E3X Optical-Fibre Sensor

Increase Competitiveness, Reduce Costs

"All Inclusive" Optical-Fibre Sensors

Customer-specific production

Extremely simple operation

Precise object detection

Comprehensive communication

Fast commissioning

Smart Platform

Advanced Industrial Automation

OMRON

Optical-fibre technology for demanding applications

① **E3X-DAS**
THE standard

② **E3X-DA-B/G/H-S**
For coloured objects
and colour mark
sensing

③ **E3X-MDA**
Dual Amplifier

④ **E3X-DA-AN-S**
1 to 5 Volt Analogue
voltage output

⑤ **E3X-DA-AT-S**
Self Monitoring

**You are building serial
machines and looking
for potential savings?**

You expect precision?

**Your machines are set up
in a rough environment
prone to dirt?**

**You want to combine
excellent functionality
with easy operation?**

**You want to avoid
setting errors?**

eco

Compatible with ROHS

2 in 1 – saves space and costs

Only at OMRON

The E3X-MDA incorporates two separate amplifiers in one slim line housing, the same size as any other E3X unit. It is possible to treat these as separate outputs or they can be combined in AND - OR modes, saving space, wiring and hardware costs – and providing a solution to a wider range of applications.
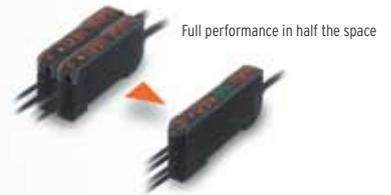
Full performance in half the space

The first dual-channel optical-fibre amplifier

Better detection reliability thanks to power tuning

Only at OMRON

The light level can be adjusted to match the application during the set-up. This means that the full range of the optical-fibre amplifiers power is used over the switching point to give highest possible resolution.

523
Increase level
Press
2000 1234
Reduce level
4000

## ATC – precision and reliability despite dirt build-up

Only at OMRON

In many applications, the machines – and the sensors – become soiled in the course of time. The ATC (Active Threshold Control) updates the signal and the threshold as the dirt build up gradually increases. Therefore, the switching characteristics of your machines remain constant.

Previously: drift   With ATC

Positioning

Dirt build-up - contamination
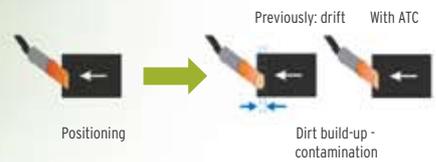
Don't set – just teach

Our amplifiers can be taught with or without an object, the switching threshold is defined automatically. This can be carried out in the E3X-DA-RMS either via an external input or via the communication bus. By using the communication bus, you can set-up entire banks of sensors for new batches, automatically, at the touch of a button.

All settings in the group are copied
Machine A
Machine B
Machine C
Machine D
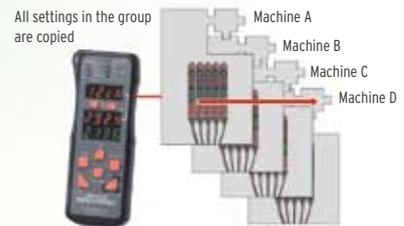
Simple upload and download of data

Our E3X sensors possess an optical window for communication purposes from amplifier to amplifier when mounted together. This avoids setting them repeatedly as machines ar built and means that it is possible to transfer each or all amplifiers settings to a new installation. With the setting console, you can set a number of E3X optical-fibre sensors, E2C inductive sensors or E3C laser sensors and copy these settings.

DeviceNet™

Optical communication
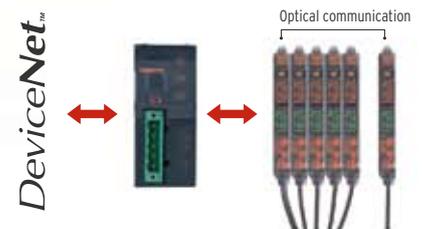
One device – two views

Large figures display the actual or current value in red and the user set switching threshold in green. If required, you can also switch to a bar display or set the sensor so that it supplies maximum and minimum values during the sensing process.
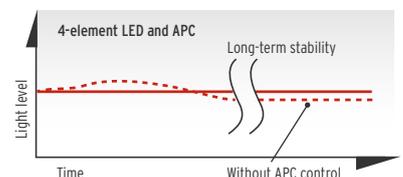
1234 1234

Switchable display

Long-term stability

In the OMRON E3X-DAS optical-fibre amplifiers, you can rely on the constant transmission performance of the LEDs. The sensors are equipped with an innovative 4-element LED coupled to an APC function (Automatic Power Control) that ensures a constant power output – long term sensing stability.

4-element LED and APC
Long-term stability
Light level
Time
Without APC control

Optical-fibre technology for demanding applications
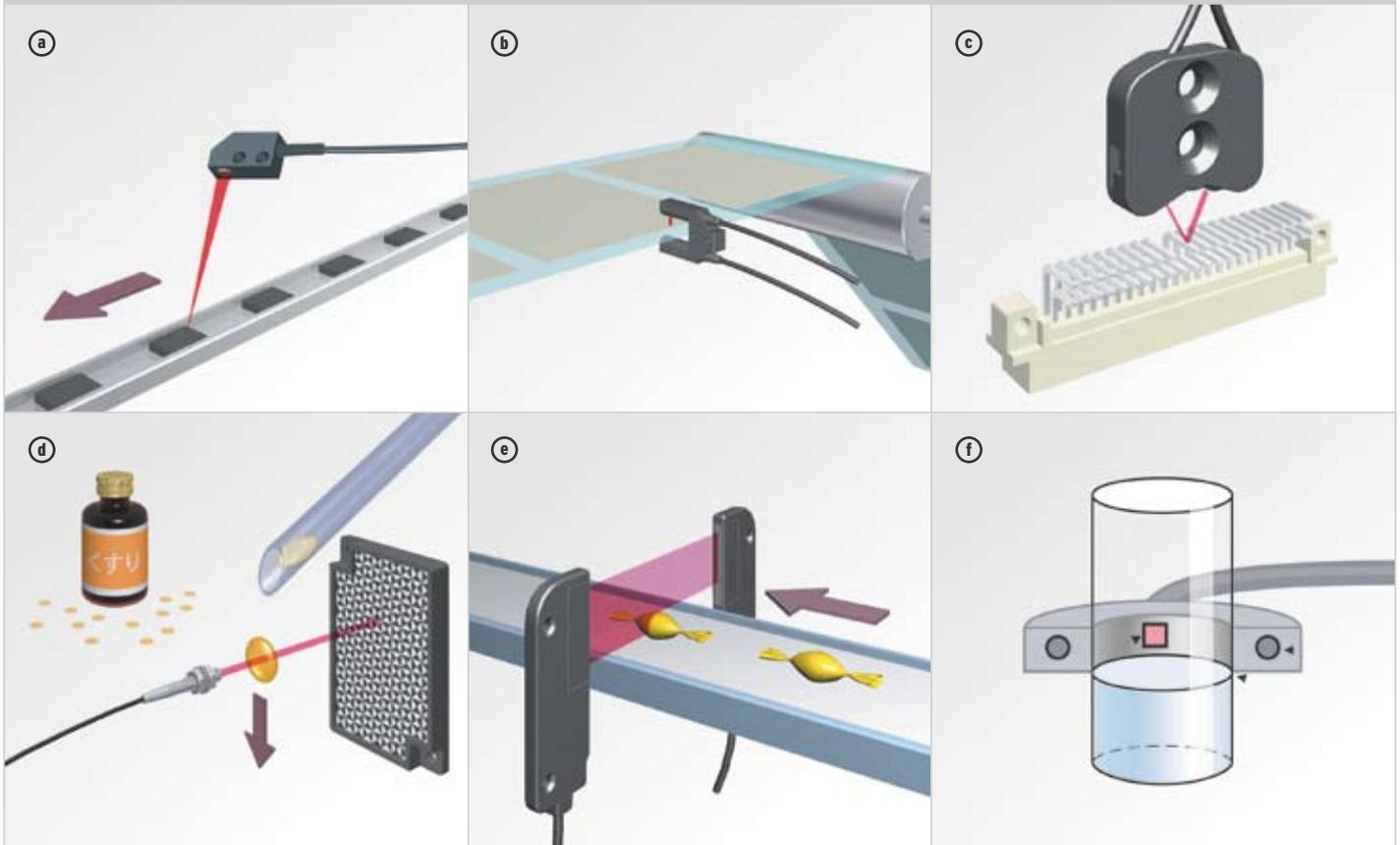
	Function	Description	Product	Name
a		Header with 90° optics, focus range adjustable from 8 to 25 mm, extremely small light spot	Coaxial optical-fibre switch & focusing lens	E32-EC31 2M E39-EF51
b		10 mm fork width for mark and label detection	Optical-fibre hybrid light barrier	E32-G14
c		Header with 90° optics, detection level 7 mm, heat resistant up to 105 °C	Optical fibre with background suppression	E32-L25L
d		Header: M6, MSR function (polarisation), range approx. 250 mm with E3X-DAS	Optical fibre with reflection light curtain	E-32-R21
e		70 mm light bandwidth, clearance up to approx. 400 mm with E3X-DAS	Optical fibre for range detection	E32-ET16WR-1
f		For transparent hoses, to ½"	Liquid-level sensor	E32-ED36-1

Capable Optical Fibre Range

With our optical-fibre selector, you can choose the right optical fibres for your application. We have fibres resistant to chemicals, heat, vacuums; there are add-on lenses, mountings, protective hoses, tools and a plethora of sensor heads to deliver a solution to the widest variety of applications.

FIBRE OPTIC SENSOR

Best Selection Guide 2005

- Standard models
- Special-beam models
- Through-beam models
- Reflective models
- Retroreflective models
- Environment-resistive models
- Special-shape models
- Application-specific models

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Do you need assistance in selecting the right sensor for the job? We shall be delighted to help you select the perfect solution.

Optical-fibre technology for simple applications

You are looking for sensors with intuitive operation?

Your machines work at high speed?

You want your wiring costs to be as low as possible?

You expect full functionality in extremely small spaces?

You expect the greatest possible operational safety?

① **E3X-NA**
THE standard

② **E3X-NA-G**
Green light for more detection

③ **E3X-NA-F**
Extremely fast response time of 20 µs

④ **E3X-NA-V**
IP67 protection with M8 cable connector

Compatible with ROHS

Intuitive setting

The sensor is set via the integral potentiometer. The LED bar indicates the sensors set status, the switching threshold and the output state – simply!

Switch status
+ 20 %
+ 10 %
Switching shaft
- 10 %
- 20 %

20 µs – high speed

The E3X-NA-F detects objects extremely quickly: it needs no more than 20 µs. It reliably detects falling SMD components or small metal parts. It can also be used for mark sensing or for determining speeds.

Via master-slave connections
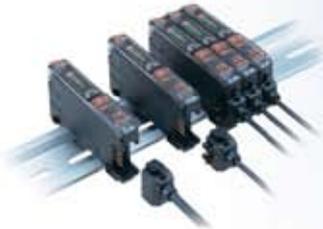
E3X-NA offers reduced wiring via its master-slave connection system. This system allows many units to be powered from only one supply. The user then needs only to connect the individual outputs from each amplifier.

Optical-fibre headers in a 0.5mm design

Optical-fibre headers can be sized for extremely small spaces. With a diameter of just 0.5mm or 2.3mm flat headers, they fit into the smallest spaces.

Operating safety thanks to signal decoupling

When banked together, the sensors can communicate via optical windows. This provides mutual interference protection and allows multiple amplifier programming and easy downloading / uploading of settings for up to 10 sensors.

Infrared interface

Up to 10 amplifiers

Switch status at a glance

The clear bar-graph display gives the user simple indication of the amplifiers status, both operation and output – even from a distance.

Detecting coloured objects

The standard amplifiers utilise a red light source, however, this is not always the best source light colour to use. Where difficult target colours need sensing, for example mark sensing on label webs, then either a blue, green or infrared light source may provide the best solution.

Sophisticated external-light security

E3X amplifiers use pulsed signals to prevent influence from external light. As a result, the sensors will work perfectly without influence from fluorescent tubes or energy-saving lamps.

Optical-fibre technology for simple applications

Application Examples
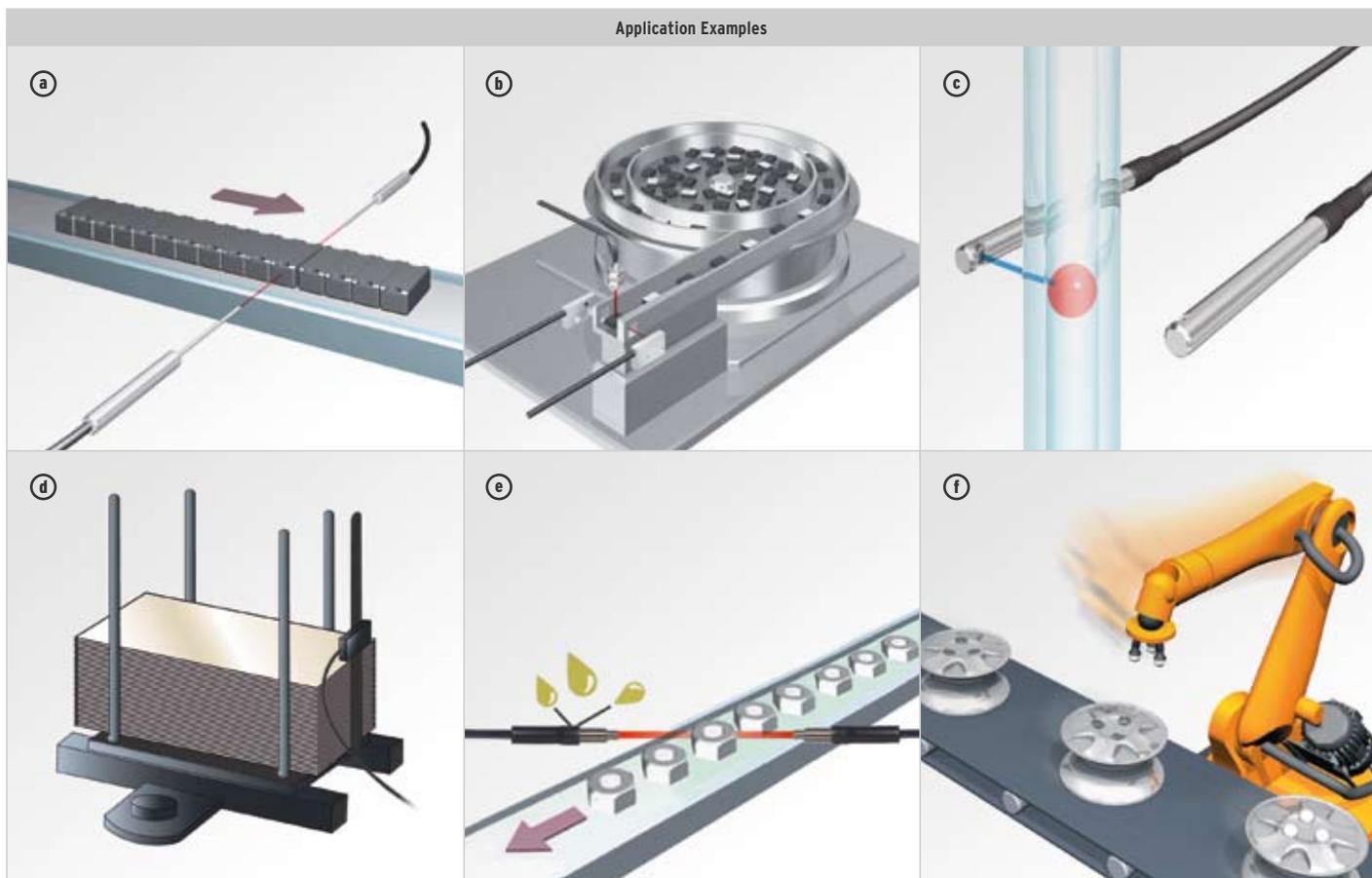
	Function	Header	Range with E3X-NA	Range with E3X-DAS	Product	Name
a		M4, tight bend radius, can be shortened	Approx. 280 mm	Approx. 530 mm	Optical-fibre through-beam sensor	E32-ET11R 2M
b		M6, tight bend radius, can be shortened	Approx. 90 mm detection range	Approx. 170 mm detection range	Optical-fibre diffuse sensor	E32-ED11R 2M
c		Diameter 3 mm, 90° optics, can be shortened	Approx. 240 mm	Approx. 460 mm	Optical-fibre through-beam sensor with 90° optics	E32-T14L 2M
d		Flat header, tight bend radius, can be shortened	Approx. 20 mm	Approx. 40 mm	Optical-fibre with narrow sensing head for small objects	E-32-EDS24R 2M
e		M4, coated with fluorin, can be shortened	Approx. 350 mm	Approx. 680 mm	Optical-fibre through-beam sensor, oil-resistant optical-fibre header	E32-T11U
f		M4, glass-fibre bundle for repeated flexing	Approx. 250 mm	Approx. 680 mm	Optical-fibre through-beam sensor, suitable for robotics	E32-T11

Pliable, robust and extendable – simply flexible!

The selection of the right optical-fibre material and the suitable accessories allows you to adapt Omron's optical fibre range to an extremely wide variety of applications. For instance, a large number of ultra-fine fibres ensure that the optical fibres can be bent without losing any intensity. Special spiral protective hoses protect the sensors for applications in harsh machine environments.

You can easily increase the range of our optical fibres and with our add-on lenses the possibilities are greatly increased.
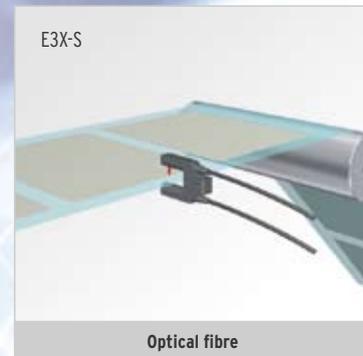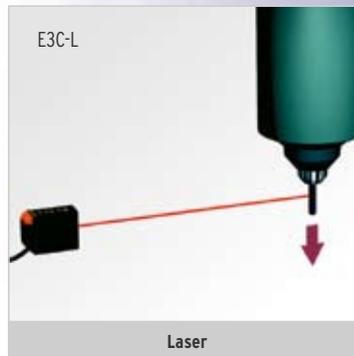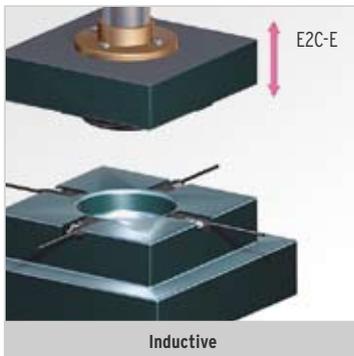
Ultra-fine fibres

Spiral protective hoses

Add-on lenses

SMART & SEAMLESS – consistency in sensor technology!

Unique:
3 procedures – 1 concept

E2C-E	E3C-L	E3X-S
Inductive	**Laser**	**Optical fibre**

Optical fibres "Made in Germany"

With our production and development site near Stuttgart, we are close to our European customers and can always act quickly and reliably. Flexibility, customised product modifications, availability and quality are the keys to our international success.

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