Create smart factories by using industrial IoT
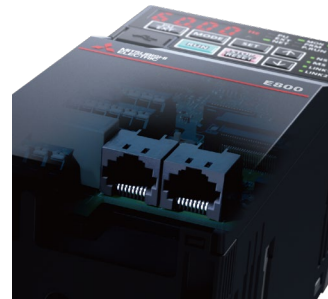
FREQROL-E800

Features

Real-time communication with the host IT system allows for centralized or remote monitoring of operations, helping to streamline production.

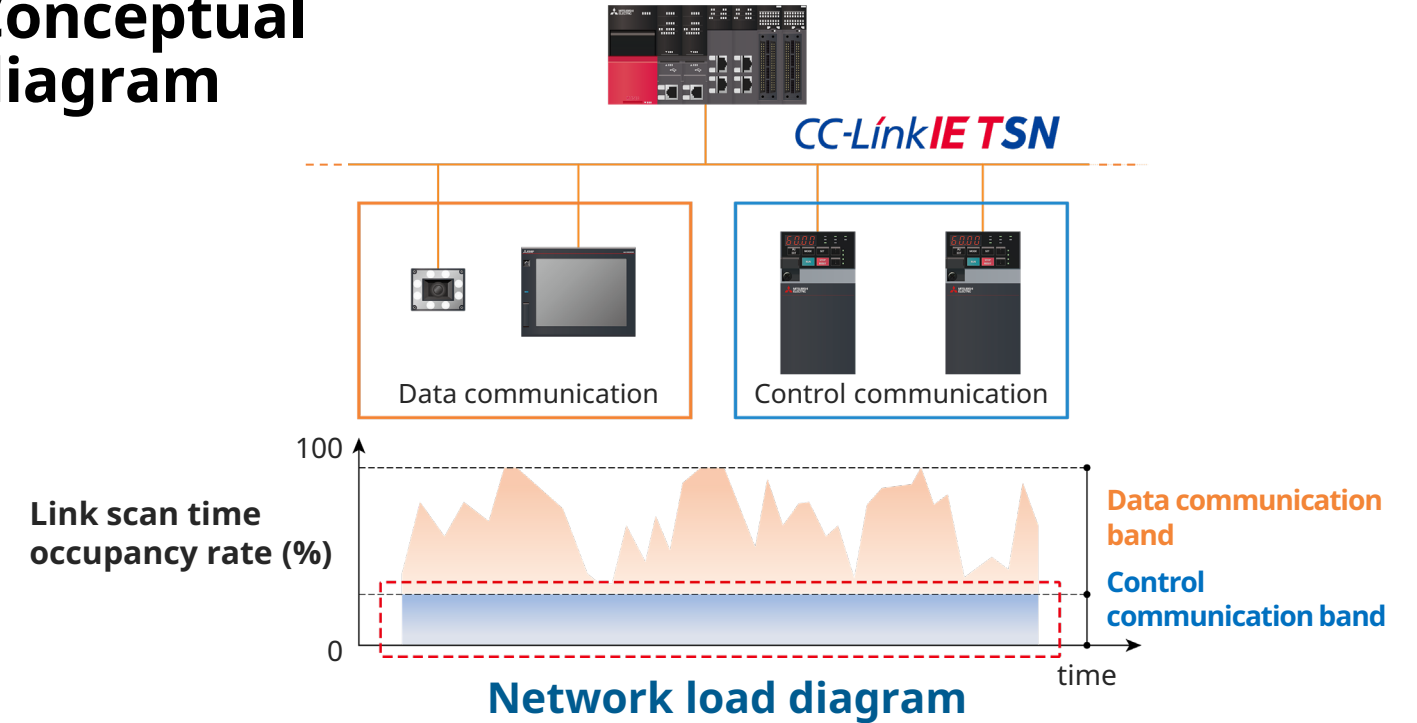## Utilizing CC-Link IE TSN to improve productivity

● Real-time production data collection is enabled by high-speed, stable communication, which contributes to productivity improvements

Dual Ethernet ports as standard enable flexible communication options

● The optional use of line topology, widens the choice of connection methods, and avoids using a switching hub

Conceptual diagram

CC-Link **IE TSN**

Data communication

Control communication

Link scan time occupancy rate (%)

Data communication band

Control communication band

time

Network load diagram

Line topology

Minimizes the total wiring length for large/extensive systems and eliminates the need for switching hubs, supporting the flexible installation of inverters in confined spaces.
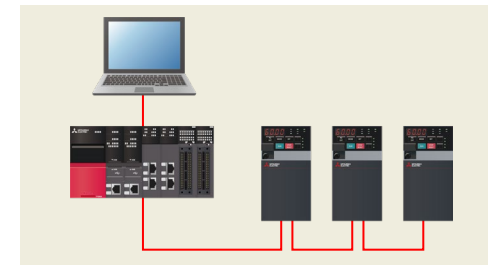
Star topology

Minimize the effect of faulty devices, allows their quick identification and fast system recovery.

Close collaboration between humans and FA devices
FREQROL-E800
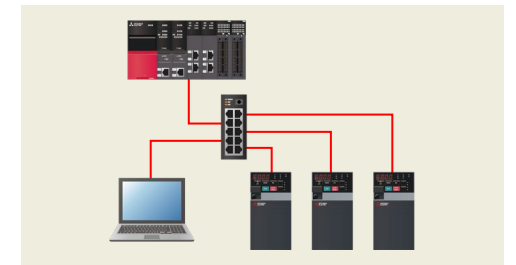
Features

- Functional safety features enable stable and safe system operation.

- FR-E846 inverters have a robust IP66/IP67 rating, which enables their installation near machines.
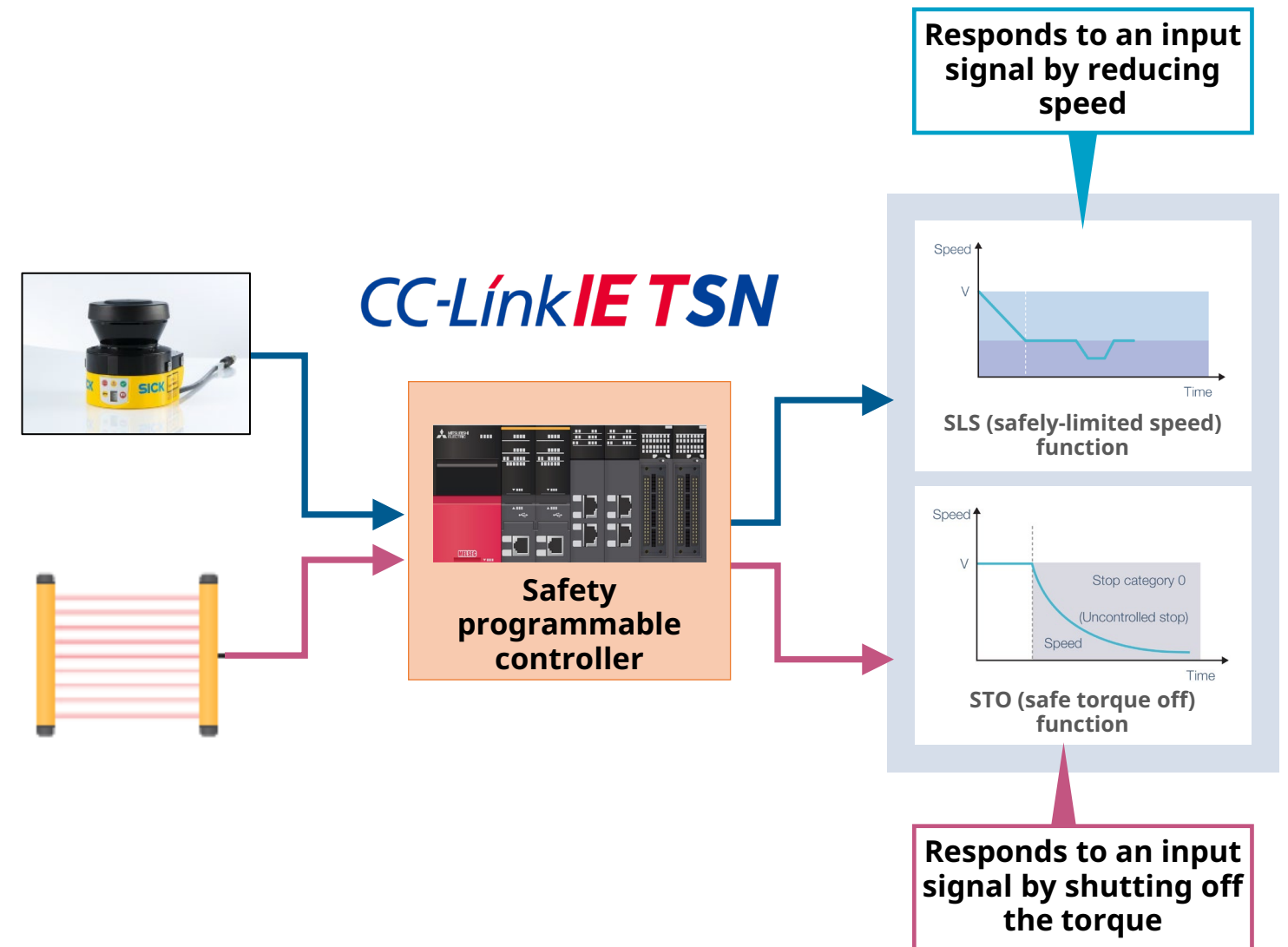
Configuring simple safety systems

● FREQROL-E800 inverters support safety communication directly, eliminating the need for a separate local safety communication device or complex wiring for both control and network cables.

Inverter installation outside of the enclosure

● Due to their compatibility with harsh conditions like high humidity (IP67) and dusty surroundings (IP66), corresponding inverters can be conveniently installed adjacent to machinery or in an accessible area without an additional enclosure.

Conceptual diagram

CC-Link **IE TSN**

SICK

Safety programmable controller

Responds to an input signal by reducing speed

Speed
V
Time
SLS (safely-limited speed) function

Speed
V
Stop category 0
(Uncontrolled stop)
Speed
Time
STO (safe torque off) function

Responds to an input signal by shutting off the torque

Artificial intelligence (AI) supports users in various ways

FREQROL-E800

Features

Smartphone and AI tools with extensive functions contribute to improvements in the initial startup, troubleshooting and maintenance of inverters.

Reducing downtime using AI diagnosis function

● AI fault diagnosis function is used to identify the cause of a fault, enabling faster troubleshooting.

Smartphone App aids inverter start-up/maintenance

● Using wireless networks from smartphones or tablets enabled with a mobile app, users can access inverters and accelerate startup and maintenance processes.

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Conceptual diagram

STEP 1 Fault occurs — Input: parameters, waveform data

STEP 2 Fault diagnosis

STEP 3 Fault cause
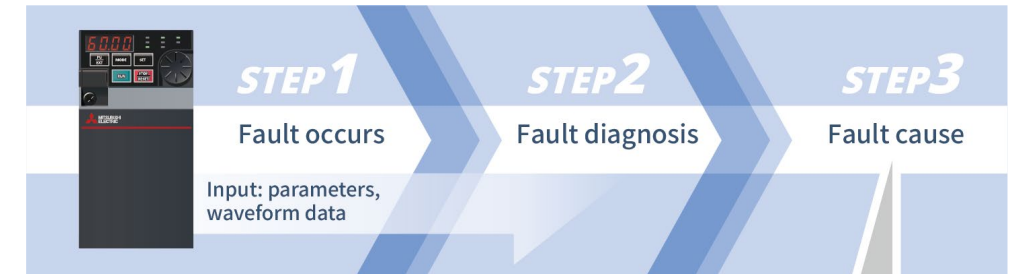
AI fault diagnosis result screen

Example: E.OC1 (Overcurrent trip during acceleration)

Operating status

Recognize inverters

Set Parameters

Check the fault history

Monitor

Outstanding drive performance facilities solution building

FREQROL-E800

Features

- Wide range of control methods support diverse applications/systems.

- Contributes to carbon neutrality through reduced energy consumption.

Multiple control methods

E800

- Wide range of control solutions including applications working with premium efficiency motors and PM motors.

Reducing the environmental burden

A800

- FREQROL-A800-SYN inverters support Mitsubishi Electric's new synchronous reluctance motors (SynRM) for enhanced energy efficiency
- Driving high-efficiency motors contributes to reduced energy consumption in production lines.

Conceptual diagram

■ Motor types/control supported by FREQROL-E800

● :Supported

	Control	Speed control	Torque control	Position control	Motor
Basic	V/F control	●	—	—	Induction motor (SF-PR, etc.)
	Advanced magnetic flux vector control	●	—	—	
	Real sensorless vector control	●	●	—	
High Performance	PM sensorless vector control	●	—	●	PM motor (MM-GKR, EM-A)
	Vector control (with plug-in option FR-A8AP E kit used)	●	●	●	Induction motor (SF-PR-SC, SF-V5RU)

■ Graph: Comparison of power consumption (MWh/year) and CO_2 emissions (t/year)

Power consumption (MWh/year)

Power consumption
About **11** % reduction!

About **6** % reduction!
Power consumption

CO_2 emission (t/year)

- IE1 motor: 39.3 / 21.8
- IE3 motor: 37.1 / 20.6
- RF-SR (IE5 motor): 35.0 / 19.4