MITSUBISHI ELECTRIC
FACTORY AUTOMATION

FX3U

MELSEC PLC

A new PLC concept with
more power and performance

IMPROVED PERFORMANCE | Increased I/O capacity for advanced network/system control

SPEED UP | Up to 4.5 times faster for quicker program response

MORE FLEXIBILITY | 5 times more data storage to make program construction easier

SIMPLER OPERATION | 8 times more memory for larger and more complex programs

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems)

FX3U - A new PLC concept

The new FX3U CPU brings a combination of greater flexibility and increased performance to the FX Family.

Introduction ///

New high speed bus

The FX3U design has increased the opportunity to configure the PLC directly for your needs. Following the standard FX Family configuration, the FX3U CPU can be expanded to the right hand side using a wide range of options. The FX3U has an enhanced communications bus that automatically switches into high speed mode for communication with new FX3U expansion modules. Full compatibility is still available with FX2N and FX0N expansion blocks, and when these are configured the FX3U automatically reduces the bus speed to suit.

Adapters add flexibility

A major design enhancement of FX3U is the new adapter expansion bus on the left hand side of the FX3U CPU. Through this bus users can add additional analog and temperature units as well as multiple communications and positioning blocks.

However, the major benefit for the user is that the analog and positioning adapter units no longer require the use of the traditional To/From instructions to configure and operate.

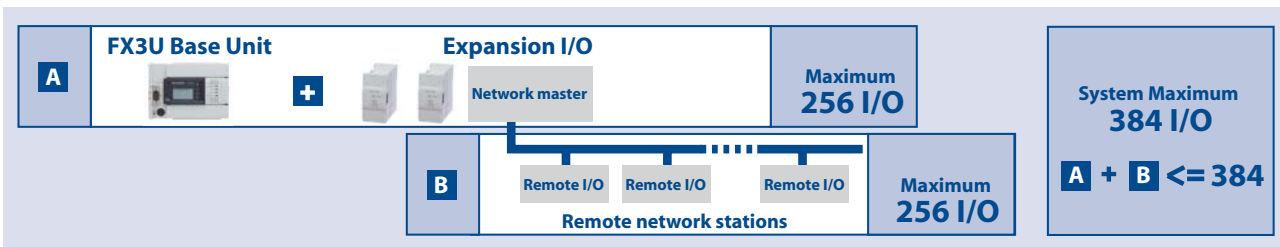The FX3U can use new FX3U blocks as well as standard FX2N and FX0N expansion blocks.

All control is through direct access data registers and setting bits. This means quicker set-up, easier use, and above all much higher processing speeds.

FX3U has a unique new system of directly programmable adapters.

What's new ///

FX3U provides additional I/O and networking capacity.

Increased I/O capacity

With enhanced networking functions, the FX3U requires an increased input/output (I/O) range. FX3U can support systems with combined local I/O and networked I/O up to a total of 384 I/O points. For users, this means increased system control and added possibilities for advanced networks.

In addition FX3U also fully supports Profibus/DP as well as Ethernet using TCP and UDP protocols.

Up to 4.5 times faster

This means the PC MIX value has been greatly improved with basic instructions now being processed in 0.065μsec.

For users this means quicker program response and more accurate process performance as inputs, outputs and actions are processed and monitored more times per second.

8 times more memory

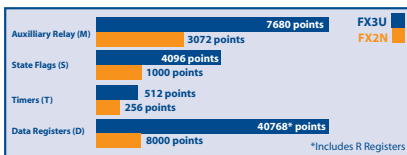FX3U comes with a standard internal memory of 64k steps, which is 8 times more memory than FX2N.

More memory means users can write larger and more complex programs, store more data in file registers, or take greater advantage of using IEC 61131-3 style programming tools.

	FX3U	FX2N
Basic instruction	0.065μs	0.08μs
Applied instruction (M0V)	0.642μs	1.52μs

FX3U provides increased performance in all areas.

5 times more data storage

With a larger program memory comes the need for more operational devices such as timers, state flags, auxiliary relays and data registers. The FX3U has increased capacity in all of these major areas making program construction easier. Data register capacity has increased by a factor of 5 reflecting the needs of users who have an increased requirement to log operation information against products or batches of products being manufactured.

	FX3U	FX2N
Auxilliary Relay (M)	7680 points	3072 points
State Flags (S)	4096 points	1000 points
Timers (T)	512 points	256 points
Data Registers (D)	40768* points	8000 points

*Includes R Registers

FX3U provides increased performance in all areas.

75 new instructions

The FX3U has 75 new instructions in comparison with FX2N. This now makes available 209 instructions for program creation. All of the instructions follow the traditional FX Applied instruction concept designed to make the task of application building and program writing easier and quicker, with less chance for errors.

New instructions include greater control over data processing with a range of new comparison and string manipulation commands.

Simple high speed positioning

The FX3U has been designed with six high speed counters that can each count up to 100kHz simultaneously per channel. This, combined with three 100kHz pulse train outputs, means users can directly configure simple 3-axis positioning systems without the use of additional modules.

However, the new High Speed Counter ADP and Pulse train ADPs can provide the FX3U with maximum positioning performance. Each unit can process signal speeds of up to 200kHz.

FX3U at a glance

I/O range
16 – 384 (Discrete I/O, maximum 256)
Program memory
64k steps (standard)
Basic instruction processing
0.065μsec/logical instruction
Analog signal processing
Up to 80 analog inputs,
48 analog outputs
Analog resolution
8, 12 and 16 bits
Analog options
14 analog input, output and temperature blocks available
for selection
Positioning
Internal:
6 high speed counters (100kHz)
2 high speed counters (10kHz)
3 pulse train outputs (100kHz),
transistor unit only
External:
High speed counter ADP module
(200kHz)
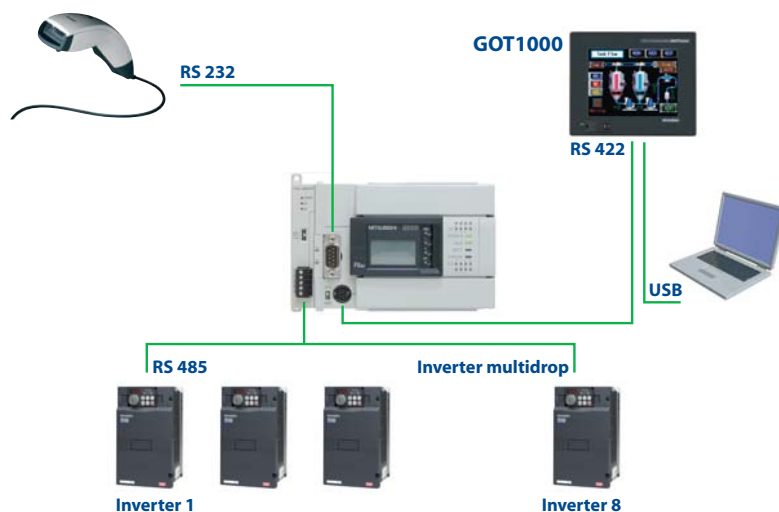Pulse train ADP (200kHz)
Pulse train output block (1MHz)

Improved communications ///

A great communicator

FX3U has strengthened the communications capability of the FX Family even further.

The new adapters allow up to three RS communication channels to be operated simultaneously allowing multiple HMIs to be connected to a single FX3U CPU or combinations of HMIs, third party devices and programming tools – the choice is yours.

The FX3U also supports a wide range of network options including AS-interface, Profibus/DP, CC-Link, DeviceNet, CANopen as well as Ethernet.

RS 232
GOT1000
RS 422
USB
RS 485
Inverter multidrop
Inverter 1
Inverter 8

FX3U has a range of flexible communication options.

Specifications ///

Specifications	FX3U
I/O points (addresses)	Max. total 384 (with remote I/O) Address range Max. 256 direct addressing and max. 256 network I/O
Program memory	64,000 steps RAM (internal), exchangeable FL-ROM for easy program exchange
Cycle period	0.065 µs /basic instruction
Number of instructions	27 sequence instructions, 2 step ladder instructions, 209 applied instructions
Programming language	Step ladder, instruction list, SFC and IEC61131-3 languages using GX IEC Developer
Program execution	Cyclical execution, refreshmode processing
Internal relays	7680
Special relays	512
State relays	4096
Timer	512
Counter	235
High-speed counter	8 points 1 phase (6 points max. 100kHz, 2 points max. 10 kHz); 2 points 2 phase max. 50kHz
Real-time clock	Year, month, day, hour, minute, second, weekday
Data register	8000
File register	32768
Index register	16
Special register	512
Pointer	4096
Nestings	8
Interrupt inputs	6
Communication options	Ethernet (TCP/UDP), Profibus-DP, CC-Link, DeviceNet, CANopen, AS-interface, RS 485, RS 232, USB