Compact Variable Speed Drives
M1 Series

OMRON

The Integrated AC Drives Solution

Safety over EtherCAT®

PROFINET®

EtherNet/IP™

Modbus TCP/IP

New M1 Series The Integrated Global AC Drives Solution

System integration on EtherCAT® leads you to the stage where machine design is more flexible and higher efficiency, such as expanding motor options, reducing wiring, saving space, and integrated configuration by software tool. Safety functionality realizes a safe working environment, and the flexible network topology, like ring topology, makes your

Flexible and efficient engineering

Optimization of machine design

Machine design flexibility is enhanced by scalable Omron EtherCAT solutions.

Efficiency of assembly and configuration

Easy wiring and integrated configuration software tool for all of Omron automation components improve development efficiency of your team.

Safe and reliable manufacturing

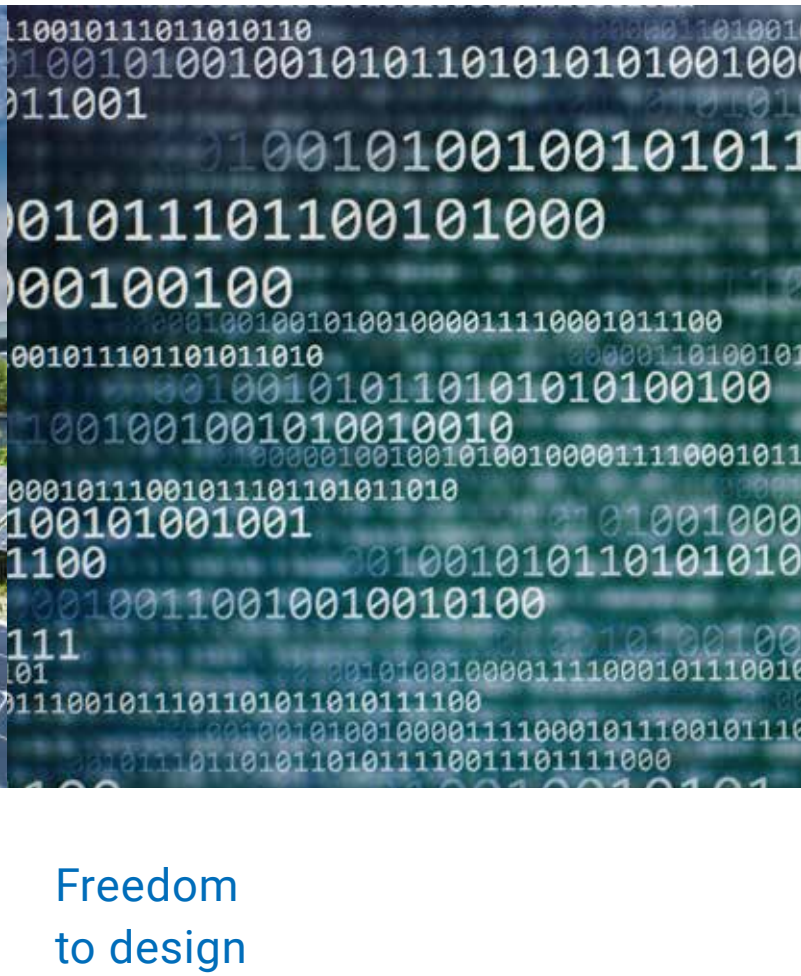
Safe working environment

The M1 Series realizes a safe working environment according to the customer requirement—not only alone but also together with Omron's scalable safety solutions.

Reliable production

We always consider that a safe working environment should not limit the production capability. Integrated safety solutions, such as sensors, controllers, drives and collaborative robots, enable reliable production.

production more robust.
Sustainability in production lines will be supported by highly efficient motors, energy saving functions, efficient power supply, and energy consumption monitoring on IoT technology.



Sustainable manufacturing

System digitalization

The networked system makes the machine closer to IoT technology. It enables to show machine condition on a dashboard at the factory floor or remotely.

Energy saving

In addition to functions in the drive itself, supporting highly efficient motors makes the machine flexible and efficient.

Freedom to design

Open EtherNet communication

Integration of your application could not be made easier. Besides a built-in EtherCAT model and a Standard model, the new M1-EMP model supports Ethernet communication for EtherNet/IP, PROFINET and Modbus TCP.

Customize Function

Customize your solution adding intelligence inside the drive, lowering the cost and building a decentralized system.

M1 Series

Flexible and efficient engineering

Optimization of machine design

Built-in EtherCAT allows you to integrate the M1 Series into any EtherCAT network.It saves total engineering cost.

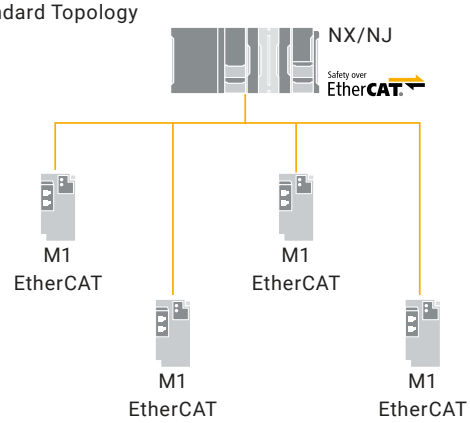
EtherCAT embedded as standard
FSoE (STO) support

Position control with built-in
encoder interface (ABZ, 1CH)

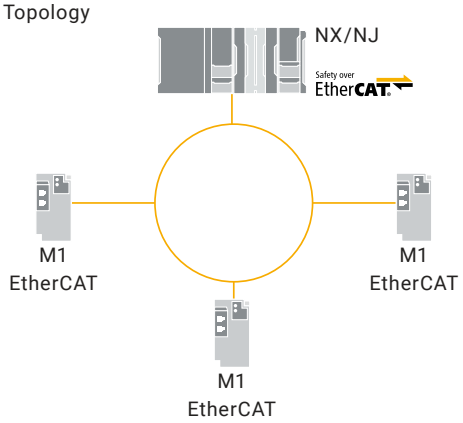
Flexible connection

The EtherCAT topology allows variable machine design, and the ring topology contributes to robust manufacturing.

Standard Topology



Ring Topology



Choices of motors

The M1 Series expands the choices of motors that can be used for the drive system. Standard induction motors, permanent magnet motors, direct drive PM motors (up to 128 poles), and special motors such as drum motors are supported. Motor parameters can be adjusted by autotuning function in Sysmac Studio.

Efficiency of assembly and configuration, Enhanced usability

One software for programming, configuration, simulation and monitoring.
User friendly and helpful GUI for drive configuration by Sysmac Studio Drive Edition.

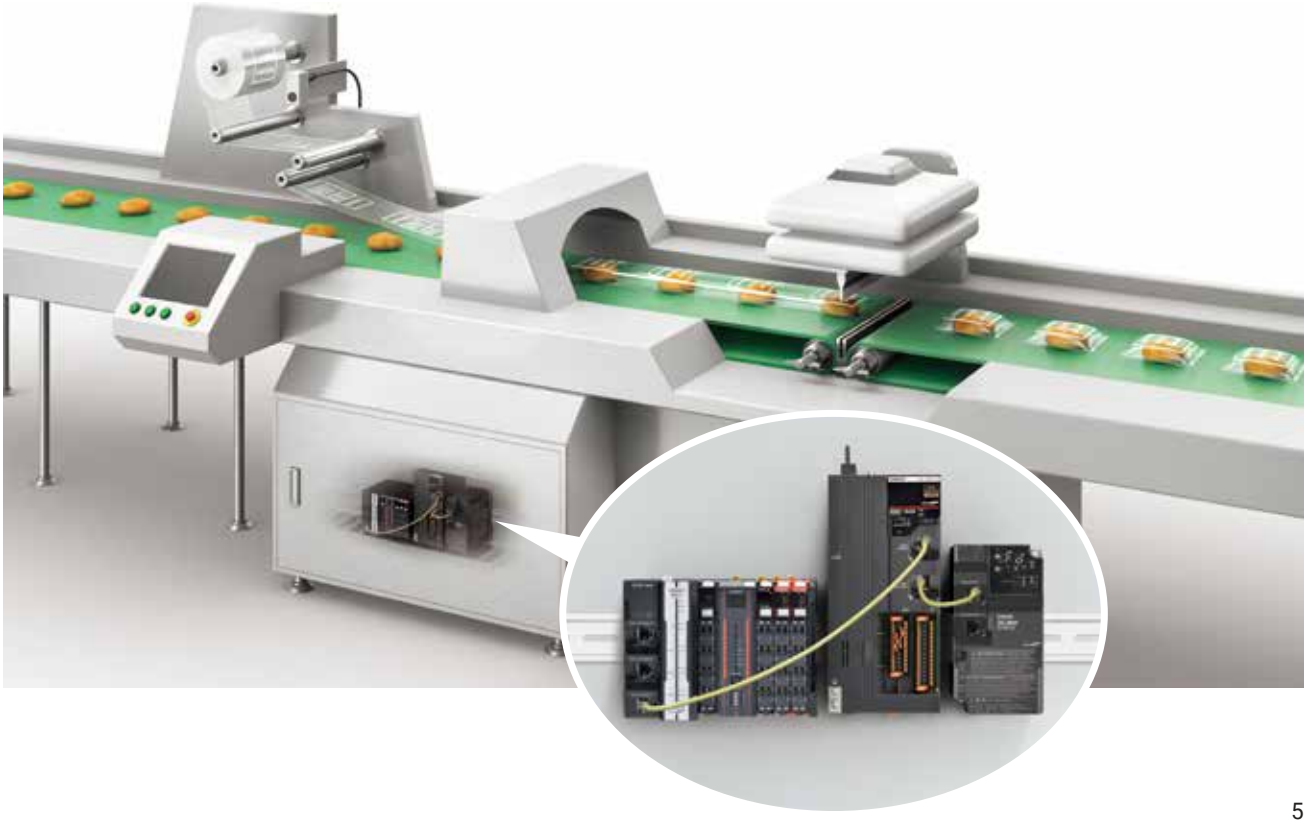
- Integrated configuration
- Setup & Tuning
- Wizards
- Data Trace Monitor
- Test Run
- Auto Tuning

New Free of Charge Software

“OMRON Drives App.” for Smartphone, Tablet and PC.
Copy and Paste Functionality and M1-EMP Protocol Configuration.

Reduce wiring, improve efficiency

Easy wiring by EtherCAT leads to quick installation and less mistakes. Also small footprint reduces the panel size.



Safe and reliable manufacturing

Safe working environment

Safety always comes first. Omron's scalable safety solutions allow you to design machine safety according to customer needs.
The M1 Series expands the flexibility of your safety solution.

Reliable production

Modern production lines should be safe and reliable at the same time.
Omron's integrated safety solution realizes a safe working environment for workers and high operational availability of each machine.

1 Safety Door Switches

D4SL-N Guard Lock Safety-door Switch

2 Safety Laser Scanners

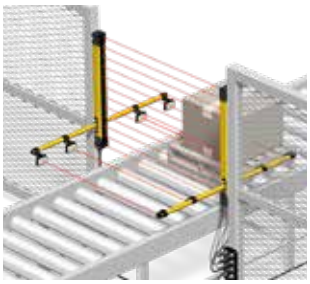
OS32C Safety Laser Scanner

Safety over EtherCAT
EtherNet/IP
CIP Safety

3 Programmable Safety Controller

Machine Automation Controllers
NX-Series NX1 CPU Units
NX-series Safety Controllers
NX-SL5/SI/SO Safety Control Units

Safety over EtherCAT



4 Safety Light Curtains

F3SG-SR/PG Series
Safety Light Curtains/Safety Multi-Light Beam

5 Safety Relay Units

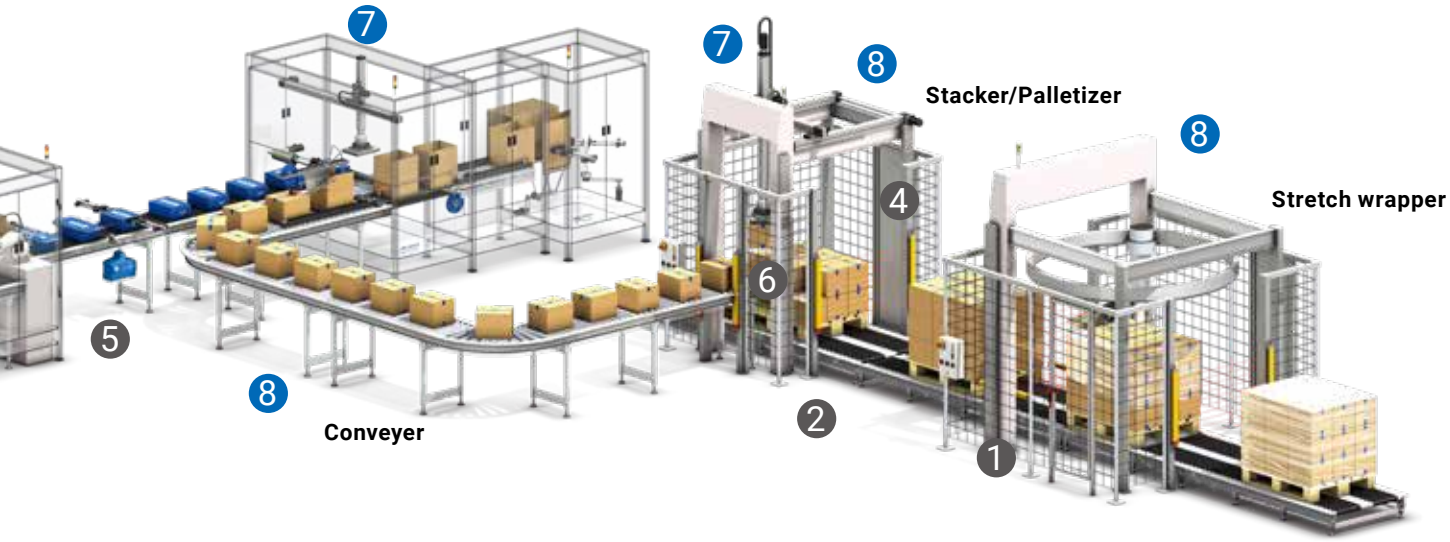
G9SA Safety Relay Units

6 Force-guided Relays

G7SA/G7S-E Relay with Forcibly Guided Contacts

7 Motion and Drives

AC Servo System
1S-series with Safety Functionality



8 Motion and Drives

The M1 Series expands the possibility to support a variety of machine types which require high level safety.

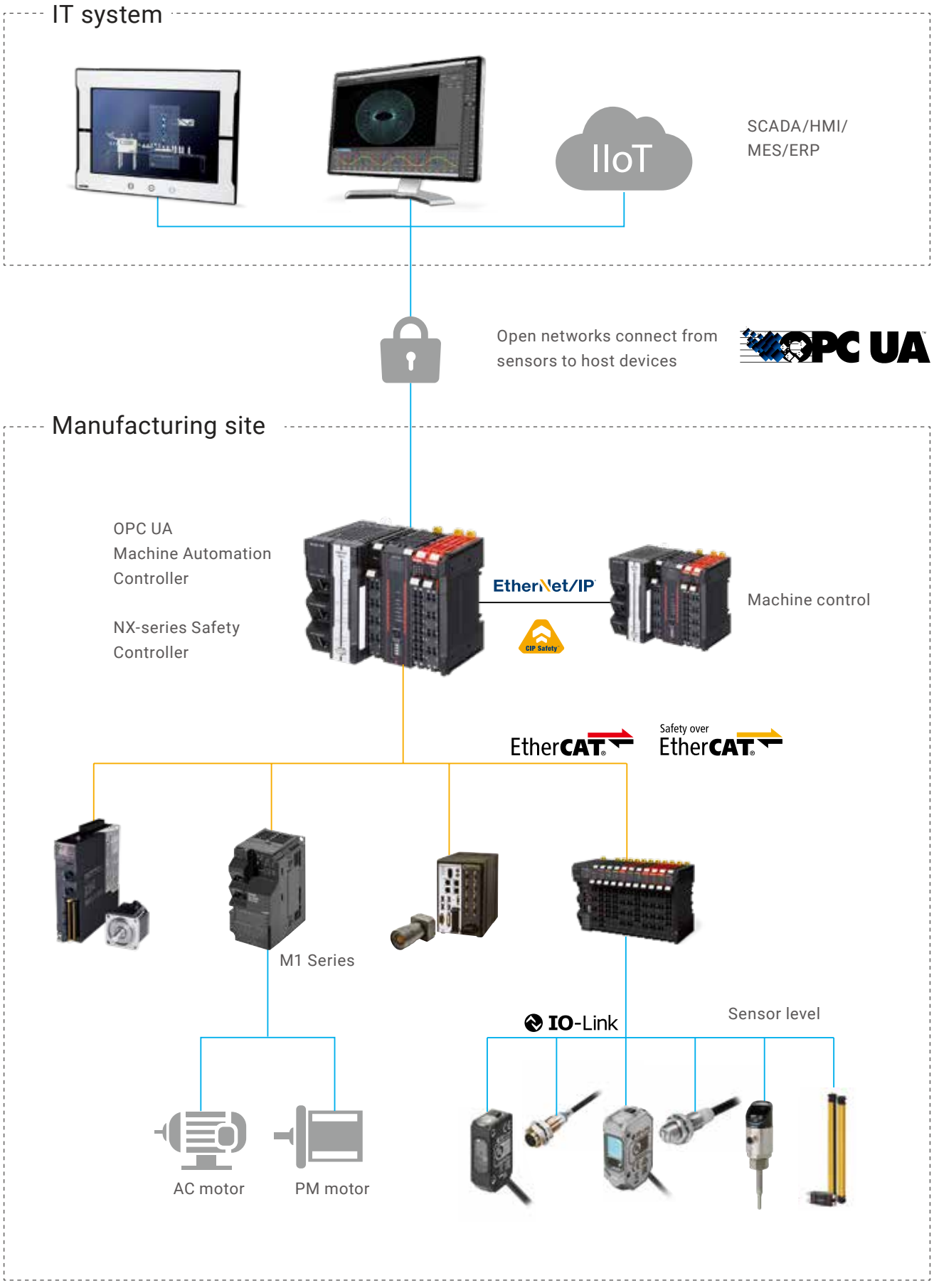
- STO (ISO 13849-1 Cat.3/PLe)
- FSoE
- Safety input (2CH) + EDM output

Safety over EtherCAT

SIL3 PLe FUNCTIONAL SAFETY

M1 Series

Sustainable manufacturing



System digitalization

The networked system makes the machine closer to IoT technology. Information of each device can be gathered from the upper layer controller and displayed as useful information to understand the condition of the production line. The information can be shown at the factory floor or monitored from a different location remotely, not only informing current conditions but also being useful for predictive maintenance.

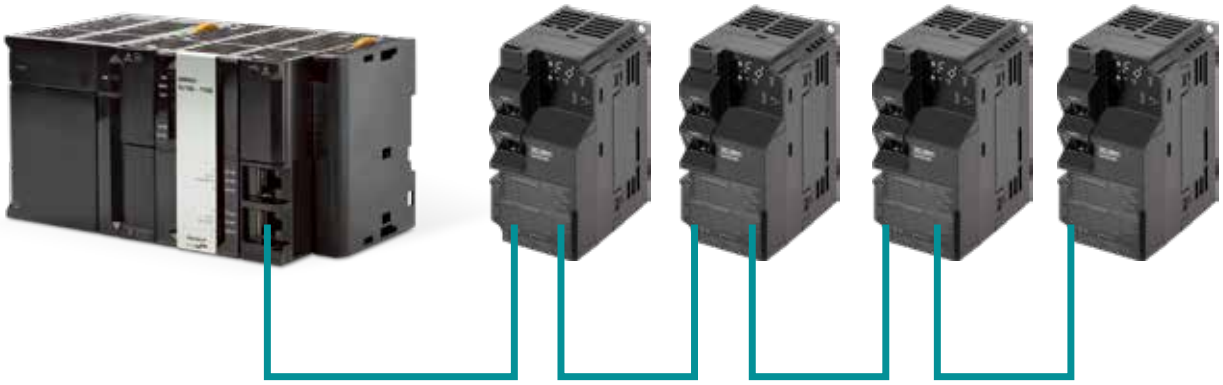
Energy saving

Almost half of world's electrical power consumption is by motors. Selecting the correct motor and optimizing the motion are the most effective way to save energy. The M1 Series has adaptability for various kinds of motors and ability to drive them.

Freedom to design

Open EtherNet communication

3G3M1-EMP Multiprotocol Ethernet communications type inverter allows information to be transferred seamlessly between several Ethernet-based networks with minimal configuration requirements.



Software selectable supported protocols :

- EtherNet/IP
- PROFINET IO
- Modbus-TCP

Hardware

- Duplex Mode - 10/100Mbps
- Cyclic message: Pre-configured or Free Mapping
- Noncyclic message: Full parameter access
- External 24Vdc backup

Network Topology Supported

Protocol	Ethernet Port		Network Topology		
	Port 1	Port 2	Star	Linear	Ring
EtherNet/IP	Supported	Supported	Supported	Supported	N/A
PROFINET IO	Supported	N/A	Supported	N/A	N/A
Modbus-TCP	Supported	Supported	Supported	Supported	N/A

Customize Function

The M1 inverter features easy Plug-In Development, enabling built-in custom functionality that provides advanced "thinking" - functioning like a brain inside the inverter to power intelligent processes.

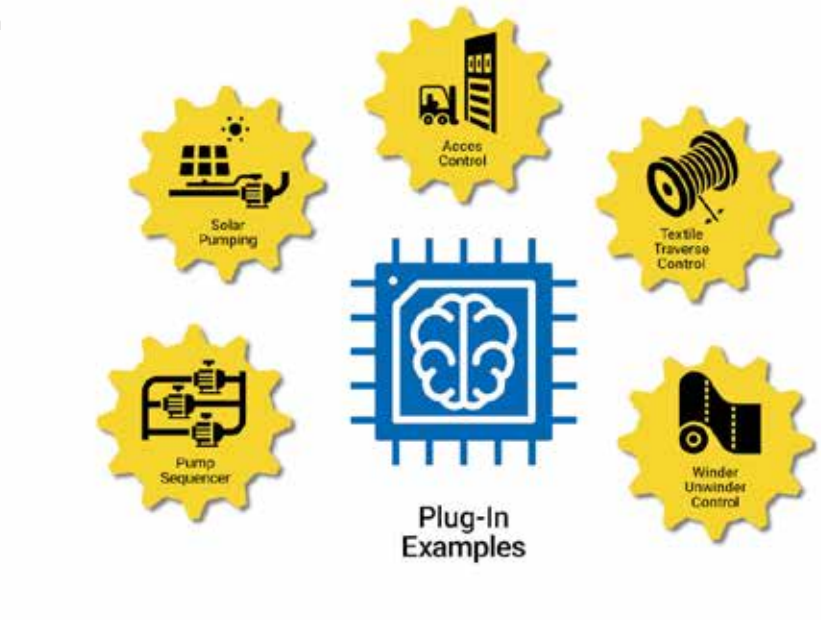
Customize your solution adding intelligence inside the drive, lowering the cost and building a decentralized system.

For both, simple and complex control system, reduce the program load of the PLC and perform a faster and precise motion by local control.

Provide an optimized UI, parameter and function for your custom machine, reducing commissioning time, reducing mistakes and allowing manual-less manipulation during operation and trouble shooting.

Some examples of applications:

- Winder/Unwinder
- Traverse Function
- Access Control
- Pump Sequencer
- Solar Pump



M1 Series lineup

Built-in EtherCAT Communications Type

- Power supply and capacity
  Single-phase 200 V: 0.1 to 3.7 kW
  Three-phase 400 V: 0.4 to 22 kW
  Three-phase 200 V: 0.1 to 22 kW
- High starting torque: 200% at 0.5 Hz
- Safety function: STO (Safe Torque Off), PLe/SIL3
- Safety over EtherCAT (FSoE)
- Built-in ABZ phase
- Built-in EtherCAT communication

Standard Type

- Power supply and capacity
  Single-phase 200 V: 0.1 to 3.7 kW
  Three-phase 400 V: 0.4 to 22 kW
  Three-phase 200 V: 0.1 to 22 kW
- High starting torque: 200% at 0.5 Hz
- Safety function: STO (Safe Torque Off), PLe/SIL3
- Built-in ABZ phase

Built-in Ethernet Communication Type

- Power supply and capacity
  Single-phase 200 V: 0.2 to 3.7 kW
  Three-phase 400 V: 0.4 to 22 kW
  Three-phase 200 V: 0.2 to 22 kW
- High starting torque: 200% at 0.5 Hz
- Built-in ABZ phase
- Built-in Ethernet communication
- Safety function: STO (Safe Torque Off), PLe/SIL3

Automation platform

Machine Controller

The NX-series Safety Network Controller connected with the NX1 Machine Controller enables the use of both EtherNet/IP + CIP Safety and EtherCAT + FSoE at the same time.

NJ/NX Series

- Logic sequence, Motion, Safety, Robotics and Database connection functionality
- Scalable motion control: CPUs from 2 up to 256 axes
- IEC 61131-3 controller
- PLCopen Function Blocks for Motion Control and Safety
- Advanced motion with Robotics functionality
- Built-in EtherCAT and EtherNet/IP ports

Motion

1S Motion Safety servo

- Servo drive for rotary motors
- Up to 3 kW
- Battery-free absolute multi-turn encoder
- Advanced safety functions: STO/SS1/SS2/SOS/SLS/SLP/SDI/SBC
- Servo drive for rotary motors with one cable connection

1S Servo System - General purpose servo

- Servo drive for rotary motors
- Up to 15 kW
- Battery-free absolute multi-turn encoder
- Safty function: STO

APP

OMRON Drives App

- Free Tool for Smartphone, Tablet and PC
- Available for download in Microsoft Store and Google Play Store
- Copy and Paste Functionality
- M1-EMP Protocol Configuration

Software

Sysmac Studio, the integrated software

- One single tool for logic sequence, motion, safety, robotics, vision and HMI
- Fully compliant with open standard IEC 61131-3
- PLCopen Function Blocks for Motion and Safety
- Supports Ladder, Structured Text and In-Line ST programming with a rich instruction set
- CAM editor for easy programming of complex motion profiles
- Database Connectivity Function Block library

MEMO

MEMO

Would you like to know more?

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