G

Network-Compatible Products, Controller

Network-Compatible Products Overview

Modbus (RTU)

EtherCAT

Network Converters

Controller Overview

SCX11

Overview of Network-Compatible Products

Motor control via network communication can detect the status of the motor directly by data. This results in a shorter development period and increased reliability, maintainability of the equipment.
By expanding the network supported product line, Oriental Motor meets diversifying network environments of factory automation (FA).
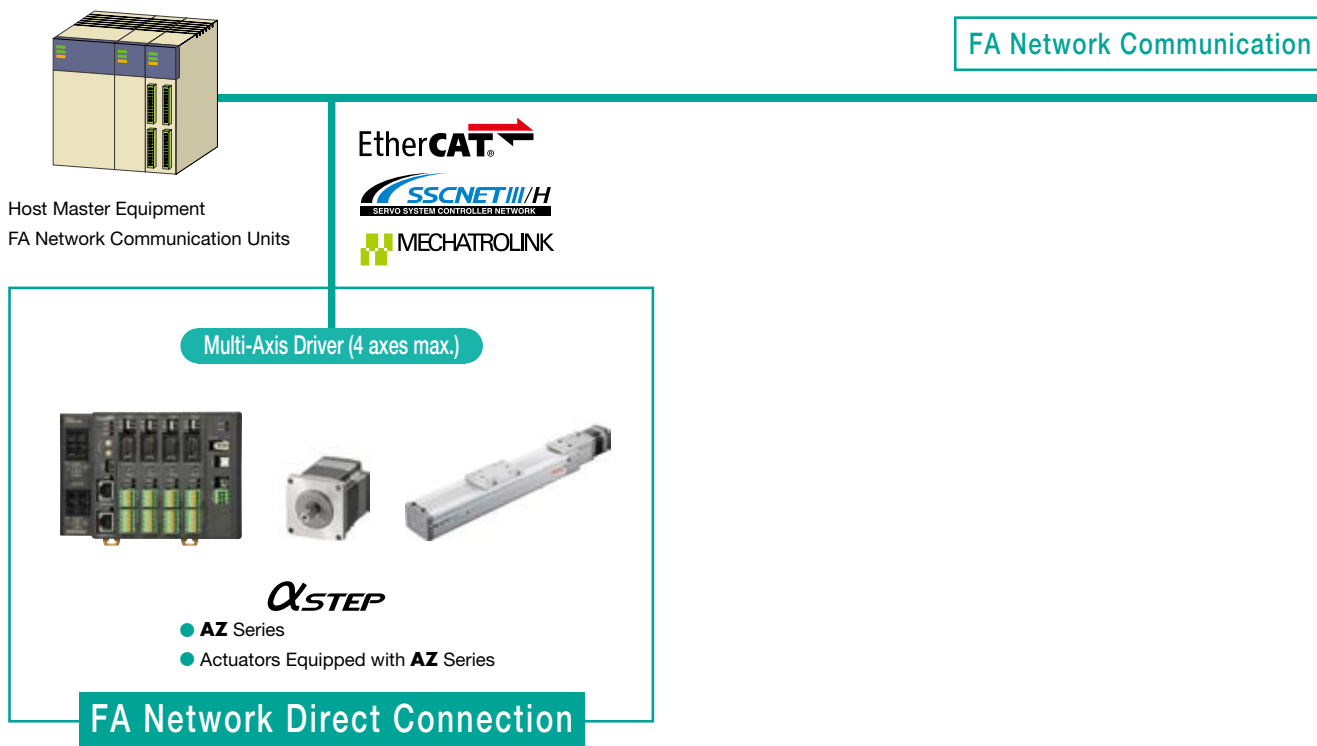
■Features

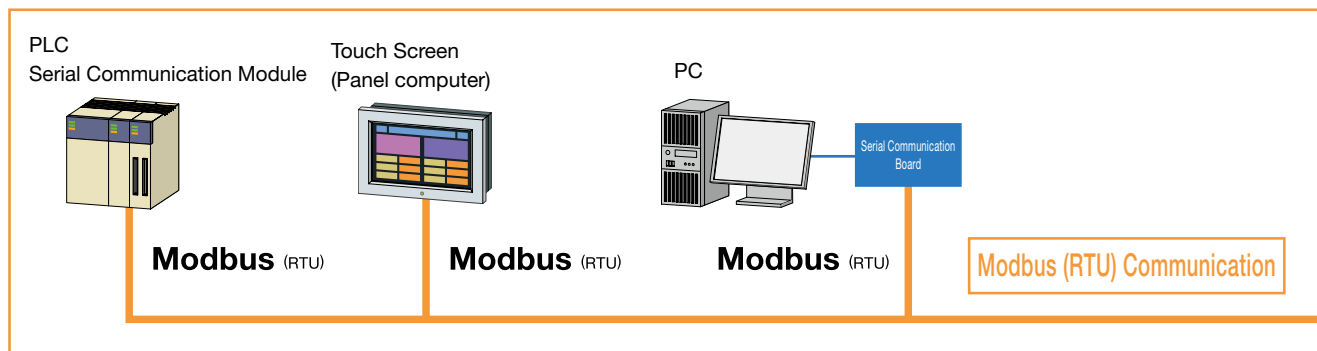Network-compatible products offer the following benefits:
- Simple wiring for smaller equipment size.
- Transmission distance can be extended up to several hundred meters. This makes wiring route design easier and enables products to be positioned in appropriate locations.
- Reduces the man-hours for the wiring process and the cost of wiring.
- Operating status is monitored by product I/O information, alarm, etc. This achieves improved maintainability of the system.
- Simple wiring makes wiring and checking process easier when replacing the product.

■Network Configuration and Product Line

Oriental Motor offers "FA network direct connection" and "gateway connection" products compatible with FA networks.

FA Network Communication

Host Master Equipment
FA Network Communication Units

EtherCAT.

SSCNETⅢ/H
SERVO SYSTEM CONTROLLER NETWORK

MECHATROLINK

Multi-Axis Driver (4 axes max.)

αSTEP
- **AZ** Series
- Actuators Equipped with **AZ** Series

FA Network Direct Connection

Modbus (RTU) Can be Used to Provide Control from a Range of Host Devices

PLC
Serial Communication Module

Touch Screen
(Panel computer)

PC

Serial Communication Board

Modbus (RTU)　　　**Modbus** (RTU)　　　**Modbus** (RTU)　　　Modbus (RTU) Communication

■Compatible Networks

Modbus (RTU)

Modbus is the open field network with Modbus Protocol installed. Modbus is used widely in the fields of factory and process automation because its protocol specification is open to the public and it is very simple.

＊Modbus is a registered trademark of Schneider Automation Inc.

EtherCAT.

EtherCAT is an Ethernet (IEEE802.3)-compliant, open, high-speed, industrial network system.

＊EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

CC-Link

CC-Link (Control & Communication Link) is the open field network promoted by CC-Link Partner Association.

＊CC-Link is a registered trademark of CC-Link Partner Association.

MECHATROLINK

MECHATROLINK-Ⅱ and MECHATROLINK-Ⅲ are motion networks promoted by MECHATROLINK Members Association.

＊MECHATROLINK is a registered trademark of MECHATROLINK Members Association.

SSCNETⅢ/H
SERVO SYSTEM CONTROLLER NETWORK

SSCNETⅢ/H is an open field network promoted by Mitsubishi Electric Corporation.

＊SSCNETⅢ/H is a registered trademark of Mitsubishi Electric Corporation

EtherCAT. CC-Link MECHATROLINK

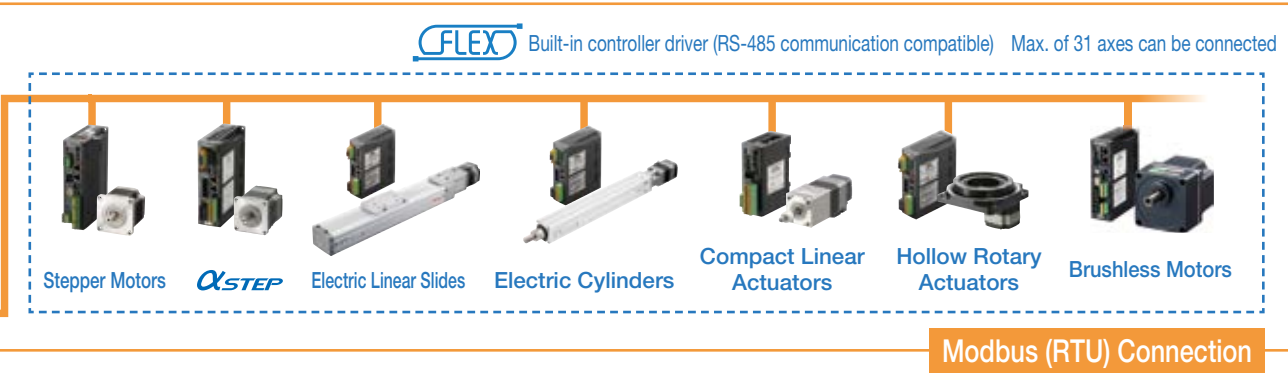Network Converters

FLEX Built-in controller driver (RS-485 communication compatible)
Max. of 16 axes can be connected

Stepper Motors	αSTEP	Electric Linear Slides	Electric Cylinders	Compact Linear Actuators	Hollow Rotary Actuators	Brushless Motors
● RKⅡ Series	● AZ Series ● AR Series	● EZS Series	● EAC Series	● DRS2 Series	● DGⅡ Series	● BLE Series

Gateway Connection

FLEX Built-in controller driver (RS-485 communication compatible) Max. of 31 axes can be connected

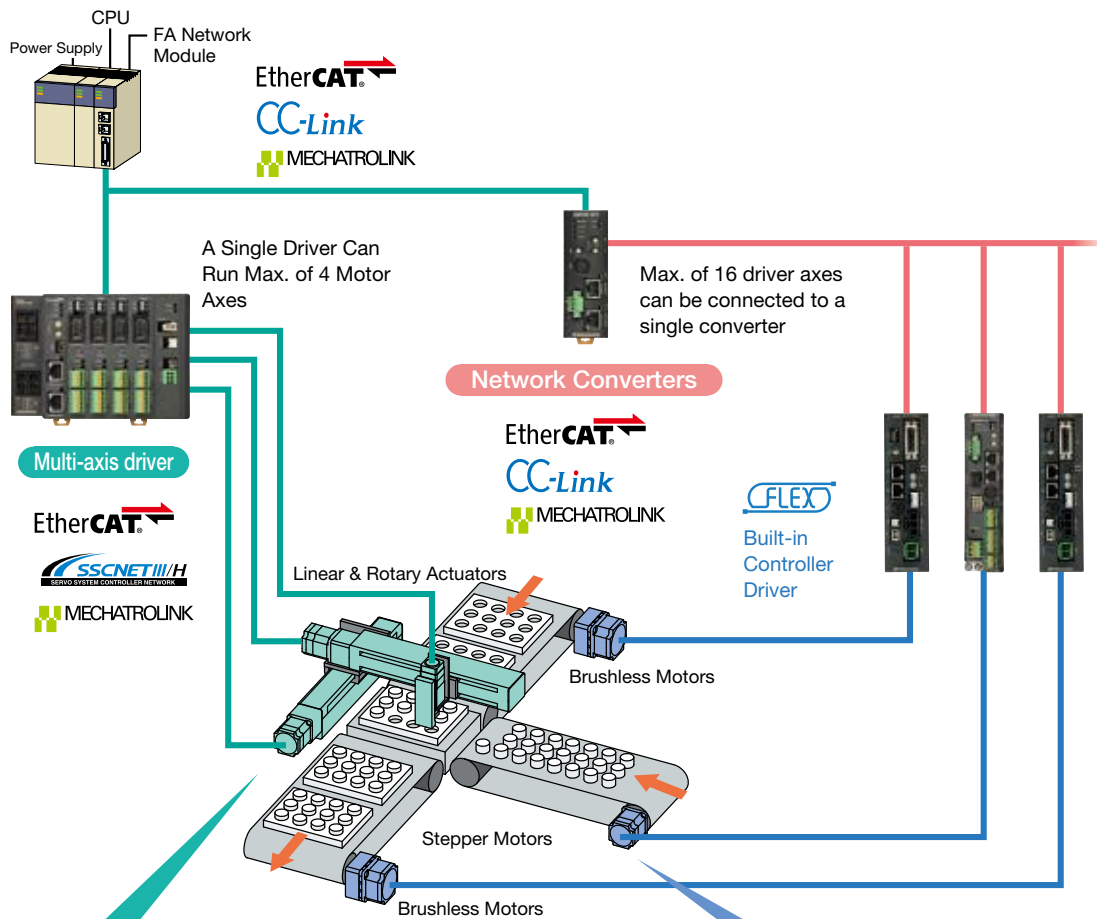| Stepper Motors | αSTEP | Electric Linear Slides | Electric Cylinders | Compact Linear Actuators | Hollow Rotary Actuators | Brushless Motors |

Modbus (RTU) Connection

■Examples of Using FA Network-Compatible Products

This section introduces how to use products depending on whether a "FA network direct connection" or "gateway connection" is used.

Common Features	FA Network Direct Connection Features	Gateway Connection Features
● Set operating data from the network, and overwrite data when needed ● Provides monitoring required for visualization	Allows use of motion system network communication ● High speed communication (conforms with network being used) ● Synchronous operation ● Linear and circular interpolation operation	Drive FLEX-compatible products over a network converter ● Operation is similar to I/O control as a slave of the FA network ● Multiple axes at a reasonable cost without the need to add PLC units

CPU
Power Supply — FA Network Module

EtherCAT
CC-Link
MECHATROLINK

A Single Driver Can Run Max. of 4 Motor Axes

Max. of 16 driver axes can be connected to a single converter

Network Converters

EtherCAT
CC-Link
MECHATROLINK

Multi-axis driver

EtherCAT
SSCNET III/H
MECHATROLINK

FLEX
Built-in Controller Driver

Linear & Rotary Actuators

Brushless Motors

Stepper Motors

Brushless Motors

[FA Network Direct Connection] Pick and Place X-Y-Z Axis

Choose a motion system network for applications requiring multi-axis synchronous operation, linear interpolation operation or high speed
● System Configuration Example (X-Y-Z axis)
· **AZ** Series multi-axis driver EtherCAT drive profile-compatible × 1
· **EZS** Series electric linear slides (with **AZ** Series) × 2
· **DRS2** Series compact linear actuator
  (with **AZ** Series) × 1

[Gateway Connection] Transportation Axis

Choose a field system network for FLEX-compatible product control (over a network converter) for synchronous operation applications or applications that do not require fast communication
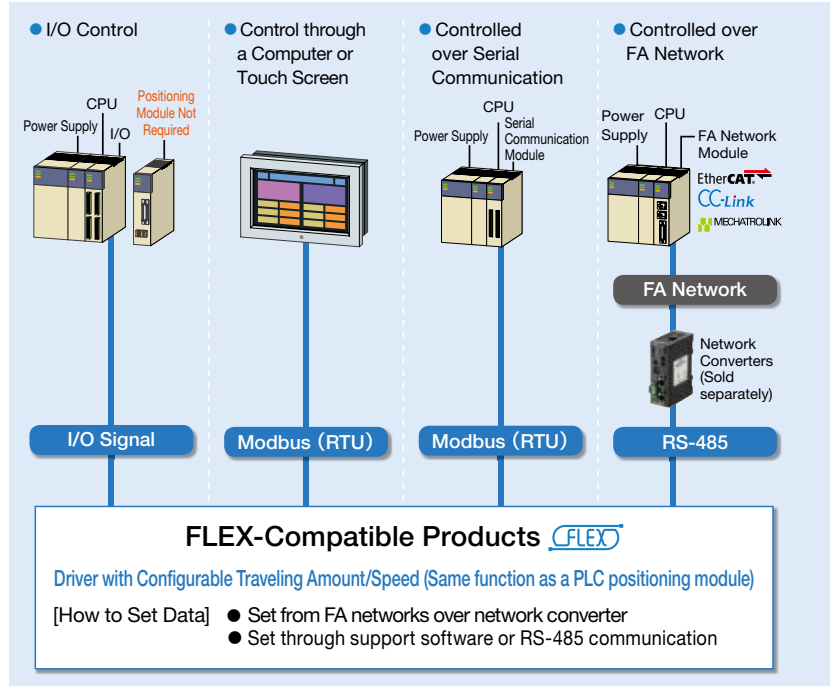● System Configuration Example (Transportation axis)
· EtherCAT-compatible network converter × 1
· **BLV** Series brushless motors × 2
· **RKII** Series FLEX-compatible stepper motor × 1

■ What is FLEX?

FLEX is a collective name for control motor products that support I/O control, Modbus (RTU) control, and FA network control via network converters.

■ Advantages of FLEX-Compatible Products

❶ These products enable simple connection and simple control, shortening the total lead time for system configuration.

❷ Operating data is set and stored in the driver, so no PLC positioning module is required. This can reduce system configuration complexity for multi-axis control.

● I/O Control
● Control through a Computer or Touch Screen
● Controlled over Serial Communication
● Controlled over FA Network

CPU
Power Supply I/O Positioning Module Not Required

CPU
Power Supply

CPU
Power Supply Serial Communication Module

Power Supply CPU FA Network Module
EtherCAT.
CC-Link
MECHATROLINK

FA Network

Network Converters (Sold separately)

I/O Signal | Modbus (RTU) | Modbus (RTU) | RS-485

FLEX-Compatible Products FLEX

Driver with Configurable Traveling Amount/Speed (Same function as a PLC positioning module)

[How to Set Data] ● Set from FA networks over network converter
● Set through support software or RS-485 communication

A Simple Tool for Setting and Changing All Data

● MEXE02 Support Software (Distributed free of charge)

Easily set data and confirm startup operation from a PC.
You can even copy and backup sensor logic settings when copying the same settings to other equipment.
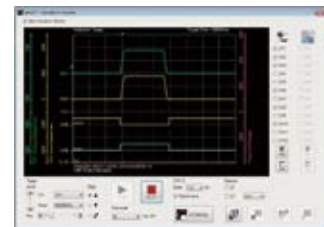
This popular tool makes it easy for anyone!

The Support Software can be downloaded from the Oriental Motor website.

Data teaching can be performed from the PC

Also includes a waveform monitor that can be used as an oscilloscope

● OPX-2A Control Module (Sold separately)

Allows you to set data and confirm operation on startup, without using a PC. Perfect for checking I/O, monitoring operation or changing settings in the field.

● Touch Screen (Commercially sold)

This allows you to overwrite operating data straight from a touch screen normally used as a monitor. Convenient for situations where settings must be changed while monitoring the operation status or changing the setup.
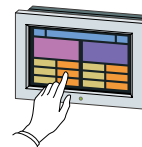
■System Configuration Examples
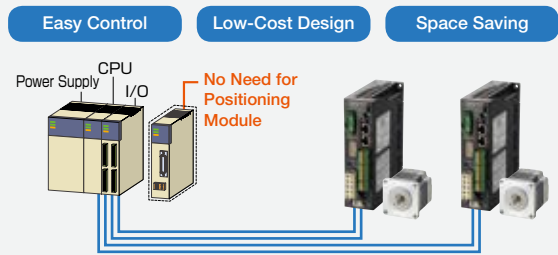
I/O Control

Set operating data (traveling amount, speed, etc.) in the driver ahead of time. Operating data is run by connecting directly with the PLC and inputting signals. No positioning module or pulse generator is required, saving space and simplifying the system.

| Easy Control | Low-Cost Design | Space Saving |

Another Possible Configuration ▶
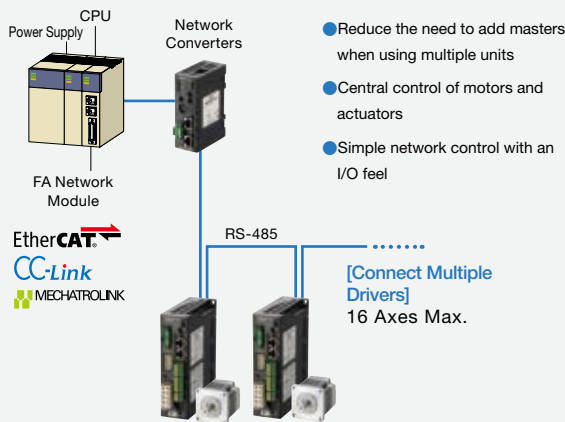

Switch Box

Use a switch instead of a PLC. Run operating data direct from I/O.

FA Network Control over Network Converter

This configuration uses a network converter to connect to an FA network. Operating data is set and operation commands are input from the network. A single converter can connect and control multiple motors, eliminating the need to add host masters and helping to reduce total costs.
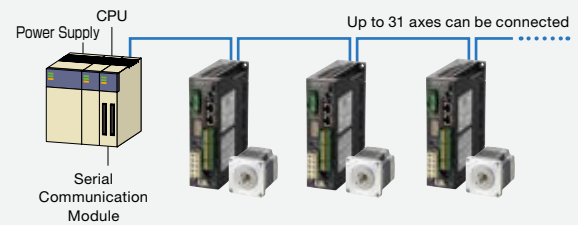
| Easy Control | Simple Wiring | Multi-Axis Control at Low Cost |

● Reduce the need to add masters when using multiple units
● Central control of motors and actuators
● Simple network control with an I/O feel

EtherCAT
CC-Link
MECHATROLINK

RS-485

[Connect Multiple Drivers]
16 Axes Max.

Modbus (RTU) Control

RS-485 communication can be used to set operating data and parameters and input operation commands. This is compatible with the Modbus (RTU) protocol, allowing for easy control from PLCs and other devices.

| Easy Control | Simple Wiring | Supports Serial Modules of Various Manufacturers |

Up to 31 axes can be connected

▼**Other Possible Configurations**

PC

Set and operate using an RS-485 communication board installed in a PC (instead of a PLC).

Touch Screen
(Panel computer)

Connect directly with a touch screen (instead of a PLC). Set operating data and parameter settings, check alarm history, conduct test runs and more—no PLC required.