX2N-8AV-BD	FX2N-6AV-BDC	FX2N-CNV-BD
Rating	CE • ABS	—	—
Applicable PLCs	FX2N	FX2N	FX2N
General Specifications	Same as Environmental Specifications on page 202.		
Interface	—	—	—
Power Supply	From base unit	From base unit	Not necessary
Resolution	8 bit	8 bit	—
Communication Speed (bit/s)	—	—	—
Communication Distance (m)	—	—	—
Communication Mode	—	—	—
Related I/O Points	0	0	0
Weight (kg)	0.08	0.08	0.15
Dimensions (mm)	52 x 35	52 x 35	54 x 35
Function	Analog manually adjustable potentiometers	Remote analog potentiometers interface	For connection for FX0N-□□□ADP Units

FX2N Analog Input / Output Special Function Blocks

Specifications		FX2N-2DA	FX2N-4DA	FX2N-5A
Rating		CE (EMC only) • ABS	CE • LR • GL • ABS • RINA • BV	CE • UL • cUL
Applicable PLCs		FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)		
General Specifications		Same as Environmental Specifications on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground		
Power Supply		5 VDC / 30 mA (from base unit), 24 VDC ±10% / 85 mA (from base unit)	5 VDC / 30 mA (from base unit), 24 VDC ±10% / 200 mA	5 VDC / 70 mA (from base unit) 24 VDC / 90 mA
Analog I/O	Inputs	—	—	4
	Outputs	2	4	1
Analog Input Range		—	—	±10 VDC; ±20 mA; ±100 mV
Analog Output Range		0-10 VDC, 0-5 VDC, 4-20 mA	-10 VDC to +10 VDC / 0 mA — +20 mA	±10 VDC ; ±20 mA
External Load	Voltage Output	2 kΩ – 1 MΩ	2 kΩ – 1 MΩ	2 kΩ – 1 MΩ
	Current Output	500 Ω	< 500 Ω	< 500 Ω
Analog Ranges	Voltage	0-10 VDC, 0-5 VDC	±10	±10 VDC; ±100 mV
	Current	4-20 mA	0 – 20 mA	±20 mA
Resolution		2.5 mV (0-10 VDC), 1.25 mV(0-5 VDC), 4 µA (4-20 mA)	5 mV / 20 µA (11 bit + sign)	5 mV / 20 µA (11 bit + sign)
Overall Accuracy		± 1% (full scale)	± 1%	± 1%
Conversion Speed	Digital – Analog	—	—	1-2 ms per channel used
	Analog – Digital	4 ms per channel	2.1 ms for 4 channels	1-2 ms per channel used
Related I/O Points		8	8	8
Weight (kg)		0.2	0.3	0.3
Dimensions W x H x D (mm)		43 x 90 x 87	55 x 90 x 87	55 x 90 x 87
Function		General purpose digital to analog conversion (output)	General purpose digital to analog conversion (output)	General purpose and load cell analog module; 4 inputs / 1 output
Required Manuals		JY992D74901	JY992D65901	JY997D11401A

FX2N Analog Input Special Function Blocks

Specifications		FX2N-2AD	FX2N-4AD	FX2N-8AD
Rating		CE (EMC only), ABS	CE, LR, GL, ABS, RINA, BV	UL • cUL • CE
General Specifications		Same as Environmental Specifications on page 202 except dielectric withstand voltage, 500VAC for 1 min. between all terminals and ground		
Applicable PLCs		FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)		
Power Supply		5 VDC /20 mA (from base unit), 24 VDC ±10% / 50 mA (from base unit)	5 VDC / 30 mA (from base unit), 24 VDC / 50 MA	5 VDC /50 mA (from base unit), 24 VDC / 80 mA (from base unit)
Analog Points	Inputs	2	4	8
	Outputs	—	—	—
Analog Input Range		0-10 VDC, 0-5 VDC, 4-20 mA	-10 VDC to +10 VDC — +20 mA to +20 mA / 4–20 mA	±10 VDC to ±20 mA 4—20 mA: K, J and T Thermocouples
Input Resistance	Voltage Input	200 kΩ	200 kΩ	200 kΩ
	Current Input	250 Ω	250	250 Ω
Analog Ranges	Voltage	0-10 VDC, 0-5 VDC	±10 VDC	±10 VDC
	Current	4-20 mA	±20	-20 to 20 mA, 4-20 mA
Resolution		2.5mV (0-10 VDC), 1.25mV (0-5 VDC), 4 µA (4-20mA)	5 mV / 20 µA (11 bit + sign)	0.63 mV (±10 VDC) 2.5 µA (±20 mA) 2.00 µA (4-20 mA) 0.1°C or 0.1°F (K, N, T thermocouple)
Overall Accuracy		± 1% (full scale)	± 1%	± 17 (full scale)
Conversion Speed	Analog – Digital	2.5 ms per channel	15 ms per channel / 6 ms per channel (high speed)	500 us per channel
	Digital – Analog	—	—	—
Related I/O Points		8	8	8
Weight (kg)		0.2	0.3	0.3
Dimensions W x H x D (mm)		43 x 90 x 87	55 x 90 x 87	67 x 90 x 75
Function		General purpose analog to digital conversion (input)		General purpose multi analog to digital conversion (input)
Required Manuals		JY992D74701	JY992D65201	JY992D86001

FX2N Temperature Sensing Special Function Blocks

Specifications	FX2N-4AD-TC	FX2N-4AD-PT
Rating	CE • LR • GL • ABS • RINA • BV	CE • LR • GL • ABS • RINA • BV
General Specifications	Same as Environmental Specifications on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground	
Applicable PLCs	FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)	
Power Supply	5 VDC / 30 mA (from base unit) 24 VDC / 50 mA	
Analog Inputs	4 (K or J type)	4 (Pt 100 sensors)
Compensated Temperature Range	-100 to +600° C (J type) / -100 to +1200° C (K type)	-100 to +600° C
Digital Outputs	-1000 to +6000 (J type) / -1000 to +12000 (K type)	-1000 to +6000 (12 bit conversion)
Resolution	0.3° C (J type) / 0.4° C (K type)	0.2° C
Overall Accuracy	±0.5%	±1% over full linear range
Conversion Speed	240 ms per channel (±2%)	15 ms for 4 channels
Related I/O Points	8	8
Weight (kg)	0.3	0.3
Dimensions W x H x D (mm)	55 x 90 x 87	55 x 90 x 87
Function	Thermocouple input	PT100 RTD input
Required Manuals	JY992D65501	JY992D65601

FX2N Temperature Control Special Function Block

Specifications	FX2N-2LC
Rating	UL • cUL • CE
General Specifications	Same as Environmental Specifications on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Applicable PLCs	FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)
Power Supply	5 VDC / 70mA, 24 VDC / 55 mA
Analog Inputs	2 (K, J, R, S, E, T, B, N,PLII, RRC 5 = 26, LL, L PT100, JPT 100)
Cold Contact Temp Error	within ±1.0
Digital Outputs	2 open collector transistor
Rated Load Voltage	5-24 VDC (30 VDC max. load) 100 mA max. current load
Control Output Cycle	30 seconds
Resolution	0.1° C (0.1° F) or 1° C (1° F) varies depending on input range of used sensor
Overall Accuracy	±0.7% of full range
Conversion Speed	500ms
Related I/O Points	8
Weight (kg)	0.3
Dimensions W x H x D (mm)	55 x 90 x 87
Function	2 Loop Temperature controller
Required Manual	JY992D85801

FX2N Motion Control Special Function Blocks

Specifications		FX2N-1HC	FX2N-1PG-E	FX2N-10PG
Rating		CE • LR • GL • ABS • RINA • BV	CE • LR • GL • ABS • RINA • BV	EMC
General Specifications		Same as Environmental Specs. on page 202 except dielectric with stand voltage, 500VAC for 1 min. between all terminals and ground		
Applicable PLCs		FX2N / FX2NC (FX2NC-CNV-IF required)		
Signal Level		5, 12, 24 VDC / 7 mA	24 VDC / 7 – 40 mA	5 – 24 VDC / <100 mA
Power Supply		5 VDC / 90 mA from base unit	5 — 24 VDC / 60 mA	5 VDC / 120 mA from base
Counter Inputs		2 (1 phase) or 1 (2 phase)	—	—
Max. Counting Frequency (kHz)		50	—	—
Type of Counter		Up/down counter, ring counter	—	—
Accessible Axes		—	1	1
Input Format (Bit)		16, 32	—	—
Output Frequency		—	10–100,000 pulse/sec	1–1,000,000 pulse/sec
Counting Range	16 Bit	0 – 65535	—	—
	32 Bit	-2147483648 to +2147483647	—	—
Output Type		2 x transistor (5 – 24 VDC; 0.5 A)	—	—
Related I/O Points		8	8	8
Weight (kg)		0.3	0.3	0.2
Dimensions W x H x D (mm)		55 x 90 x 87	43 x 90 x 87	43 x 90 x 87
Function		High speed pulse / encoder pulse counters	Servo / stepper pulse control	Advanced servo/stepper control
Required Manuals		JY992D65401	JY992D65301	JY992D93401

Note: For information on the FX2N-10GM and 20GM refer to the Motion Controller section of this catalog.

FX2N Conversion Interface

Enables FX2N PLCs to connect to FX Series extension modules.

Specifications	FX2N-CNV-IF
Rating	CE • ABS
General Specifications	Same as Environmental Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Applicable PLCs	FX2N
Power Supply	Not Applicable
Related I/O Point	0
Weight (kg)	0.15
Dimensions W x H x D (mm)	23 x 140 x 45

FX2N Profibus Interface Special Function Block

Enables FX2N extension I/O and special function modules to be connected to a Profibus DP network. The I/O does not need to be directly connected to a PLC.

Specifications		FX2N-32DP-IF
Rating		UL • cUL
General Specifications		Same as Environmental Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Applicable PLCs		FX2N / FX2NC (FX2NC-CNV-IF required)
Max. I/O Per Node		256
Power Supply 24 VDC		5 VDC, 1A, 24 VDC, 500 mA
Interface		Profibus-DP
Communication Speed	Distances	
	1200 m	9.6 / 19.2 / 93.75 kbit/s
	1000 m	187.5 kbit/s
	100 m	1500 kbit/s
	200 m	3000 / 6000 / 12000 kbit/s
Communication Distance		Max. 1200m (comms. speed varies with distance)
Communication Cable		Standard Profibus-DP cable with 9-pin DSUB connector
Dimensions W x H x D (mm)		75 x 90 x 87
Function		Profibus-DP slave interface (for I/O and special function modules)
Required Manuals		JY992D77101

FX2N Ethernet Interface Adaptor Module

Enables FX1S/1N/2N/0N PLCs to communicate via Ethernet to a PC or another FX Series PLC.

Specifications	FX2NC-ENET-ADP
Rating	UL • cUL
General Specifications	Same as Environ. Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Applicable PLCs	FX2N(C) / FX1N / FX1S
Max. Data Transmission	16 words
Power Supply 24 VDC	Supplied from PLC
Communication Cable	Ethernet with RJ45 connector
Dimensions W x H x D (mm)	19 x 90 x 78
Function	Ethernet connection module
Required Manuals	JY997D12301

Note:
Connection to a FX2N PLC requires an FX2N-CNV-DB. Connection to an FX1S/1N PLC requires an FX1N-CNV-BD.

FX2N DeviceNet Interface Special Function Block

Specifications	FX2N-64DNET
Rating	UL • cUL • CE
Applicable PLCs	FX2N / FX2NC (FX2NC-CNV-IF required)
General Specifications	Same as Environmental Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Power Supply 24 VDC	50 mA
I/O Points	8
5 VDC Requirements	120 mA
Weight	0.2
Dimensions W x H x D (mm)	43 x 90 x 87
Function	DeviceNet slave interface block (for PLC)
Required Manual	JY992D86301

FX2N CC-Link Interface Special Function Blocks

Specifications	FX2N-16CCL-M	FX2N-32CCL	FX2N-32CCL-NP
Rating	—	CE (EMC only)	—
Applicable PLCs	FX1N/2N (Ver 2.20 or later) / FX2NC (Ver. 2.20 or later). Cannot use with FX2N-32ASI-M AS-i interface master block		
General Specifications	Same as Environmental Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground		
Power Supply 24 VDC	150 mA	50 mA	150 mA
I/O Points	8	8	8
5 VDC Requirements	—	130 mA	—
Weight	0.4	0.2	0.4
Dimensions W x H x D (mm)	85 x 90 x 87	43 x 90 x 87	85 x 90 x 87
Function	CC-Link Network Master	CC-Link slave interface block	Programmable CC-Link Slave Interface
Required Manuals	JY992D93101	JY992D71801	—

FX2N AS-i Master Special Function Block

Specifications	FX2N-32ASI-M
Rating	CE (EMC only)
Applicable PLCs	FX1N / FX2N
General Specifications	Same as Environ. Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Power Supply 24 VDC	Powered by AS-i standard power supply
Certification	"Shadow" AS-i mark
Related I/O Points	8
Weight	0.2 kg
Dimensions W x H x D (mm)	55 x 90 x 87
Function	AS-i network master
Required Manuals	JY992D76901

FX2N I/O Link Special Function Block

Specifications	FX2N-16LNK-M
Rating	UL • cUL • CE
Applicable PLCs	FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)
General Specifications	Same as Environ. Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Power Supply 24 VDC	90 mA
I/O Points	—
5 VDC Requirements	200 mA
Weight	0.5 kg
Dimensions W x H x D (mm)	43 x 90 x 87
Function	I/O Link master
Required Manual	JY992D73701

Note: For I/O Link Terminal Blocks, please see A Series I/O Link Selection Guide.

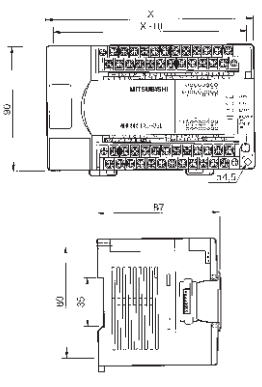
FX2N Power Supply

Specifications		FX2N-20PSU
Rating		UL • cUL • CE • Class II
Applicable PLC		FX2N
General Specifications		Same as FX2N Environmental Specs. on page 202
Input	Input	85-264 VAC
	Frequency	50/60 Hz
	Fuse Rating	3.15A (built in)
	Rush Current	60A/200 VAC max.
Output	Output Voltage	Green LED (POWER) is lit while voltage is output
	Output Current	2A (maximum), 0.2A (minimum) (Derating is performed if ambient temperature exceeds 40° C)
	Ripple Noise	500mVp-p or less
	Hold Time	10 ms/100 VAC
I/O Points		—
Weight (kg)		0.3
Dimensions W x H x D (mm)		60 x 90 x 75
Required Manual		JY992D85101

FX2N Base Unit Dimensions

Type	X (mm)
FX2N-16M	130
FX2N-32M	150
FX2N-48M	182
FX2N-64M	220
FX2N-80M	285
FX2N-128M	350

Note: All base units of same I/O count are the same length with the exception of 32, 48 and 64 I/O **MR-UA1/UL units which are slightly longer.



FX2N Electronic Cam Switch Special Function Block

Specifications	FX2N-1RM-E-SET
Rating	CE • ABS
Applicable PLCs	FX2N (Max. 3); FX2NC (FX2NC-CNV-IF required, Max. 1)
General Specifications	Same as Environ. Specs. on page 202 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground
Power Supply 24 VDC	400 mA
I/O Points	8
5 VDC Requirements	N/A
Weight	N/A
Dimensions W x H x D (mm)	55 x 90 x 97
Function	Electronic cam switch block (includes resolver, cable and keypad)
Required Manual	JY992D71101

FX2N Communication Special Function Block

Specifications	FX2N-232IF
Rating	CE • LR • GL • ABS • RINA • BV
Applicable PLCs	FX1N / FX2N / FX2NC (FX2NC-CNV-IF required)
General Specifications	Same as FX2N Environmental Specs. on page 202
Interface	RS-232 with 9-pole D-SUB connector
Power Supply	5 VDC / 40 mA (from base unit), 24 VDC / 80 mA
Communication Speed (Bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200
Communications Distance (m)	Max. 15
Communication Mode	Full duplex
Protocols	No protocol mode / start-stop synchronization
I/O Points	—
Weight (kg)	0.3
Dimensions W x H x D (mm)	55 x 90 x 87
Required Manual	JY992D66701

I/O Extension Units

Type	X (mm)
FX2N-32E	150
FX2N-48E	182

I/O Extension Blocks

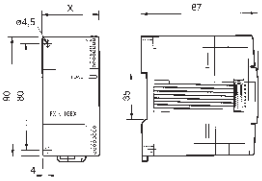
Type	X (mm)
FX2N-16E	40

Note: All extension I/O units and blocks of same I/O count are the same length regardless of type.

Special Function Blocks

Type	X (mm)
FX2N-2AD	43
FX2N-2DA	43
FX2N-4AD	55
FX2N-4DA	55
FX2N-4AD-PT	55
FX2N-4AD-TC	55
FX2N-1HC	55
FX2N-1PG-E	43
FX2N-32CCL	43
FX2N-32ASI-M	55
FX2N-16LNK-M	43
FX2N-232IF	55
FX2N-64DNET	43
FX2N-8AD	67
FX2N-16CCL-M	85
FX2N-32CCL-NP	85
FX2N-2LC	55
FX2N-10PG	43
FX2N-5A	55

Note: FX2N-32DP-IF and FX2N-1RM-E-SET have a different form factor. Please refer to specification tables for dimensions.



FX2N I/O Extension Unit, Block and Special Function Block Dimensions

FX2N Base Unit Terminal Layouts

Note: FX2N-☐☐MR-DS, FX2N-☐☐MT-DSS, FX3U-☐ ☐MR/DS and FX3U-☐☐MT/ESS units have the same I/O layout. Power terminals are labeled for AC or DC power respectively. Power supply terminals are labeled 24V, 0V or L, N.

FX2N-16MS/MT

⏚	•	COM	X0	X2	X4	X6	•	•	•
L	N	•	24+	X1	X3	X5	X7	•	•

FX2N-16MR-UA1/UL

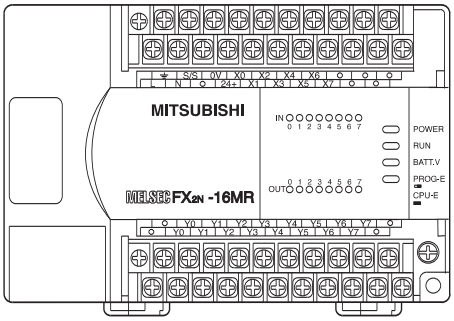
⏚	•	COM	COM	X0	X2	X4	X6	•	•
L	N	•	•	•	X1	X3	X5	X7	•

FX2N-16MT-ESS/UL

⏚	S/S	0V	X0	X2	X4	X6	•	•	•
L	N	•	24V	X1	X3	X5	X7	•	•

FX2N-16MR-ES/UL

⏚	S/S	0V	X0	X2	X4	X6	•	•	•
L	N	•	24V	X1	X3	X5	X7	•	•



FX2N-16MR-ES/UL

•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	•
•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	•

FX2N-16MT-ESS/UL

•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	•
•	+V0	+V1	+V2	+V3	+V4	+V5	+V6	+V7	•

FX2N-16MR-UA1/UL

•	•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
•	•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7

FX2N-16MS/MT

•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	•
•	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	•

Note: FX2N-☐☐MR-DS, FX2N-☐☐MT-DSS, FX3U-☐ ☐MR/DS and FX3U-☐☐MT/ESS units have the same I/O layout. Power terminals are labeled for AC or DC power respectively. Power supply terminals are labeled 24V, 0V or L, N.

FX2N-32MS/MT/ET

⏚	•	COM	X0	X2	X4	X6	X10	X12	X14	X16	•
L	N	•	24+	X1	X3	X5	X7	X11	X13	X15	X17

FX2N-32MR-UA1/UL

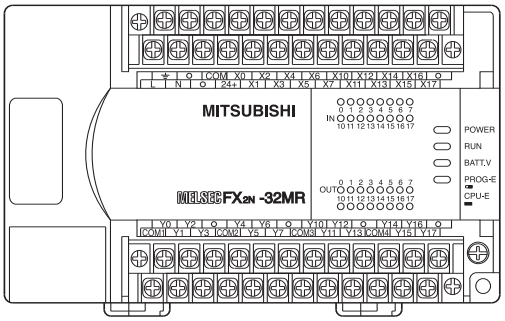
⏚	•	COM	COM	X0	X2	X4	X6	•	•	X10	X12	X14	X16	•	•
L	N	•	•	•	X1	X3	X5	X7	•	•	X11	X13	X15	X17	•

FX2N-32MT-ESS/UL

⏚	S/S	0V	X0	X2	X4	X6	X10	X12	X14	X16	•
L	N	•	24V	X1	X3	X5	X7	X11	X13	X15	X17

FX2N-32MR-ES/UL

⏚	S/S	0V	X0	X2	X4	X6	X10	X12	X14	X16	•
L	N	•	24V	X1	X3	X5	X7	X11	X13	X15	X17



FX2N-32MR-ES/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17

FX2N-32MT-ESS/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
+V0	Y1	Y3	+V1	Y5	Y7	+V2	Y11	Y13	+V3	Y15	Y17

FX2N-32MR-UA1/UL

Y0	Y2	•	•	Y4	Y6	•	•	•	Y10	Y12	•	•	Y14	Y16	•
COM1	Y1	Y3	•	COM2	Y5	Y7	•	•	COM3	Y11	Y13	•	COM4	Y15	Y17

FX2N-32MS/MT/ET

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	COM5	Y17

FX2N Base Unit Terminal Layouts

Note: FX2N-☐☐MR-DS, FX2N-☐☐MT-DSS, FX3U-☐ ☐MR/DS and FX3U-☐☐MT/ESS units have the same I/O layout. Power terminals are labeled for AC or DC power respectively. Power supply terminals are labeled 24V, 0V or L, N.

FX2N Base Unit Terminal Layouts

FX2N-48MS/MT/ET

⏚	•	COM	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	•									
L	N	•	24+	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27									

FX2N-48MR-UA1/UL

⏚	•	COM	COM	X0	X2	X4	X6	•	•	X10	X12	X14	X16	•	•	X20	X22	X24	X26	•				
L	N	•	•	•	X1	X3	X5	X7	•	•	X11	X13	X15	X17	•	•	X21	X23	X25	X27				

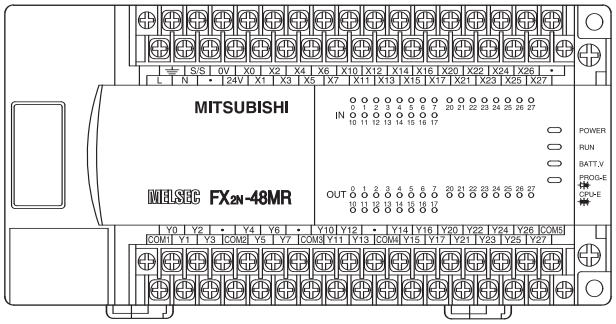
FX2N-48MT-ESS/UL

⏚	S/S	0V	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	•									
L	N	•	24V	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27									

FX2N-48MR-ES/UL

⏚	S/S	0V	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	•									
L	N	•	24V	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27									

Note: FX2N-□□MR-DS, FX2N-□□MT-DSS, FX3U-□ □MR/DS and FX3U-□□MT/ESS units have the same I/O layout. Power terminals are labeled for AC or DC power respectively. Power supply terminals are labeled 24V, 0V or L, N.



FX2N-48MR-ES/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	Y20	Y22	Y24	Y26	COM5									
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17	Y21	Y23	Y25	Y27									

FX2N-48MT-ESS/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	Y20	Y22	Y24	Y26	+V4									
+V0	Y1	Y3	+V1	Y5	Y7	+V2	Y11	Y13	+V3	Y15	Y17	Y21	Y23	Y25	Y27									

FX2N-48MR-UA1/UL

Y0	Y2	•	Y4	Y6	•	•	•	Y10	Y12	•	Y14	Y16	•	•	•	Y20	Y22	Y24	Y26	•				
COM1	Y1	Y3	COM2	Y5	Y7	•	•	COM3	Y11	Y13	COM4	Y15	Y17	•	•	COM5	Y21	Y23	Y25	Y27				

FX2N-48MS/MT/ET

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	Y20	Y22	Y24	Y26	COM5									
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17	Y21	Y23	Y25	Y27									

FX2N-64MS/MT

⏚	•	COM	COM	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	•				
L	N	•	24+	24+	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37				

FX2N-64MR-UA1/UL

⏚	•	•	COM	COM	X0	X2	X4	X6	•	X10	X12	X14	X16	•	•	•	X20	X22	X24	X26	•	•	X30	X32	X34	X36	•
L	N	•	•	•	•	X1	X3	X5	X7	•	X11	X13	X15	X17	•	•	•	X21	X23	X25	X27	•	•	X31	X33	X35	X37	

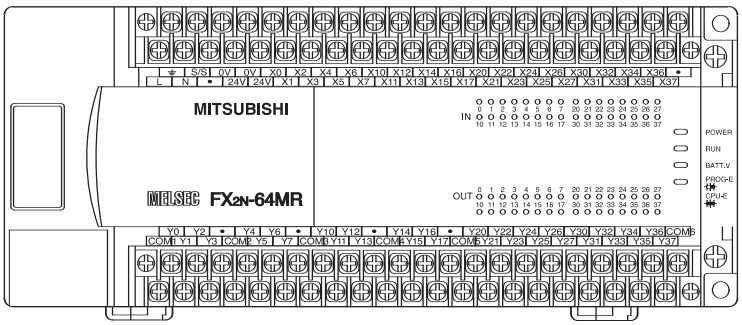
FX2N-64MT-ESS/UL

⏚	S/S	0V	0V	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	•				
L	N	•	24V	24V	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37				

FX2N-64MR-ES/UL

⏚	S/S	0V	0V	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	•				
L	N	•	24V	24V	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37				

Note: FX2N-□□MR-DS, FX2N-□□MT-DSS, FX3U-□ □MR/DS and FX3U-□□MT/ESS units have the same I/O layout. Power terminals are labeled for AC or DC power respectively. Power supply terminals are labeled 24V, 0V or L, N.



FX2N-64MR-ES/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•	Y20	Y22	Y24	Y26	Y30	Y32	Y34	Y36	COM6				
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17	COM5	Y21	Y23	Y25	Y27	Y31	Y33	Y35	Y37				

FX2N-64MT-ESS/UL

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•	Y20	Y22	Y24	Y26	Y30	Y32	Y34	Y36	+V5				
+V0	Y1	Y3	+V1	Y5	Y7	+V2	Y11	Y13	+V3	Y15	Y17	+V4	Y21	Y23	Y25	Y27	Y31	Y33	Y35	Y37				

FX2N-64MR-UA1/UL

Y0	Y2	•	Y4	Y6	•	•	•	Y10	Y12	•	Y14	Y16	•	•	Y20	Y22	Y24	Y26	•	•	•	•	Y30	Y32	Y34	Y36	•
COM1	Y1	Y3	COM2	Y5	Y7	•	•	COM3	Y11	Y13	COM4	Y15	Y17	•	COM5	Y21	Y23	Y25	Y27	•	•	•	COM6	Y31	Y33	Y35	Y37	

FX2N-64MS/MT

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•	Y20	Y22	Y24	Y26	Y30	Y32	Y34	Y36	COM6				
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17	COM5	Y21	Y23	Y25	Y27	Y31	Y33	Y35	Y37				

FX2N Extension Unit Terminal Layouts

FX2N-32 ET/ES

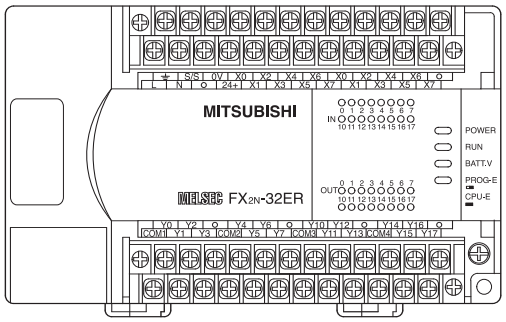
⏚	•	COM	X0	X2	X4	X6	X10	X12	X14	X16	•
L	N	•	24+	X1	X3	X5	X7	X11	X13	X15	X17

FX2N-32ET-ESS/UL

⏚	S/S	0V	X0	X2	X4	X6	X0	X2	X4	X6	•
L	N	•	24V	X1	X3	X5	X7	X1	X3	X5	X7

FX2N-32ER-ES/UL

⏚	S/S	0V	X0	X2	X4	X6	X0	X2	X4	X6	•
L	N	•	24V	X1	X3	X5	X7	X1	X3	X5	X7



FX2N-32ER-ES/UL

Y0	Y2	•	Y4	Y6	•	Y0	Y2	•	Y4	Y6	•
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y1	Y3	COM4	Y5	Y7

FX2N-32ET-ESS/UL

Y0	Y2	•	Y4	Y6	•	Y0	Y2	•	Y4	Y6	•
+V0	Y1	Y3	+V1	Y5	Y7	+V2	Y1	Y3	+V3	Y5	Y7

FX2N-32 ET/ES

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	•
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	COM5	Y17

FX2N-48ER-UA1/UL

⏚	•	COM	COM	X0	X2	X4	X6	•	•	X0	X2	X4	X6	•	•	X0	X2	X4	X6	•
L	N	•	•	•	X1	X3	X5	X7	•	•	X1	X3	X5	X7	•	•	X1	X3	X5	X7

FX2N-48ET

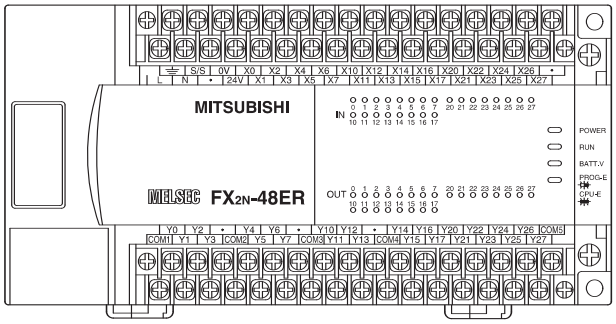
⏚	•	COM	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	•
L	N	•	24+	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27

FX2N-48ET-ESS/UL

⏚	S/S	0V	X0	X2	X4	X6	X0	X2	X4	X6	X0	X2	X4	X6	•
L	N	•	24V	X1	X3	X5	X7	X1	X3	X5	X7	X1	X3	X5	X7

FX2N-48ER-ES/UL

⏚	S/S	0V	X0	X2	X4	X6	X0	X2	X4	X6	X0	X2	X4	X6	•
L	N	•	24V	X1	X3	X5	X7	X1	X3	X5	X7	X1	X3	X5	X7



FX2N-48ER-ES/UL

Y0	Y2	•	Y4	Y6	•	Y0	Y2	•	Y4	Y6	Y0	Y2	Y4	Y6	COM5
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y1	Y3	COM4	Y5	Y7	Y1	Y3	Y5	Y7

FX2N-48ET-ESS/UL

Y0	Y2	•	Y4	Y6	•	Y0	Y2	•	Y4	Y6	Y0	Y2	Y4	Y6	+V4
+V0	Y1	Y3	+V1	Y5	Y7	+V2	Y1	Y3	+V3	Y5	Y7	Y1	Y3	Y5	Y7

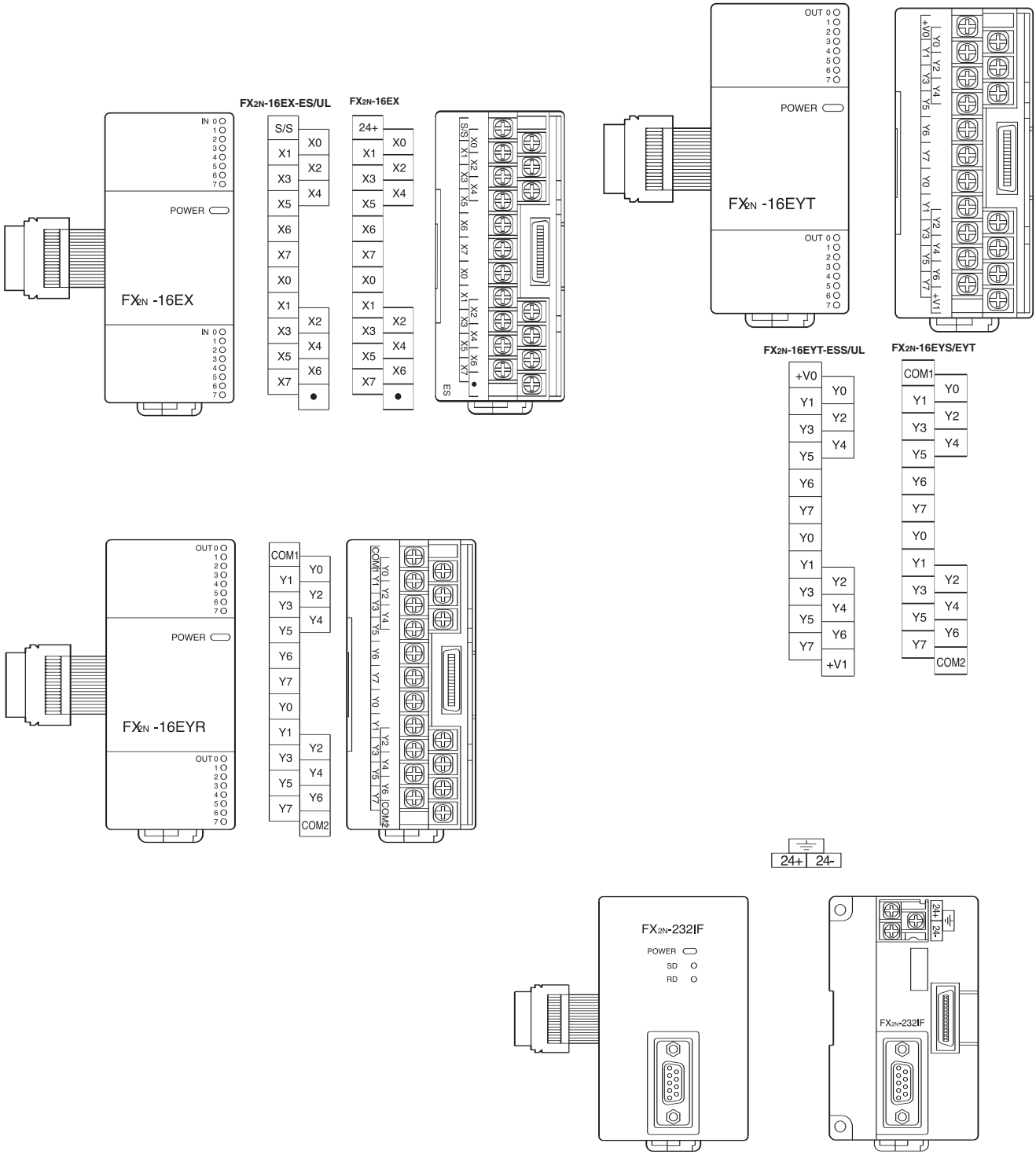
FX2N-48ET

Y0	Y2	•	Y4	Y6	•	Y10	Y12	•	Y14	Y16	Y20	Y22	Y24	Y26	COM5
COM1	Y1	Y3	COM2	Y5	Y7	COM3	Y11	Y13	COM4	Y15	Y17	Y21	Y23	Y25	Y27

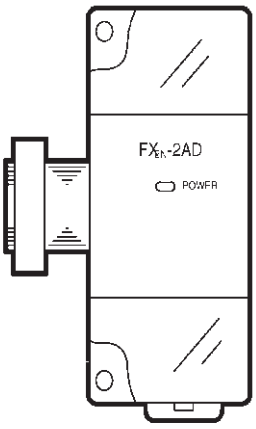
FX2N-48ER-UA1/UL

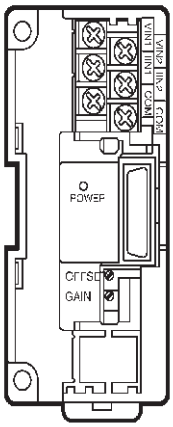
Y0	Y2	•	Y4	Y6	•	•	•	Y0	Y2	•	Y4	Y6	•	•	•	Y0	Y2	Y4	Y6	•
COM1	Y1	Y3	COM2	Y5	Y7	•	•	COM3	Y1	Y3	COM4	Y5	Y7	•	•	COM5	Y1	Y3	Y5	Y7

FX2N I/O Extension/Special Function Block Terminal Layouts

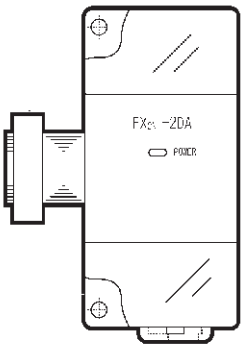


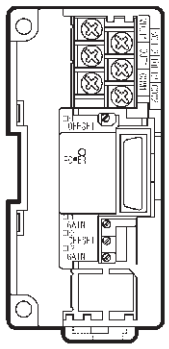
FX2N I/O Extension/Special Function Block Terminal Layouts





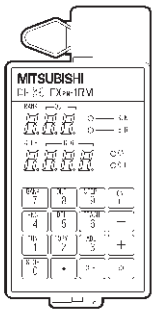
VIN2	IIN2	COM2
VIN1	IIN1	COM1

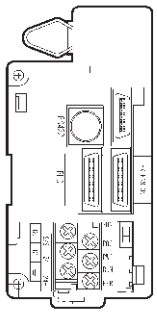




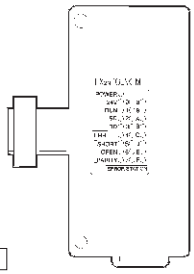
VOUT2	IOUT2	COM2
VOUT1	IOUT1	COM1

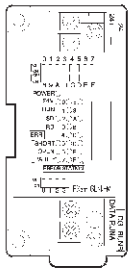
FX2N I/O Extension/Special Function Block Terminal Layouts





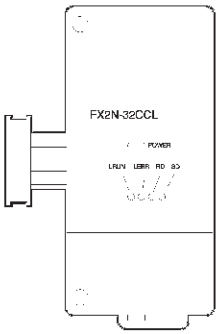
S/S	24+	24-
B0	B1	⏚

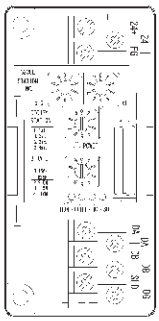




24-
24+ ⏚

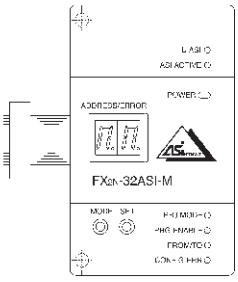
DG	RUNB
DATA	RUNA

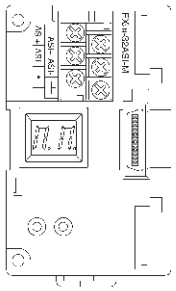




24-
24+ FG

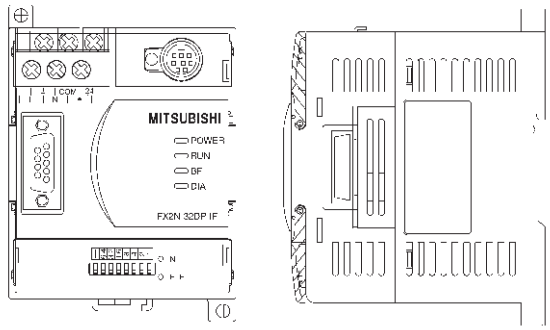
DA	DB	DG
DA	DB	SLD

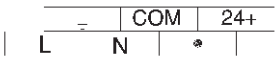


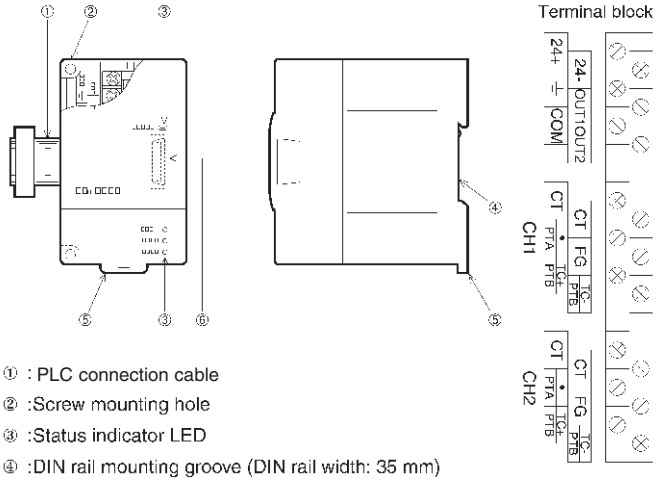


ASI+	ASI-	⏚
ASI+	ASI-	•

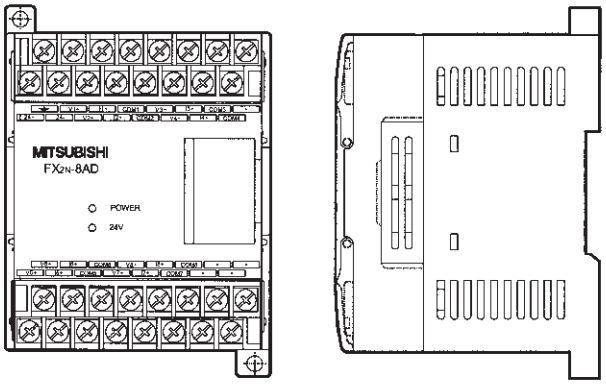
FX2N I/O Extension/Special Function Block Terminal Layouts







① : PLC connection cable
② :Screw mounting hole
③ :Status indicator LED
④ :DIN rail mounting groove (DIN rail width: 35 mm)
⑤ :DIN rail mounting hook
⑥ :Connector for next step extension cable

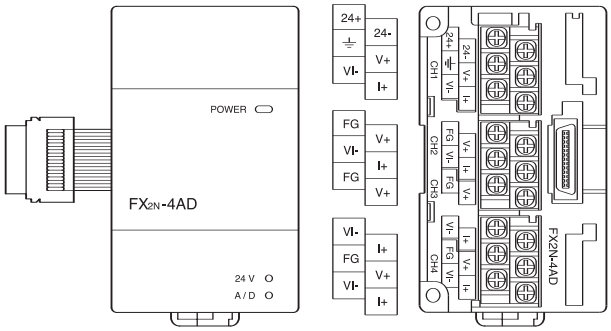


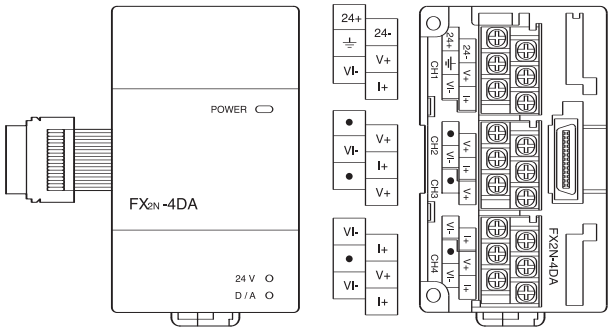
	⏚	V1+	I1+	COM1	V3+	I3+	COM3	•
24+	24-	V2+	12+	COM2	V4+	14+	COM4	

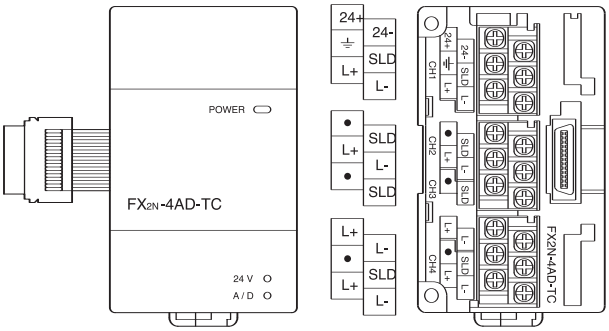
FX2N-8AD

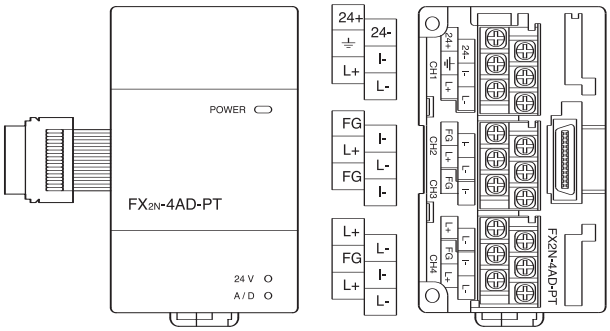
V6+	16+	COMB6	V8+	18+	COMB8	•	•
V5+	15+	COM5	V7+	17+	COM7	•	•

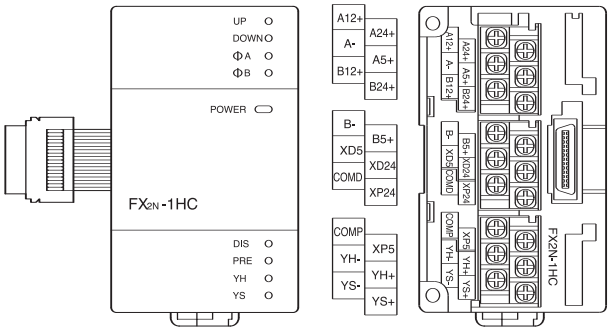
FX2N I/O Extension/Special Function Block Terminal Layouts

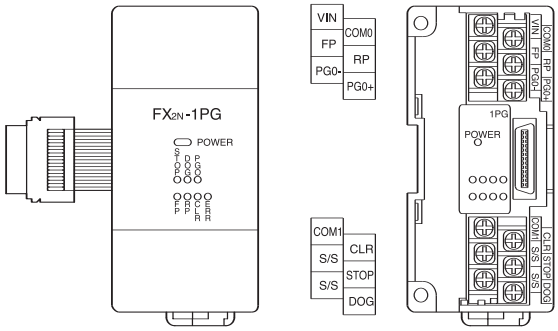






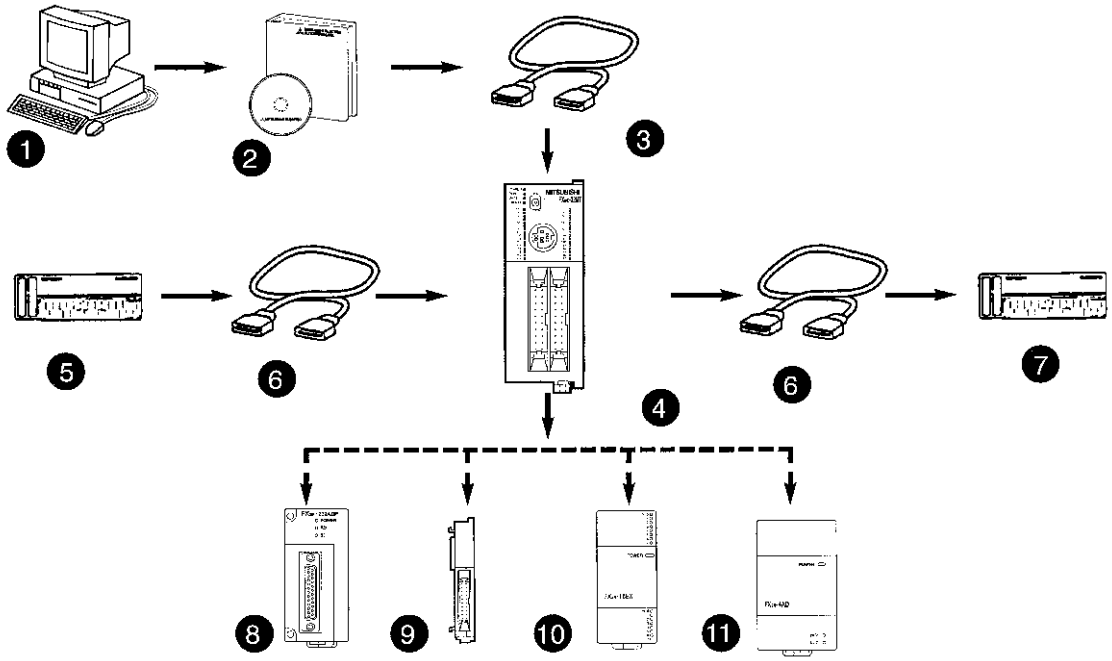






Programmable Logic Controllers
FX2NC SuperMicro™

The FX2NC SuperMicro™ offers all the features of the FX2N, but in an ultra compact format. By using distributed terminal block I/O, the FX2NC offers machine and panel builders significant productivity benefits. The FX2NC allows the cost and labor of regular wire harness construction and installation to be reduced by up to 80% by using Mitsubishi Electric or third party terminal block I/O systems.



FOR AN OPERATIONAL SYSTEM, SELECT:

1. Personal Computer
2. Programming Software
3. Programming Cable SC09*
4. FX2NC PLC
5. FX Input Terminal Block/ Third Party Input Terminal Block (also connects to FX2NC I/O extension blocks)
6. Terminal Block Cable
7. FX Output Terminal Block/Third Party Output Terminal Block (also connects to FX2NC I/O blocks)
8. FX0N Communication Adapter (*1)
9. FX2NC Extension I/O Blocks
10. FX0N/2N Special Function Blocks (*2)
11. FX0N/2N Extension I/O Blocks/Units (*2)

* Use the supplied 25-8 pin adapter

Notes:

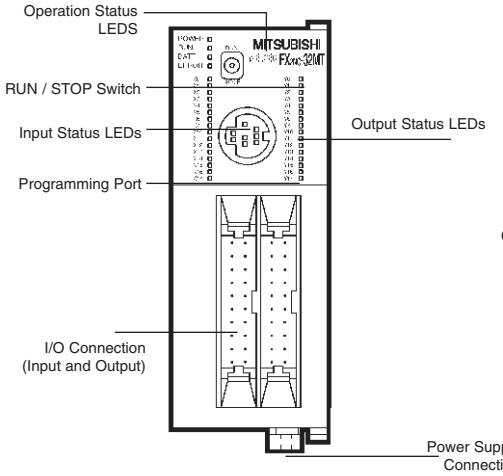
1. Fits on left hand side of PLC.

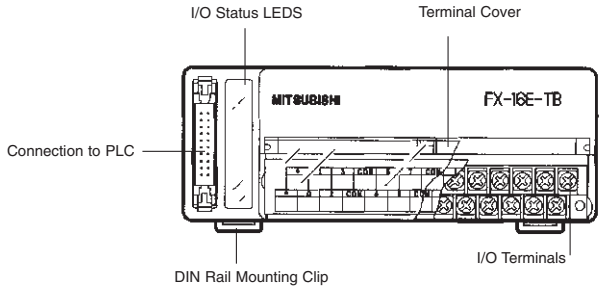
2. Fits on right hand side of PLC — requires FX2NC-CNV-IF.

Programming Manual JY992D88101 available separately.

FX2NC

- Conventional panels require several layers of wiring, termination, and labeling. The FX2NC uses high-density cables that connect the PLC directly to the field terminals by locking IDC connectors.
- Panel size can be decreased, and construction time/effort associated with wiring, terminating, and labeling are greatly reduced, allowing faster and more cost-effective panel construction.
- Wires in groups of 16 circuits, via distributed terminal blocks, or connect directly to custom-designed harnesses. Use Mitsubishi or third party terminal products.
- Tiny — 16 and 32 I/O CPUs are about the size of a cassette tape case.
- Compatibility with all other Mitsubishi FX2N SuperMicro™ and FX0N products including software, operator interfaces, CPU performance, options, software and connectivity.
- CPU virtually same as FX2N; 32K program memory, 8K data memory, 80 nanosecond execution, embedded twin axis motion control, floating point math, and auto-tuning PID control, etc.
- The real time clock feature is optional for FX2NC CPUs.





FX2NC Base Unit Extension Rules

The FX2NC series input extension I/O blocks and FX2NC series output extension I/O blocks can be directly connected to the FX2NC series base unit. These input/output extension blocks can be connected in the desired order. After connection, octal numbers will be assigned to the input/output points of the extension blocks. These octal numbers are regarded as the input/output numbers, and the smallest number will be assigned to the input/output point next to the main unit, and then sequentially increased for the subsequent input/output points.

Rules

1. Add the input/output points of the extension blocks and special function blocks to the input/output points of the main unit. The total number of input points should be 184 points or less, and the total number of output points should be 184 points or less also. The total number of input and output points should be 256 points.
2. The FX2NC series base unit supplies the control power (5 VDC) to the extension blocks and special function blocks. For this reason, the total current consumption of all the blocks connected to the main unit should not exceed the current capacity of the main unit.
3. Next to the FX2NC-CNV-IF, up to 4 blocks can be connected. To connect a special function unit, such as the FX2N-1RM-E-SET, refer to the instruction manual of the corresponding special function block. To connect the FX2NC series main unit to the FX0N or FX2N series extension blocks, be sure to connect the FX2NC-CNV-IF connector conversion adapter first. Following the adapter, you can connect up to 4 blocks. In addition, one communication adapter can be connected to the left side of the base unit.

Example System Configuration Using FX2NC Series Extension I/O

	X020	X040		X060			X100	
X000-X017	X037	X057		X077			X117	
FX2NC-32MT-DSS 16EX X: 16 Points Y: 16 Points	16EX 16 Points	16EYT 16 Points	16EX 16 Points	16EYT 16 Points	16EYT 16 Points	16EX 16 Points	16EYT 16 Points	16 Points

	Y020		Y040	Y060		Y100
Y000-Y017	Y037		Y057	Y077		Y117

Example System Configuration Using FX2NC, FX0N and FX2N Series Extension I/O

FX0N-232ADP (Communication adapter) FX2NC-CNV-IF (Connector conversion adapter)

	FX2NC-32MT-DSS	FX2NC Series extension blocks	FX2N-16EYR-ES/UL relay output block	FX2N-232IF RS-232C block	FX2N-1PG pulse output block	FX2N-4AD analog block
			4 blocks, maximum			

5V Current Consumption and I/O Totals

The following tables show the 5V current consumption and input/output points of various types of FX2NC series base units, I/O extension blocks in general and special function blocks. Use these tables to determine the total 5V current being drawn from the base unit and the total system I/O. This will allow you to remain within the specified limits.

FX2NC Base Units (all types)

Model	Current Capacity 5 VDC	Input X	Output Y	Total
FX2NC-16M	600mA	8	8	16
FX2NC-32M	560mA	16	16	32
FX2NC-64M	480mA	32	32	64
FX2NC-96M	400mA	48	48	96

I/O Extension Blocks (all types)

Model	Current Consumption 5 VDC	Input X	Output Y	Total
FX2NC-16EX-DS	30mA	16	—	16
FX2NC-16EYT-DSS	50mA	—	16	16
FX2NC-32EX-DS	60mA	32	—	32
FX2NC-32EYT-DSS	100mA	—	32	32
FX2NC-16EX-T-DS	30mA	16	—	16
FX2NC-16EYR-T-DS	50mA	—	16	16
FX2N-8ER-ES/UL	25mA	4(8)	4(8)	16*
FX2N-8EX-ES/UL	25mA	8	—	8
FX2N-8EX-UA1/UL	25mA	8	—	8
FX2N-8EYR-ES/UL	30mA	—	8	8
FX2N-8EYT-ESS/UL	30mA	—	8	8
FX2N-16EX-ES/UL	40mA	16	—	16
FX2N-16EYT-ESS/UL	40mA	—	16	16
FX2N-16EX-ES/UL	45mA	16	—	16
FX2N-16EYR-ES/UL	40mA	—	16	16
FX2N-16EYT-ESS/UL	180mA	—	16	16

*8 points are used for actual input/output, however, this block occupies 16 input/output points

Special Function Blocks and Communication Adapters

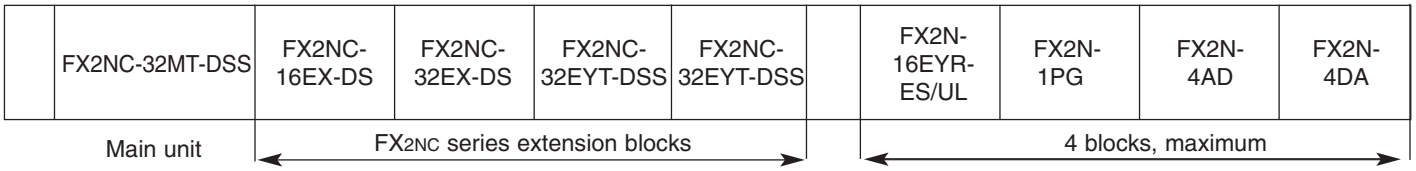
Model	Current Consumption 5 VDC	Input X	X/Y	Output Y	Total
FX0N-3A	30mA	—	8	—	8
FX0N-16NT	20mA	8	—	8	16
FX0N-32NT-DP	170mA	—	8	—	8
FX2N-2AD	20mA	—	8	—	8
FX2N-4AD	30mA	—	8	—	8
FX2N-4AD-PT	30mA	—	8	—	8
FX2N-4AD-TC	30mA	—	8	—	8
FX2N-2DA	30mA	—	8	—	8
FX2N-4DA	30mA	—	8	—	8
FX2N-1HC	90mA	—	8	—	8
FX2N-1PG	55mA	—	8	—	8
FX2N-232IF	40mA	—	8	—	8
FX2N-32CCL	130mA	—	8	—	8
FX2N-16LNK-M	200mA	*	8	*	*
FX0N-232ADP	200mA	—	—	—	—
FX0N-485ADP	30mA	—	—	—	—
FX-2PIF	290mA	—	—	—	—
FX2NC-232ADP	100mA	—	—	—	—
FX2NC-485ADP	150mA	—	—	—	—
FX2NC-4AD	50mA	—	8	—	8
FX2NC-4DA	30mA	—	8	—	8

* I/O Link Master: Value depends on number of remote I/O being used.

FX2NC System Configuration Example

FX0N-485ADP (Communication Adapter)

FX2NC-CNV-IF (Connector Conversion Adapter)



Example Calculation

Block	Model	Current Consumption	Number of Blocks Connected	Current Consumption x Number of Blocks	Input X	X/Y	Output Y
FX2NC Series Input Extension Block	FX2NC-16EX-DS	30 mA	1 blocks	30 mA	16 points		0 points
	FX2NC-32EX-DS	60 mA	1 blocks	60 mA	32 points		0 points
FX2NC Series Output Extension Block	FX2NC-16EYT-DSS	50 mA	0 blocks	0 mA	0 points		0 points
	FX2NC-32EYT-DSS	100 mA	2 blocks	200 mA	0 points		64 points
FX0N/FX2N Series Extension Block (4 Block Maximum)	FX2N-16EYR-ES/UL	40 mA	1 blocks	40 mA	0 points	points	16 points
	FX2N-1PG	55 mA	1 blocks	55 mA	0 points	8 points	0 points
	FX2N-4AD	30 mA	1 blocks	30 mA	0 points	8 points	0 points
	FX2N-4DA	30 mA	1 blocks	30 mA	0 points	8 points	0 points
Function Adapter	FX2N-485ADP	30 mA	1 blocks	30 mA	—		
2-Port Interface	FX-2PIF	310 mA	0 blocks	0 mA	—		
				5 Total current consumption: 475 mA	Total input points:		48 points
					Total output points:		80 points
					Total input/output common points:		24 points
					Total I/O points:		152 points

Judgment (Example)

a) 5 VDC Control Current Capacity Check

5 VDC current capacity of main unit 560 mA ≥ Total current consumption of all connected blocks (from table above) 475 mA

b) Input/Output Point Connection Upper Limit Check

Input point connection Upper limit: 184 points ≥ (Input points of main unit (from table above): 16 points + Total input points of all connected blocks (from table above): 48 points) = 64 points

Output point connection Upper limit: 184 points ≥ (Output points of main unit (from table above): 16 points + Total output points of all connected blocks (from table above): 80 points) = 96 points

Total I/O points Upper limit: 256 points ≥ (Input/Output points of main unit (from table above): 32 points + Total I/O points of all connected blocks from table above): 152 points) = 184 points

Calculation results:
The 5 VDC power total current consumption value and total input/output points are in the specified ranges, therefore the above system configuration is possible.

FX2NC Performance Specifications

Model Number		FX2NC	REMARKS
Operation Control Method		Cyclic operation by stored program	
I/O Control Method		Batch processing (takes place after END instruction is executed)	I/O refresh instruction is available
Operation Process Time		Basic instructions: 0.08μs — Applied instructions: 1.52 - several 100μs per instruction	
Programming Language		Relay symbolic language + Stepladder	Stepladder can be used to produce an SFC style program
Program Capacity		16K (8000 step) standard	Expandable to 32K (16000 steps) using addl. memory cassette
Number of Instructions		Basic sequence instructions: 27 — Step ladder instructions: 2 — Applied instructions: 125	
I/O Configuration		Max hardware I/O config. pts. 256, dependent on user selection (Max. software addressable inputs & outputs 256)	
Auxiliary Relay (M Coils)	General	3072 points	M0 to M371
	Latched	2572 points (subset)	M500 to M3071 (Battery backed)
	Special	256 points	From the range M8000 to M8255
State Relays (S Coils)	General	1000 points	S0 to S999
	Latched	500 points (subset)	S500 to S999 (Battery backed)
	Initial	10 points	S0 to S9
	Annunciator	100 points	S900 to S999
Timers (T)	100 Msec	Range: 0 to 3,276.7 sec. 200 points	T0 to T199
	10 Msec	Range: 0 to 327.67 sec. 46 points	T200 to T245
	1 Msec Retentive	Range: 0 to 32.767 sec. 4 points	T246 to T249 (Battery backed)
	100 Msec Retentive	Range: 0 to 3,276.7 sec. 6 points	T250 to T255 (Battery backed)
Counters (C)	General 16 Bit	Range: 1 to 32,767 counts 200 points	C0 to C199 Type: 16 bit up counter
	Latched 16 Bit	100 points (subset)	C0 to C199 Type: 16 bit up counter (Battery backed)
	General 32 Bit	Range:-2,147,483,648 to 2,147,483,647 35 points	C200 to C234 Type: 32 bit up/down counter
	Latched 32 Bit	15 points (subset)	C219 to C234 Type: 32 bit up/down counter (Battery backed)
High Speed Counters (C)	1 Phase	Range:-2,147,483,648 to +2,147,483,647 counts Note: All high speed counters are latched	C235 to C240 6 points
	1 Ph., C/W Start/Stop Input		C241 to C245 5 points
	2 Phase		C246 to C250 5 points
	A/B Phase		C251 to C255 5 points
Data Registers (D)	General	8000 points	D0 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	Latched	7800 points (subset)	D200 to D7999 Type: 16 bit data storage register, pair for 32 bit device
	File Registers	7000 points (subset)	D1000 to D7999 set by parameter in 14 blocks of 500 program steps: Type: 16 bit data storage register
	Special	256 points	From the range D8000 to D8255 Type: 16 bit data storage register
	Index	16 points	V0 to V7 and Z0 to Z7 Type: 16 bit data storage register
Pointers (P)	For Use w/ CALL	128 points	P0 to P127
	For Use w/ Interrupts	6 input points, 3 timers, 6 counters	I00□ to I50□ and I6☆☆ to I8☆☆ I010 to I060 (rising trigger □=1, falling trigger □=0, ☆☆= time in msec)
Nest Levels		8 points for use with MC and MCR	N0 to N7
Numbers	Decimal K	16 bit: -32,768 to +32,767 32 bit: -2,147,483,648 to +2,147,483,647	
	Hexadecimal H	16 bit; 0000 to FFFF 32 bit: 00000000 to FFFFFFFF	
	Floating Point	32 bit: 0, -1.175×10^{-38}, -3.403×10^{38}	
Environment			
Ambient Temperature		0–55° C (in operation) –20 +70° C (in storage)	
Ambient Humidity		35–85% RH, no condensation (in operation)	
Vibration Resistance – Direct Mounting		Conforms to JIS C0040; 10-57 Hz: 0.75 mm Half Amplitude 57-150 Hz: 9.8m/s² Acceleration	
Vibration Resistance – DIN Rail Mounting		Conforms to JIS C0040; 10-57 Hz: 0.035 mm Half Amplitude 57-150 Hz: 4.9m/s² Acceleration	
Shock Resistance		Conforms to JIS C0041: 147m/s² Acceleration, Action Time: 11 ms 3 times in each direction X, Y, and Z	
Noise Immunity		1000 Vpp noise voltage, 1 μs pulse width at 30–100Hz	
Dielectric Withstand Voltage		500 VAC for 1 minute	Between all terminals and ground
Insulation Resistance		5MΩ or larger by 500 VDC insulation resistance tester	Between all terminals and ground
Ground		Class 3 ground, where available. (100Ω or less)	
Operating Environment		Must be free from corrosive gases. Dust should be minimal.	

FX2NC Base Unit Hardware Specifications

Specifications		FX2NC-16 MR-T-DS	FX2NC-16 MT-D-UL	FX2NC-16 MT-DSS	FX2NC-32 MT-D/UL	FX2NC-32 MT-DSS	FX2NC-64 MT-D/UL	FX2NC-64 MT-DSS	FX2NC-96 MT-D/UL	FX2NC-96 MT-DSS
Rating		UL • cUL • CE	UL • cUL	UL • cUL • CE	UL • cUL	UL • cUL • CE	UL • cUL	UL • cUL • CE	UL • cUL	UL • cUL • CE
Integrated Inputs / Outputs		16	16	16	32	32	64	64	96	96
Power Supply	AC Range (+10%, -15%)	—								
	Frequency at AC Hz	—								
	DC Range (+10%, -15%)	24 VDC								
Max. Apparent Input Power		6W	6 W	6 W	8 W	8 W	11 W	11 W	14 W	14 W
Inrush Current at ON	100 VAC	—								
	200 VAC	—								
	24 VDC	30 A/0.5 ms								
Allowable Momentary Power Failure Time (ms)		5								
External Service Power Supply (24 VDC) mA		—								
Integrated Inputs*		8 (24 VDC)	8 (24 VDC)	8 (24 VDC)	16 (24 VDC)	16 (24 VDC)	32 (24 VDC)	32 (24 VDC)	48 (24 VDC)	48 (24 VDC)
Min. Current for Logical 1 (mA) (X0-X7/X10 onwards)		4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5	4.5 / 3.5
Max. Current for Logical 0 (mA)		1.5								
Response Time (ms)		0 to 60 X000-X007 All other inputs 10	0 to 60 X000-X007 All other inputs 10	0 to 60 X000-X007 All other inputs 10	0 to 60 X000-X017 All other inputs 10	0 to 60 X000-X017 All other inputs 10	0 to 60 X000-X017 All other inputs 10	0 to 60 X000-X017 All other inputs 10	0 to 60 X000-X017 All other inputs 10	0 to 60 X000-X017 All other inputs 10
Integrated Outputs		8	8	8	16	16	32	32	48	48
Output		Relay	Sink Trans.	Source Trans.	Sink Trans.	Source Trans.	Sink Trans.	Source Trans.	Sink Trans.	Source Trans.
Switching Voltage (Max.) VDC		250 VAC, 30 VDC	30							
Max. Output Current	Per Output (A)	2A/pt	0.1 (0.3 A/pt Y0 to Y3)							
	Per 4 Outputs (A)	4A	0.8							
Max Switching Current	Inductive Load (W)	—	2.4 (7.2 [Y0 to Y3])							
	Lamp Load (W)	100W	0.3 (0.9 [Y0 to Y3])							
Response Time (ms)	OFF→ON	10 ms	<0.2 (<15 µs, Y0, Y1)							
	ON→OFF	10 ms	<0.2 (<30 µs, Y0, Y1)							
Life of Relay Contacts (Cycles)		1,000,000@ 35VA	—							
Weight (kg)		.25	0.20	0.20	0.20	0.20	0.35	0.35	0.45	0.45
Dimensions (W x H x D) mm		35 x 90 x 87	35 x 90 x 87	35 x 90 x 87	35 x 90 x 87	35 x 90 x 87	60 x 90 x 87	60 x 90 x 87	86 x 90 x 87	86 x 90 x 87

* Sink/Source except for MT and MT-D units = Sink only

FX2NC Extension Unit Hardware Specifications

Specifications		FX2NC-16 EX-D/UL	FX2NC-16 EX-DS	FX2NC-16 EX-T-DS	FX2NC-16EYT-D/UL	FX2NC-16EYT-DSS	FX2NC-16EYR-T-DS	FX2NC-32 EX-DS	FX2NC-32 EX-DS	FX2NC-32EYT-D/UL	FX2NC-96 MT-DSS
Rating		UL • cUL	UL • cUL • CE	UL • cUL • CE	UL • cUL	UL • cUL • CE	UL • cUL • CE	UL • cUL	UL • cUL • CE	UL • cUL	UL • cUL • CE
Max. Number of Inputs / Outputs		16	16	16	16	16	16	32	32	32	32
Power Supply		Supplied from base unit or external source									
Integrated Inputs*		16	16	16	—	—	—	32	32	—	—
Min. Current for Logical 1 (mA)		3.5	3.5	3.5	—	—	—	3.5	3.5	—	—
Max. Current for Logical 0 (mA)		1.5	1.5	1.5	—	—	—	1.5	1.5	—	—
Response Time (ms)		10	10	10	—	—	10	10	10	—	—
Integrated Outputs		—	—	—	16	16	16	—	—	32	32
Output		—	—	—	Sink Trans.	Source Tran.	Relay	—	—	Sink Trans.	Source Trans.
Switching Voltage (Max.) VDC		—	—	—	30	30	30	—	—	30	30
Max. Output Current	Per Output (A)	—	—	—	0.1	0.1	2A	—	—	0.1	0.1
	Per 4 Outputs (A)	—	—	—	0.8	0.8	4A	—	—	0.8	0.8
Max Switching Current	Inductive Load (W)	—	—	—	2.4	2.4	—	—	—	2.4	2.4
	Lamp Load (W)	—	—	—	0.3	0.3	100	—	—	0.3	0.3
Response Time (ms)		—	—	—	<0.2	<0.2	10	—	—	<0.2	<0.2
Life of Relay Contacts (Cycles)		—	—	—	—	—	1,000,000 @ 35 VA	—	—	—	—
Weight (kg)		0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.2	0.2	0.2
Dimensions (W x H x D) mm		14.6 x 90 x 87	14.6 x 90 x 87	20.2 x 90 x 87	14.6 x 90 x 87	14.6 x 90 x 87	24.4 x 90 x 87	26.2 x 90 x 87	26.2 x 90 x 87	26.2 x 90 x 87	26.2 x 90 x 87

* EX: Sink, EX-DS, Sink/Source

FX2NC Terminal Blocks Hardware Specifications

Specifications		FX-16E-TB/UL	FX-16EX-A1-TB/UL	FX-16EYR-ES-TB/UL	FX-16EYS-ES-TB/UL	FX-16EYT-ES-TB/UL	FX-16EYT-ESS-TB/UL	FX-32E-TB/UL
Compatibility		Use with FX2NC-□□MT-DSS base units only						
Max. Number of Inputs / Outputs		16	16	16	16	16	16	32
Power Supply		24 VDC from external supply						
Integrated Inputs*		16 (24VDC)	16 (120 VAC)	—	—	—	—	32 (24VDC)
Min. Current for Logical 1 (mA)		Passive block: same as FX2NC base unit	3.8	—	—	—	—	Passive block: same as FX2NC base unit
Max. Current for Logical 0 (mA)		Passive block: same as FX2NC base unit	1.7	—	—	—	—	Passive block: same as FX2NC base unit
Response Time (ms)		Passive block: same as FX2NC base unit	25	—	—	—	—	Passive block: same as FX2NC base unit
Integrated Outputs		—	—	16	16	16	16	—
Output		—	—	Relay	Triac (SSR)	Sink Trans.	Source Trans.	—
Switching Voltage (max.)		—	—	240 VAC / 30 VDC	242 VAC	30 VDC	30 VDC	—
Max. Output Current	Per Output (A)	—	—	2	0.3	0.5	0.5	—
	Per 4 Outputs (A)	—	—	8	0.8	0.8	0.8	—
Max Switching Load	Inductive Load	—	—	80 VA	30 VA	12 W	12 W	—
	Lamp Load (W)	—	—	100 W	30 W	1.5 W	1.5 W	—
Response Time (ms)	ON→OFF	—	—	10	<12	1.5	1.5	—
	OFF→ON	—	—	10	<2	0.2	0.2	—
Life of Relay Contacts (Cycles)		—	—	3,000,000 at 20 VA	—	—	—	—
Dimensions (W x H x D) mm		150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45

* Sink / source

FX2NC Terminal Blocks Hardware Specifications

Specifications		FX-16E-TB	FX-16EX-A1-TB	FX-32E-TB/UL	FX16EYS-TB	FX16EYT-TB
Compatibility		Use with FX2NC-□□MT base units only				
Max. Number of Inputs/Outputs		16	16	16	16	16
Power Supply		24 VDC from external supply				
Integrated Inputs*		16 (24 VDC)	16 (120 VAC)	—	—	—
Min. Current for Logical 1 (mA)		Passive block: same as FX2NC base unit	3.8	—	—	—
Max. Current for Logical 0 (mA)		Passive block: same as FX2NC base unit	1.7	—	—	—
Response Time (ms)		Passive block: same as FX2NC base unit	25	—	—	—
Integrated Outputs		—	—	16	16	16
Output		—	—	Relay	Triac (SSR)	Sink Transistor
Switching Voltage (Max.)		—	—	240 VAC / 30 VDC	242 VAC	30 VDC
Max. Output Current	Per Output (A)	—	—	2	0.3	0.5
	Per 4 Outputs (A)	—	—	8	0.8	0.8
Max Switching Load	Inductive Load (W)	—	—	80 VA	30 VA	12 W
	Lamp Load	—	—	100 W	30 W	1.5 W
Response Time (ms)	ON→OFF	—	—	10	<12	1.5
	OFF→ON	—	—	10	<2	0.2
Life of Relay Contacts (Cycles)		—	—	3,000,000 at 20 VA	—	—
Dimensions (W x H x D) mm		150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45	150 x 55 x 45

* Sink

FX2NC Terminal Block Cables

Specifications	FX-16E-150CAB-R	FX-16E-300CAB-R	FX-16E-500CAB-R
Compatibility	Use with FX2NC base units and terminal blocks Note: users are encouraged to make their own wiring harnesses to meet specific length requirements		
Connector Type	MIL C 83503 or equivalent		
Number of Pins	20 (2x10)		
Length	1.5 m	3 m	5 m

FX2NC Analog Input / Output Special Function Blocks

Specifications		FX2NC-4DA	FX2NC-4AD
Rating		CE	CE
Applicable PLCs		FX2NC	
General Specifications		Same as FX2NC Environmental Specifications on page 223 except dielectric withstand voltage, 500 VAC for 1 min. between all terminals and ground	
Power Supply		5 VDC / 30 mA (from base unit), 24 VDC ±10% / 130 mA	5 VDC / 50 mA (from base unit), 24 VDC / 130 mA
Analog I/O	Inputs	—	4
	Outputs	4	—
Analog Input Range		—	-10 VDC to +10 VDC / +20 mA - +20 mA / 4-20 mA
Analog Output Range		-10 VDC to +10 VDC / 0 mA - +20 mA	—
External Load	Voltage Output	2 kΩ – 1 MΩ	—
	Current Output	<500 Ω	—
Input Resistance	Voltage Input	—	200 kΩ
	Current Input	—	250 Ω
Analog Ranges	Voltage	±10 VDC	±10 VDC
	Current	0 – 20 mA	+20 mA
Resolution		Voltage Output: 5mV (10V x 1/2000) 11 bit plus sign Current Output: 20µA (20mA x 1/1000)	Voltage Output: 0.32 mV or 20V x 1/64000 Current: 1.25 µA or 40 mA x 1/32000 (14 bit plus sign) Current Output: 20µA (20mA x 1/1000)
Overall Accuracy		± 1%	± 0.5%
Conversion Speed	Digital—Analog	—	15 ms per channel / 6 ms per channel (high speed)
	Analog—Digital	2.1 ms per channel	—
Related I/O Points		8	8
Weight (kg)		0.3	0.3
Dimensions W x H x D (mm)		24 x 90 x 89	20 x 90 x 89
Function		General purpose digital to analog conversion (output)	General purpose analog to digital conversion (input)
Required Manuals		JY997D07601	JY997D07801

FX2NC RS-232 Communications Interface

Specifications	FX2NC-232ADP
Rating	CE (EMC only)
General Specifications	Same as Environmental Specs on page 223
Applicable PLCs	FX1S / FX1N / FX2N / FX2NC / FX0N
Interface	RS-232 with 25 pole D-SUB compact plug (Photocoupler isolated)
Power Supply	5 VDC / 100 mA (from base unit)
Communications Speed (Bit/s)	300, 600, 1200, 2400, 4800, 9600, 19200
Communications Distance (m)	Max. 15
Communications Cable	Shielded cable
Communication Mode	Half duplex
Protocols	Defined under program control
Format	7 or 8 bits, parity 1 or 0, 1 or 2 stop bit
Related I/O Points	—
Weight (kg)	0.2
Dimensions (W x H x D) mm	19 x 90 x 74
Required Manuals	JY997D01101

The optional RS-232C interface FX2NC-232ADP permits serial communication between the PLC and surrounding RS-232C peripherals.

Use the FX2NC-232ADP to transmit and receive data. The module is suitable for the connection of printers, bar code readers, PCs and other PLC systems. The communication is handled by the PLC program using the RS instruction. Note that operator interfaces should not be connected via this module.

The connection is to the communications bus on the left side of the controller. Use of the FX2NC-232ADP does not affect use of the programming port.

FX2NC RS-485 Communications Interface

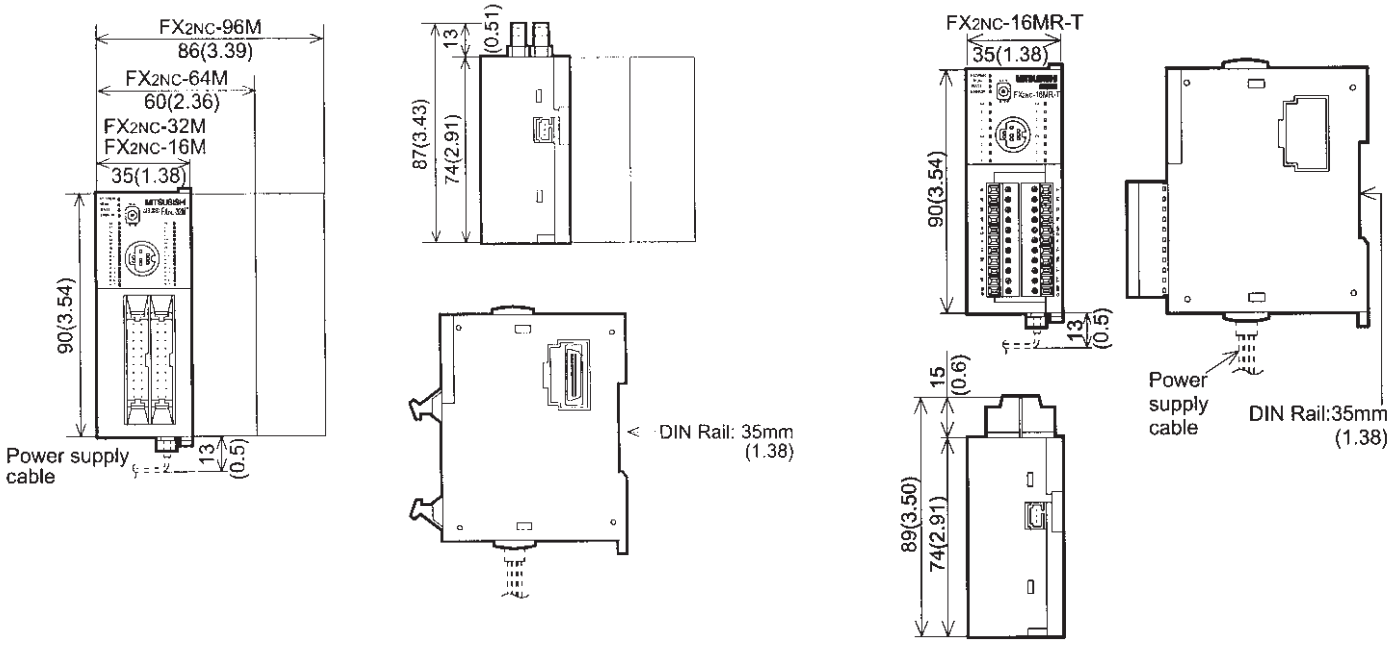
Specifications	FX2NC-485ADP
Rating	CE (EMC only)
Applicable PLCs	FX1S / FX1N / FX2N / FX2NC
General Specifications	Same as to FX2NC DC power base units on page 223
Dielectric Withstand Voltage	500 VAC for 1 minute
Power Supply	5 VDC / max.150 mA (from base unit), 24 VDC / 50 mA
Interface	RS-485/422 with screw terminals
Communications Speed (Bit/s)	300 — 19200
Communications Distance (m)	Max. 500
Communications Cable	Shielded cable
Communication Mode	Half duplex
Protocols	Protocol 1 and 4 of AJ71UC24
Related I/O Points	—
Weight (kg)	0.2
Dimensions (W x H x D) mm	19 x 90 x 74
Required Manuals	JY997D01201

The FX2NC-485ADP communications module enables the configuration of masters/slave multidrop and parallel link networks using RS-485 interface.

In FX2NC systems the module is connected directly to the communications bus on the left hand side of the FX2NC base unit. The FX2N-CNV-BD communications adapter is required for connection to the FX2N base unit.

FX2NC Base Unit Dimensions

Units: mm (inches)



FX2NC Terminal Pin Outs

FX2NC-16MT-DSS

IN		OUT	
X0	•	Y0	•
X1	•	Y1	•
X2	•	Y2	•
X3	•	Y3	•
X4	•	Y4	•
X5	•	Y5	•
X6	•	Y6	•
X7	•	Y7	•
COM0	COM0	+V0	+V0
•	•	•	•

FX2NC-32MT-DSS

IN		OUT	
X0	X10	Y0	Y10
X1	X11	Y1	Y11
X2	X12	Y2	Y12
X3	X13	Y3	Y13
X4	X14	Y4	Y14
X5	X15	Y5	Y15
X6	X16	Y6	Y16
X7	X17	Y7	Y17
COM0	COM0	+V0	+V0
•	•	•	•

FX2NC-16MR-T-DS

IN	OUT
X0	Y0
X1	Y1
X2	Y2
X3	Y3
COM	COM1
•	•
X4	Y4
X5	Y5
X6	Y6
X7	Y7
COM	COM2

FX2NC-64MT-DSS

IN		OUT		IN		OUT	
X0	X10	Y0	Y10	X20	X30	Y20	Y30
X1	X11	Y1	Y11	X21	X31	Y21	Y31
X2	X12	Y2	Y12	X22	X32	Y22	Y32
X3	X13	Y3	Y13	X23	X33	Y23	Y33
X4	X14	Y4	Y14	X24	X34	Y24	Y34
X5	X15	Y5	Y15	X25	X35	Y25	Y35
X6	X16	Y6	Y16	X26	X36	Y26	Y36
X7	X17	Y7	Y17	X27	X37	Y27	Y37
COM0	COM0	+V0	+V0	COM1	COM1	+V1	+V1
•	•	•	•	•	•	•	•

FX2NC-96MT-DSS

IN		OUT		IN		OUT		IN		OUT	
X0	X10	Y0	Y10	X20	X30	Y20	Y30	X40	X50	Y40	Y50
X1	X11	Y1	Y11	X21	X31	Y21	Y31	X41	X51	Y41	Y51
X2	X12	Y2	Y12	X22	X32	Y22	Y32	X42	X52	Y42	Y52
X3	X13	Y3	Y13	X23	X33	Y23	Y33	X43	X53	Y43	Y53
X4	X14	Y4	Y14	X24	X34	Y24	Y34	X44	X54	Y44	Y54
X5	X15	Y5	Y15	X25	X35	Y25	Y35	X45	X55	Y45	Y55
X6	X16	Y6	Y16	X26	X36	Y26	Y36	X46	X56	Y46	Y56
X7	X17	Y7	Y17	X27	X37	Y27	Y37	X47	X57	Y47	Y57
COM0	COM0	+V0	+V0	COM1	COM1	+V1	+V1	COM2	COM2	+V2	+V2
•	•	•	•	•	•	•	•	•	•	•	•

FX2NC-16MT

IN		OUT	
X0	•	Y0	•
X1	•	Y1	•
X2	•	Y2	•
X3	•	Y3	•
X4	•	Y4	•
X5	•	Y5	•
X6	•	Y6	•
X7	•	Y7	•
COM	COM	COM1	COM1
•	•	•	•

FX2NC-32MT

IN		OUT	
X0	X10	Y0	Y10
X1	X11	Y1	Y11
X2	X12	Y2	Y12
X3	X13	Y3	Y13
X4	X14	Y4	Y14
X5	X15	Y5	Y15
X6	X16	Y6	Y16
X7	X17	Y7	Y17
COM	COM	COM1	COM1
•	•	•	•

FX2NC-64MT

IN		OUT		IN		OUT	
X0	X10	Y0	Y10	X20	X30	Y20	Y30
X1	X11	Y1	Y11	X21	X31	Y21	Y31
X2	X12	Y2	Y12	X22	X32	Y22	Y32
X3	X13	Y3	Y13	X23	X33	Y23	Y33
X4	X14	Y4	Y14	X24	X34	Y24	Y34
X5	X15	Y5	Y15	X25	X35	Y25	Y35
X6	X16	Y6	Y16	X26	X36	Y26	Y36
X7	X17	Y7	Y17	X27	X37	Y27	Y37
COM	COM	COM1	COM1	COM	COM	COM2	COM2
•	•	•	•	•	•	•	•

FX2NC-96MT

IN		OUT		IN		OUT		IN		OUT	
X0	X10	Y0	Y10	X20	X30	Y20	Y30	X40	X50	Y40	Y50
X1	X11	Y1	Y11	X21	X31	Y21	Y31	X41	X51	Y41	Y51
X2	X12	Y2	Y12	X22	X32	Y22	Y32	X42	X52	Y42	Y52
X3	X13	Y3	Y13	X23	X33	Y23	Y33	X43	X53	Y43	Y53
X4	X14	Y4	Y14	X24	X34	Y24	Y34	X44	X54	Y44	Y54
X5	X15	Y5	Y15	X25	X35	Y25	Y35	X45	X55	Y45	Y55
X6	X16	Y6	Y16	X26	X36	Y26	Y36	X46	X56	Y46	Y56
X7	X17	Y7	Y17	X27	X37	Y27	Y37	X47	X57	Y47	Y57
COM	COM	COM1	COM1	COM	COM	COM2	COM2	COM	COM	COM3	COM3
•	•	•	•	•	•	•	•	•	•	•	•

FX2NC-16EX-DSS

	IN		
Lower	X0	X0	Upper
	X1	X1	
	X2	X2	
	X3	X3	
	X4	X4	
	X5	X5	
	X6	X6	
	X7	X7	
	COM0	COM0	
	•	•	

FX2NC-32EX-DSS

	IN		IN		
Lower	X0	X0	X0	X0	Upper
	X1	X1	X1	X1	
	X2	X2	X2	X2	
	X3	X3	X3	X3	
	X4	X4	X4	X4	
	X5	X5	X5	X5	
	X6	X6	X6	X6	
	X7	X7	X7	X7	
	COM0	COM0	COM1	COM1	
	•	•	•	•	

FX2NC-16EX-T-DS

	IN
UPPER	X0
	X1
	X2
	X3
	X4
	X5
	X6
	X7
	COM
	COM
LOWER	X0
	X1
	X2
	X3
	X4
	X5
	X6
	X7
	COM
	COM

FX2NC-16YR-T-DS

	IN
UPPER	Y0
	Y1
	Y2
	Y3
	Y4
	Y5
	Y6
	Y7
	COM1
	COM1
LOWER	Y0
	Y1
	Y2
	Y3
	Y4
	Y5
	Y6
	Y7
	COM2
	COM2

FX2NC-16EYT-DSS

	OUT	
Lower	Y0	Y0
	Y1	Y1
	Y2	Y2
	Y3	Y3
	Y4	Y4
	Y5	Y5
	Y6	Y6
	Y7	Y7
	+V0	+V0
	•	•

FX2NC-32EYT-DSS

	OUT		OUT	
Lower	Y0	Y0	Y0	Y0
	Y1	Y1	Y1	Y1
	Y2	Y2	Y2	Y2
	Y3	Y3	Y3	Y3
	Y4	Y4	Y4	Y4
	Y5	Y5	Y5	Y5
	Y6	Y6	Y6	Y6
	Y7	Y7	Y7	Y7
	+V0	+V0	+V1	+V1
	•	•	•	•

FX Accessories

FX Programming Tools

Specifications	FX-10P-E	FX-20P-E-SET-0	FX0-10LDR
Rating	—	CE (EMC only)	—
Purpose	For online PLC programming	For online or offline PLC programming	For program up/download
Display	2x16 LCD	4x16 backlit LCD	N/A
Off Line Programming	No	Yes	N/A
Compatible PLCs	**All FX**	**All FX (*1)**	**All FX (*2)**
Cable Required	FX-20P-CAB + FX-20P-CADP	Supplied (FX-20P-CABO)	Supplied

Note: This table excludes programming software. Please refer to the Software Selection Guide for these products.
1. For connection to F / F1 / F2 / FX, the FX-20P-ADP-KIT is also required.
2. Program download size for FX1N/2N is 8k step unless otherwise specified; an FX-EEPROM-4 cannot be used with these PLCs unless the programming area is reduced (GX-Developer/View/Project/Data List/Parameter/Memory Capacity)

Specifications	FX-20P-RWM	FX-ROM-SOC-1	SC09
Rating	—	—	—
Purpose	Writing to EPROM memory cassette from FX-20P-E	EPROM to FX-20P-RWM adapter	For program up/download from PC
Display	N/A	N/A	N/A
Off Line Programming	N/A	N/A	N/A
Compatible PLCs	**FX0N, FX2N**	**FX0N, FX2N**	**All FX**
Cable Required	N/A	N/A	N/A

Note: This table excludes programming software. Please refer to the Software Selection Guide for these products.

FX Network Accessories

Specifications	FX-485PC-IF-KIT
Rating	CE (EMC only)
Applicable PLCs	**FX / FX0N / FX2N / FX2NC**
Purpose	RS-232-422/485 converter for multi-drop network connection to PC
Power Supply	Supplied

FX Battery Back-Up

Specifications	F2-40BL	FX2NC-32BL	FX0N-40B
Rating	—	—	—
Purpose	Maintains base unit memory during power down	Maintains base unit memory during power down	Maintains RTC data during power down (if RTC option installed)
Compatible PLCs	**FX2N**	**FX2NC**	**FX0N**

FX Accessory Cables

Specifications	FX0N-30EC	FX0N-65EC	FX2N-CNV-BC
Rating	—		—
Purpose	For extending distance between base unit and powered extension units.		
Length (mm)	300	650	
Compatible PLCs	**FX0N, FX1N, FX2N; FX2NC (when used with FX2NC-CNV-IF)**		**Use with FX0N-30EC and FX-0N-65EC**

FX Training Guides

Specifications	FX-INTRO-GUIDE	FX-101APPLIC
Full Title	Introductory Guide to Programmable Controllers	101 Ways to Use a Programmable Controller
Theme	Teaches what PLCs are, and how to program them	Applications source material and programming techniques

FX Removable Memory Cassettes

Specifications	FX-EEPROM-4	FX-EEPROM-4C	FX2NC-EEPROM-4C
Rating	CE	CE	—
Applicable PLCs	FX2N (*1)		FX2NC
Memory Type	EEPROM	EEPROM	EEPROM
Memory Size	8K	8K	8K
Number of Program Steps	4K	4K	4K
Clock Function (*2)	No	Yes	Yes
Calendar Function (*2)	No	Yes	Yes
Non Volatile Storage	Yes	Yes	Yes
Write Protection	Yes (switch)	Yes (switch)	Yes (switch)
Required Manuals	JY992D45801	JY992D45901	JY992D76101

Specifications	FX-EEPROM-8	FX-EEPROM-8C	FX-EPROM-8
Rating	CE	CE	CE
Applicable PLCs	FX2N (*1)		
Memory Type	EEPROM	EEPROM	EPROM
Memory Size	16K	16K	16K
Number of Program Steps	8K	8K	8K
Clock Function (*2)	No	Yes	No
Calendar Function (*2)	No	Yes	No
Non Volatile Storage	Yes	Yes	Yes
Write Protection	Yes (switch)	Yes (switch)	Yes (EPROM)
Required Manuals	JY992D45801	JY992D45901	JY992D45801

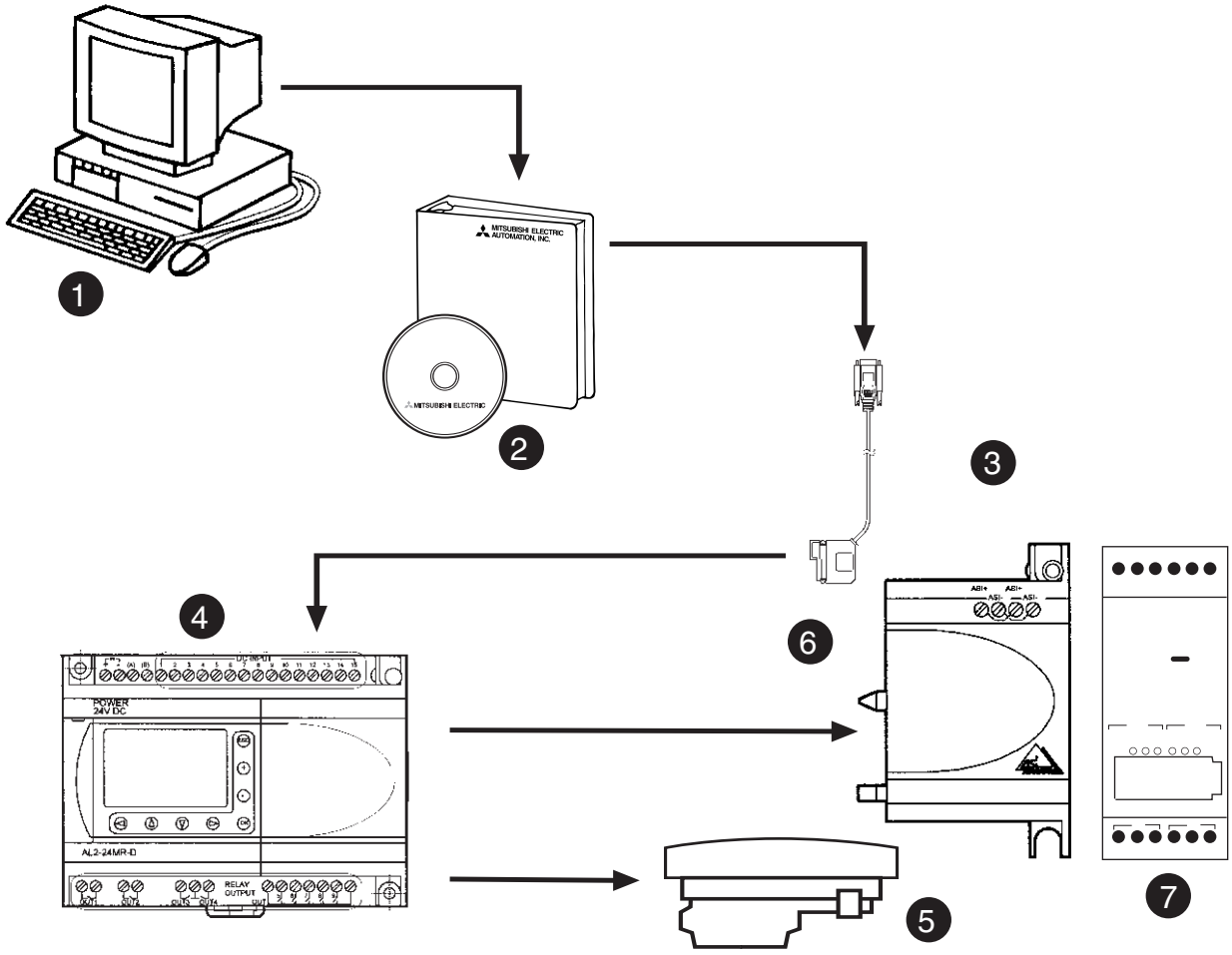
Specifications	FX-RAM-8	FX-RAM-8C	FX-EEPROM-16	FX2N-ROM-E1
Rating	—	—	—	—
Applicable PLCs	FX2N (*1)	FX2N	FX2N (*1)	FX2N (*1)
Memory Type	RAM	RAM	EEPROM	EEPROM
Memory Size	16K	16K	32K	32K
Number of Program Steps	8K	8K	16K	16K
Clock Function (*2)	No	Yes	No	No
Calendar Function (*2)	No	Yes	No	No
Non Volatile Storage	No	No	Yes	Yes
Write Protection	No	No	Yes (switch)	Yes (switch)
Required Manuals	JY992D45801	JY992D45901	JY992D45801	JY997D00101

Specifications	FX2NC-EEPROM-16	FX2NC-EEPROM-16C	FX2NC-RTC
Rating	—	—	—
Applicable PLCs	FX2NC	FX2NC	FX2NC
Memory Type	EEPROM	EEPROM	None
Memory Size	32K	32K	None
Number of Program Steps	16K	16K	None
Clock Function (*2)	No	Yes	Yes
Calendar Function (*2)	No	Yes	Yes
Non Volatile Storage	Yes	Yes	N/A
Write Protection	Yes (switch)	Yes (switch)	N/A
Required Manuals	—	JY992D76101	JY992D76101

Notes:
1. FXO-10LDR and FX-EEPROM-☐ can be used to download programs to FX0N/0S/1S/1N PLCs. Cassette memory size must match PLC memory size.
2: FX2N PLCs include a built-in RTC. FX2NC PLCs do not have a built-in RTC.

Programmable Logic Controllers • Alpha2 Series

Mitsubishi Electric's Alpha2 Series Controllers are the "Tiny Giants" of automation, designed to provide easy, flexible, and powerful control that is rugged enough for the factory floor and easy enough to use at home. The Tiny Giants offer an unbeatable combination of features, including real-time clock, high current output relays, analog inputs, secured access, built-in display / programming panel, battery backup, and industrial ruggedness and reliability.



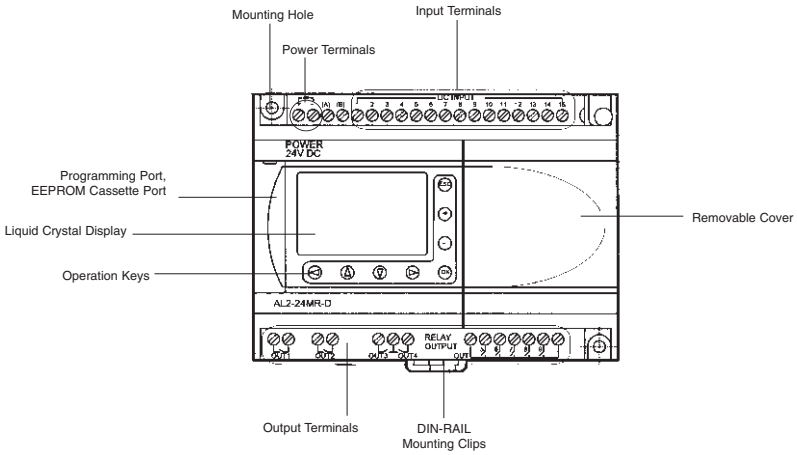
FOR AN OPERATIONAL SYSTEM, SELECT:

1. Personal Computer
2. Programming Software
3. Programming Cable AL-232CAB
4. Alpha2 Series
5. EEPROM Cassette
6. Alpha2 Extension Modules
7. Alpha2 Adaptor Modules

Note: Alpha2 can also be programmed directly by its built-in display and keypad. Programming Manual JY992D76601 available separately.

The Alpha2 is a new class of controller, *not* a PLC, designed to address simple control applications at the low end of the industrial and commercial control markets. Key features include:

- Very compact size: comparable to DC FX0S PLC.
- 14 and 24 I/O
- Program directly on the unit or via optional VLS Windows software.
- Built-in LCD screen for programming panel or operator interface functions.
- Programmable display screen.
- Graphical "function block" style programming with drag and drop icons.
- Expanded memory to 200 FBS.
- 120 – 240 VAC input versions.
- 8 Amp relay output.
- AC and DC power versions.
- Dual function DC discrete/analog input versions (an input can be "on/off" or 8-bit, 0-10 VDC).
- Y2K compliant real-time clock with 4 digit year.
- Easy to program scheduling functions.
- AS-i network interface available.
- Modem and SMS messaging (via GSM modem).
- High speed counter optional.



The Alpha2 uses a simple icon-based graphical function block language. The instruction set includes logic gates, such as AND, OR and NOT. It also includes special function blocks, such as timer, counter, latch, and compare. Using the Visual Logic Software, the programmer literally "wires" these blocks together to produce control algorithms. The programming software also includes a simulation mode to allow off-line program testing without any hardware connected. This is great for pre-testing software or verification of proper operation prior to download.

Alpha2 Series Base Unit Hardware Specifications

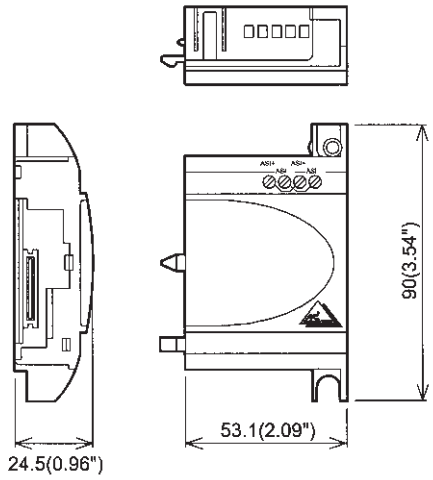
Specifications		AL2-10MR-A	AL2-10MR-D	AL2-14MR-A	AL2-14MR-D	AL2-24MR-A	AL2-24MR-D
Rating		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Max. Number of Inputs / Outputs		10	10	14	14	24	24
Power Supply	AC Range (+10%, -15%)	100-240VAC	100-240VAC	100-240VAC	—	100-240VAC	—
	Frequency at AC Hz	50/60	50/60	50/60	—	50/60	—
	DC Range (+20%, -15%)	24VDC	24VDC	—	24 VDC	—	24VDC
Max. Apparent Input Power (W)		4.9	4.0	5.5	7.5	7.0	9.0
Inrush Current at ON	120 VAC	<3.5A	—	<3.5A	—	<3.5A	—
	240 VAC	<6.5A	—	<6.5A	—	<6.5A	—
	24 VDC	—	<7A	—	<7A	—	<7A
Allowable Momentary Power Failure Time (ms)		10	5	10	5	10	5
Integrated Inputs (*1)		6	6	8	8	15	15
Min. Current for Logical 1 (mA)		—	4.3	—	4.3	—	4.3
Max. Current for Logical 0 (mA)		—	1.1	—	1.1	—	1.1
Min. Voltage for Logical 1		80 VAC	18 VDC	80 VAC	18 VDC	80 VAC	18 VDC
Max. Voltage for Logical 0		40 VAC	4 VDC	40 VAC	4 VDC	40 VAC	4 VDC
Response Time (ms)		10-40 ms	10-20 ms	10-40 ms	10-20 ms	10-40 ms	10-20 ms
Analog Input Range		—	0-255	—	0-255	—	0-255
Analog Resolution (mV)		—	10,000/256	—	10,000/256	—	10,000/256
Analog Conversion Speed (ms)		—	10	—	10	—	10
Analog Voltage Range		—	0-10	—	0-10	—	0-10
Analog Input Impedance (kOhm)		—	—	—	—	—	—
Analog Accuracy		—	±5 VDC	—	±5 VDC	—	±5 VDC
Analog Offset		—	-32768 to +32767	—	-32768 to +32767	—	-32768 to +32767
Analog Gain		—	0-255	—	0-255	—	0-255
Analog Temperature Drift		—	±3 LSB	—	±3 LSB	—	±3 LSB
Integrated Outputs		4	4	6	6	9	9
Output Type		Relay	Relay	Relay	Relay	Relay	Relay
Switching Voltage (max.)		250 VAC / 30 VDC	30 VDC	250 VAC / 30VDC	30 VDC	250 VAC / 30 VDC	30 VDC
Max. Output Current Per Output (A)		8	8	8	8	8	8
Max. Switching Load	Inductive Load	249 VA	249 VA	249 VA	249 VA	249 VA	249 VA
Response Time (ms)		≤10	≤10	≤10	≤10	≤10	≤10
Life of Relay Contacts (Number of Cycles)		100,000 @ 8A					
Weight (kg)		0.2	0.2	0.3	0.3	0.35	0.3
Required Manuals		JY992D97301 Hardware Manual; JY992D97101 Programming; JY992D97701 Communication Manual; Software Manual JY992D74001					

(*1) Sink/Source

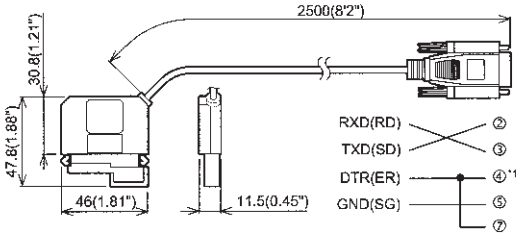
AL2-ASi-BD Connector Pin Assignment

Number	Name	Usage
1&3	ASi+	For ASi+ cable connection
2&4	ASi-	For ASi- cable connection

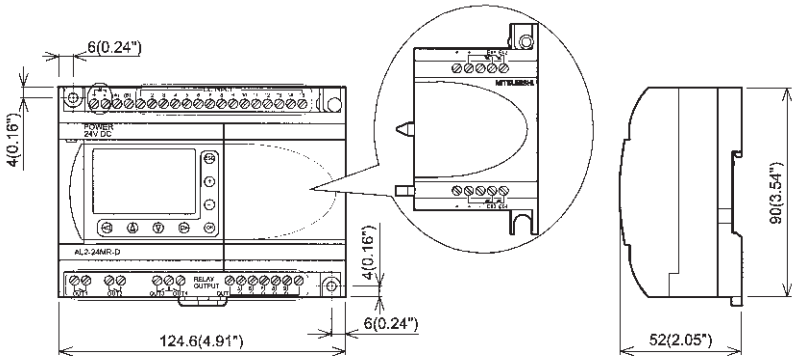
AL2-ASi-BD Layout



AL2-GSM-CAB

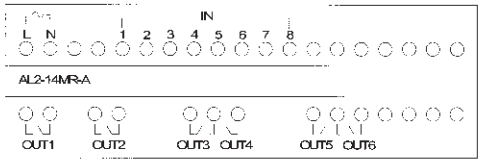


Alpha2 Dimensions

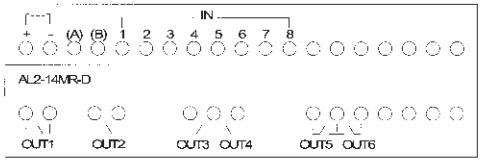


Alpha2 Base Unit Terminal Layouts

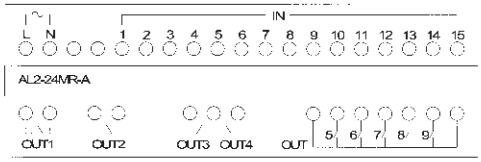
AL2-14MR-A, AC Input, Relay Output



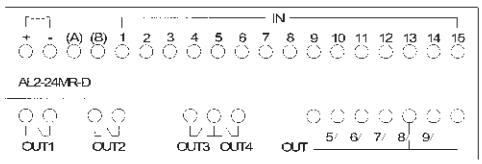
AL2-14MR-D, DC Input, Relay Output



AL2-24MR-A, AC Input, Relay Output

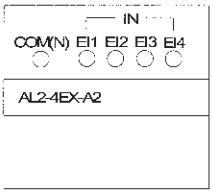


AL2-24MR-D, DC Input, Relay Output

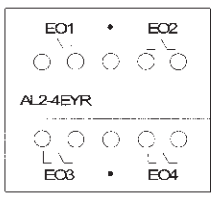


Alpha2 Extension Module Terminal Layouts

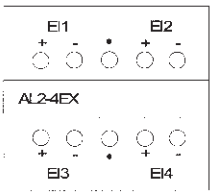
AL2-4EX-A2, 220 - 240V AC Input



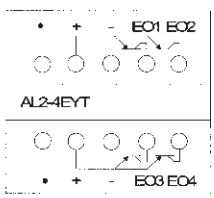
AL2-4EYR, Relay Output



AL2-4EX, DC Input



AL2-4EYT, Transistor Output



Alpha2 Expansion / Adapter Modules

AL2-4EX	4 digital inputs (24 VDC) with 2 selectable high-speed counter (1kHZ)
AL2-4EX-A2	4 digital inputs (240 VAC)
AL2-4EYR	4 relay outputs (2 A)
AL2-4EYT	4 transistor outputs (1 A)
AL2-2TC-ADP	2 Channel TC Input Adaptor Module
AL2-2PT-ADP	2 Channel PT Input Adaptor Module
AL2-2DA	2 Channel Digital to Analog Expansion Module

AL2-2PT-ADP

- 2 channel PT100 Analog Input Adaptor
- Compensated Range: -50°C ~ 200°C
- Analog voltage output: 0 ~ 10V
- Resolution: 0.5°C / digit
- Accuracy: ±1.5% for all temperature ranges, ± 1% for 25°C
- Conversion time: 20 ms per channel
- For use with DC base units only

AL2-2TC-ADP

- 2 channel K-Type Thermocouple Analog Input Adaptor
- Compensated Range: -50°C ~ 450°C
- Analog voltage output: 0 ~ 10V
- Resolution: 1.0°C / digit
- Accuracy: ±2.0% for all temperature ranges, ± 1.5% for 25°C
- Conversion time: 20 ms per channel
- For use with DC base units only

AL2-2DA

- 2 channel Analog Output Module
- Analog voltage output: 0 ~ 10V and current output 4 ~ 20 mA
- Resolution: 2.5V (Voltage output of 0 ~ 10V)
  8μA (current output of 4 ~ 20mA)
- Conversion time: 1-channel 10 ms, 2-channels 20 ms

Alpha2 version 2.00 or higher; VLS software version 2.30 or higher.

Alpha2 Removable Memory Cassettes

Specification	AL2-EEPROM2
Rating	—
Memory Type	EEPROM
Memory Size	5000 bytes
Number of Program Steps	200 function blocks
Non-Volatile Storage	Yes
Write Protection	Yes