Anniversary

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

e-F@ctory

Mitsubishi Electric AC Servo System
MELSEC iQ-F Series Motion Module
FX5-40SSC-G/FX5-80SSC-G

March 2021

New Product Release

SV2103-2E

CC-Link IE TSN

MELSEC iQ-F series

High-precision motion control with CC-Link IE TSN

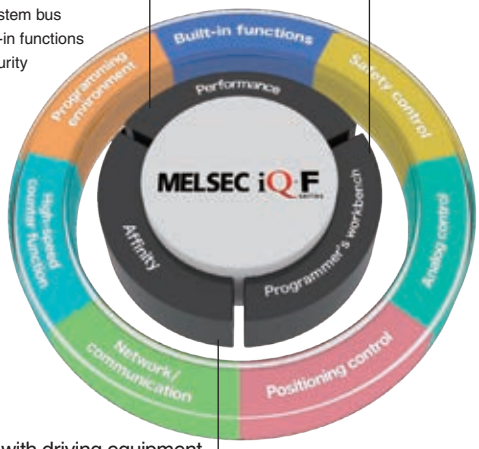
MELSEC iQ-F series

The next level of industry

Designed on the concepts of outstanding performance, superior drive control and user centric programming, Mitsubishi Electric MELSEC-F series has been reborn as the MELSEC iQ-F series.
From stand-alone use to networked system applications, MELSEC iQ-F series brings your business to the next level of industry.

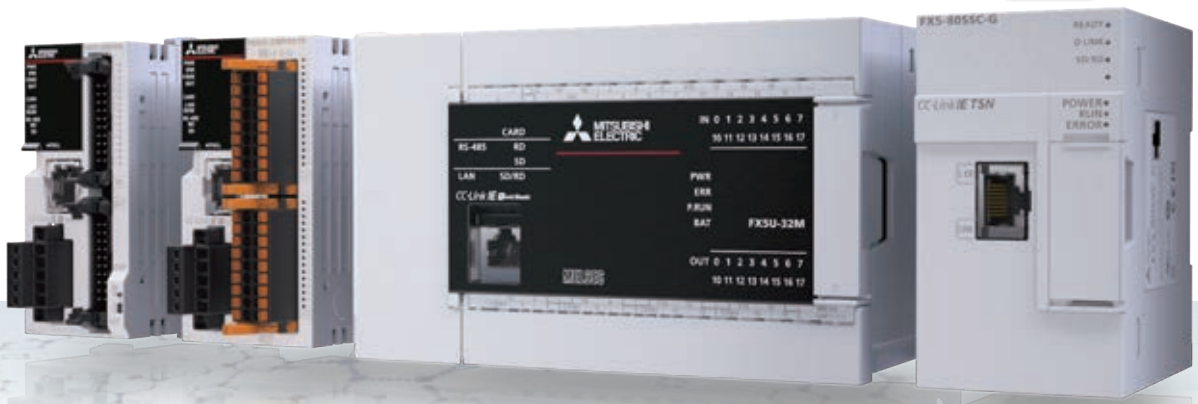
Programmer's workbench
Improvement of programming environment
- Easy programming by drag and drop
- Reduced development time with module FB
- Parameterized setup for a variety of functions

Performance
Outstanding performance
- High-speed system bus
- Extensive built-in functions
- Enhanced security functions
- Battery-less



Affinity
Cooperation with driving equipment
- Easy built-in positioning (4 axes 200 kpps)
- Simple interpolation functions
- 4/8-axis synchronization control (no special software required) by Motion module

NEW



Motion module

CC-Link IE TSN

CC-Link IE TSN supports TCP/IP communications and applies it to industrial architectures through its support of TSN enabling real-time communications. With its flexible system architecture and extensive setup and troubleshooting features make CC-Link IE TSN ideal for building an IIoT infrastructure across the manufacturing enterprise.
The communications speed is 1 Gbps.

* TSN: Time Sensitive Networking
* IIoT: Industrial Internet of Things

CC-Link IE TSN

Motion module

The Motion module performs a variety of advanced motion control, such as positioning, synchronous, cam, speed, and torque control.
The module can connect a high-performance servo amplifier via CC-Link IE TSN with a minimum operation cycle of 500 µs.
The module greatly improves the machine capability while contributing to a smaller machine design with its compact body.

Max. number of control axes*1	Max. number of connected modules*2
8 axes	4 modules

*1. The value is applicable when FX5-80SSC-G is used.
*2. This refers to the total number of the Motion modules and one FX5-CCLGN-MS (master station).

Heritage

The existing programs of iQ-F Simple Motion modules (previous model) can be reused for driving the CC-Link IE TSN-compatible MELSERVO-J5 series servo amplifiers.

MITSUBISHI ELECTRIC SERVO SYSTEM
MELSERVO-J5

Create new value with MELSERVO-J5. Unlock performance with a total drive solution.

Predictive maintenance

Maisart

Predictive maintenance is the practice of detecting changes in vibrations and frictions of mechanical drive components (ball screws, belts, etc.) to predict their service life.
Performing predictive maintenance helps to reduce downtime and maintenance time, leading to increased machine availability, improved productivity, and higher product quality.

Programming environment

Various features such as intuitive graphic-based system configuration and simple point-and-click programming architecture are provided.

Servo amplifier

The MELSERVO-J5 series high-performance, industry-leading servo amplifiers feature a unique control engine that is more powerful than ever before. The servo amplifier supports CC-Link IE TSN and enables high-speed, high-precision motion control.
The following various features are available - the predictive maintenance that detects service life of mechanical drive components (ball screws, etc.), the preventive maintenance that includes the servo amplifier life diagnosis, and the drive recorder function that records detailed operation status.

Servo motor

The HK series rotary servo motors are equipped with a batteryless absolute position encoder. The servo motor power supply, encoder, and electromagnetic brake can be connected using only a single cable. The one-touch lock allows for simple wiring.

Unlock new system capabilities together with CC-Link IE TSN

CC-Link IE TSN
MELSEC iQ-F series

Motion module

FX5-40SSC-G NEW

FX5-80SSC-G NEW

Combined with a CC-Link IE TSN-compatible servo amplifier, the Motion module offers a high-performance servo system that improves machine capability.

- Performs advanced motion control, such as positioning, synchronous, cam, and speed-torque control.
- Connects remote I/O modules and FR-A800-GN inverters via CC-Link IE TSN. The data of these devices can be read/written by a CPU module.
- Connects TCP/IP devices, enabling a flexible system configuration.
- Possible to reuse the existing projects of iQ-F Simple Motion modules (previous model).

Product Lines

The Motion module enables advanced motion control while offering cost-effectiveness.
The module has the capability and functions required for stand-alone/small-scale systems.

CC-Link IE TSN
MELSEC iQ-F series

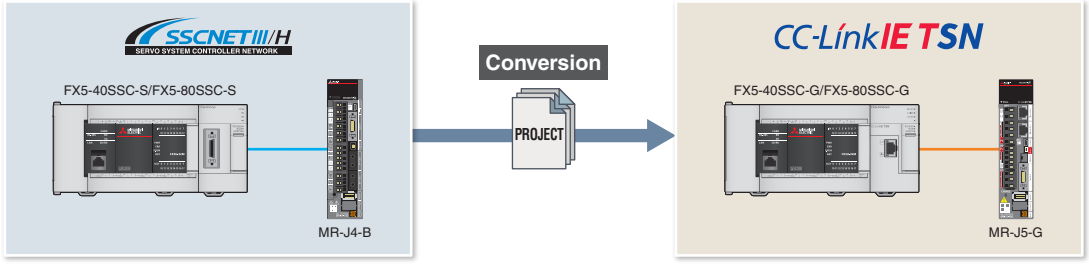
FX5-40SSC-G NEW　　FX5-80SSC-G NEW

- Maximum number of control axes: 4 axes/module (FX5-40SSC-G), 8 axes/module (FX5-80SSC-G)
- Minimum operation cycle*1: 500 [μs]
- Maximum number of connected modules*2: 4 modules/system

*1. The operation cycle varies by the number of control axes and the models.
*2. This refers to the total number of the Motion modules and one FX5-CCLGN-MS (master station).

Heritage (Reuse of Existing Projects)

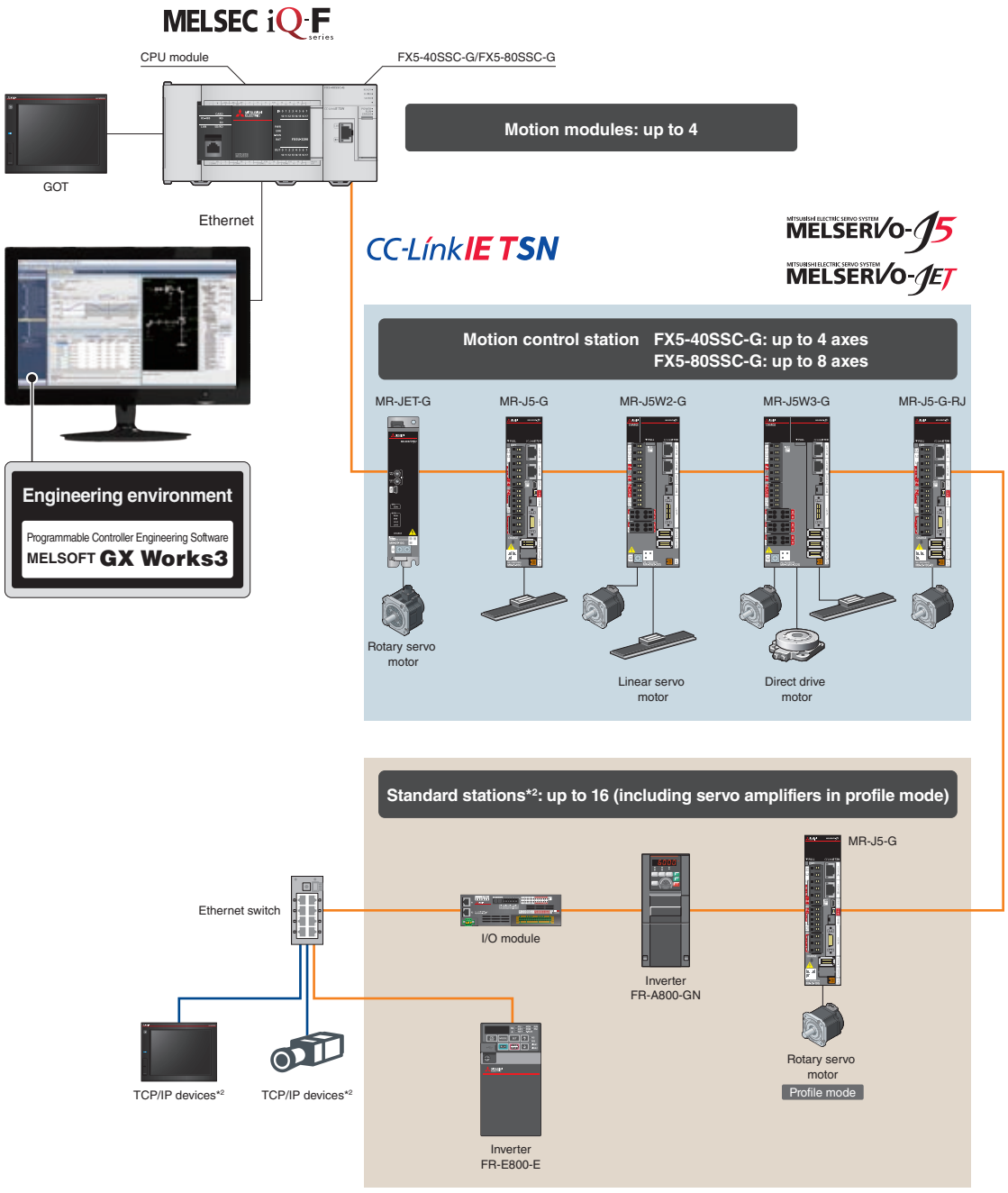
The existing projects of the iQ-F Simple Motion module (previous model) can be reused. This enables reduction in program development time.



* Parameter settings for the network and servo amplifiers are required.

System Configuration

The Motion module can function as a master station of CC-Link IE TSN.*1
This feature enables users to create a system more flexibly by connecting various devices, such as servo amplifiers, remote I/O modules, and TCP/IP devices, to the Motion module.

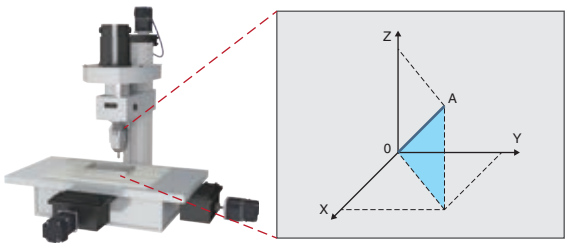


*1. The Motion modules are not provided with the following functions: sub-master station, local station, multi-master configuration, and backup/restore function.
*2. Standard stations refer to slave stations other than motion control stations on CC-Link IE TSN. TCP/IP devices are not included in the standard stations.

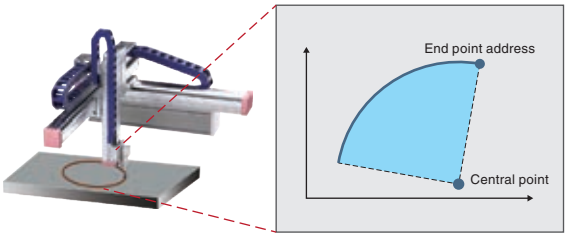
Positioning Control

The Motion module executes various positioning control, such as trajectory control that combines linear and circular interpolation and speed-position switching.

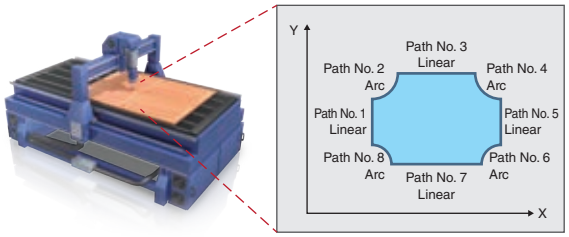
Linear interpolation



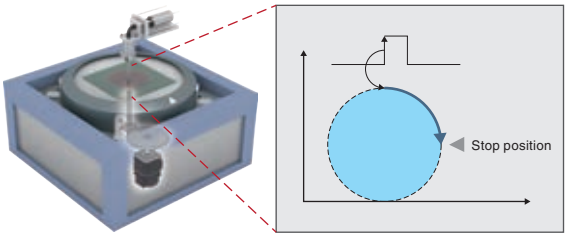
Circular interpolation



Trajectory control

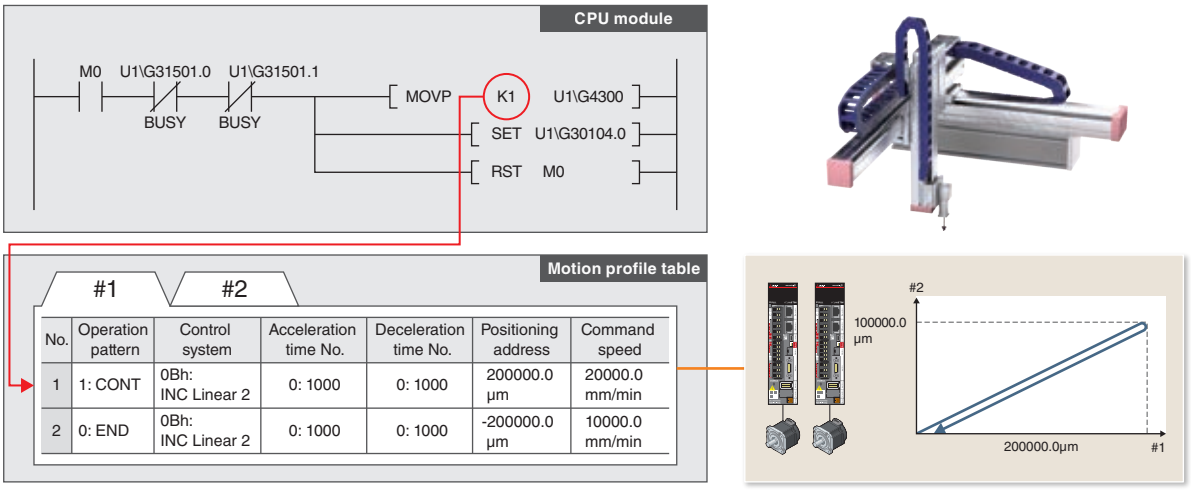


Speed-position switching



Programming

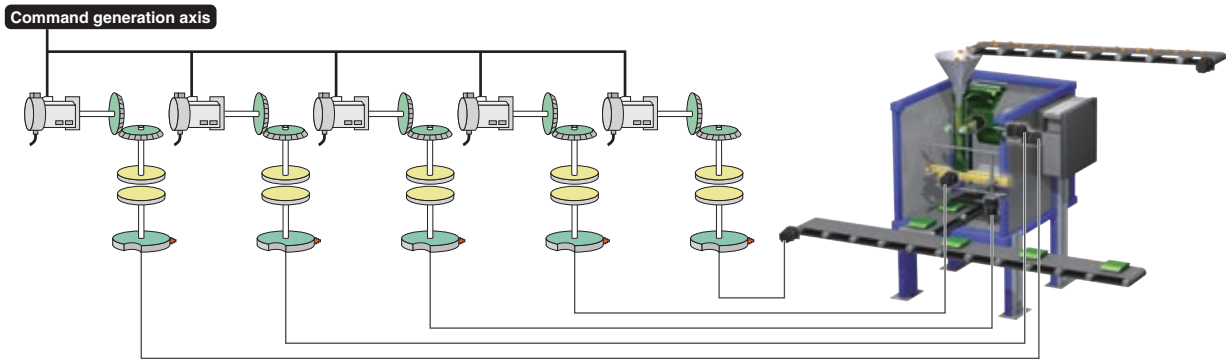
The Motion module easily executes positioning operation with the instruction in a sequence program that starts a positioning data of the motion profile table. To meet various application needs, the Motion module offers various types of control, such as linear/two-axis circular interpolation, fixed-pitch feed, and trajectory control.



Synchronous Control

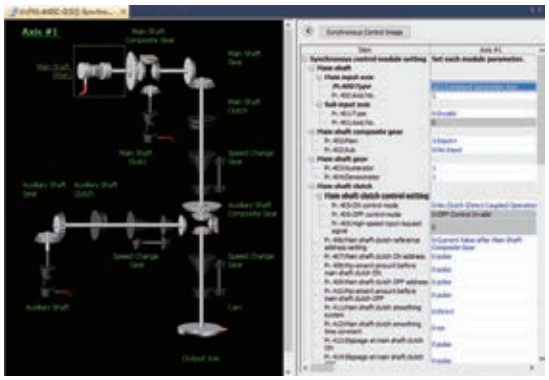
Synchronous control can be achieved using software instead of controlling mechanically with gear, shaft, clutch, speed change gear or cam, etc.

- Synchronous control can be flexibly started/ended for each axis, enabling the synchronous control axis and positioning control axis to be used within the same program.
- Command generation axis, servo input axis, or synchronous encoder axis can be set as the input axis.
- The output axis is operated with a cam. The following three operations can be performed with the cam functions: linear operation, two-way operation, and feed operation.
- An incremental synchronous encoder*1 can be connected via MR-J5-G(-RJ)/MR-J5W2-G servo amplifier.

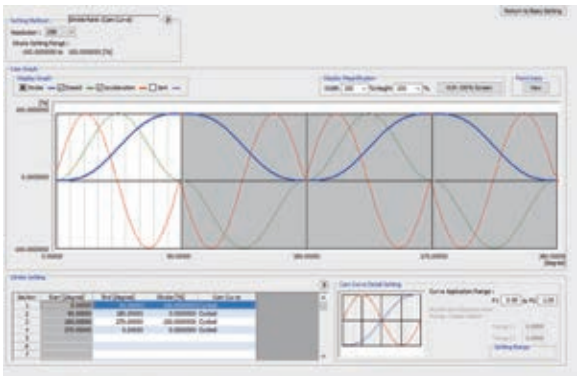


*1. When configuring an absolute position system, use an encoder of HK series servo motors.

Parameter Settings



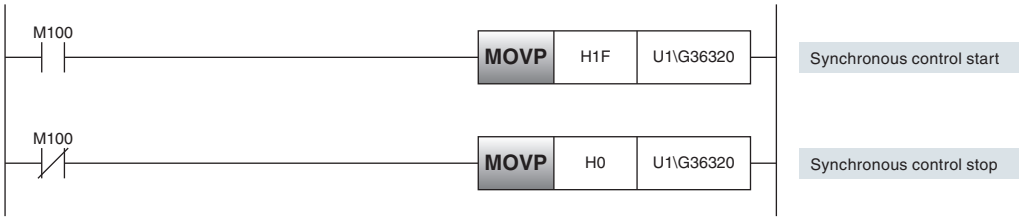
Synchronous control is executed by setting parameters of the input axis, output axis, gear, and clutch for synchronous control and turning on the synchronous control start signal.



The cam graph can be flexibly and easily created through drag & drop. The waveform is changed according to the pointer's movement.

Start/Stop

Synchronous control can be executed after synchronous parameters are set for each output axis. When synchronous control start signal is turned on, the synchronous control parameters are analyzed, and the status is changed to during synchronous control. The output axis is operated by the commands transmitted from the input axis.



Speed-Torque Control

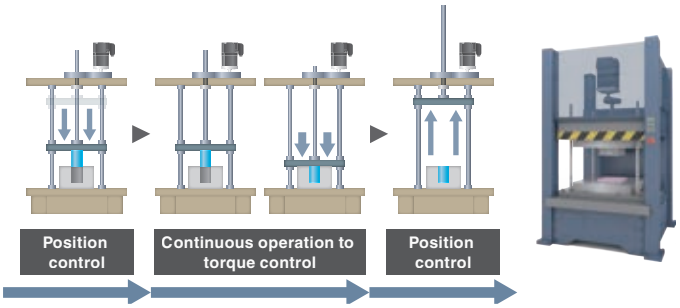
Speed Control/Torque Control

The axes in speed control are controlled to run at the constant speed following the speed command, and the axes in torque control are at the constant torque following the torque command.
The Motion module can be used for tension control application, such as unwinding or rewinding.
In addition, the current positions are always tracked even in speed and torque control, and therefore positioning is executed smoothly in accordance with the absolute position coordinate in position control after switched from the speed and torque control.

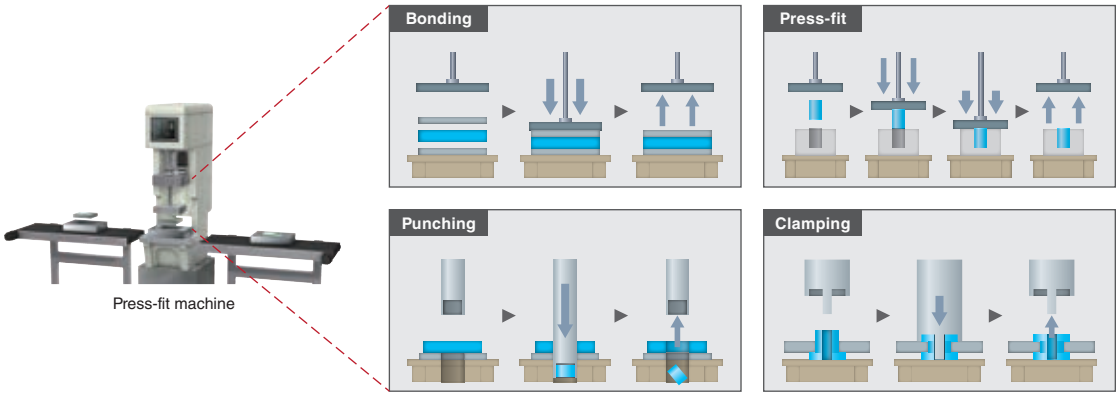
Continuous Operation to Torque Control

When using this control, you can switch from position control to torque control continuously without stopping the servo motor.

- The current positions are always tracked even in torque control, and therefore positioning is executed smoothly in position control after switched from the torque control.
- Position control is smoothly switched to torque control without stopping the servo motor.

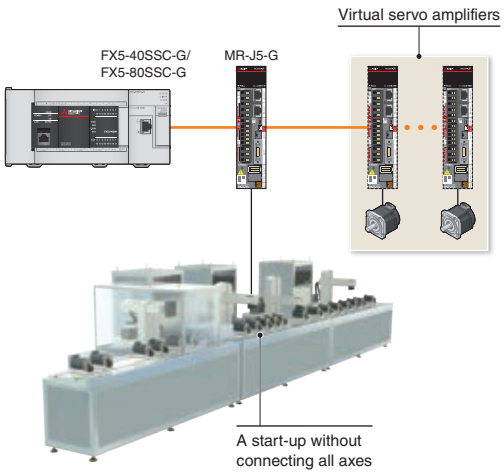


[An example of continuous operation to torque control]
This control is applicable to a variety of machines, such as bonding, press-fit, punching, and clamping machines.



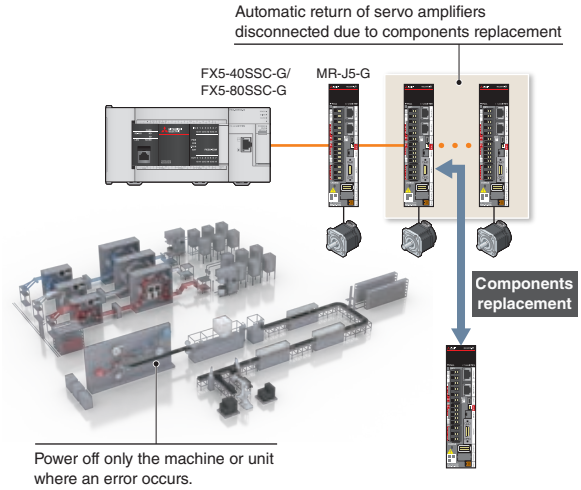
Auxiliary Features

Virtual Servo Amplifier



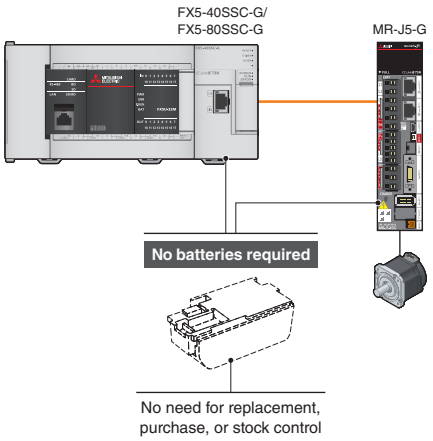
The virtual servo amplifier function enables operations of a virtual servo amplifier as if an actual unit is connected.
When the virtual servo amplifier is set as a servo input axis of synchronous control, the Motion module executes synchronous control with virtually generated input commands.
In addition, this function is used to simulate an axis without an actual connection.

Automatic Return



When slave stations are back to normal status after disconnected due to a data link error, this function automatically returns the disconnected stations to the network and restarts data link.
When defective components need to be replaced in one of the machines in a production line or one of the units in a machine, only the machine or the unit can be partly turned off without powering off the whole system.

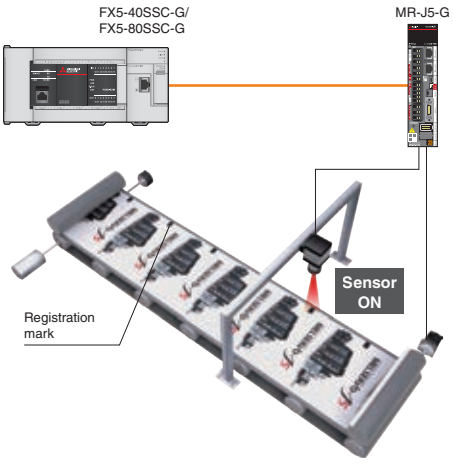
Batteryless Operation



The Motion module and the servo amplifier can be operated without a battery.*1
Maintenance costs are reduced as a result of eliminating the battery replacement and stock control.

*1. Direct drive motors may require a battery.

Mark Detection

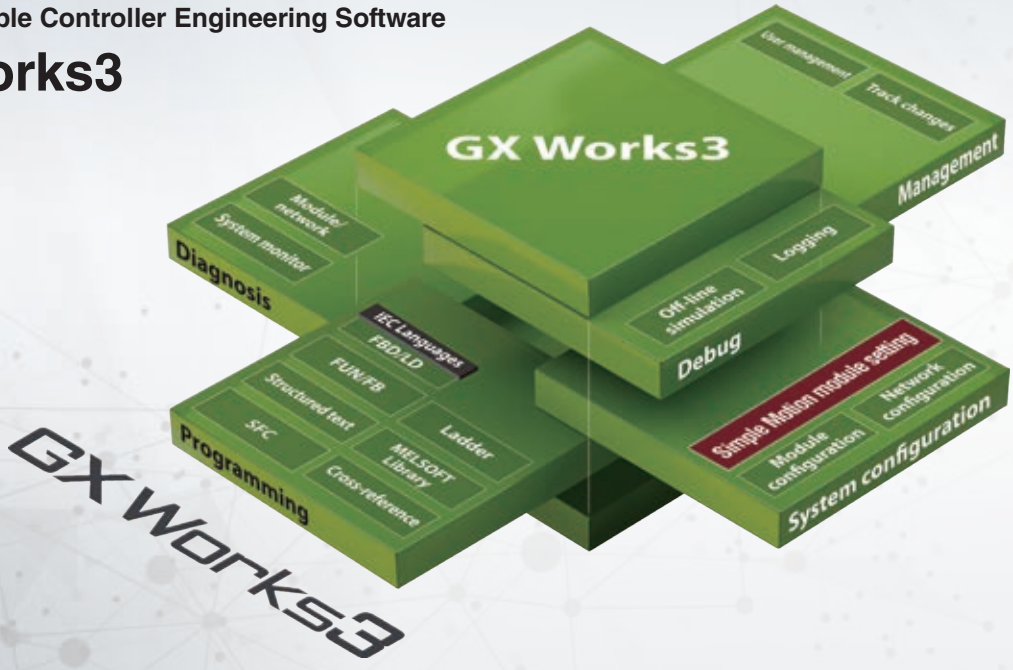


This function latches data responding to a trigger signal input to a servo amplifier.
The compensation amount is calculated based on the latched data, and the error is compensated using a compensation axis.

One software, many possibilities

Programmable Controller Engineering Software

GX Works3



MELSOFT GX Works3 has a variety of features which help users create projects and conduct maintenance more flexibly and easily. Our variety of engineering software (GX Works3, sizing software, and model selection software, etc.) fully covers all stages of development processes from parameter settings to maintenance of Motion module, servo amplifier, and servo motors.

GX Works3

This software supports overall development processes for PLC CPUs from system design to maintenance.

Servo Setup Software MR Configurator2

Tuning, monitor display, diagnosis, reading/writing parameters, and test operations are easily performed on a personal computer. This powerful software tool supports a stable machine system and optimum control, and moreover, shortens setup time.

Model Selection Software

Servo amplifiers, servo motors, and indispensable options such as encoder cables can all be selected.

Simple Motion Module Setting

This software covers various development processes for the Motion module from parameter settings, debug, to maintenance.

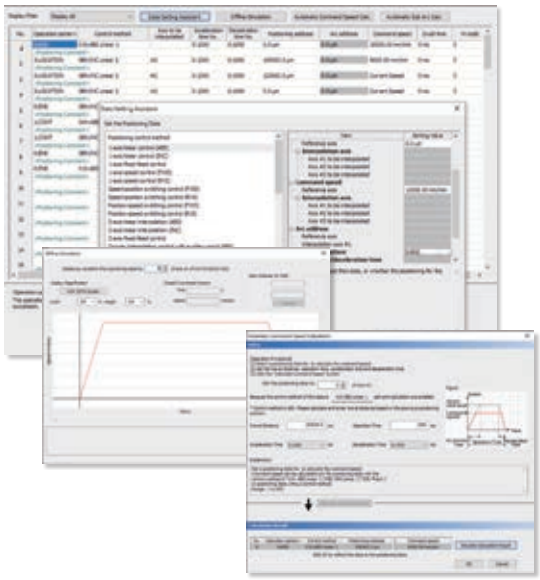
Drive System Sizing Software "Motorizer"

The most suitable servo motors, servo amplifiers, and regenerative options for your machine can be selected just by setting machine specifications and operation patterns.

System Design

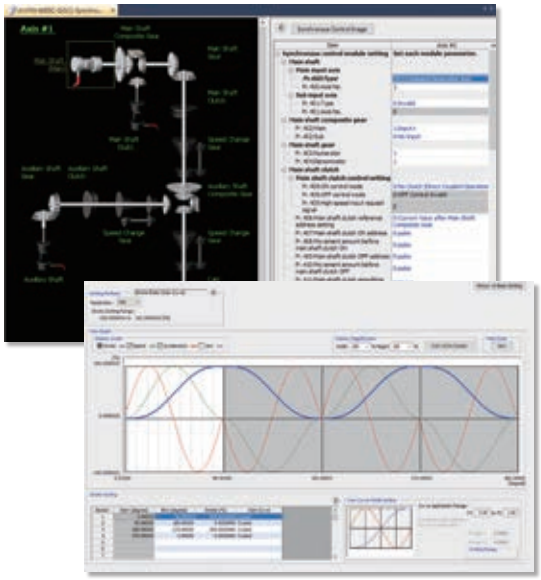
- Module configuration
- Network configuration
- Data settings for servo amplifiers
- Settings for remote I/O

Programming (Positioning)



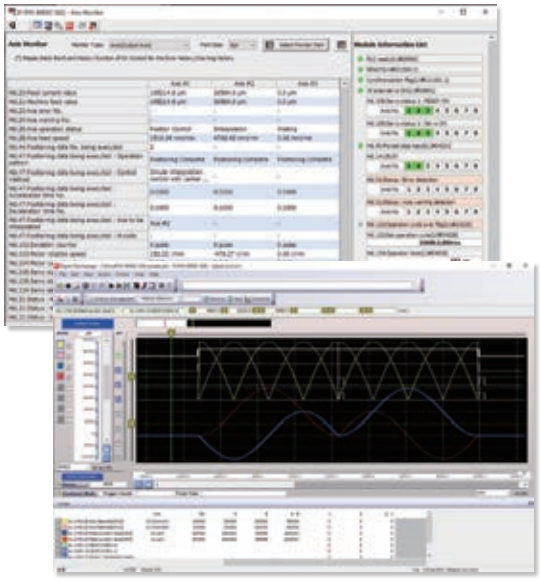
- Programming with Ladder, SFC, FBD/LD
- Positioning data settings
- Offline simulation, automatic calculation of command speed

Programming (Synchronous Control)



- Synchronous control parameter
- Cam data creation, cam data list

Debug/Maintenance



- Event history
- Current value history, start history, axis monitor
- Servo monitor
- Digital oscilloscope

Motion module

Control specifications

Item		Specifications	
		FX5-40SSC-G	FX5-80SSC-G
Maximum number of control axes		4 axes	8 axes
Operation cycle (operation cycle setting) [μs]		500, 1000, 2000, 4000	
Interpolation function		Linear interpolation (up to 4 axes), 2-axis circular interpolation	
Control method		Positioning control, trajectory control (linear and arc), speed control, speed-torque control, synchronous control, continuous operation to torque control	
Compensation function		Backlash compensation, electronic gear, near pass function	
Synchronous control		Synchronous encoder input, command generation axis, cam, phase compensation, cam auto-generation	
Cam control	Number of cam registrations (Note 1)	Up to 128	
	Cam data	Stroke ratio data format, coordinate data format	
	Cam auto-generation	Cam auto-generation for rotary knife	
Positioning control method		Motion profile table	
Control unit		mm, inch, degree, pulse	
Number of positioning data		600 data (positioning data No. 1 to 600)/axis (Can be set with MELSOFT GX Works3 or a sequence program.)	
Backup		Parameters, positioning data, and block start data can be saved on flash ROM (batteryless backup)	
Home position return		Driver home position return (Note 2)	
Positioning control		Linear interpolation control (Up to 4 axes (Note 3) (vector speed, reference axis speed)), fixed-pitch feed control (up to 4 axes), 2-axis circular interpolation (auxiliary point-specified, central point-specified), speed control (up to 4 axes), speed-position switching control (INC mode, ABS mode), position-speed switching control (INC mode), current value change (positioning data, start No. for a current value changing) NOP instruction, JUMP instruction (conditional, unconditional), LOOP, LEND, high-level positioning control (block start, condition start, wait start, simultaneous start, repeated start)	
Manual control		JOG operation, inching operation, manual pulse generator operation (up to 1 module (incremental), unit magnification (1 to 10000 times), via CPU (buffer memory))	
Speed-torque control		Speed control not including position loop, torque control, continuous operation to torque control	
Absolute position system		Provided	
Synchronous encoder operation function		Up to 4 modules (via CPU or servo amplifier)	
Speed limit		Speed limit value, JOG speed limit value	
Torque limit function		Torque limit value same setting, torque limit value individual setting	
Forced stop		Via buffer memory, valid/invalid setting	
Software stroke limit function		Movable range check with feed current value or with machine feed value	
Hardware stroke limit function		Provided	
Speed change		Provided	
Override		1 to 300 [%]	
Acceleration/deceleration process change		Acceleration/deceleration time	
Torque limit change		Provided	
Target position change		Speed to a target position address and a target position is changeable.	
M-code output function		Provided	
Other functions	Step function	Deceleration unit step, data No. unit step	
	Skip function	Via CPU, via external command signal	
Parameter initialization function		Provided	
External input signal select function		Via CPU, via servo amplifier	
Mark detection function		Continuous detection mode, specified number of detections mode, ring buffer mode	
	Mark detection signal	Signals for the number of axes of the connected servo amplifiers	
	Mark detection setting	16 settings	
Optional data monitor function		Up to 4 points/axis	
Automatic return		Provided	
Digital oscilloscope function		Bit data: 16 channels, word data: 16 channels (Note 4)	

Notes: 1. The number of cam registrations depends on the memory capacity, cam resolution, and number of coordinates.
2. The home position return method set in a driver (a servo amplifier) is used.
3. 4-axis linear interpolation control is enabled only at the reference axis speed.
4. Eight channels of each word data and bit data can be displayed in real time.

CC-Link IE TSN specifications

Item		Specifications	
		FX5-40SSC-G	FX5-80SSC-G
Communications speed	[bps]	1G	
Maximum stations per network		Motion control stations: 4 Standard stations: 16	Motion control stations: 8 Standard stations: 16
Connection cable		Ethernet cable (category 5e or higher, double shielded/STP) straight cable	
Maximum distance between stations	[m]	100	
Maximum number of networks		239	
Topology (Note 1)		Line, star, line/star mixed topologies	
Communications methods		Time-sharing method	
Maximum transient transmission capacity		1920 bytes	
Maximum link points per network			
RX/RY		8192 points, 1K bytes (master station)	
RWr/RWw		1024 points, 2K bytes (master station)	
Maximum link points per station			
RX/RY		8192 points, 1K bytes (master station)	
RWr/RWw		1024 points, 2K bytes (master station)	

Notes: 1. Use a switching hub (certified class: B) for star topology.

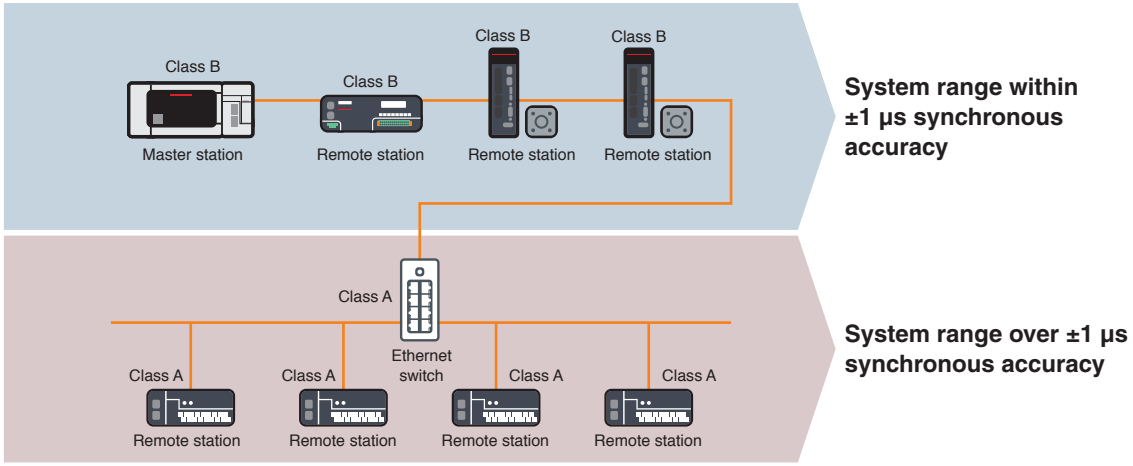
[Note when connecting devices]

Connect class A remote stations after class B remote stations.

Certified Class

CC-Link IE TSN certifies nodes and switches to a specific class level according to its functionality and performance classification. Products can be classified as either class A or B. For the certified classification of each product, please check the CC-Link partner association website or the relevant product catalog or manual. Supported functions and system configuration may differ according to the certified class of products used. For example, products compatible with certified class B are necessary to configure a high-speed motion control system. For details of configuring systems with both class A and class B devices, please refer to relevant master product manual.

System configuration



- Synchronous accuracy of a system varies relative to the combination of connected devices and switches certification class
- Use class B Ethernet switch when configuring a star topology with class B devices
- Use class B devices when configuring a system within ±1 µs high-accuracy synchronization, connect class A devices to a separate branch line from class B devices (for details of system configuration, please refer to relevant master product manual)

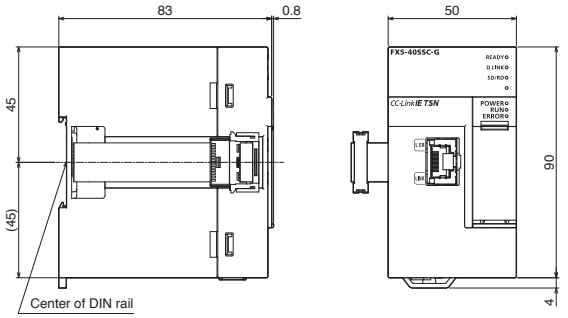
Module specifications

Item	FX5-40SSC-G	FX5-80SSC-G
Maximum number of control axes	4	8
Maximum number of connectable stations	20	24
Servo amplifier connection method	CC-Link IE TSN	
Certified class	B	
Maximum distance between stations [m]	100	
24 V DC external current consumption [A]	0.24	
Mass [kg]	0.3	
Dimensions [mm]	90 (H) × 50 (W) × 83 (D)	
Applicable CPU (Note 1)	FX5U, FX5UC (Note 2)	

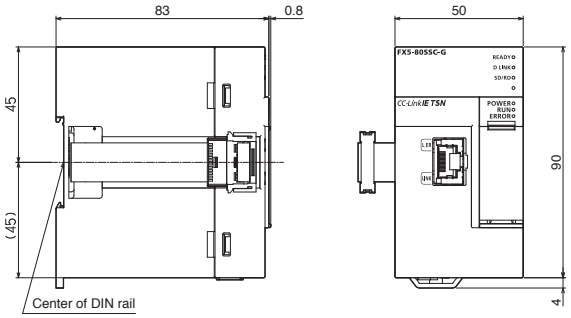
Notes: 1. Use a CPU module with firmware version 1.230 or later.
The following CPU modules can be updated to that firmware version.
• CPU module with serial No. 17X**** or later
• FX5UC-32MT/DS-TS and FX5UC-32MT/DSS-TS with serial No. 178**** or later.
2. FX5-CNV-IFC is required to connect the Motion module to a FX5UC CPU module.

Dimensions

FX5-40SSC-G



FX5-80SSC-G



[Unit: mm]

System components

Product name	Model	Specifications	Standards
Motion module	FX5-40SSC-G	Maximum number of control axes: 4, CC-Link IE TSN master station	CE, UL, KC
	FX5-80SSC-G	Maximum number of control axes: 8, CC-Link IE TSN master station	CE, UL, KC

Product lines of FX5U series CPU modules

Screw terminal block type

Maximum number of control points	Program capacity	Pulse train	Up to
512* points	64 k/128 k steps	200 kpps	4 axes

Spring clamp terminal block type

Maximum number of control points	Program capacity	Pulse train	Up to
512* points	64 k/128 k steps	200 kpps	4 axes

Connector type

FX5U All-in-one model

As an all-rounder CPU, this module can help introducing IoT to facilities and equipments in any scenes.

- High-speed counter function (Max. 8 ch)
- Positioning function (Up to 4 axes)
- Ethernet port
- RS-485 port
- SD memory card slot
- Analog input/output

FX5UC Vibration resistant/ maintenance-free model

Employs a spring clamp terminal block which strengthens vibration resistance and shortens wiring time.

- High-speed counter function (Max. 8 ch)
- Positioning function (Up to 4 axes)
- Ethernet port
- RS-485 port
- SD memory card slot

FX5UC Compact model

Because I/O connection is configured through external terminal block, this module can be located freely in any panel.

- High-speed counter function (Max. 8 ch)
- Positioning function (Up to 4 axes)
- Ethernet port
- RS-485 port
- SD memory card slot

* It is the maximum number of control points including remote I/O points.

Engineering Software

MELSOFT GX Works3 operating environment (Note 1)

Item	Description
OS	Microsoft® Windows® 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSB (Note 2)) (64 bit/32 bit) Microsoft® Windows® 8.1 (64 bit/32 bit), Microsoft® Windows® 8.1 (Enterprise, Pro) (64 bit/32 bit) Microsoft® Windows® 7 (Enterprise, Ultimate, Professional, Home Premium) (64 bit/32 bit)
Personal computer	Windows® supported personal computer
CPU	Intel® Core™2 Duo Processor 2 GHz or more recommended
Required memory	For 64-bit edition: 2 GB or more recommended For 32-bit edition: 1 GB or more recommended
Free hard disk space	For installation: 17 GB or more free hard disk capacity For operation: 512 MB or more free virtual memory capacity
Optical drive	DVD-ROM supported disk drive
Monitor	Resolution 1024 × 768 pixels or higher

Notes: 1. Refer to Installation Instructions for precautions and restrictions regarding the operating environment.
2. The 32-bit edition is not supported.

Engineering software list

Item	Model	Description	
MELSOFT GX Works3	SW1DND-GXW3-E	•Programmable Controller Engineering Software [MELSOFT GX Works3 (Note 1, 2), GX Works2, GX Developer, PX Developer] •MITSUBISHI ELECTRIC FA Library	DVD-ROM
MELSOFT iQ Works	SW2DND-IQWK-E	FA engineering software (Note 3) • System Management Software [MELSOFT Navigator] • Programmable Controller Engineering Software [MELSOFT GX Works3 (Note 1, 2), GX Works2, GX Developer, PX Developer] • Motion Controller Engineering Software [MELSOFT MT Works2] • Screen Design Software [MELSOFT GT Works3] • Robot Programming Software [MELSOFT RT ToolBox3 (Note 4)] • Inverter Setup Software [MELSOFT FR Configurator2] • MITSUBISHI ELECTRIC FA Library	DVD-ROM

Notes: 1. MELSOFT GX Works3 with version 1.072A or later and MR Configurator2 with version 1.120A or later are required.
2. The MELSOFT GX Works3 menu is switchable between Japanese, English, and simplified Chinese.
3. Refer to each product manual for the software supported by the model.
4. RT ToolBox3 mini (simplified version) will be installed if iQ Works product ID is used. When RT ToolBox3 (with simulation function) is required, please purchase RT ToolBox3 product ID.

■Products on the market

Manual pulse generator

Mitsubishi Electric has confirmed the operation of the following manual pulse generator. Contact the manufacturer for details.

Product name	Model	Description	Manufacturer
Manual pulse generator (Note 1)	RE46A2CO2B	Number of pulses per revolution: 25 pulses/rev (100 pulses/rev after magnification by 4)	Tokyo Sokuteikizai Co.,Ltd.

Notes: 1. Connect the manual pulse generator to a CPU module or a high-speed pulse input/output module. Refer to user's manuals and each product manual for details.

Driving a wide range of motors

Servo amplifier

MELSERVO-J5 Series

Rotary servo motor
HK Series

Linear servo motor
LM Series

Direct drive motor
TM Series

Servo amplifier

MELSERVO-JET Series

Rotary servo motor
HG Series

Linear servo motor
LM Series

CC-Link IE TSN

Product Lines

Servo amplifier

CC-Link IE TSN

MR-J5-G

Supports Ethernet-based CC-Link IE TSN, featuring high-speed, large-capacity communication (1 Gbps). Command communication cycle of ≥ 31.25 µs and speed frequency response of 3.5 kHz enable advanced motion control.

CC-Link IE TSN

MR-J5W2-G
MR-J5W3-G

Drives two to three servo motors. This simplifies wiring, saves energy, and enables a compact machine at a lower cost.

Simple converters

MR-CM

MR-J5

Utilizing a common bus connection conserves energy through the efficient use of regenerative power. Wiring can be simplified, and installation space can be saved by reducing the number of molded-case circuit breakers and magnetic contactors.

CC-Link IE TSN

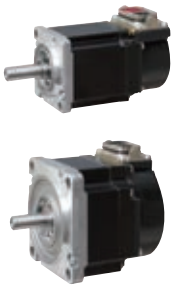
MR-JET-G

Supports Ethernet-based CC-Link IE TSN, featuring high-speed, large-capacity communication (1 Gbps). Command communication cycle of ≥ 125 µs and speed frequency response of 2.5 kHz enable advanced motion control.

Servo motors

[Rotary servo motors]

HK series: servo motors with a 26-bit batteryless absolute position encoder **MR-J5**



Small capacity, low inertia

HK-KT Series

Rated speed:
3000 r/min*1
Max. speed:
6700 r/min*1

Medium capacity, medium inertia

HK-ST Series

Rated speed:
2000 r/min*1
Max. speed:
4000 r/min*1

Medium capacity, ultra-low inertia

HK-RT Series

Rated speed:
3000 r/min
Max. speed:
6700 r/min*1

HG series: servo motors with a 22-bit absolute position encoder **MR-JET**

Small capacity, low inertia

HG-KNS Series

Rated speed: 3000 r/min
Max. speed: 6000 r/min

Medium capacity, medium inertia

HG-SNS Series

Rated speed: 2000 r/min
Max. speed: 3000 r/min*1

*1. The speed varies by the models.

[Linear servo motors]

MR-J5
MR-JET

Core type

LM-H3 Series

Max. speed:
3 m/s
Rated thrust:
70 N to 960 N
Max. thrust:
175 N to 2400 N

MR-J5
MR-JET

Core type

LM-AJ Series

Max. speed:
2 to 6.5 m/s
Rated thrust:
68.1 N to 446.8 N
Max. thrust:
214.7 N to 1409.1 N

MR-J5

Core type (natural/liquid cooling)

LM-F Series

Max. speed:
2 m/s
Rated thrust:
300 to 1200 N
(natural cooling)
600 to 2400 N
(liquid cooling)
Max. thrust:
1800 to 7200 N
(natural/liquid cooling)

MR-J5

Coreless type

LM-U2 Series

Max. speed:
2 m/s
Rated thrust:
50 N to 800 N
Max. thrust:
150 N to 3200 N

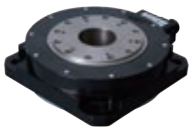
MR-J5

Core type with magnetic attraction counter-force

LM-K2 Series

Max. speed: 2 m/s
Rated thrust: 120 N to 2400 N
Max. thrust: 300 N to 6000 N

[Direct drive motors] MR-J5



Low-profile flange type

TM-RG2M Series

Low-profile table type

TM-RU2M Series

Rated torque: 2.2 to 9 N·m
Max. torque: 8.8 to 27 N·m

High-rigidity

TM-RFM Series

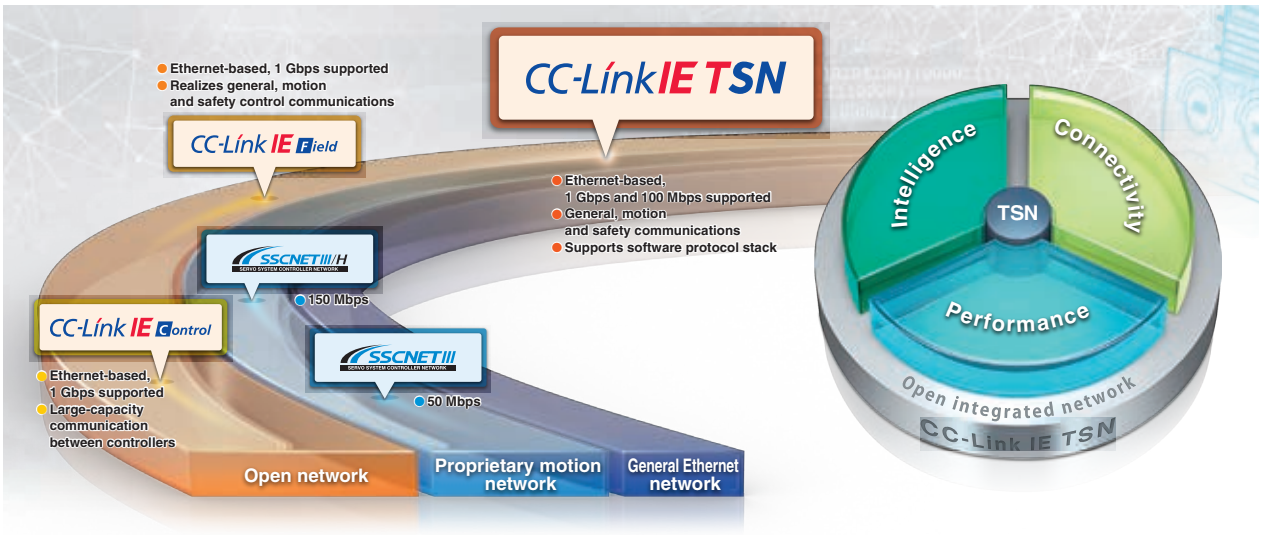
Rated torque: 2 to 240 N·m
Max. torque:6 to 720 N·m

Open integrated networking across the manufacturing enterprise

CC-Link IE TSN

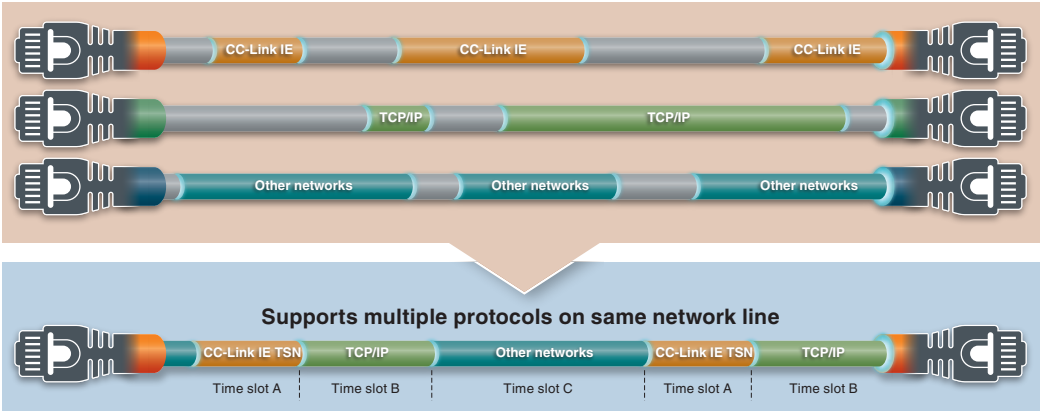
CC-Link IE TSN supports TCP/IP communications and applies it to industrial architectures through its support of TSN enabling real-time communications. With its flexible system architecture and extensive setup and troubleshooting features make CC-Link IE TSN ideal for building an IIoT infrastructure across the manufacturing enterprise.

* TSN: Time Sensitive Networking
* IIoT: Industrial Internet of Things



Real-Time Network Performance Even When Integrated with Information Data

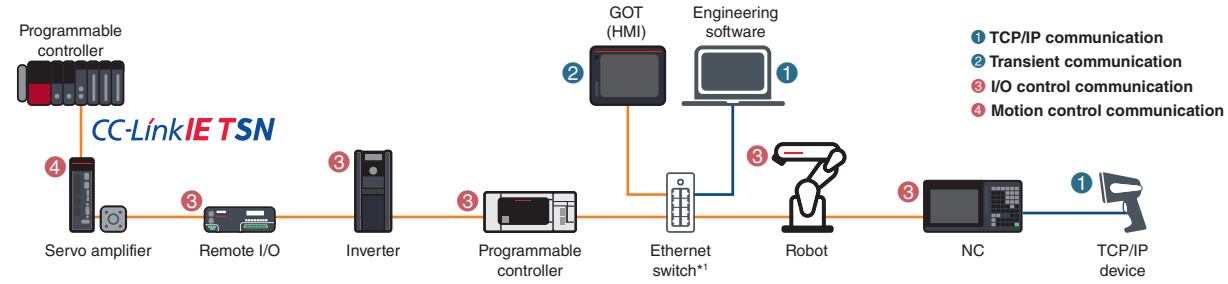
TSN technology enables mixing of deterministic communications with IT system information data on the same network. Giving higher priority to CC-Link IE TSN cyclic communications and TCP/IP communications by allocating increased network bandwidth, devices using general Ethernet communications can be connected on the same network while maintaining real-time control communication performance.

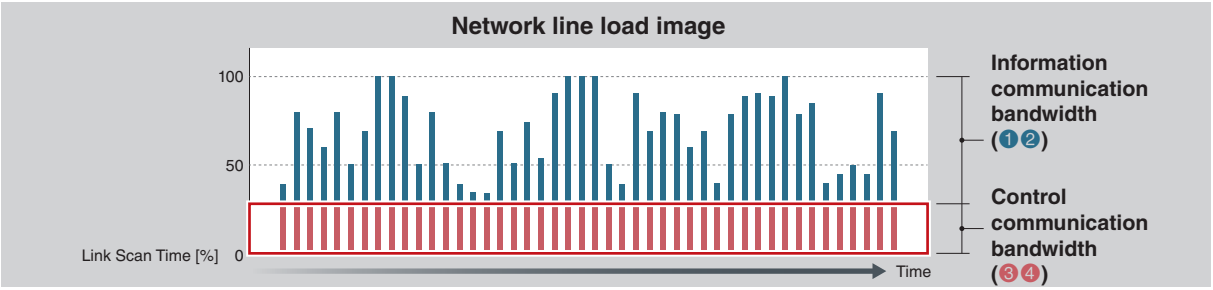


Deterministic Control Even When Mixed with TCP/IP Communication

Deterministic performance of cyclic communication is maintained even when mixed with slower information data (non real-time).
This enables TCP/IP communication devices to be used without affecting overall control.

* Some devices cannot be connected to CC-Link IE TSN depending on the system configuration.

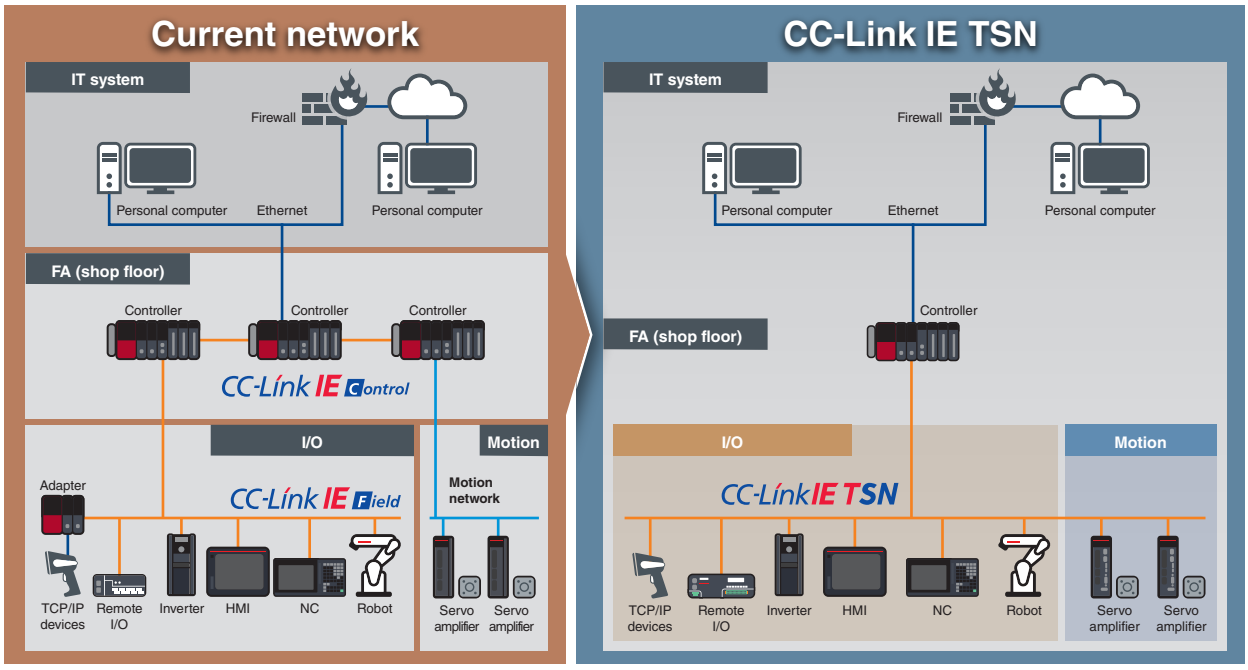




*1. Class B switching hub supporting CC-Link IE TSN recommended by the CC-Link Partner Association.

Integrated Network

Current network systems use multiple networks to enable communication between IT and control systems on the shop floor.
CC-Link IE TSN is a one-stop solution for integrating different networks, thereby realizing flexibility in topology and reducing wiring cost.

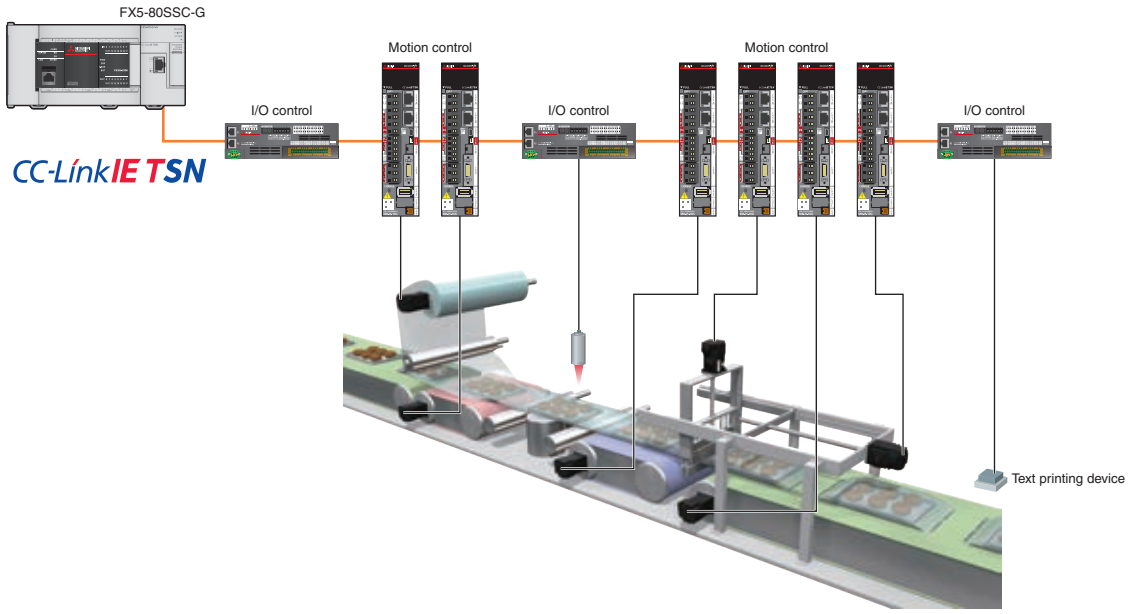


Network configuration example (includes functions and products planned for future support/release.)

High-Speed, High-Accuracy Motion Control

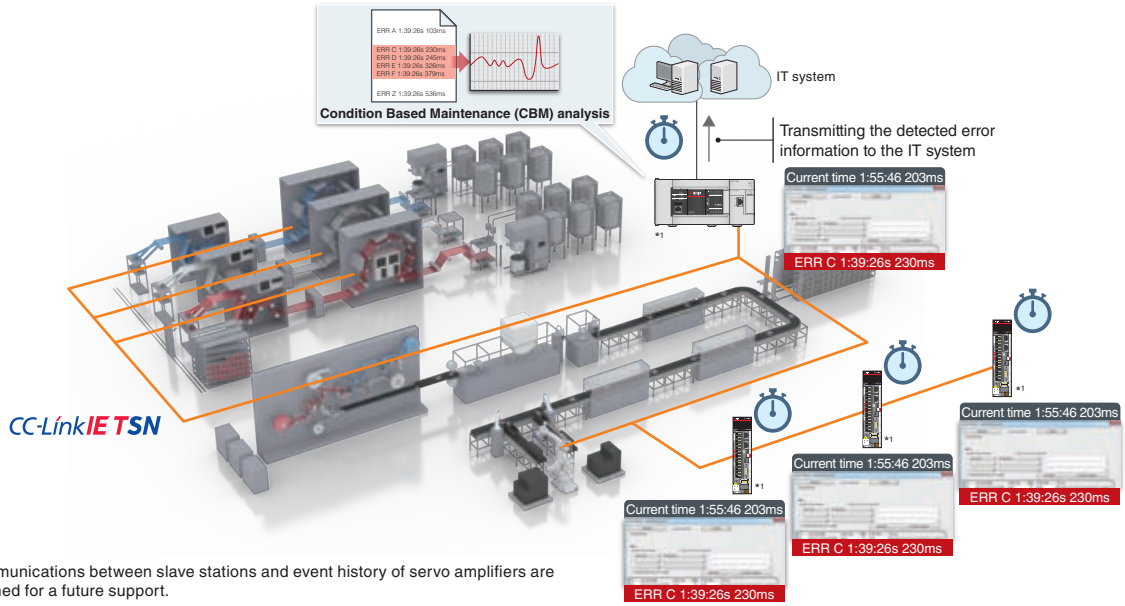
CC-Link IE TSN controls I/O modules while also maintaining high-speed motion control. The single network boosts machine performance.

- Motion control (high-speed processing)
- I/O control (low-speed processing)



Time Synchronization

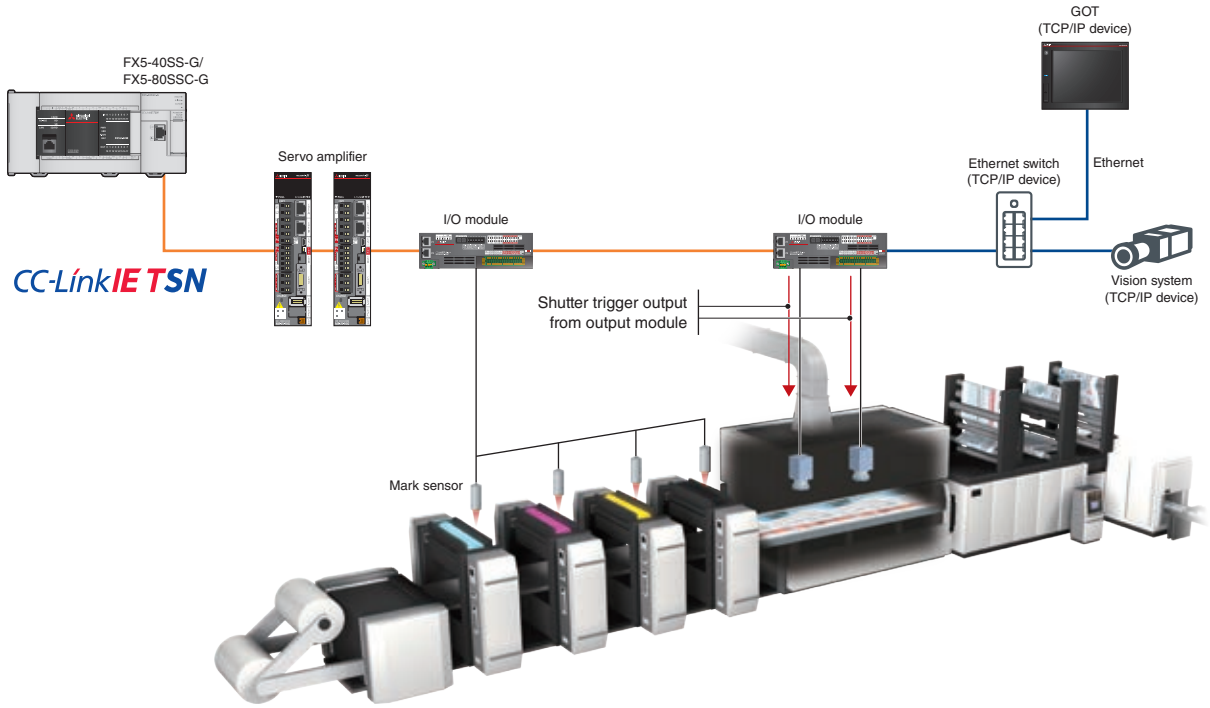
Set time is completely synchronized among servo amplifiers, Motion modules, and PLC CPUs. This time synchronization enables accurate recording of the event history in chronological order, making it simple to identify the cause of errors.



*1. Communications between slave stations and event history of servo amplifiers are planned for a future support.

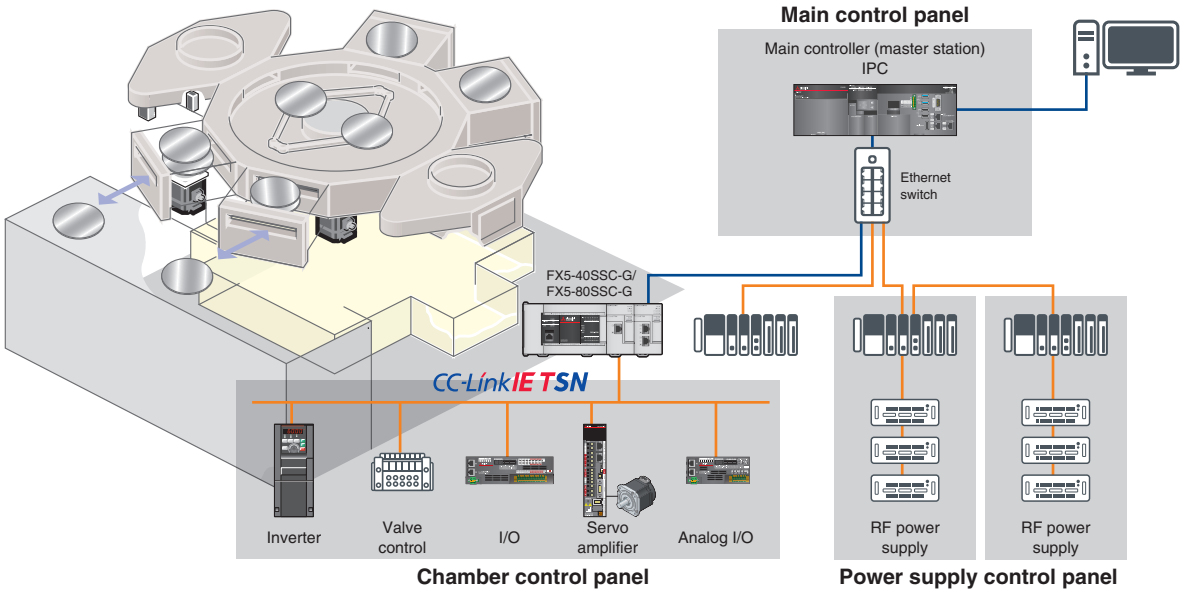
Seamless Connectivity Between TCP/IP Devices and a Servo System

TCP/IP communication (information communication) can be mixed in the same line with the real-time control communications of CC-Link IE TSN.
CC-Link IE TSN slave devices and TCP/IP devices can be connected on the same network, achieving a flexible and integrated network system.
Note that the TCP/IP devices must be connected after servo amplifiers and I/O modules.



Large-Capacity Data Communications

CC-Link IE TSN is a high-speed, large-capacity 1 Gbps communications network that is capable of sending and receiving large amounts of data, such as manufacturing, quality, and control data from the production process. The network can transmit large recipe data or traceability data at high speeds without degrading the performance of servo system communications. In addition, Ethernet supported devices can directly and seamlessly connect to controllers on the same network line.



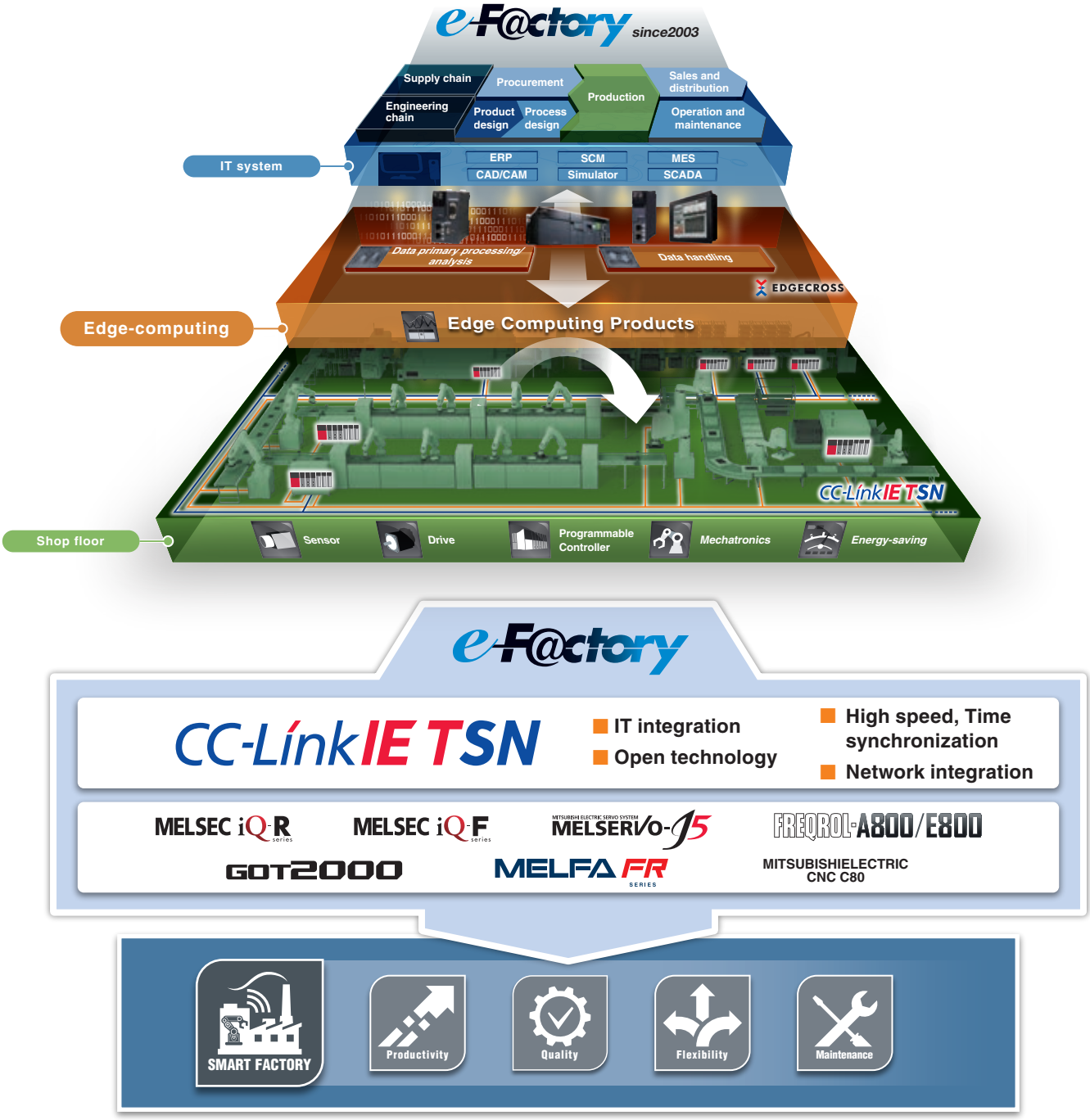
Network configuration example (includes functions and products planned for future support/release.)

Mitsubishi Electric Solutions

e-F@ctory

Maximize productivity and reduce costs with an intelligent smart factory solution

Intelligent smart factories utilize high-speed networks with large data bandwidths to meet current manufacturing needs. The combination of CC-Link IE TSN and Mitsubishi Electric's e-F@ctory solution ensures robust integration between IT and factory automation systems, providing an intelligent smart factory solution that reduces total cost while improving operations, production yield, and efficient management of the supply chain. e-F@ctory is the Mitsubishi Electric solution for adding value across the manufacturing enterprise by enhancing productivity, thereby simultaneously reducing maintenance and operating costs, and enabling the seamless flow of information throughout the plant. e-F@ctory uses a combination of factory automation and IT technologies in combination with various best-in-class partner products through its alliance program.



Mitsubishi Electric FA Global Website

Mitsubishi Electric Factory Automation provides a mix of services to support its customers worldwide, through a consolidated global website. It offers a selection of support tools and a window to its local Mitsubishi Electric sales and support network.

Global & Local Websites

Mitsubishi Electric Factory Automation
Global website
www.MitsubishiElectric.com/fa

Worldwide

Local websites

Global website

e-Manual Viewer

The e-Manual viewer is a next-generation digital manual offered by Mitsubishi Electric that consolidates factory automation products manuals into an easy-to-use package with various useful features integrated into the viewer. The e-Manual allows multiple manuals to be cross-searched at once, further reducing time for setting up products and troubleshooting.

■ Key features included

- One-stop database containing all required manuals, with local file cache
- Included with GX Works3 engineering software
- Also available in tablet version
- Easily download manuals all at once
- Multiple users can share the latest manuals and knowhow with document sharing function
- Directly port sample programs within manuals to GX Works3
- Downloaded manuals are usable offline

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Mitsubishi Electric AC Servo System MELSEC iQ-F series Motion Module FX5-40SSC-G/FX5-80SSC-G

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EC 98 J 2017
UKAS MANAGEMENT SYSTEMS 0051

ISO 9001
BUREAU VERITAS Certification
BUREAU VERITAS 1828
UKAS MANAGEMENT SYSTEMS 0008

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SV2103-2E 2103〈IP〉

New publication, effective March 2021