

Sensor Series

Inductive, capacitive and photoelectric sensors

www.eaton.eu/sensors

When precision counts...

The sensor series:

E57 Inductive Sensors

E59 AccuProx Analog Sensor

E67 Long Range Perfect Prox

E71 NanoView Series

E75/76 IntelliView Series



EATON

Powering Business Worldwide

Eaton – Your partner for machines and systems

Today's mechanical engineers face unprecedented challenges to produce innovative, high-performance machinery quicker and cheaper than ever before. Eaton has developed the SmartWire-DT system to reduce inefficiencies in electrical and hydraulic components of all kinds.

Increased efficiency through SmartWire-DT

The point-to-point wiring that was the previous standard was complicated and vulnerable to faults. It has been replaced inside the machine by the SmartWire-DT communications system. In this way, costs for wiring, testing and commissioning can be reduced by up to 85%, with I/O levels on the PLC and gateways also sharply reduced. The end result is simple and direct automation structures that are compatible with rapid engineering methods.

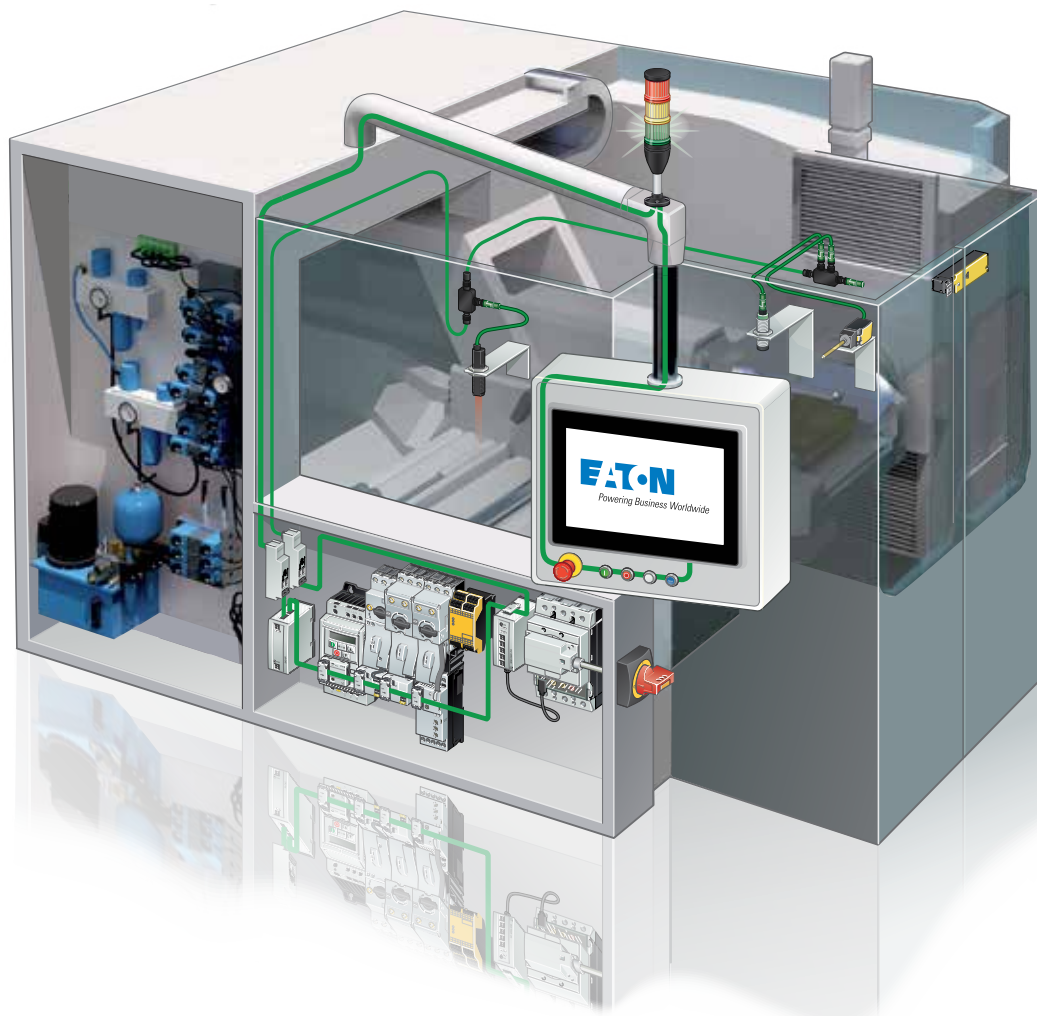
At the same time, the communications system allows for significant data transparency as well as analog and digital data from all switchgear. SmartWire-DT increases the availability of the machine and sharply cuts energy consumption.

Overview of the entire machine

Electrical and hydraulic components from Eaton enable solutions for machines and equipment from all areas:

- The input level with push buttons, sensors and relays.
- The drive level with the switches, contactors and motor drives and the entire hydraulic system.
- Automation with visualization and controller.
- The energy management system from the main switch to the UPS equipment.

From the control panel to the peripherals – wonderfully simple.



A broad spectrum of sensors for reliable control, worldwide.

Machine tools

The Eaton sensors check the milling tool also with contamination through lubricants or cutting fluids. The process also detects tool wear, as well as the tool's position and any cracks on the tool.



Injection molding machines

Injection molding machines work by heating up a plastic granulate and injecting it into hollow molds. Capacitive and optical sensors detect the state of the plastic granulate in the feed hopper and check the position of the tool and the number of parts coming from the injection molds. Thereafter the Eaton sensors monitor the volumes and dimensions of the objects. This translates into far lower costs and effort than traditional visual inspection systems.



Material handling systems

Various products are transported at top speeds from one station to the next. Along the travel path, special optical sensors detect transparent or differently colored objects. Inductive and optical sensors count the products and detect gaps that could potentially indicate missing products or products that have fallen off the conveyor.



Filling equipment

Within the filling machine, bottles and other objects are positioned by light sensors. Capacitive sensors or special light sensors inspect the precise fill levels within the containers. The Eaton E71 sensors for transparent objects offer outstanding reliability, even for bottles in different colors and thicknesses.



Seal container

During the filling, light sensors are used to detect the position of containers within the machine, while capacitive sensors determine the individual fill levels. Depending on the type of cap, light and/or inductive sensors can be used to inspect for correct cap placement and fixing. Once capped, the bottles are wrapped in a plastic seal containing special UV colors. Upon leaving the machine, UV light sensors are also used to check the proper fit of the seal.



Packaging

During packaging, a certain number of the products are grouped together and brought into a carton. The sides of the carton are then folded up and around the product to form the finished box. Light sensors are used to verify the correct product count during collation and ensure that the cardboard is present and that the group is correctly positioned. Sensors can also be used to verify that box sides have been folded up to the correct height, and to count finished packages moving on to a palletizer or a finished goods station. The station where the boxes are then wrapped on the pallet for transport is also monitored and controlled by an Eaton sensor.



Inductive Sensors – versatile and reliable

Inductive sensors from Eaton are offered in a variety of shapes and sizes, but all share one common feature: tremendous reliability. The programmable iProx sensors are also suited for universal applications.

Precision recording of positions

The inductive sensors have a robust construction that allows them to record metallic objects during production. With nine different series available in either cylindrical or cubic constructions, Eaton has the right sensor for every industry. From standard industrial sensors to devices that

can be parameterized using software, the entire spectrum is covered. Thanks to the analog output on the E59 AccuProx sensors, it's easy to detect unevenness in the materials or to measure gaps.



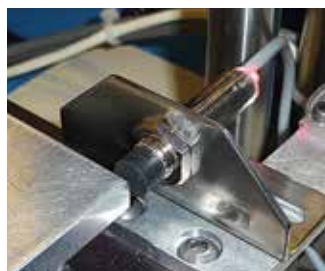
Scopes of application:

E59 AccuProx checks the correct seat for the bottle caps. If they are not seated properly, the analog output reports the error.

E59 iProx for extreme ambient temperatures of -40°C to $+70^{\circ}\text{C}$.

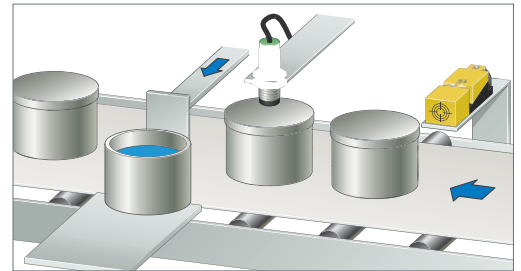
The E57P model features a rugged stainless steel enclosure, impact-resistant front caps and an impact-absorbing sealant.

E59 iProx features a high-visibility status display. The programmable sensing distance makes it perfect for many different applications.



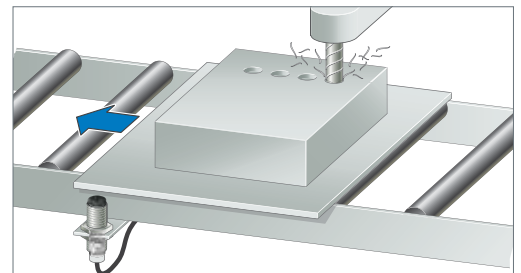
Detect cover

Two inductive sensors are used to inspect a key production step. The metallic containers are detected on a conveyor and the presence of the cap is checked.



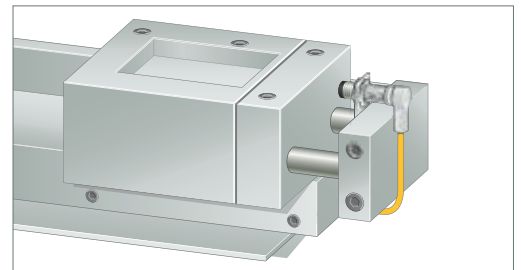
Exact positioning

The workpiece carrier is precisely identified on the conveyor to allow for the workpiece to be properly processed. Inductive sensors on the E57P(S) series stand out for their high resistance to shocks and vibration.



Detect tool position

The sensors on the E57G series review the correct position of the tool. Thanks to the numerous construction sizes and variants, this comprehensive family of sensors offers far-reaching flexibility.



E59 iProx

The world's most versatile proximity sensor

Windows software
ProxView

E59 iProx
sensor

USB
programming-
cable

USB stick with ProxView software



Program applications flexibly

The iProx is Eaton's highest-performance and most versatile inductive, cylindrical sensor. Thanks to an integrated microprocessor, it offers unsurpassed flexibility in its configuration. The ProxView software for Windows is used to program the sensor for any application. Sensor characteristics such as range can be set to the nearest tenth of a millimeter. The outputs can be configured as N/O or N/C. Even interference immunity and pick-up time can be adjusted. With its large range, high quality, sophisticated design, and adaptability to its environment, iProx is the ideal choice for demanding applications.

Optical sensors – robust and powerful

Optical sensors from Eaton stand out for their great robustness and strong light output. Various different construction designs allow them to be used in a wide range of applications. Eaton's PerfectProx technology is highly effective at suppressing the background for reliable functionality.

Strong light output

The strong light output of Eaton sensors ensures longer, uninterrupted operation. Even when deployed in harsh conditions, such as contaminant-rich environments, the strong, visible

beam of light reliably detects the desired object. A large excess gain helps avoiding failures and downtimes and extends maintenance intervals.



Scopes of application:

E58 Harsh Duty is successfully used for controllers in car washes.

The Comet series detects transparent plastic bottles.

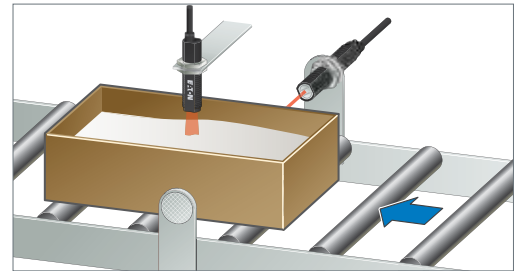
E76 color sensors detect misprinted pieces of packaging.

E71 NanoView monitors the feeding of packets into the conveyor belt system.



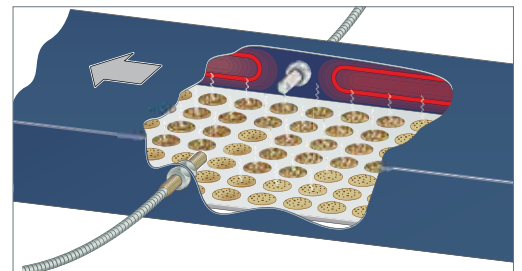
Carton Fill-Level Detection

Comet diffuse reflective sensors are used to check the fill level of containers. The Comet reflex photoelectric sensor also monitors the correct position of the carton. They reliably detect when the cartons are empty or the fill level has not been attained.



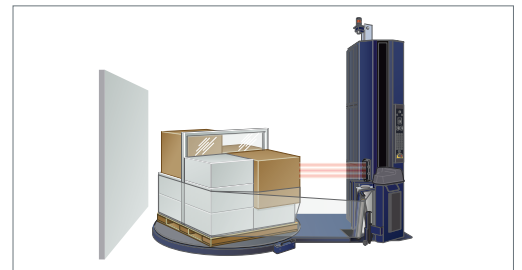
Oven controls

Comet sensors with fiber optic cables make possible the monitoring of an industrial baking oven. The thru-beam light barrier works at temperatures of 230°C and monitors the movement of the baked goods.



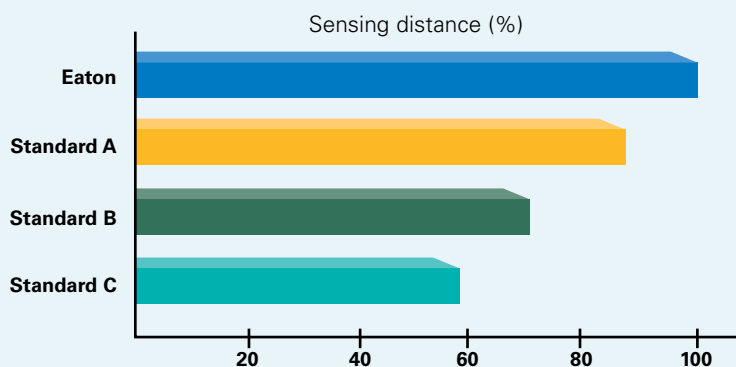
Identification of missing and difficult-to-scan objects

The E67 Long Range sensor works at extended distances of up to 240 cm and is suited for use in pallet wrapping machines. Its convenient range of settings ensures that objects are reliably captured, regardless of the color, degree of reflection, contrast or shape. It is capable of detecting films.



Comet Series Complete family for numerous applications

Eaton's high-performance light barriers feature a tubular enclosure with a diameter of 18 mm and are available in a range of versions to solve virtually any sensing problem. The sensors are available in thru-beam, reflex, polarized reflex, diffuse reflective, focused diffuse reflective, wide-angle diffuse reflective, Perfect Prox®, Fine Spot Perfect Prox® and fiber optic cable versions. Internal components are rigidly sealed in a solid encapsulated package for excellent performance in high vibration and high-shock applications.



Eaton Comet Series compared to competition

As part of an internal study, the Eaton Comet sensors were tested against sensors of the same construction by other leading manufacturers. The significantly higher sensing distance on the Comet series compared with all other competitor's products underscored the excess gain at work in the switch. The result is longer maintenance intervals and greater availability of the machines.

Capacitive sensors – flexible and universal

For the area of capacitive proximity switches and sensors, the E53 Capacitive series was developed to detect non-metallic objects. The series offers sensors that are optimally suited for monitoring fill levels of fluids and powdered substances.

Universal applicability in mechanical engineering and the packaging industry

- Ideal for preventing empty or overfilled packaging in the packaging industry.
- The check of the material volumes serves to ensure the packaging sleeves on a labelling line.
- All counting applications, such as tracking units passing a point on a conveyor, can be defined reliably and precisely.
- Detection of fill heights for plastic granulates in the feed hopper for injection molding machines ensure smooth processing.
- Versions with connection cable or plug-in connection for quick and flexible use.
- The corrosion-resistant plastic casing enables use in aggressive environments.
- Thanks to the integrated potentiometer, the detection range can be individually configured.

E53 Series Capacitive

Connection through plug connector or integrated connection cable



The device includes a mounting bracket or mounting nut

All models feature an output LED

Scopes of application:

Control of the fill level in plastic bottles.

Reflectors for positional monitoring with reflex photoelectric sensors.

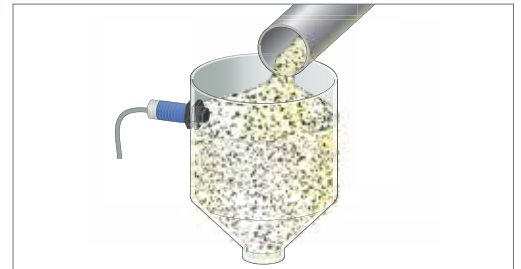
Versatile connection cables with straight and angled plugs.

Fixing bracket for flexible mounting.



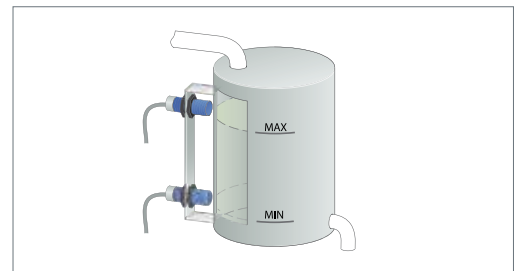
Feed management

The capacitive sensor manages the flow of bulk goods into a silo. When the predefined fill level is reached, the flow is stopped. In the process the sensor detects all types of metallic and non-metallic bulk goods. This can for example be an application to monitor the filling of plastic granulate into feed hoppers for injection molding machines.



Level monitoring

A pair of capacitive sensors are used to sense high and low liquid levels in a tank through the container wall. This arrangement starts a pump to fill the tank when the lower sensor is energized and shuts the pump off when the top sensor is energized.



Extensive accessories for simple connection and mounting

The sensors are not just flexible in their potential deployments, they're also flexible in the mounting choices. These range from simple fixing brackets to flexible brackets with ball joints.

Eaton offers connection cables of various lengths in 3 to 8-pole versions as well as straight or angled plugs.

The reflectors are between 33 and 84 mm in diameter, making them suitable for reflection light barriers with or without polarization filters. FO cables support scanning in extremely tight spaces. FO cables come in PVC and stainless steel versions. Duplex fiber optic cable styles are used for diffuse reflective sensing.



Go to flip catalogue

Fixing bracket

Bracket with ball joint

Connection cables



glass fiber optic cable

Fiberglass adapter

Download the current sensors catalog now:

The sensor catalog from Eaton offers over 120 pages of inductive, photoelectric and capacitive sensors engineered to fit your application.

It is broken into a catalog section with selection criteria, technical information and dimensions and a supplementary section with a compact sensor primer and helpful tips on practical usage.

Download catalogue:
www.eaton.eu/catalog

All sensors
at a glance:

Family Overview

Key Features

Inductive Sensors

E52 Cube Series

Industry-standard cube package style sensors with extended sensing ranges up to 40 mm

- Sensing distances from 15 to 40 mm
- All models are DC, have complementary outputs (1 N/O / 1 N/C), and automatically adapt for NPN or PNP
- Adjustable sensing head for top- and side-sensing
- Dual LEDs for power and status indication

E55 Limit Switch Style Series

PBT resin housings for high resistance to corrosion. Housings sized to offer a direct replacement for standard limit switches.

- Sensing head can be easily converted to five Sensing positions.
- Sensing distances from 15 mm to 40 mm.
- The sensors can be wired for N/O or N/C operation.

E56 Pancake Series

Self-contained powerful Inductive sensors capable of sensing up to 100 mm Robust design featuring vibration and impact-absorbing potting compound

- 40, 50, 70 and 100 mm sensing distances
- 4-wire DC models have complementary outputs (1 N/O / 1 N/C)
- 4-wire DC models automatically adapt for NPN or PNP
- M12x1 connector

E57G Series

Full family of inductive sensors with status LED, stainless steel housing

- 12, 18 and 30 mm diameters
- Sensing distance from 2 up to 22 mm
- 3-wire DC sensors
- Shielded and unshielded models

E57P(S) Series

High performance inductive sensors include stainless steel models

- 12, 18 and 30 mm diameters
- 3-wire DC sensors
- Sensing distance from 2 up to 15 mm
- 360° LED indicators standard
- Available in short body models (E57PS)

E57 Miniatur Series

Small diameter and short body (4, 5, 6.5 and 8 mm) tubular housings for tight sensing applications

- Variety of diameters in stainless steel housings
- PVC cable or M12x1 connections
- LED indicators standard
- Short overall lengths
- Short circuit and reverse polarity protection

E59 iProx Series

Designed to be the highest performing sensor. Standard features include extended sensing ranges, high noise immunity, extreme durability and includes Autoconfigure Technology

- Automatically detects a sinking (NPN) or sourcing (PNP)
- ProxView configuration software for easy sensor customization
- Advanced features like dual outputs, delays, and speed detection
- Resistant to extreme temperatures (-40°C)
- Complementary (1 N/O / 1 N/C) outputs available

E59 AccuProx Series

The AccuProx™ sensor features analog outputs that change linearly as the target moves closer or further from the sensor face.

- Extended linear sensing range of up to 25 millimeters
- Outputs available in current (4 – 20, 0 – 20 mA), voltage (0 – 10 V)
- High output resolution and repeatability
- For applications requiring precision analog sensing performance
- Robust stainless steel housing

All sensors at a glance:



Family Overview

Key Features

Optical Sensors

Comet Series

This high performance, 18 mm tubular sensor family features a wide variety of models in all sensing modes to solve many sensing problems. Internal components are rigidly sealed in a solid encapsulated package for excellent performance in high vibration and high-shock applications.

- Thru-Beam: 6 m and 24 m
- Reflex: 7,6 m
- Polarized Reflex: 3 m and 4,5 mD
- Diffuse Reflective: 200 mm and 610 mm.
- Focused Diffuse Reflective: 40 mm
- Wide Angle Diffuse Reflective: 150 mm
- Perfect Prox® Background Rejection: 50 mm (fine spot); 50, 100, 150, 225 mm
- Fiber Optic: range varies with glass fiber

E58 Harsh Duty Series

Photoelectric Sensors were designed to withstand harshest physical, chemical and optical environments, 18 and 30 mm tubular enclosures.

- Thru-Beam: 250 m
- Reflex: 18 m
- Polarized Reflex: 10 m
- Perfect Prox® Background Rejection: 50, 100, 150, 280 mm

E65 SM Series

SM Series photoelectric sensors provide high performance and ease of use in an economical, compact package. Target lock simplifies setup.

- Thru-Beam: 15 m
- Polarized Reflex: 3 m
- Diffuse Reflective: 200 mm
- Perfect Prox® Background Rejection: 50 mm, 100 mm

E67 Long Range Series

will reliably detect target objects within their sensing range regardless of variations in color, reflectance, contrast, or surface shape. Accordingly, they will simply ignore objects that are just outside their target range.

- Diffuse Reflective with Perfect Prox technology provides exceptional background rejection
- Sensing ranges of 60 to 240 cm are available.
- No user adjustments required.
- Dual indicators communicate both output and power status
- The DC sensors come with NPN and PNP outputs.
- Two mounting options for maximum flexibility
- Fully sealed enclosure IP67

E71 NanoView Series

A full family of miniature rectangular photoelectric sensors designed for optimum value and sensing performance for space restricted applications.

- Thru-Beam: 1,5 m (narrow beam), 6 m
- Polarized Reflex: 2,5 m
- Diffuse Reflective: 350 mm
- Fixed-Focus Diffuse Reflective: 100 mm focal point
- Clear Object Detector: 800 mm

E75/E76 IntelliView Series

A family of compact, high performance specialty photoelectric sensors encompassing a variety of new technologies: color, contrast and UV sensing; field adjustable foreground/background suppression; analog distance measurement; and laser sensing.

- Adjustable Foreground/Background Suppression: 30 mm to 1200 mm (by model)
- Analog Distance Measurement: 30 cm to 400 cm (laser), 50 mm to 100 mm
- Color Sensing: 5 mm to 45 mm
- Contrast Sensing: 10 mm
- UV Sensing: 8 mm to 20 mm

Capacitive Sensors

E53 Capacitive Series

These self-contained devices will detect both metallic and nonmetallic targets. A threaded housing provides ease of mounting. They are ideally suited for liquid level control and for sensing powdered or granulated material.

- 18 and 30 mm diameters with threaded housing
- 34 mm tubular unthreaded
- 2-wire AC — 20 to 250V
- 3-wire DC — 10 to 30V, NPN and PNP
- Adjustable sensitivity

At Eaton, we're energized by the challenge of powering a world that demands more. With over 100 years experience in electrical power management, we have the expertise to see beyond today. From groundbreaking products to turnkey design and engineering services, critical industries around the globe count on Eaton.

We power businesses with reliable, efficient and safe electrical power management solutions. Combined with our personal service, support and bold thinking, we are answering tomorrow's needs today. Follow the charge with Eaton. Visit **eaton.eu**.

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