for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

MELSEC iQ-F Series
iQ Platform-compatible PLC

FX5-16ET/E□-H Application Leaflet

01
Affordable and compact!

02
High speed pulse input max. 16 ch!

03
Positioning control max. 12 axes!

High-speed pulse I/O module is a hit!!

See the key points of the high-speed pulse I/O module!

Key point!

01 Affordable and compact.

High-speed pulse I/O module that easily expands the built-in high speed I/O functions of the CPU module is released!
Programming can be done efficiently by reusing the CPU module program.
Affordable and efficient multi-axis control can be realized for a wide variety of production sites.

High speed counter function
2 ch
200 kHz

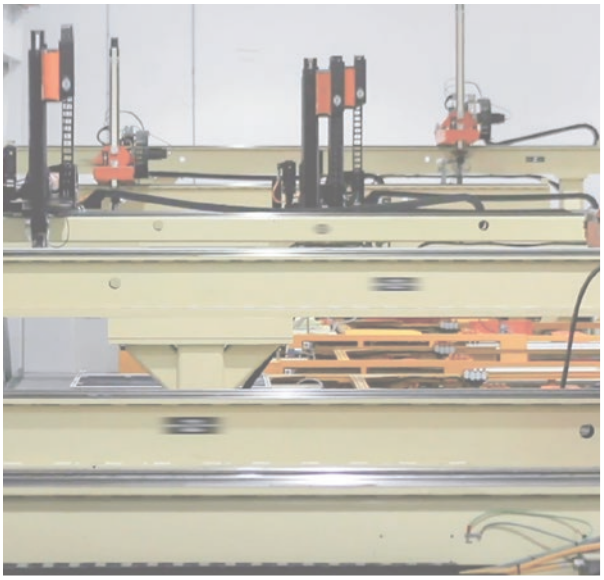
Positioning function
2 axes
200 kpps

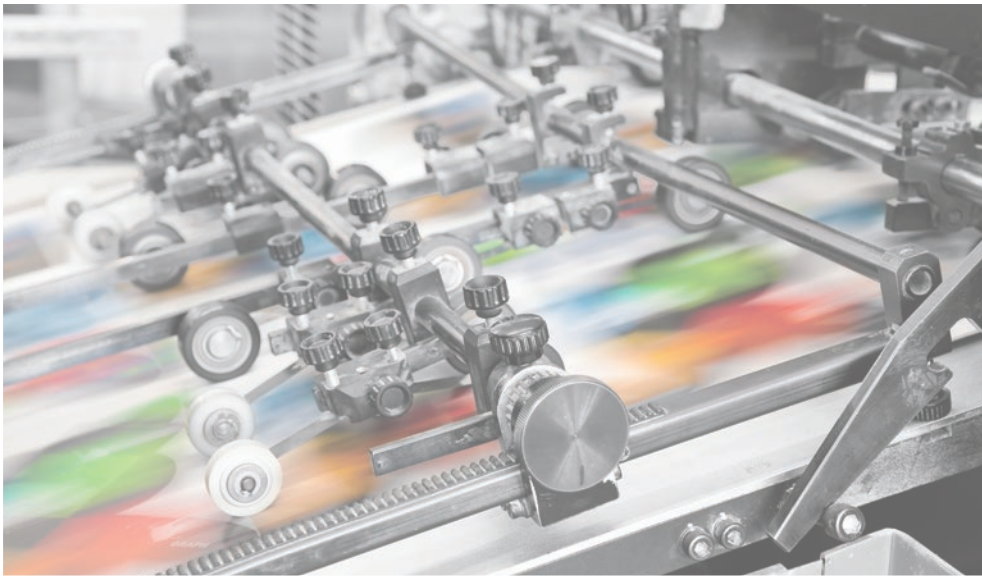
Maximum 4 modules connectable

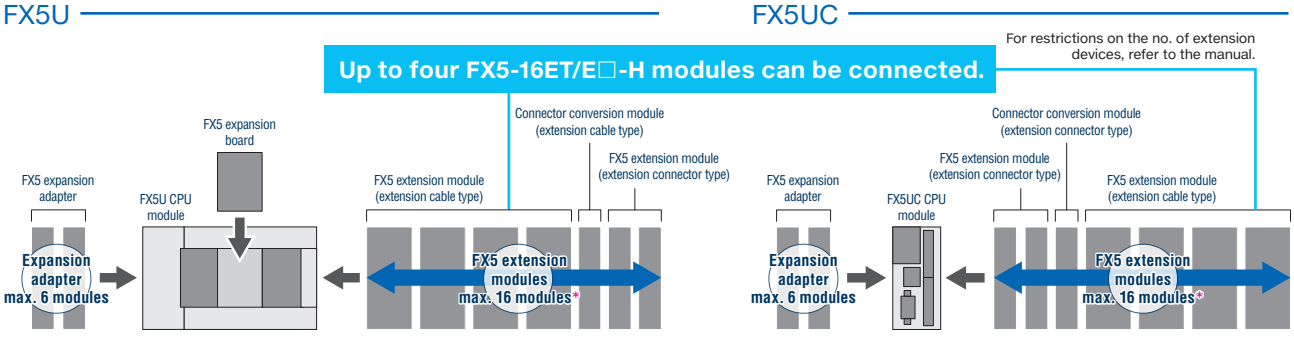
High-speed pulse I/O module

FX5-16ET/ES-H
FX5-16ET/ESS-H

High-speed pulse I/O module that expands the built-in high speed I/O functions of the CPU module.







*: Up to 12 modules can be directly connected to the CPU module. By adding powered I/O module or extension power supply module, up to 16 modules can be connected. However, extension power supply modules and connector conversion modules are not included.

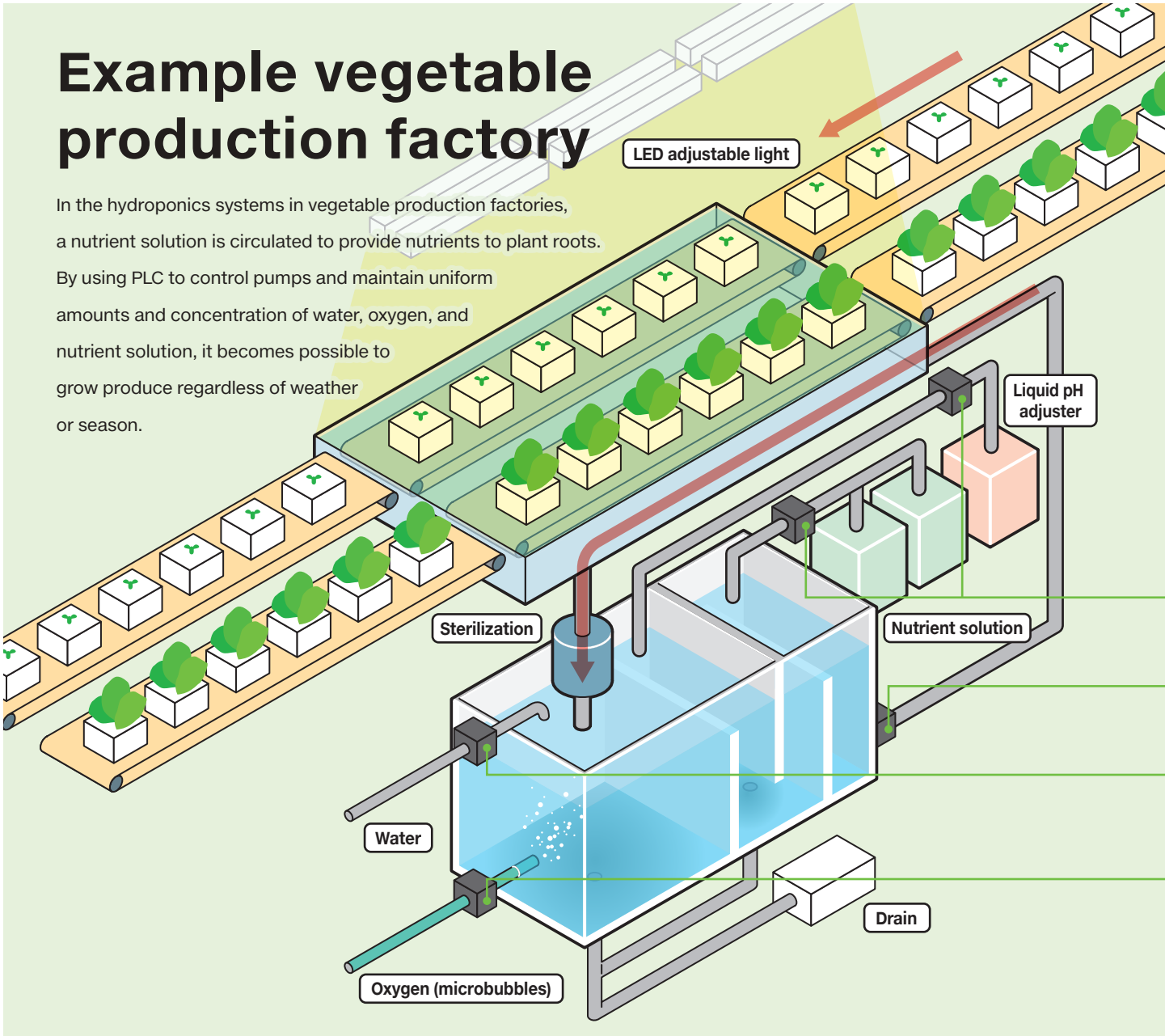
Key point!

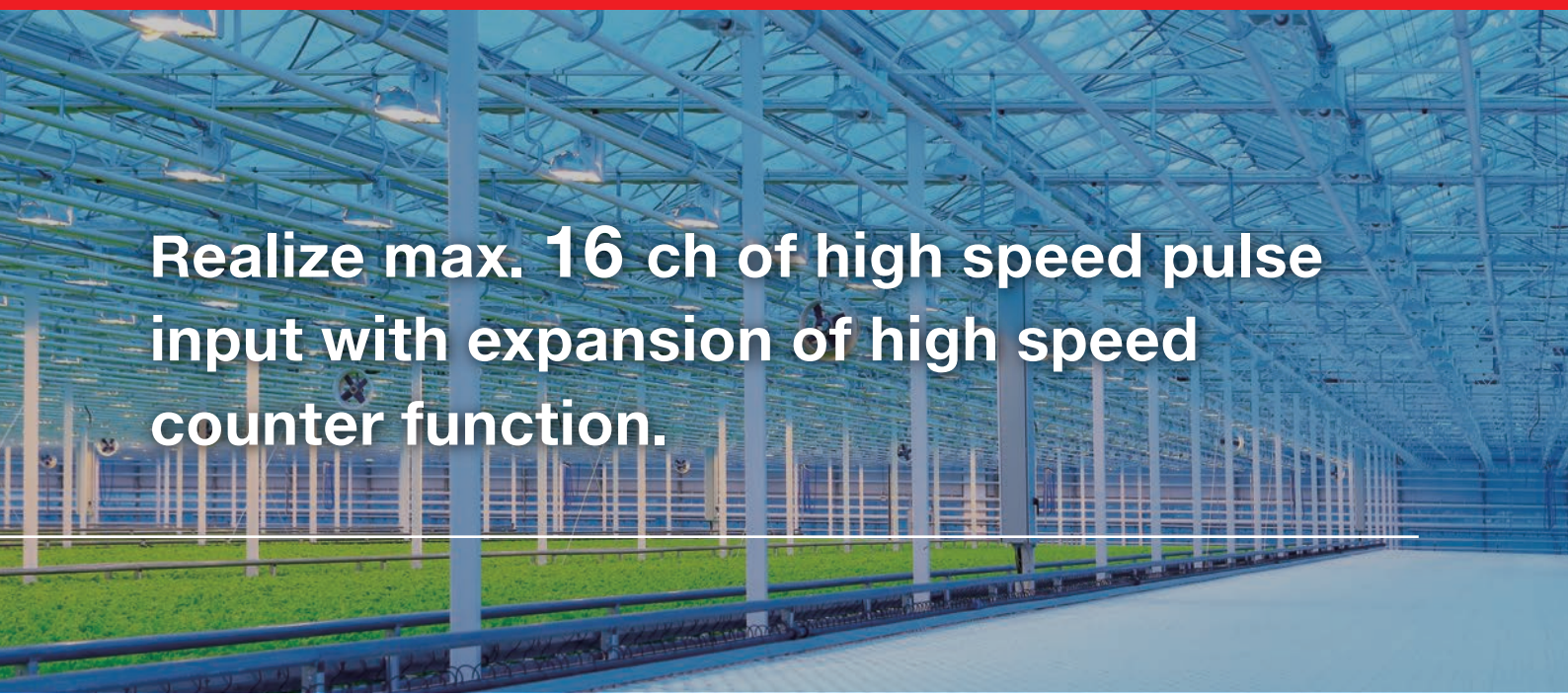
02

Vegetable production factory

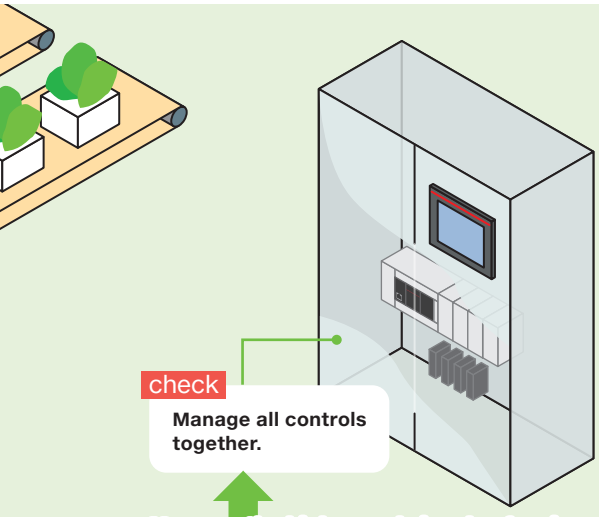
Example vegetable production factory

In the hydroponics systems in vegetable production factories, a nutrient solution is circulated to provide nutrients to plant roots. By using PLC to control pumps and maintain uniform amounts and concentration of water, oxygen, and nutrient solution, it becomes possible to grow produce regardless of weather or season.





Realize max. 16 ch of high speed pulse input with expansion of high speed counter function.



check
Manage all controls together.

Measure the high speed signals of various flow meters with CPU module and high-speed pulse I/O module, and adjust flow rate.

check
Periodic injection of nutrient solution and liquid pH adjuster is also possible.

check
Pump control for water circulation.

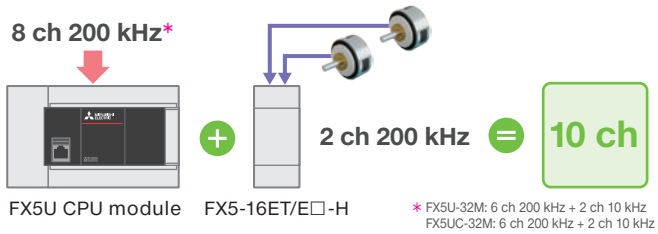
check
Replenish water lost through evaporation and cultivation.

check
Manage air pump for adding adequate oxygen to the water to prevent root rot and plant disease.

Realize high accuracy pump control with expansion of high speed counter function!

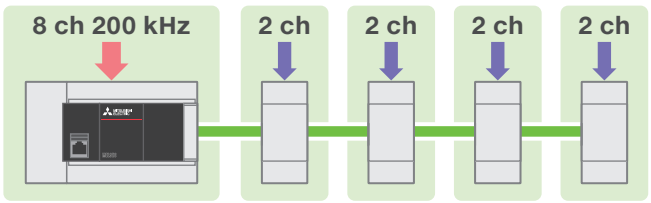
High speed counter function (2 ch) built in!

Realize 10 ch of high speed pulse input by combining with FX5U/FX5UC CPU module built-in high speed counters!



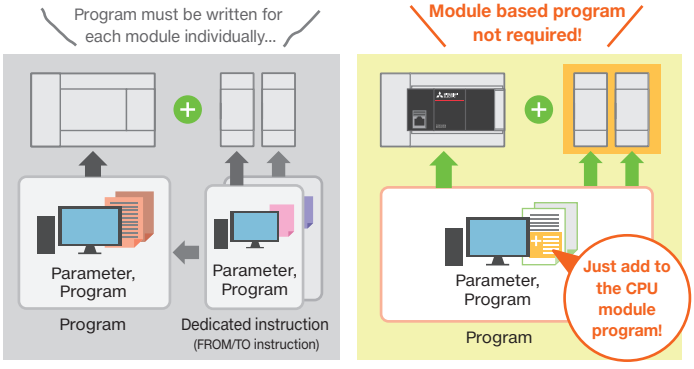
Further

Total of 16 ch of high speed pulse input is possible!



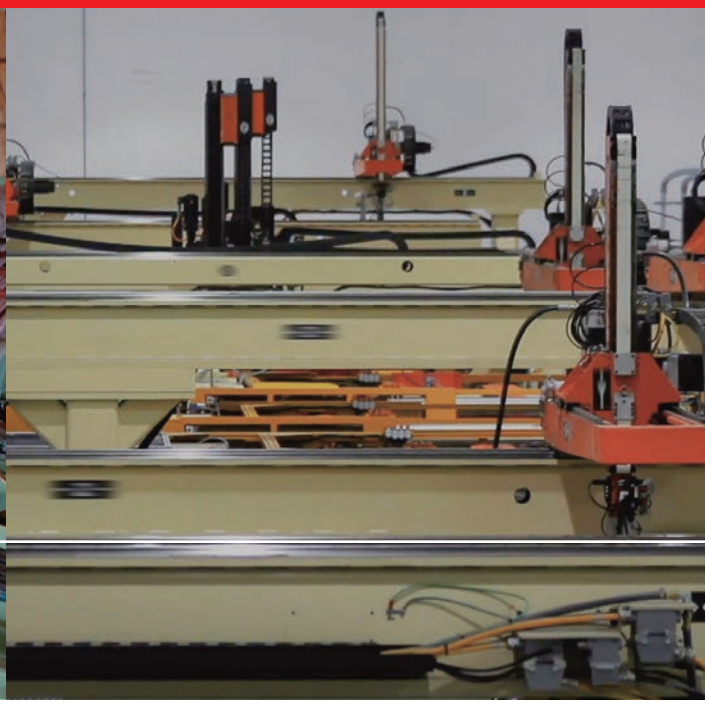
Programming is easy and efficient!

No dedicated instructions (FROM/TO instructions) are required. Engineering time can be reduced because programming is the same as for the CPU module.



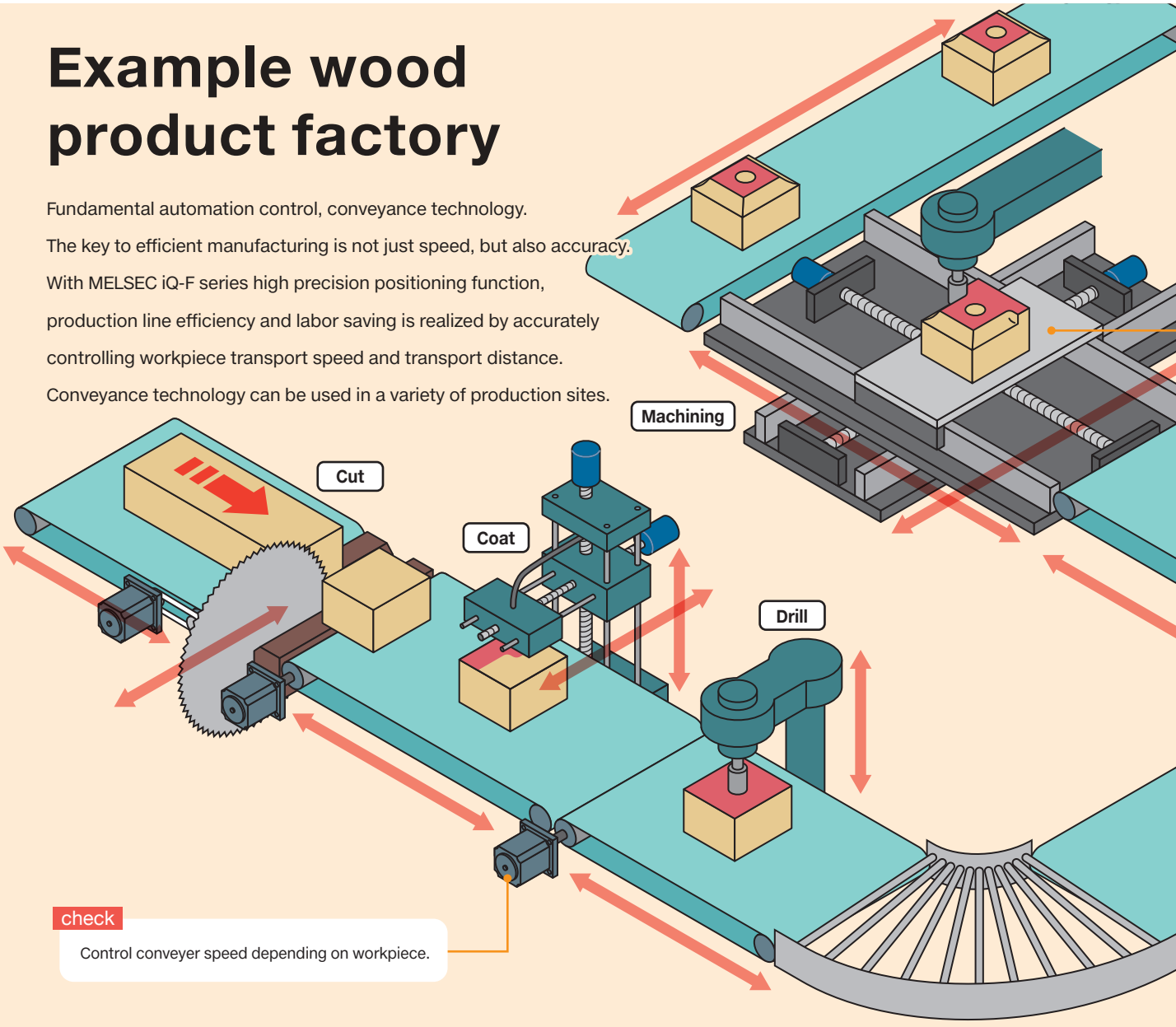
Key point!

03 Wood product factory



Example wood product factory

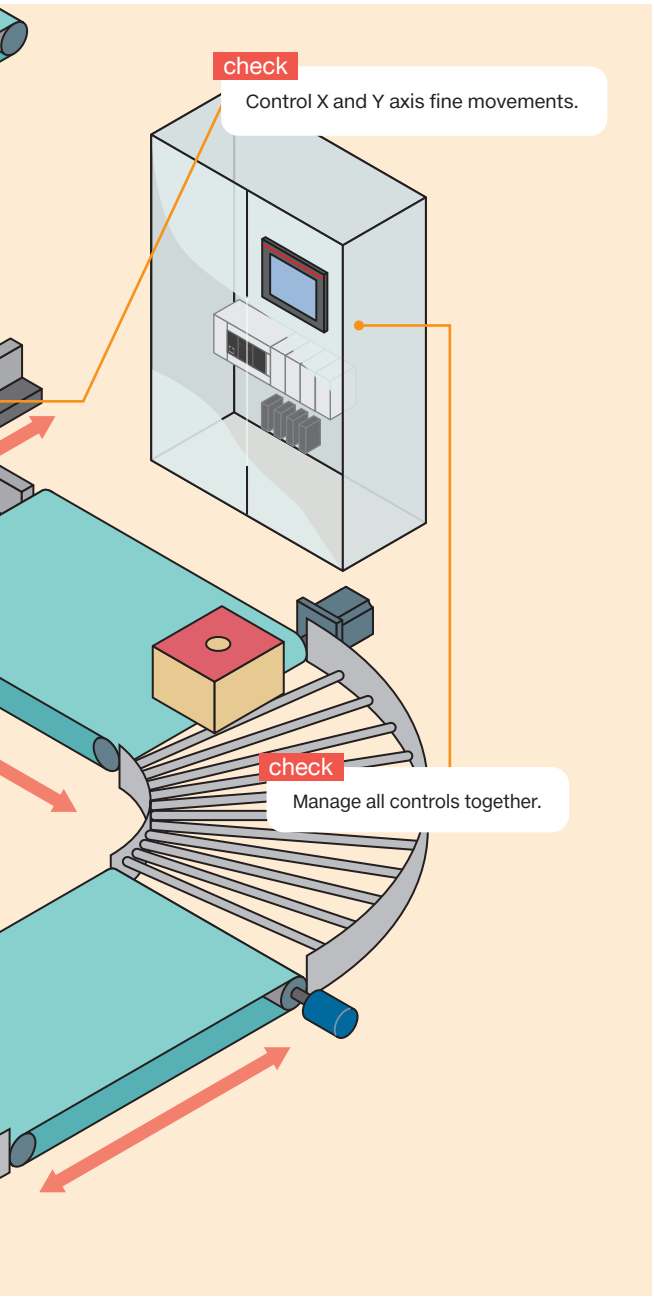
Fundamental automation control, conveyance technology.
The key to efficient manufacturing is not just speed, but also accuracy.
With MELSEC iQ-F series high precision positioning function,
production line efficiency and labor saving is realized by accurately
controlling workpiece transport speed and transport distance.
Conveyance technology can be used in a variety of production sites.



check

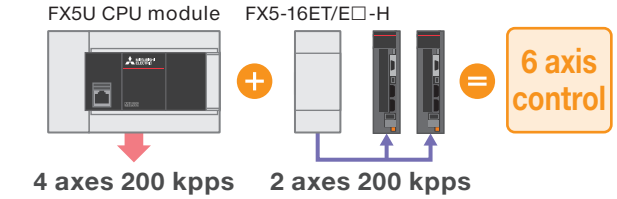
Control conveyer speed depending on workpiece.

Max. 12 axes of positioning control is possible. High speed counter and positioning function can be combined, and normal I/O can also be used.



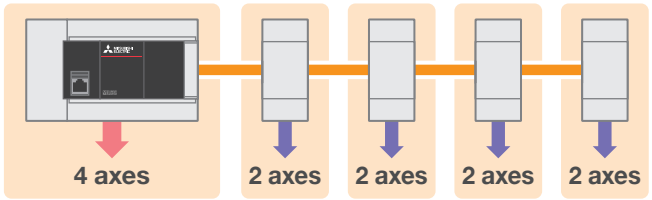
Positioning function (2 axes) built in!

Realize 6 axis control by expanding FX5U/FX5UC CPU module!



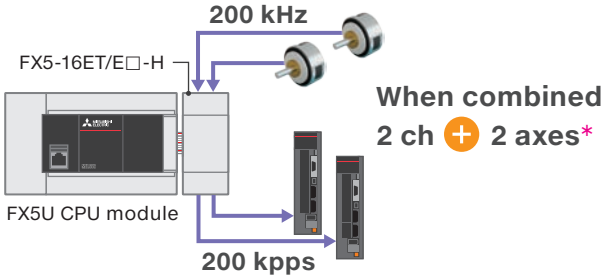
Further

Max. 12 axes of positioning control is possible!



High speed counter and positioning can be combined!

High speed counter function (2 ch) and positioning function (2 axes) can be combined.



I/O not used by high speed counter or positioning function can be used as normal input/output.

*: Simultaneous use of 2 axes and 2 ch may not be possible depending on the functions used. For details, refer to the manual.

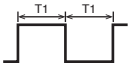
PROGRAMMABLE CONTROLLERS
MELSEC iQ-F Series

FX5-16ET/E□-H

■ Power supply specification

Item	Specifications
Rated voltage	5 V DC (internal power) 24 V DC (service power supply or external power supply)
Current consumption	100 mA/5 V DC 125 mA/24 V DC (The current of the input circuit is included.)

■ Input specification

Item		Specifications	
No. of input points		8 points	
Connection type		Terminal block (M3 screw)	
Input type		Sink/source	
Input signal voltage		24 V DC +20%, -15%	
Input signal current		5.3 mA/24 V DC	
Input impedance		4.3 kΩ	
ON input sensitivity current		3.5 mA or more	
OFF input sensitivity current		1.5 mA or less	
Input response frequency	X□ to X□+5*	200 kHz	
	X□+6, X□+7*	10 kHz	
Pulse waveform	Waveform	T1 (pulse width) 	T2 (rise/fall time) 
	X□ to X□+5*	2.5 µs or more	1.25 µs or less
	X□+6, X□+7*	50 µs or more	25 µs or less
Input response time (H/W filter delay)	X□ to X□+5*	ON: 2.5 µs or less	OFF: 2.5 µs or less
	X□+6, X□+7*	ON: 30 µs or less	OFF: 50 µs or less
Input response time (Digital filter setting value)		None, 10 µs, 50 µs, 0.1 ms, 0.2 ms, 0.4 ms, 0.6 ms, 1 ms, 5 ms, 10 ms (initial values), 20 ms, 70 ms When using this product in an environment with much noise, set the digital filter.	
Input signal format		No-voltage contact input Sink: NPN open collector transistor Source: PNP open collector transistor	
Input circuit insulation		Photo-coupler insulation	
Indication of input operation		LED is lit when input is on	

*: □ Head input number of each high-speed pulse input/output module.

■ Output specification

Item		Specifications
No. of output points		8 points
Connection type		Terminal block (M3 screw)
Output type	FX5-16ET/ES-H	Transistor/sink output
	FX5-16ET/ESS-H	Transistor/source output
External power supply		5 to 30 V DC
Maximum load		1.6 A/8 points common
Open circuit leakage current		0.1 mA or less/30 V DC
Voltage drop when ON	Y□, Y□+1, Y□+4, Y□+5*	1.0 V or less
	Y□+2, Y□+3, Y□+6, Y□+7*	1.5 V or less
Maximum frequency	Y□, Y□+1, Y□+4, Y□+5*	200 kpps
Response time	Y□, Y□+1, Y□+4, Y□+5*	2.5 µs or less/10 mA or more (5 to 24 V DC)
	Y□+2, Y□+3, Y□+6, Y□+7*	0.2 ms or less/200 mA or more (24 V DC)
Output circuit insulation		Photo-coupler insulation
Indication of output operation		LED is lit when output is on

*: □ Head output number of each high-speed pulse input/output module.

■ Applicable CPU module

FX5U, FX5UC*	Ver. 1.030 or later

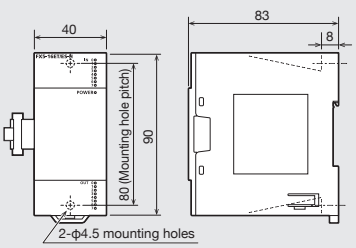
*: FX5-CNV-IFC or FX5-C1PS-5V is necessary to connect FX5-16ET/E□-H with the FX5UC CPU module.

■ Supported engineering tool

GX Works3	Ver. 1.025B or later

■ External dimensions

Unit: mm



· MASS (Weight) : Approx. 0.25 kg
· External color : Munsell 0.6B7.6/0.2

⚠ Safety Warning

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

Registration

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