

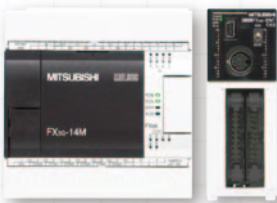
# All-inclusive FX3 series

Function and performance



## High-end Model FX3U FX3UC

Superior speed, power, and flexibility. Realize high speed control, network support, data logging, and more.



## Standard Model FX3G FX3GC

From automation to network, to more advanced control. Supports features required for basic control and a variety of applications.



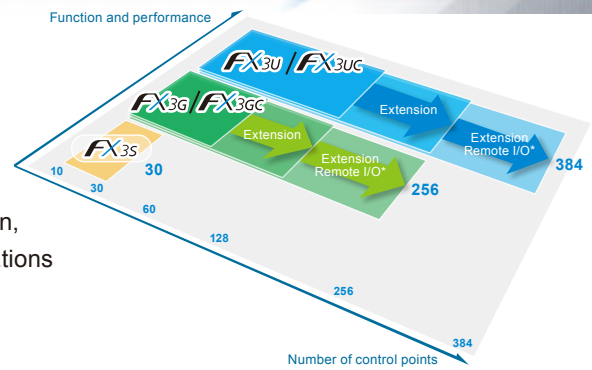
## Entry level Model FX3S NEW

Simple and cost effective. Basic model that supports analog and communication expansion. Perfect for simple automation tasks.

## FX3 series is the 3rd generation of micro programmable controllers.

High speed, large capacity, and enhanced performance and functions are assured.

Equipped with excellent expandability for analog, communication, Ethernet, and positioning functions, a whole world of FX applications awaits.



### FX3 series feature comparison

	FX3S NEW	FX3G	FX3U
<b>Hardware</b>			
Main unit I/O Control size	10/14/20/30 points Max. 30 points	14/24/40/60 points Max. 128 points (Max. 256 with remote I/O*)	16/32/48/64/80/128 points Max. 256 points (Max. 384 with remote I/O*)
Power supply	AC	AC, DC	AC, DC
24 V DC input	Sink/Source	Sink/Source	Sink/Source
Output	Relay Type Transistor Type	Relay Type Transistor Type	Relay Type Transistor Type
Internal memory	16,000 steps EEPROM (program capacity is limited to 4,000 steps.)	32,000 steps EEPROM	64,000 steps RAM (Battery backed)
Communication port	USB/RS-422	USB/RS-422	RS-422 (USB option)
High-speed counter	1-phase 60 kHz : 2 points 10 kHz : 4 points	1-phase 60 kHz : 4 points 10 kHz : 2 points	1-phase 100 kHz : 6 points 10 kHz : 2 points
Positioning control (transistor output type)	2 axes 100 kHz	14/24 Point type : 2 axes 40/60 Point type : 3 axes 100 kHz	3 axes 100 kHz
Variable analog potentiometer	2 points	2 points	—

\*: Remote I/O is CC-Link I/O.

## PROGRAMMABLE CONTROLLERS

Item	Specification			
	FX3S-10M-E	FX3S-14M-E	FX3S-20M-E	FX3S-30M-E
Supply voltage	100 to 240 V AC	100 to 240 V AC	100 to 240 V AC	100 to 240 V AC
Allowable supply voltage range	85 to 264 V AC	85 to 264 V AC	85 to 264 V AC	85 to 264 V AC
Rated frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Allowable instantaneous power failure time	Operation can be continued upon occurrence of instantaneous power failure for 10 ms or less.			
Power fuse	250 V 1 A	250 V 1 A	250 V 1 A	250 V 1 A
Rush current	15 A max. 5 ms or less/100 V AC, 28 A max. 5 ms or less/200 V AC	15 A max. 5 ms or less/100 V AC, 28 A max. 5 ms or less/200 V AC	15 A max. 5 ms or less/100 V AC, 28 A max. 5 ms or less/200 V AC	15 A max. 5 ms or less/100 V AC, 28 A max. 5 ms or less/200 V AC
Power consumption*1	19 W	19 W	20 W	21 W
24 V DC service power supply	400 mA	400 mA	400 mA	400 mA

\*1: This item shows values when all 24 V DC service power supplies are used in the maximum configuration connectable to the main unit, and includes the input current (5 or 7 mA per point).

Item	Specification			
	FX3S-10M	FX3S-14M	FX3S-20M	FX3S-30M
Number of input points	6 points	8 points	12 points	16 points
Input connecting type	Fixed terminal block (M3 screw)			
Input form	Sink/Source			
Input signal voltage	24 V DC +10%, -10%	24 V DC +10%, -10%	24 V DC +10%, -10%	24 V DC +10%, -10%
Input impedance	X000 to X007 3.3 kΩ	X000 to X007 3.3 kΩ	X000 to X007 3.3 kΩ	X000 to X007 3.3 kΩ
Input signal current	X000 to X007 7 mA/24 V DC	X000 to X007 7 mA/24 V DC	X000 to X007 7 mA/24 V DC	X000 to X007 7 mA/24 V DC
ON input sensitivity	X000 to X007 4.5 mA or more	X000 to X007 4.5 mA or more	X000 to X007 4.5 mA or more	X000 to X007 4.5 mA or more
OFF input sensitivity	X000 to X007 1.5 mA or less	X000 to X007 1.5 mA or less	X000 to X007 1.5 mA or less	X000 to X007 1.5 mA or less
Input response time	Approx. 10 ms			
Input signal sink input form	No-voltage contact input NPN open collector transistor			
Input signal source input form	No-voltage contact input PNP open collector transistor			
Input circuit insulation	Photocoupler insulation			
Input operation display	LED on panel lights when photocoupler is driven.			

### Relay output specifications (Please see the manual for output circuit configuration.)

Item	Relay output specification			
	FX3S-10M/ES	FX3S-14M/ES	FX3S-20M/ES	FX3S-30M/ES
Number of output points	4 points	6 points	8 points	14 points
Output connecting type	Fixed terminal block (M3 screw)			
Output form	Relay			
External power supply	30 V DC or less, 240 V AC or less (250 V AC or less when the unit does not comply with CE, UL or cUL standards.)			
Max. load	2 A point The total load current of resistance loads per common terminal should be the following value. - 1 output point/common terminal: 2 A or less - 4 output points/common terminal: 8 A or less 80 VA (UL and cUL standards approved at 120 and 240 V AC)			
Min. load	5 V DC, 2 mA (reference value)			
Open circuit leakage current	2 A point Approx. 10 ms			
Response OFF→ON time	ON→OFF			
Output circuit insulation	Mechanical insulation			
Output operation display	LED on panel lights when power is applied to relay coil.			

### Transistor output specifications (Please see the manual for output circuit configuration.)

Item	Transistor output specification			
	FX3S-10M/ES	FX3S-14M/ES	FX3S-20M/ES	FX3S-30M/ES
Number of output points	4 points	6 points	8 points	14 points
Output connecting type	Fixed terminal block (M3 screw)			
Output form	Transistor/sink output (FX3S-MT/ES) Transistor/source output (FX3S-MT/ESS)			
External power supply	5 to 30 V DC			
Max. load	0.5 A point The total load current of resistance loads per common terminal should be the following value. - 1 output point/common terminal: 0.5 A or less - 4 output points/common terminal: 0.8 A or less 12 W/24 V DC The total inductive loads per common terminal should be the following value. - 1 output point/common terminal: 12 W or less/24 V DC - 4 output points/common terminal: 19.2 W or less/24 V DC			
Open circuit leakage current	0.1 mA or less/30 V DC			
ON voltage	1.5 V or less			
Response OFF→ON time	Y000, Y001: 5 μs or less/10 mA or more (5 to 24 V DC) Y002 to Y015: 0.2 ms or less/200 mA or more (24 V DC)			
Output circuit insulation	Photocoupler insulation			
Output operation display	LED on panel lights when photocoupler is driven.			

### Performance specifications (General specification is the same as that of FX3U series. Please see the "MELSEC FX-FAMILY" catalog.)

Item	Specification	
	FX3S	FX3U
Operation control system	Stored program repetitive operation system with interruption function.	Batch processing system (when END instruction is executed) Input/output refresh instruction and pulse catch function are provided.
Programming language	Relay symbol system + step-ladder system (SFC notation possible)	Relay symbol system + step-ladder system (SFC notation possible)
Program memory	Built-in memory capacity: 16,000 steps/EEPROM memory (Program capacity is 4,000 steps) Memory cassette (Option): 32,000 steps/EEPROM memory (with loader function) The FX3S series PLC is available only to 16,000 steps. (Program capacity is 4,000 steps.) Max. allowable write: 10,000 times	Built-in memory capacity: 64,000 steps/EEPROM memory (Program capacity is 16,000 steps) Max. allowable write: 10,000 times
Writing function during power failure	Provided (Program can be modified while the PLC is running).	Provided (Program can be modified while the PLC is running).
Keyword function	With keyword/Custom keyword function	With keyword/Custom keyword function
Real-time clock	Clock function*2: Built-in 1800 to 2079 (with correction for leap year) 2- or 4-digit year, accuracy within 45 seconds/month at 25 °C	Clock function*2: Built-in 1800 to 2079 (with correction for leap year) 2- or 4-digit year, accuracy within 45 seconds/month at 25 °C
Basic instructions	Sequence instructions: 29 Step-ladder instructions: 2	Sequence instructions: 29 Step-ladder instructions: 2
Applied instructions	116 kinds	116 kinds
Processing speed	0.21 μs/instruction	0.21 μs/instruction
Input points	16 points or less (Extension is impossible.)	16 points or less (Extension is impossible.)
Output points	14 points or less (Extension is impossible.)	14 points or less (Extension is impossible.)
Input relay	X000 to X017 The device numbers are octal.	X000 to X017 The device numbers are octal.
Output relay	Y000 to Y015	Y000 to Y015
Auxiliary relay	For general: M0 to M383 EEPROM keep: M384 to M511 For special: M512 to M535 For general: M8000 to M8511	For general: M0 to M383 EEPROM keep: M384 to M511 For special: M512 to M535 For general: M8000 to M8511
State	For initial state (EEPROM keep): S0 to S9 EEPROM keep: S10 to S127 For general: S128 to S255	For initial state (EEPROM keep): S0 to S9 EEPROM keep: S10 to S127 For general: S128 to S255
Timer (on-delay timer)	T0 to T31 100 ms/10 ms	T0 to T31 100 ms/10 ms
Counter	C0 to C15 16 bits up (For general) C16 to C31 16 bits up (EEPROM keep) C32 to C234 32 bits up/down (For general)	C0 to C15 16 bits up (For general) C16 to C31 16 bits up (EEPROM keep) C32 to C234 32 bits up/down (For general)
High-speed counter	1-phase 1-count input in both directions (32 bits up/down) (EEPROM keep) C246 to C250 2-phase 2-count input in both directions (32 bits up/down) (EEPROM keep) C251 to C255	1-phase 1-count input in both directions (32 bits up/down) (EEPROM keep) C235 to C245 Counting from -2,147,483,648 to +2,147,483,647 C246 to C250 2-phase 2-count input in both directions (32 bits up/down) (EEPROM keep) C251 to C255
Data register (32 bits when paired)	For general (16 bits): D0 to D127 For EEPROM keep (16 bits): D128 to D255	For general (16 bits): D0 to D127 For EEPROM keep (16 bits): D128 to D255
Pointer	For branching of JUMP and CALL: P0 to P255 Input interruption: IR0 to IR15 Timer interruption: TR0 to TR15 File register: R0 to R999	For branching of JUMP and CALL: P0 to P255 Input interruption: IR0 to IR15 Timer interruption: TR0 to TR15 File register: R0 to R999
Needle	For master control: N0 to N7 Decimal number (K): 16 bits Hexadecimal number (H): 32 bits Real number (E): 32 bits	For master control: N0 to N7 Decimal number (K): 16 bits Hexadecimal number (H): 32 bits Real number (E): 32 bits
Software/peripheral equipment	GX Works2 FX-3GP	Version 1.492N or later*3 Version 1.50 or later

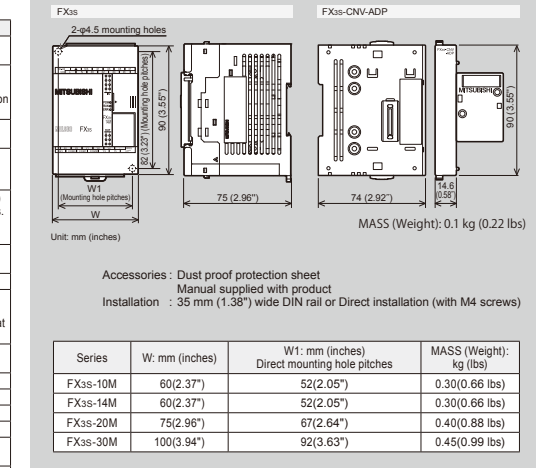
\*2: The current time of the clock is backed up by the capacitor built-in the PLC. Supply the power to the PLC for 30 minutes or more to completely charge this large-capacity capacitor.  
\*3: The capacitor works for 10 days (atmosphere: 25 °C)  
\*4: To program FX3S in GX Developer, select FX3S as the PLC type. Please read the FX3S series user's manual about limitations.

**▲ Safety Warning**  
To ensure proper use of the products in this document, please be sure to read the instruction manual prior to use.

**Registration**  
• Ethernet is a trademark of Xerox Corporation in the United States.  
• MODBUS is a registered trademark of Schneider Electric SA.  
• All other company names and product names used in this document are trademarks or registered trademarks of their respective companies.

**MITSUBISHI ELECTRIC CORPORATION**  
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### External Dimensions



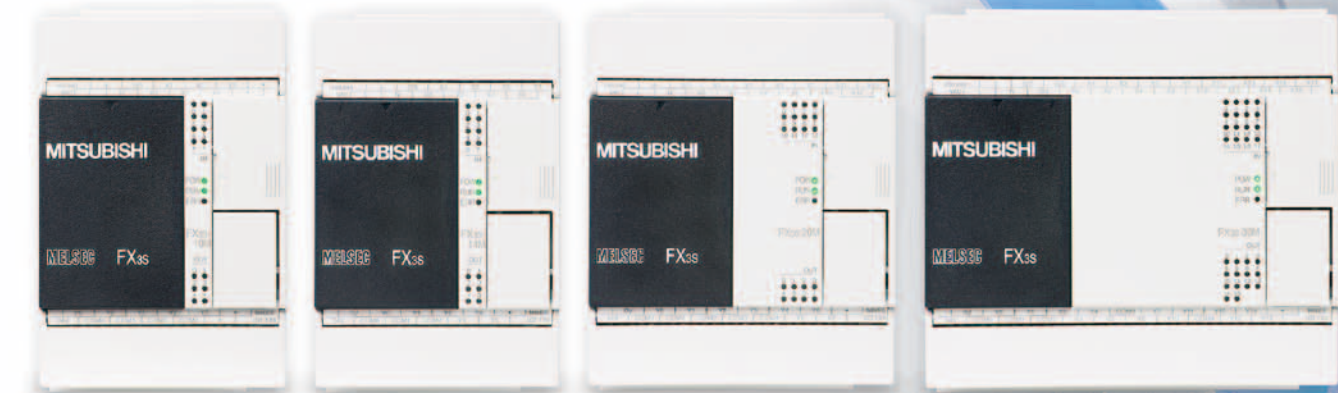
### Product specification

Series	Model name	Power Supply	Input Specifications		Output Specifications	
			Number of points	Input type	Number of points	Output type
Main Units	FX3S-10MR/ES	100 to 240 V AC	6	24 V DC (Sink/Source)	4	Relay
	FX3S-10MT/ES	100 to 240 V AC	6	24 V DC (Sink/Source)	4	Transistor (Sink)
	FX3S-10MT/ESS	100 to 240 V AC	6	24 V DC (Sink/Source)	4	Transistor (Source)
	FX3S-14MR/ES	100 to 240 V AC	8	24 V DC (Sink/Source)	6	Relay
	FX3S-14MT/ES	100 to 240 V AC	8	24 V DC (Sink/Source)	6	Transistor (Sink)
	FX3S-14MT/ESS	100 to 240 V AC	8	24 V DC (Sink/Source)	6	Transistor (Source)
	FX3S-20MR/ES	100 to 240 V AC	12	24 V DC (Sink/Source)	8	Relay
	FX3S-20MT/ES	100 to 240 V AC	12	24 V DC (Sink/Source)	8	Transistor (Sink)
	FX3S-20MT/ESS	100 to 240 V AC	12	24 V DC (Sink/Source)	8	Transistor (Source)
	FX3S-30MR/ES	100 to 240 V AC	16	24 V DC (Sink/Source)	14	Relay
FX3S-30MT/ES	100 to 240 V AC	16	24 V DC (Sink/Source)	14	Transistor (Sink)	
FX3S-30MT/ESS	100 to 240 V AC	16	24 V DC (Sink/Source)	14	Transistor (Source)	
Connector conversion adapter	FX3S-CNV-ADP	Special adapter connection conversion adapter				
Special adapters	FX3U-232ADP-MB	For RS-232C(MODBUS)communication				
	FX3U-485ADP-MB	For RS-485(MODBUS)communication				
	FX3S-ENET-ADP1	For Ethernet communication				
	FX3U-4AD-ADP	4-ch voltage/current input				
	FX3U-4DA-ADP	4-ch voltage/current output				
	FX3U-3A-ADP	2-ch voltage/current input 1-ch voltage/current output				
	FX3U-4AD-PT-ADP	4-ch platinum resistance thermometer sensor input (-50 to +250 °C)				
	FX3U-4AD-PTW-ADP	4-ch platinum resistance thermometer sensor input (-100 to +600 °C)				
	FX3U-4AD-PNK-ADP	1-ch Pt1000/P1000 resistance thermometer sensor input				
	FX3U-4AD-TC-ADP	4-ch thermocouple (K, J type) temperature sensor input				
Expansion boards	FX3G-232-BD	For RS-232C communication				
	FX3G-422-BD	For RS-422 communication				
	FX3G-485-BD	For RS-485 communication				
	FX3G-8AV-BD	For 8-ch Analog volume				
	FX3G-2AD-BD	2-ch voltage/current input				
	FX3G-1DA-BD	1-ch voltage/current output				
	Memory cassette	FX3G-EEPROM-32L	32,000 steps EEPROM memory (with transfer switch)*5			

\*4: FX3U-ENET-ADP Ver. 1.20 or later is applicable to the FX3S series PLC.  
\*5: FX3S series PLC can hold 16,000 steps of memory, but user program capacity is limited to 4,000 steps.

**MITSUBISHI ELECTRIC**  
Changes for the Better  
PROGRAMMABLE CONTROLLERS  
MELSEC-F

for a greener tomorrow



## New possibilities

- Introducing an entry level model for the FX3 series -



**Empowering Industries**



# FX3S

**NEW**

The newly released FX3s adds extra expandability to the high cost performance of the venerable entry-level FX1s.

FX3s makes it possible to utilize analog, Ethernet and MODBUS® functions even in small-scale systems.

## New possibilities

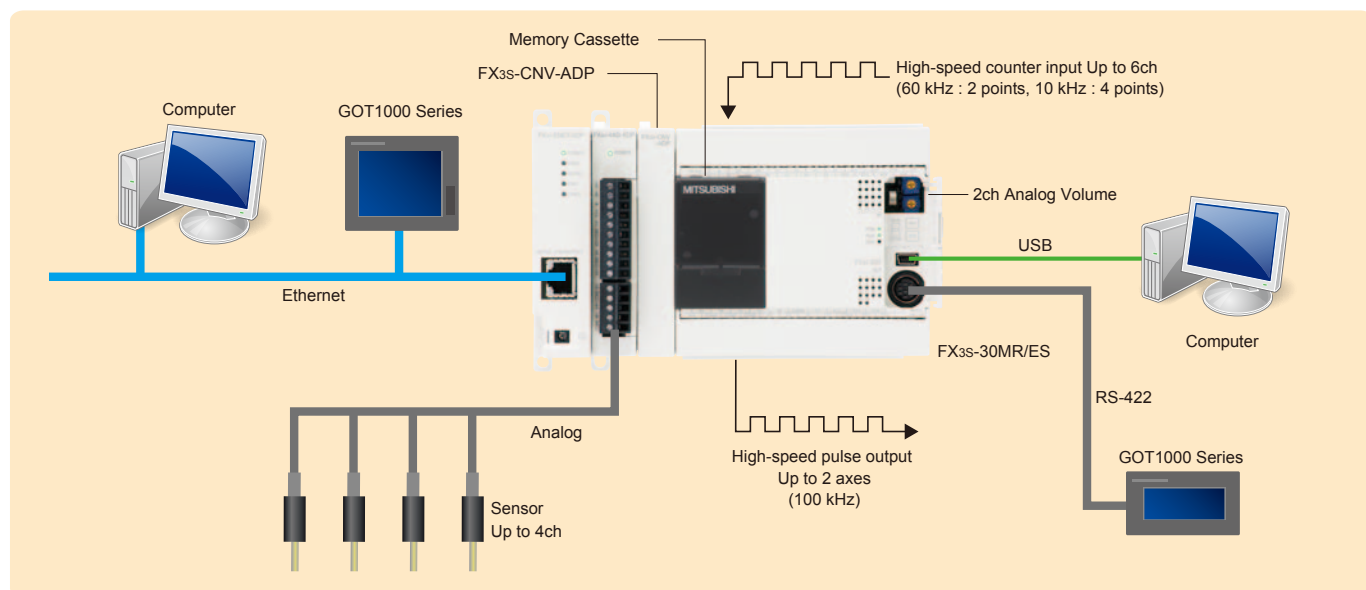
### Main unit lineup



FX3s-10MR/ES	AC D R	FX3s-20MR/ES	AC D R	FX3s-30MR/ES	AC D R
FX3s-10MT/ES	AC D T1	FX3s-20MT/ES	AC D T1	FX3s-30MT/ES	AC D T1
FX3s-10MT/ESS	AC D T2	FX3s-20MT/ESS	AC D T2	FX3s-30MT/ESS	AC D T2
6 inputs 4 outputs		12 inputs 8 outputs		16 inputs 14 outputs	
FX3s-14MR/ES	AC D R				
FX3s-14MT/ES	AC D T1				
FX3s-14MT/ESS	AC D T2				
8 inputs 6 outputs					

AC AC power supply    D DC input (sink/source)  
R Relay output    T1 Transistor output (sink)    T2 Transistor output (source)

### System configuration example

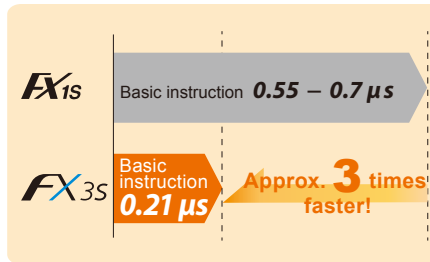


## Excellent cost performance!

Equipped with the performance of FX3 series while maintaining backwards compatibility with FX1s.

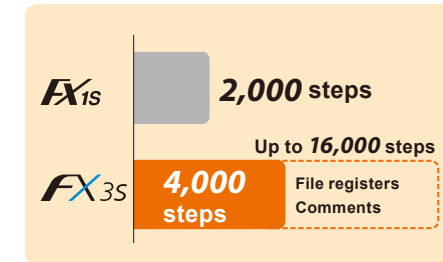
### • High-speed operation

- FX3s processes basic instructions in 0.21 μs, which is faster by approximately 3 times compared with FX1s.



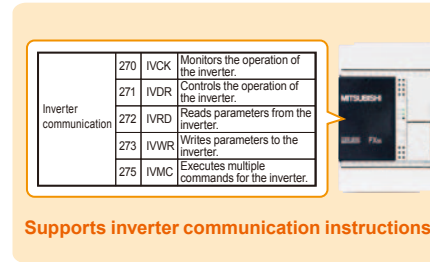
### • Increased program capacity

- Up to 4,000 steps program capacity.  
- 2,000 steps file register capacity.  
- Up to 12,000 steps for comments.  
In total, the built-in EEPROM of the FX3s can store up to 16,000 steps.



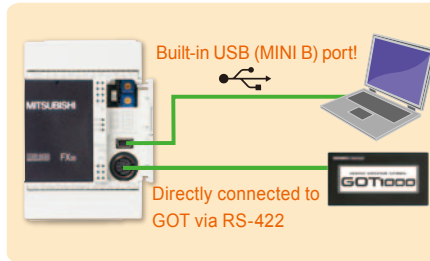
### • More instructions

- Supports inverter communication instructions.  
- Supports floating point instructions.  
- Supports 116 applied instructions (31 more instructions than FX1s).



### • Enhanced communication functions

- Built-in USB (MINI B) port and RS-422 port.  
- 115.2 kbps serial communication.  
USB port supports 12 Mbps communication speed.



### • Enhanced analog expandability

- Analog expansion board can be connected.  
- Special analog adapter can be connected.  
- Analog input adapter for temperature sensor can be connected.



### • Compatibility with global standards

- Conforms to the EC Directive and UL Standard.  
- Conforms to the Radio Law in South Korea.  
- Select between sink and source inputs.

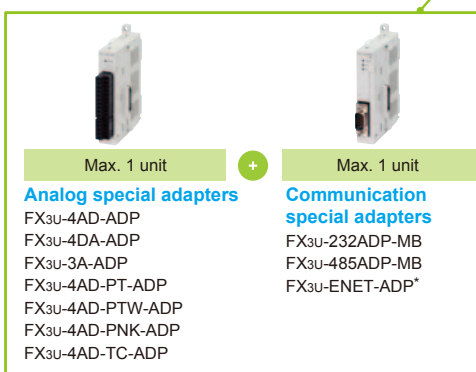
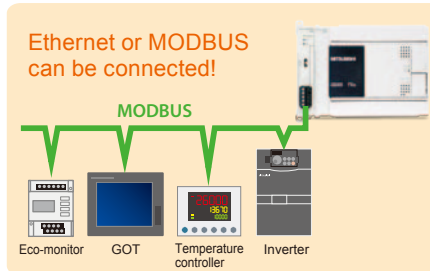


## Unprecedented expandability with optional products!

Analog, Ethernet and MODBUS products can be connected.

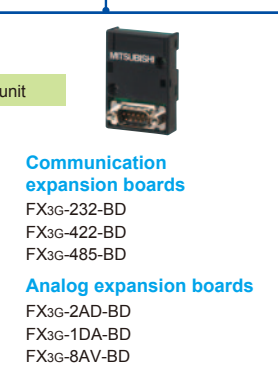
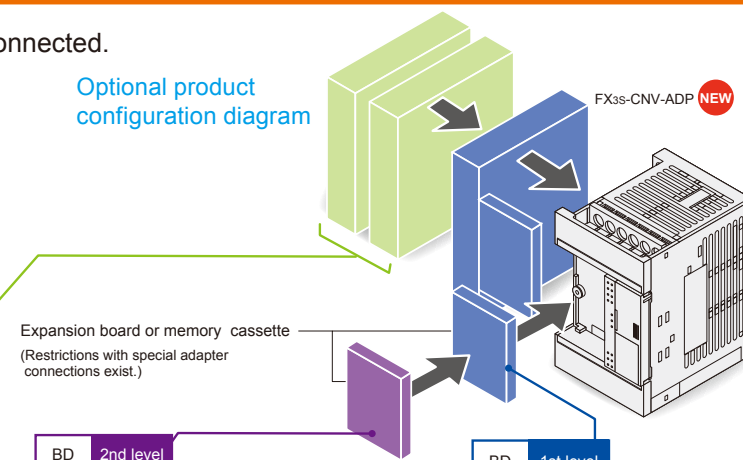
### • Enhanced expandability

- Special adapter for Ethernet can be connected.  
- Special adapter for serial communication (compatible with MODBUS) can be connected.



Up to two special adapters (up to one analog adapter and up to one communication adapter) can be connected. (Restrictions with expansion board connections exist.)  
\* : When using FX3u-ENET-ADP, connect it at the last stage (left end) of adapters.

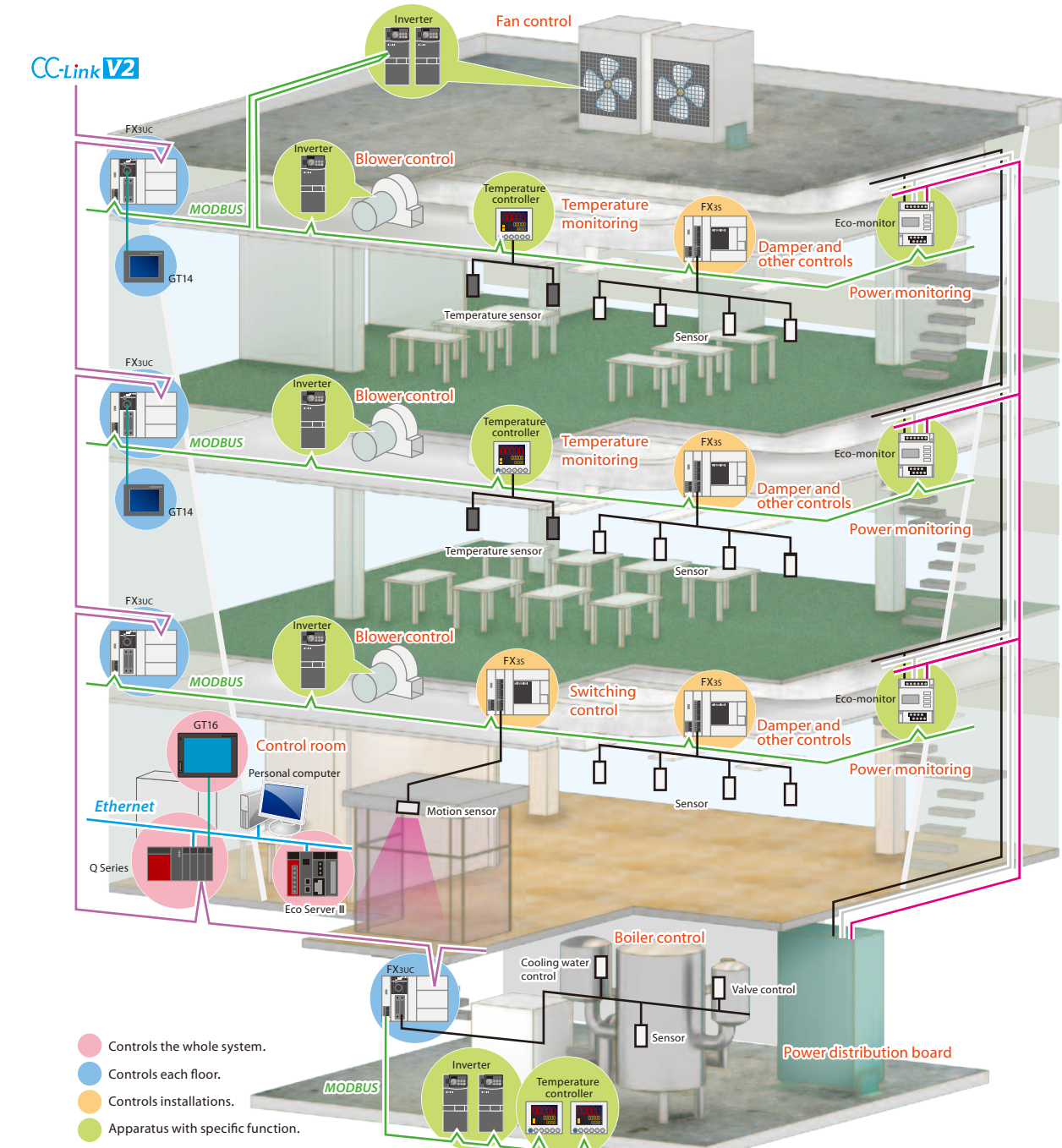
### Optional product configuration diagram



## New possibilities using FX3s

Achieve extensive cost reductions by flexibly combining FX3s with other PLCs.

For example, by properly distributing PLCs in a network in accordance with the desired application, you can reduce loads on each CPU and costs of the entire system. In addition, you can construct an energy-saving system by combining with power monitoring functions.



## Straightforward programming with GX Works2

Powerful, intuitive, and efficient. GX Works2 reduces program development time with an easy-to-use interface.

Use GX Works2 also for setting up Ethernet.

FX3U-ENET-ADP



PLC engineering software

# GX Works2