

NEW

OMRON

N-Smart

Sensor Communications Unit

Distributed Sensor Unit

E3NW

Revolutionize the Workplace

Introducing the Next-generation E3NW Sensor Networking Units

Introduction

Lower Costs

Commissioning

Less Time

Operation

Higher Productivity



Sensor Communications Unit
E3NW-ECT



Distributed Sensor Unit
E3NW-DS

BEST
PRICE

realizing

EtherCAT

From Introduction to Commissioning and Operation

Revolutionize the Workplace

The Next-generation Sensor Networking Units

E3NW

A new Distributed Sensor Unit appears as a slave to the Sensor Communications Unit master. Use these two next-generation Sensor Networking Units to connect distributed N-Smart Sensors to an open-network controller. Implementing a Sensor Network solves many workplace issues from introduction to commissioning and operation.



Point

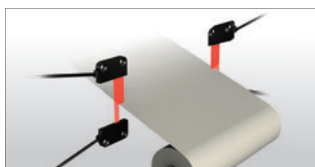


Industry's Fastest ^{*2} Reading Time for Present Values

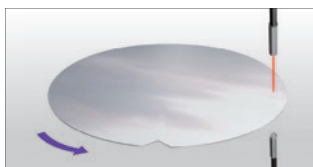
Ideal for high-speed workpieces and high-precision position feedback control.

Ultra-high speed, such as 0.2 ms for I/O data between the Sensor Amplifier Units and Sensor Communications Unit, 1 ms for present value data. A network also allows you to easily control applications that previously required Analog Units. At 5 ms, high speed is also provided between the Distributed Sensor Units and Sensor Communications Unit.

^{*2.} As of February 2013. According to OMRON investigation.



Detecting Snaking in Wrapping Sheets



Detecting Wafer Notch Positions

I/O data: **0.2 ms**
Present value data: **1 ms**



I/O data and present value data: **5ms**

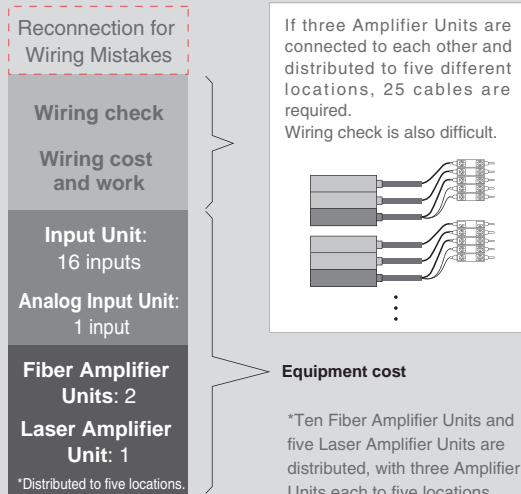


Radically Reduce Manufacturing Costs

Even if you implement a Sensor Network, the cost of introduction is greatly reduced.

Previously (without a Sensor Network)

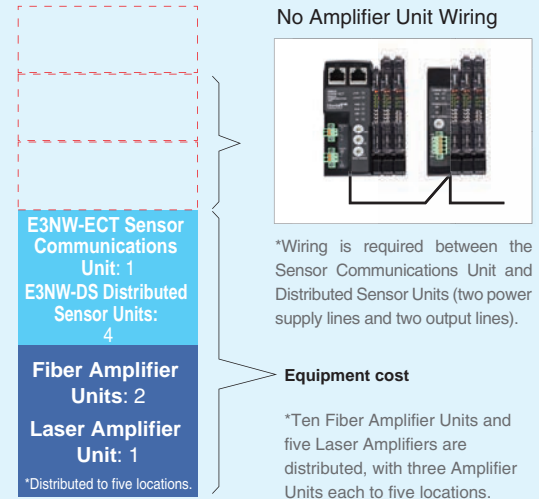
Equipment cost + Wiring cost and wiring work +
Wiring check + Possible reconnection for
wiring mistakes



Equipment cost, wiring cost, and wiring time are all required for distributed placement. If any wiring mistakes occur, the Amplifier Units must be checked individually, resulting in a high construction cost.

With the E3NW

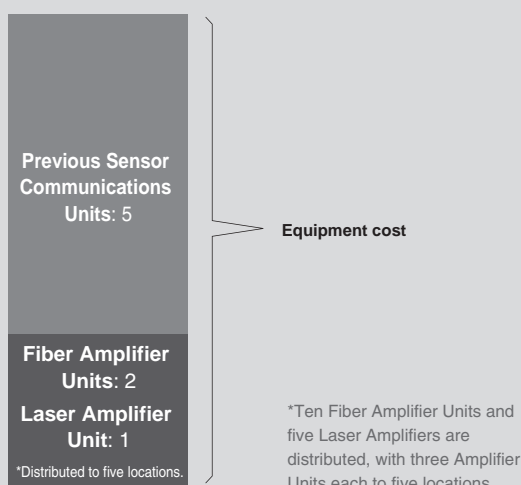
Large reduction in equipment cost
+ **Reduced wiring and reduced work**



Implementing a network is possible with the current distributed placement without increasing the cost. There is less wiring so wiring cost and work are also reduced. Commissioning systems overseas and reconnection by the user are both easier.

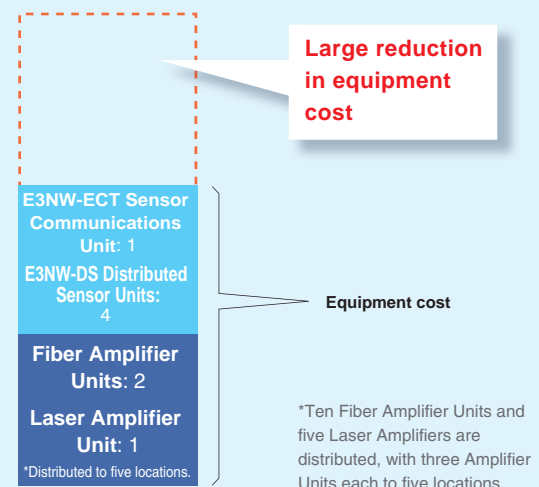
Greatly Reduce Introduction Cost in Comparison to Previous Sensor Networks

Previous Sensor Networks



Distributed placement is used for the Sensor Amplifier Units, so a Sensor Communications Unit is required in each location. Previous Sensor Communications Units were expensive, which drove up equipment costs.

With the E3NW



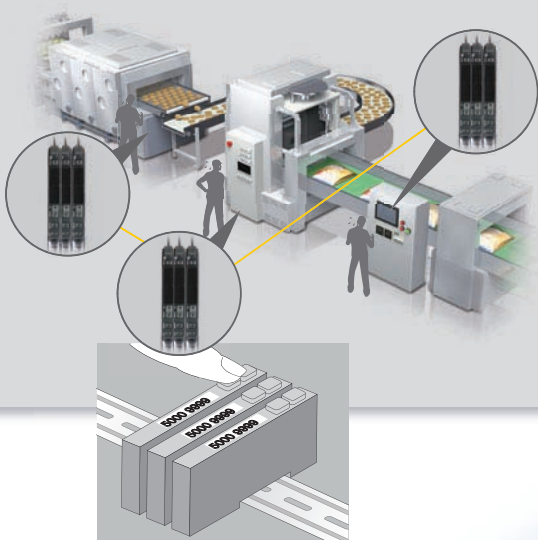
The cost makes Sensor Communications Unit introduction easier than for previous Units. And the release of the reasonably priced Distributed Sensor Unit means the cost of new introduction is greatly reduced even more.

Radically Reduce System Commissioning Time

Easy Batch Setting from a Touch Panel

Previously (without a Sensor Network)

When Sensor Amplifier Units must be distributed to narrow locations, the Units had to be set individually, creating extensive work and requiring time to make the settings.



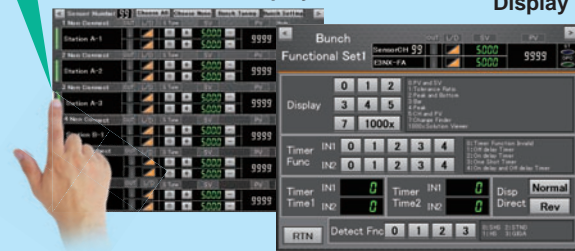
With the E3NW

Even if the Sensors are distributed, you can set all of them from a touch panel. It's easy and quick to set all of them from the same location.

Press the button for the Amplifier Unit to set.

Initial Display

Settings Display



*The displays are conceptual illustrations.

Line Changeovers Are Also Easy with a Setup Backup Function

Previously (without a Sensor Network)

The Sensor Amplifier Units must be set whenever the workpiece changes. Sometimes adjustments are difficult and the setup is time consuming, which can reduce productivity.



With the E3NW

The setup data is saved in the Controller. If the workpiece changes, just select the correct setup. This also makes Amplifier Unit replacement easier and more reliable should it ever be necessary.

Function Settings Display

Setup Selection Display



*The displays are conceptual illustrations.

Radically Increase Machine Productivity

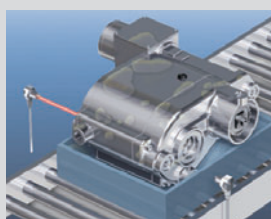
Monitoring for Predictive Maintenance

Previously (without a Sensor Network)

In harsh environments, Sensors can become dirty, resulting in malfunctions.



Detection in Dusty Environment



Detection in Oily Environment

With the E3NW

If Sensor status is monitored in realtime, maintenance is possible before the Sensor malfunctions.

Initial Display



Trend Graph



*The displays are conceptual illustrations.



You can use E3NW communications to create controller programming or touch panel displays to perform all of the settings and monitoring that are described on pages 4 and 5. Display samples for OMRON NS-series Programmable Terminals (touch panels) and sample programming for OMRON NJ-series Controllers are available. For details, please contact your OMRON sales representative.

Reduced Downtime When Troubles Occur

Previously (without a Sensor Network)

If the equipment stopped due to a problem with a Sensor, time was required to isolate the Sensor where the problem occurred and find the cause.



With the E3NW

You can immediately find the location, the Sensor, and the type of error to quickly recover normal operation and reduce downtime.

Initial Display for Errors



*The displays are conceptual illustrations.

Sensor Communications Unit



CompoNet-compatible and CC-Link-compatible products are also available.
Refer to your OMRON website for details.

| Type | Model |
|---|-----------|
| Smart Fiber Amplifier Unit | E3NX-FA0 |
| Smart Fiber Amplifier Unit (Infrared models) | E3NX-FAH0 |
| Smart Fiber Amplifier Unit (2-channel models) | E3NX-MA0 |
| Color Fiber Amplifier Unit | E3NX-CA0 |
| Smart Laser Amplifier Unit | E3NC-LA0 |
| Smart Laser Amplifier Unit (CMOS type) | E3NC-SA0 |
| | E2NC-EA0 |
| Smart Proximity Amplifier Unit | E2NC-EA10 |
| | E2NC-EA40 |
| Contact-Type Smart Amplifier Unit | E9NC-TA0 |

| Item | Type Model | Sensor Communications Unit | Distributed Sensor Unit |
|--|--|----------------------------|---|
| | | E3NW-ECT | E3NW-DS |
| Connectable Sensor Amplifier Units | N-Smart | | |
| | Smart Fiber Amplifier Unit: | E3NX-FA0 | |
| | Smart Fiber Amplifier Unit (Infrared models): | E3NX-FAH0 | |
| | Smart Fiber Amplifier Unit (2-channel models): | E3NX-MA0 | |
| | Color Fiber Amplifier Unit: | E3NX-CA0 *1 | |
| | Smart Laser Amplifier Unit: | E3NC-LA0 | |
| | Smart Laser Amplifier Unit (CMOS type): | E3NC-SA0 | |
| | Smart Proximity Amplifier Unit: | E2NC-EA0 | |
| | | E2NC-EA10 | |
| | E2NC-EA40 | | |
| | E9NC-TA0 *2 | | |
| Power supply voltage | 24 VDC (20.4 to 26.4 V) | | |
| Power and current consumption | 2.4 W max. (Not including the power supplied to Sensors.), 100 mA max. (Not including the current supplied to Sensors.) | | 2 W max. (Not including the power supplied to Sensors.), 80 mA max. (Not including the current supplied to Sensors.) |
| Indicators | L/A IN indicator (green), L/A OUT indicator (green), PWR indicator (green), RUN indicator (green), ERROR indicator (red), and SS (Sensor Status) indicator (green/red) | | RUN indicator (green) and SS (Sensor Status) indicator (green/red) |
| Vibration resistance (destruction) | 10 to 60 Hz with a 0.7-mm double amplitude, 50 m/s ² at 60 to 150 Hz, for 1.5 hours each in X, Y, and Z directions | | |
| Shock resistance (destruction) | 150 m/s ² for 3 times each in X, Y, and Z directions | | |
| Ambient temperature range | Operating: 0 to 55°C; *3 Storage: -30 to 70°C (with no icing or condensation) | | |
| Ambient humidity range | Operating and storage: 25% to 85% (with no condensation) | | |
| Maximum connectable Sensors *4 | 30 (when connected to an OMRON NJ-series Controller, 16 for E2NC-EA10/EA40) | | 10 |
| Maximum connectable Distributed Sensor Units | 8 | | — |
| Insulation resistance | 20 MΩ min. (at 500 VDC) | | |
| Dielectric strength | 500 VAC at 50/60 Hz for 1 minute | | |
| Mounting method | 35-mm DIN track - mounting | | |
| Weight (packed state/Unit only) | Approx. 185 g/approx. 95 g | | Approx. 160 g/approx. 40 g |
| Materials | Polycarbonate | | |
| Accessories | Power supply connector, E3NW-DS Communications Connector, DIN Track End Plates (2), and Instruction Manual | | Power supply/communications connector, DIN Track End Plates (2), ferrite cores (2), and Instruction Manual |

*4. This is the total number of Sensors that can be connected to the Sensor Communications Unit and Distributed Sensor Units.

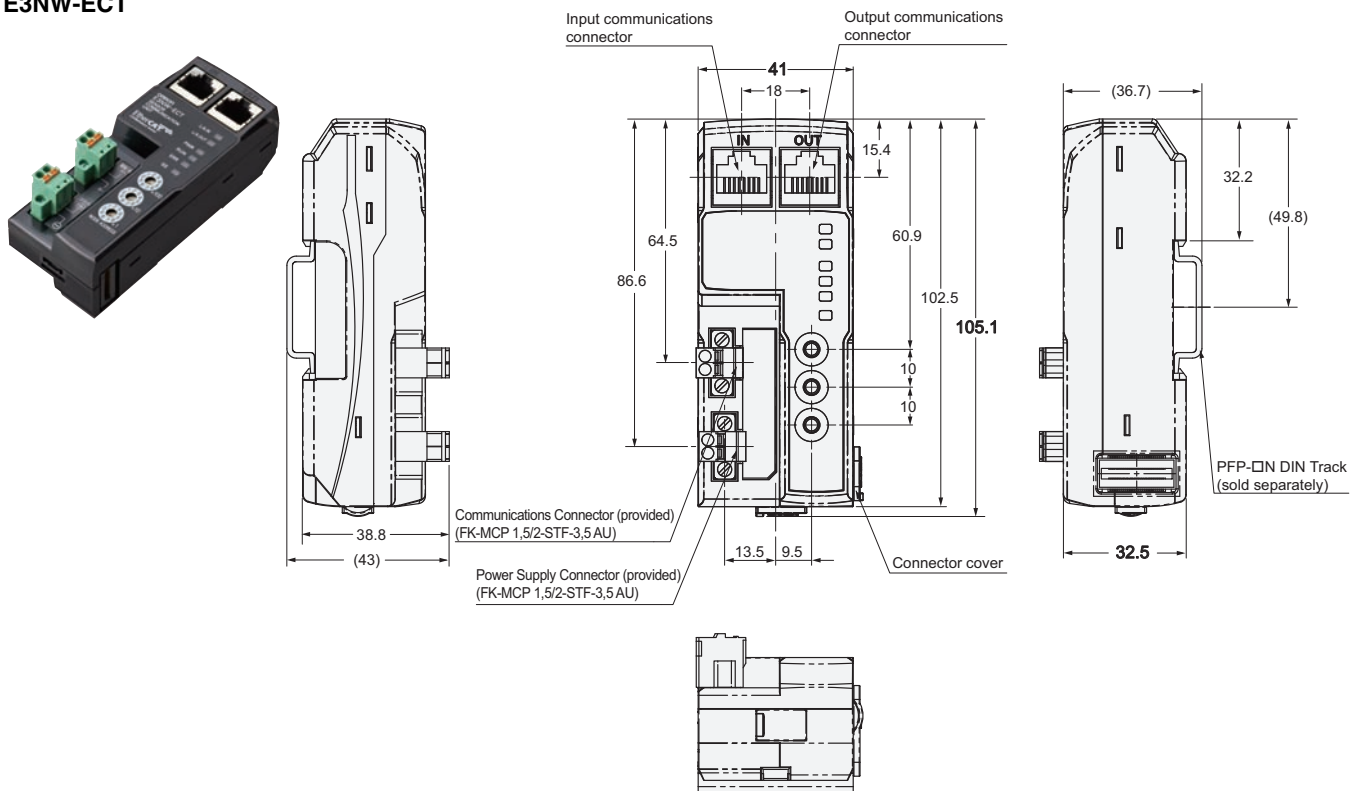
| Item | Specification |
|-----------------------------|--|
| Communication protocol | Dedicated protocol for EtherCAT |
| Modulation | Base band |
| Baud rate | 100 Mbps |
| Physical layer | 100BASE-TX (IEEE 802.3u) |
| Topology | Daisy chain |
| Communications media | STP category 5 or higher |
| Communications distance | Distance between nodes: 100 m max. |
| Noise resistance | Conforms to IEC 61000-4-4, 1 kV or higher |
| Node address setting method | Set with decimal rotary switches or software* ¹ |
| Node address range | 000 to 192* ² |

*2. The range depends on the EtherCAT master that is used. Refer to the *E3NW-ECT EtherCAT Sensor Communications Unit Operation Manual* for details.

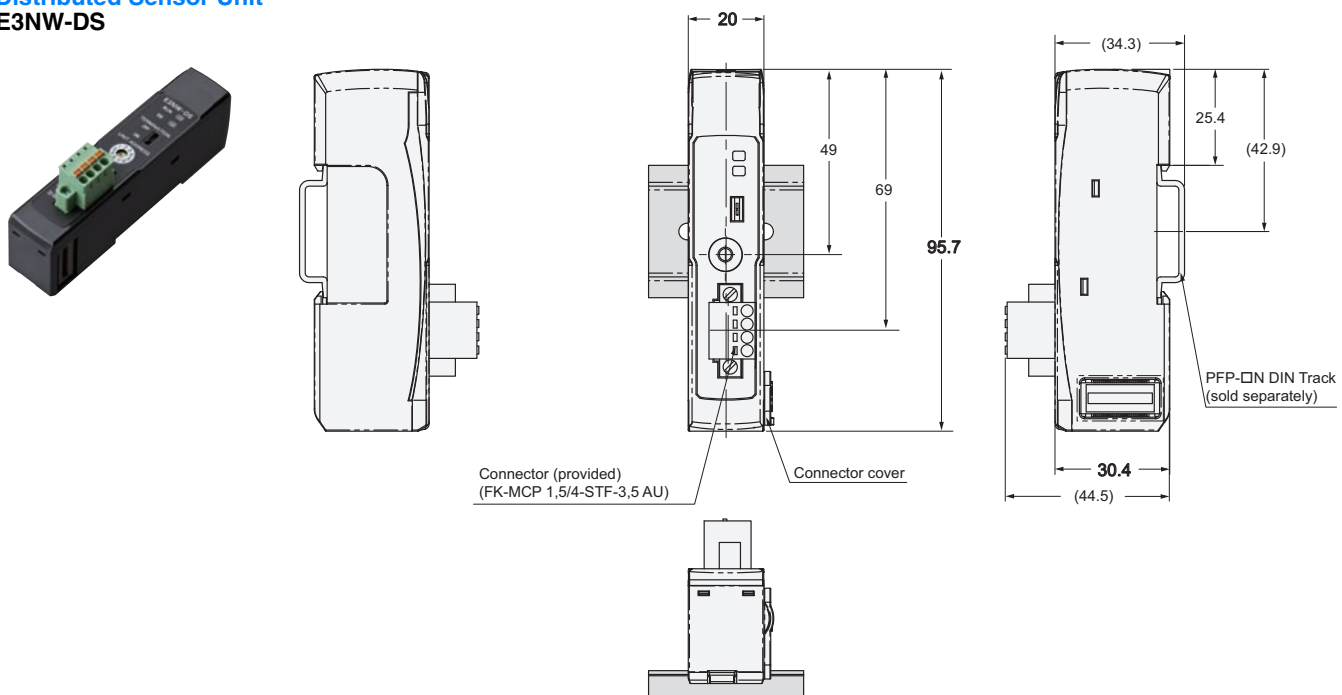
Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Communications Unit E3NW-ECT



Distributed Sensor Unit E3NW-DS

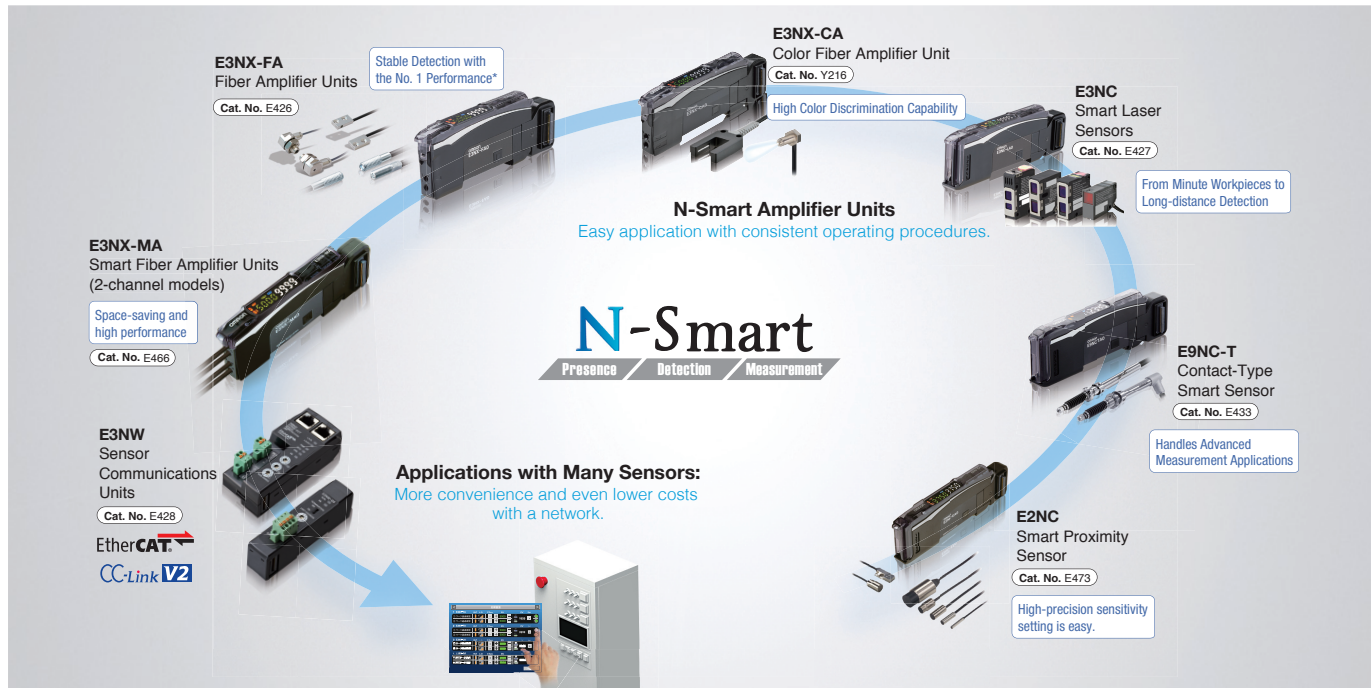


N-Smart

Introduction to the
N-Smart Series

The IoT platform that enables you to see, complete a lineup, and deliver

Winner of the
Good Design Award



* For performance (sensing distance and minimum sensing object) based on November 2017 OMRON investigation.

Fiber Amplifier Units and Laser Sensors

- A New Level of Detection Performance for More-stable Equipment Operation

Smart Fiber Amplifier Units
E3NX-FA
Cat.No.E426



- Select the Best Laser Sensor at the Best Price for Your Application

Smart Laser Sensors
E3NC-L/E3NC-S
Cat.No.E427



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