GENERAL CATALOGUE 2004/2005

Sensing & Safety

- Photoelectric Sensors
- Displacement Sensors
- Vision Systems
- Safety Sensors
- Safety Switches
- Safety Relays
- Proximity Sensors
- Rotary Encoders
- Pressure Sensors

Advanced Industrial Automation

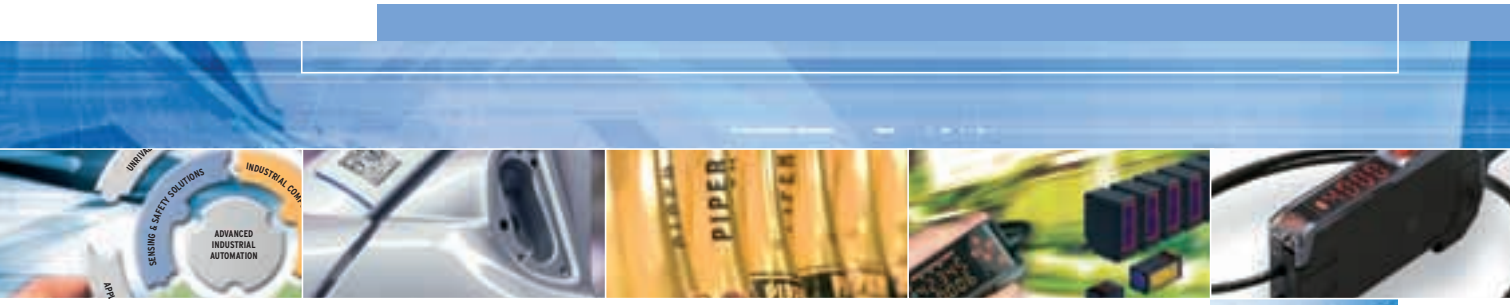
Cat.No. F502-EN2-03A SEN

OMRON

WELCOME TO OMRONS

SENSING & SAFETY CATALOGUE

This catalogue features products that lead the field in technology by providing new solutions for quality assurance and safety issues. More about the latest products such as the ZX laser sensors and the safety light curtains in the F3SN range can be found on pages 6-13 of this catalogue.



1

2 Advanced Industrial Automation

4 Proven application expertise

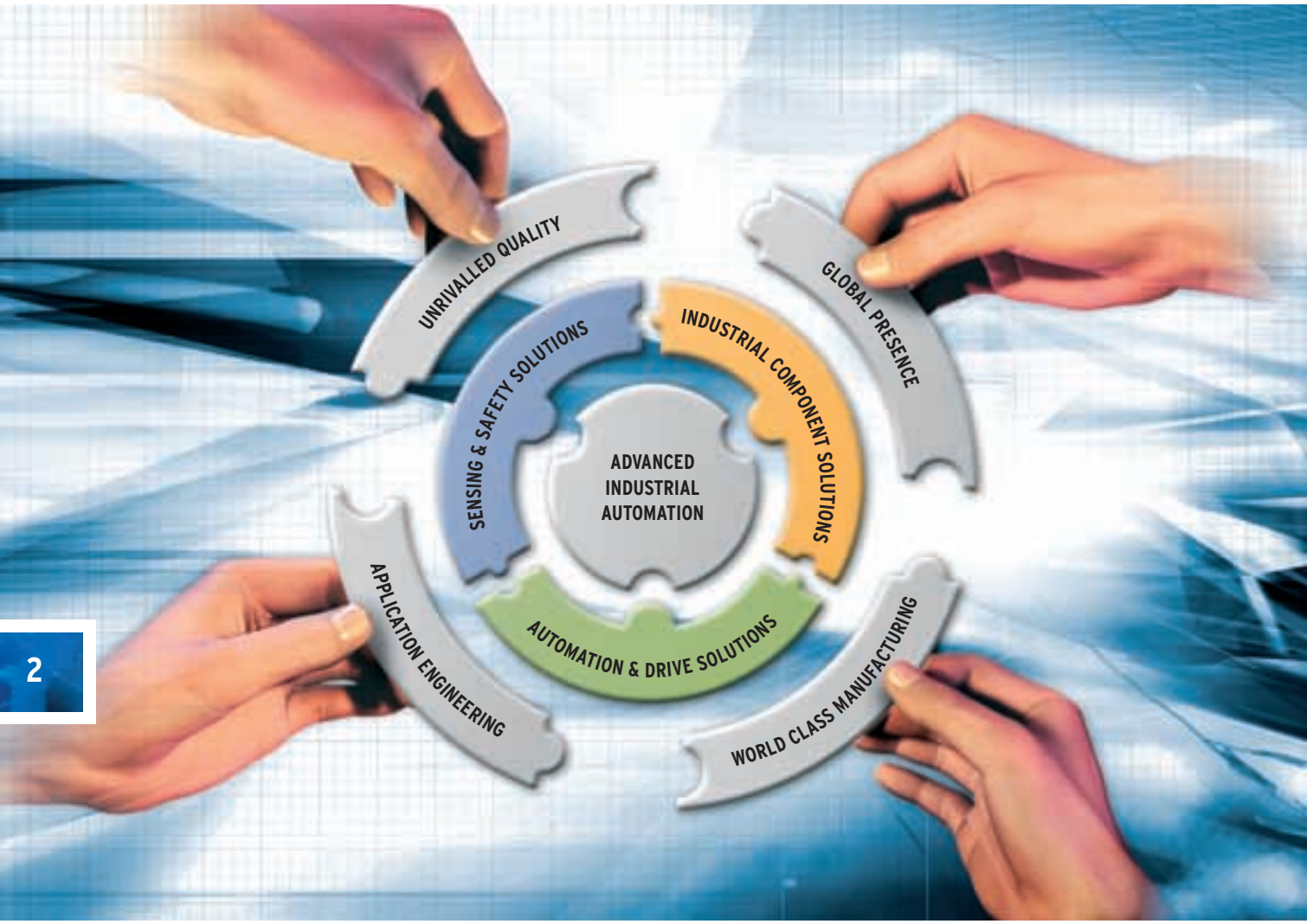
5 Our products make the world go round

6 New products

14 Product selection table

17 Catalogue content

ADVANCED INDUSTRIAL AUTOMATION



Today's industrial manufacturers are constantly faced with new challenges posed by ever increasing demands on performance, quality and cost. In an environment where every movement, every component and every assembly operation must be immediately and automatically recorded, checked and documented for maximum efficiency, Omron can provide the solution. Omrons industrial automation product range includes optical sensors and measuring systems, high-speed industrial-grade image processing systems, controlling and switching devices, highly dynamic drives and product tracking systems for information interchange, all of which meet today's industrial automation challenges.

Omron also caters to the logistics and information processing sectors by developing advanced network and field bus systems, which ensure that relevant data collected in the field by sensors and other equipment can be easily accessed and analysed by production managers through standard Office applications.

Omron is your one-stop shop for future-oriented products matched to perform in perfect unison. We are constantly developing new products and enhancing existing ones. Each year sees the introduction of at least 20 new product ranges in industrial components, safety engineering, sensors, image processing, drives and automation systems.

Our close relations with customers and partners in industry mean we are well-placed to quickly identify new trends which we can incorporate in the development of our own new products. In this we are helped by our Research and Development (R&D) Centres and our highly efficient production sites in the major regions of the world. With such distributed facilities, Omron can achieve customer-specific solutions and modifications with a very short time to market. In fact our customers see us more as joint developers for their own machinery and plant and as solution providers for their increasingly complex automation requirements, while we see our customers as providing the product ideas and development impetus so vital to our own future. It's a partnership that works very well on both sides.

You too can choose such a partnership. Choose Advanced Technology & Services – choose Omron.

PROVEN APPLICATION EXPERTISE

"We know your industry"

Omrons in-depth knowledge of many specific industries enables us to offer high-quality products as diverse as the applications they are designed for. You'll find our components in every sector of manufacturing, including industries as diverse as automotive, ceramics, food, beverage, glass, dyeing, and pharmaceuticals, building automation and public services, and telecom. And our software products are used world-wide in the design, development and control of complex industrial processes.

We even develop cost-effective products for demanding process environments such as metall processing industry and energy production facilities. And in industrial processing applications, where quality control and safety are paramount, Omron has contributed to important improvements in the manufacturing process.

OUR PRODUCTS MAKE THE WORLD GO ROUND

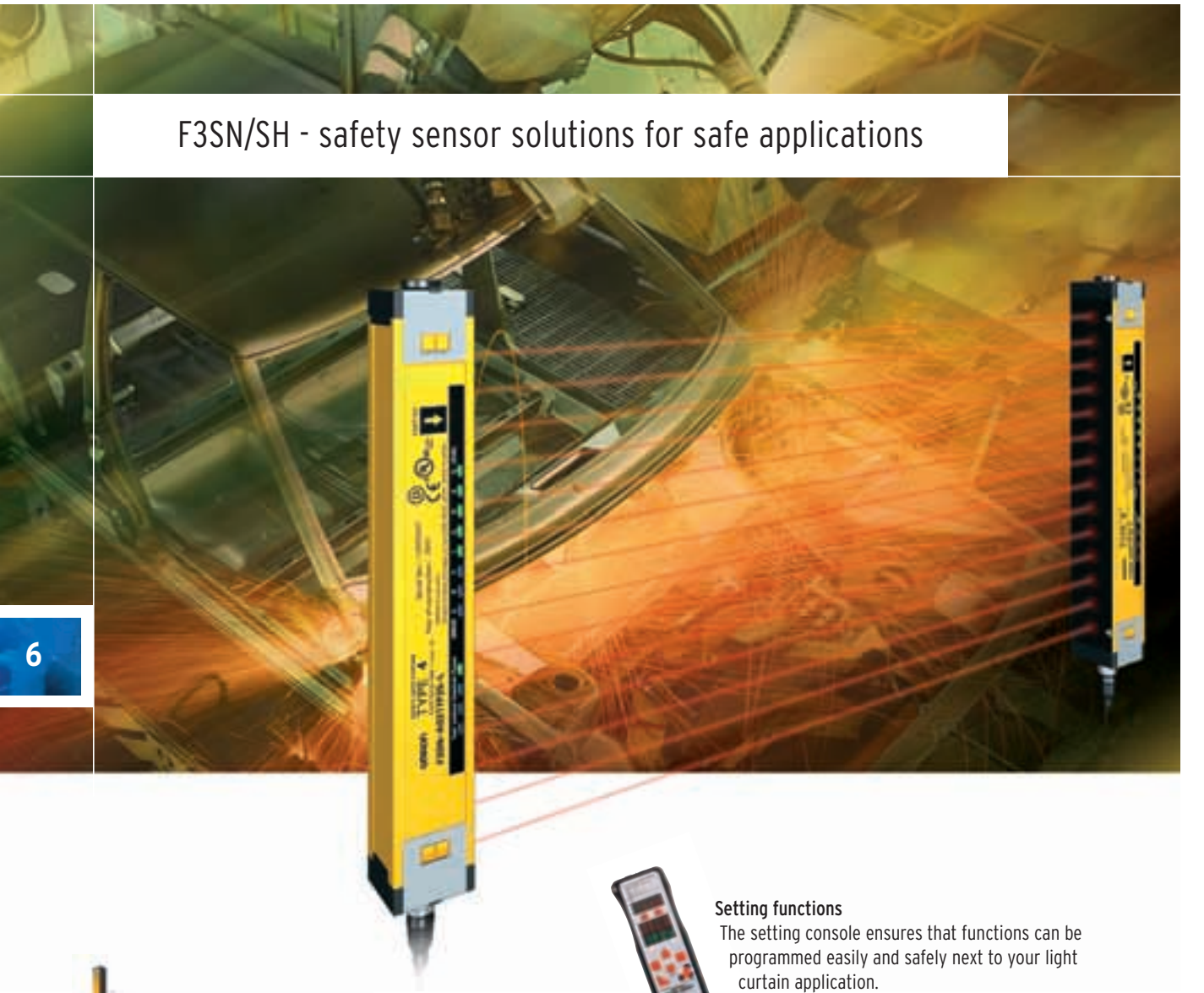
"We have touched your life"

Omrons technologies support the way the world lives and works - it is very likely that their effect will have touched your life in some way over the past 24 hours. You'll find Omron automation products everywhere: in coffee vending machines and cash machines, traffic lights and petrol pumps, in hospitals and surgeries – and, of course, in factories all over the world, helping to make the products you use every day.

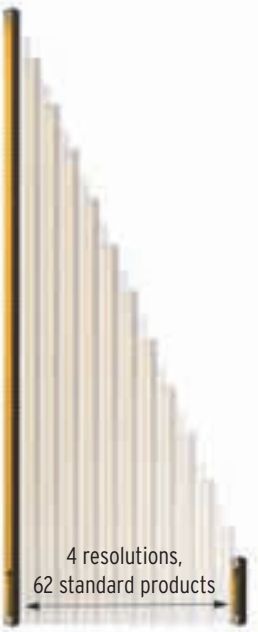
Whatever industry you are in, Omron can help make you more efficient, more reliable, more competitive and more profitable. Just ask any Omron customer!

NEW PRODUCTS

F3SN/SH - safety sensor solutions for safe applications



Setting functions
The setting console ensures that functions can be programmed easily and safely next to your light curtain application.



Omrons new safety light curtains, the F3SN and the F3SH are Category 4 sensors whose robust, metal construction and slim profiles make them invaluable in areas where operation, maintenance and repair work is a necessity in an industrial environment.

Meeting the highest safety standards
The F3SN provides finger, hand, limb and body protection in areas where access to dangerous machine parts is required while systems are still operating. The F3SH is a multi-beam safety sensor for body protection. If a person enters a dangerous zone the F3SH ensures that the hazardous equipment within that zone is shut off. Both sensors meet the highest safety standards, and their modular construction means that you have a wide variety of detection heights and resolutions to choose from.

The perfect solution for all your safety requirements

The range completes Omrons safety product portfolio, and brings exceptional value to customers who need to meet appropriate levels of safety in the most cost-effective way possible.

Leading the range is the D4F, a four-contact limit safety switch whose ultra-compact size and performance make it unique. The D4NL and D4GL are guard lock safety-door switches with the same impressive holding force (minimum 1000N) and number of contacts (4 or 5); they only differ in shape to suit the application. The safety relay unit, the GS9B, is one of the smallest safety-monitoring relays on the market. All of these products are ideal for any industrial application where personnel need to be protected from machinery that could cause serious injury.

NEW PRODUCTS

E2A - Best-in-class sensors, modular for total solutions

Omrons E2A series of proximity sensors is designed to provide highly reliable detection of ferrous metal objects. What's unique about these sensors is their construction; Omron has developed a fully automated process that enables these sensors to be produced in a modular way, and which guarantees the highest level of reliability available. And because these sensors are modular in design, Omron can satisfy customer application requirements faster and cost-effectively!

Housed in metal cylinders, the E2A sensors are available in a full range of standard sizes (M8, M12, M18 and M30, both long and short-barrelled) and with a full range of standard connections (pre-wired, M8 and M12 connectors). Their tough construction and reliability make these sensors ideal for use in diverse applications such as automotive manufacturing, packaging process machines, commercial vehicles and materials handling.

ZX-E-Smart control - designed to suit your every measurement need

PLUG & PLAY
THE ZX SENSOR

Omron, the world's leading sensor manufacturer, continues to set new standards in fast, precise measurement sensing with the ZX-E series of inductive displacement sensors. Designed specifically for metal measurement applications, the ZX-E series is based on Omrons unique Plug & Play concept, in which a wide variety of interchangeable sensor heads can be connected to the same amplifier. This concept covers all of your measurement requirements and takes the costly and time-consuming process out of selecting the best sensor heads for the job!

The ZX-E features a host of remarkable features and functions, some of which are unique! These include the smart calculation function, simple linearity adjustment, easy resolution display, dual digital display and mutual interference prevention function. The ZX-E is not only easy to use, it also features intelligent communication,
enabling it to detect and log data for more efficient and effective process analysis and quality control.
This inductive displacement sensor is the ideal solution
for those who need very accurate, high-resolution measurement sensing in high-tech environments like
the packaging, metal processing, machinery, automotive and semiconductor industries.

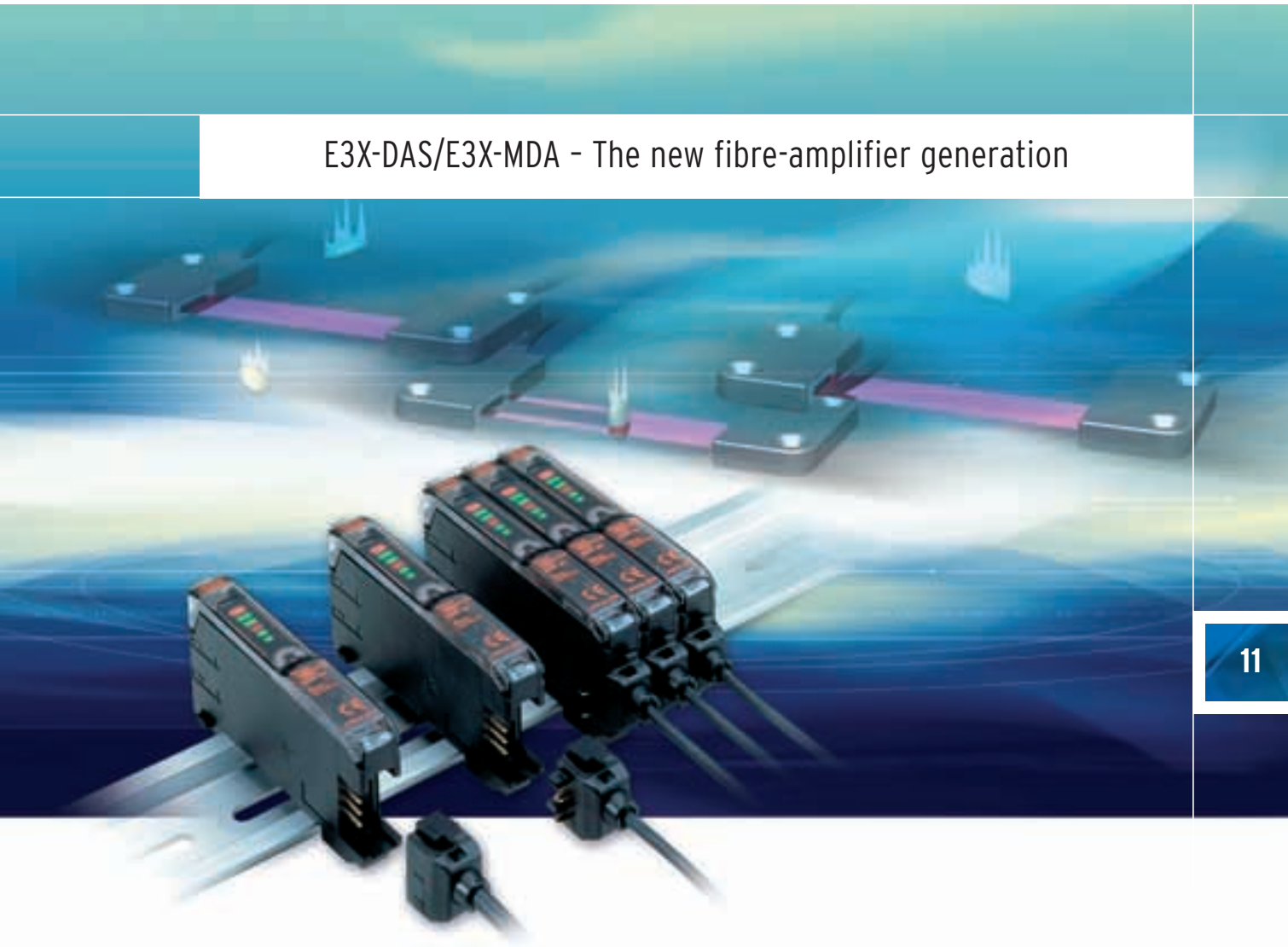
NEW PRODUCTS

E3C-LDA - Compact, fast and very accurate

Omrons E3C-LDA photoelectric laser sensor series is designed to provide advanced object detection, positioning and high-resolution sensing. What's unique about the E3C-LDA is that the focal point and optical axis on the sensor head can be easily adjusted for precise beam adjustment, which in turn ensures easy set-up and very precise operation from a long distance. In addition, the E3C-LDA series offers three separate laser beam types – spot beam, line beam and area beam - to cover a multitude of applications!

Its state-of-the-art construction, speed, accuracy and built-in reliability combine to make this very compact photoelectric sensor series ideal for use in today's production processes, where high precision and fast response time are vital. Typical applications include object detection in the semiconductor industry, grease, adhesive and seal inspection, assembly oriented applications in the automotive industry, and sheet displacement inspection in the paper and packaging industries.

E3X-DAS/E3X-MDA - The new fibre-amplifier generation



The new Omrons E3X-DA-S digital fiber amplifier takes a leading part in fiber sensing technology.

The E3X-DA-S offers fast and stable detection over a wide range of applications. It is the first digital fiber amplifier with Power Tuning Function, witch provides optimal incident light level settings for your sensor. This feature saves time and money by eliminating labour-intensive adjustments just Plug and Play.

Omrons innovative Auto Power Control (APC) function uses a 4-element LED circuit to counteract the deterioration of the light emitting element over time and therefore a highly stable long term detection performance. In addition, Omron offers a super slim version with the E3X-MDA series witch contains a two-channel amplifier in one body with just 10 mm width. This dual fiber sensor is currently the slimmest in the industry.

This represents saving of up to 50 % in space and 40 % in power, the optimum solution where multiple detection in limited area is required. It is equipped with an AND/OR control output, so compact PLC's and sensor controllers are no longer required.

The E3X-series is the ideal general purpose sensor for a wide range of applications. Typical applications are for small object detection in the semiconducter industry, position- and orientation check of parts in assembling and packaging industries also high precision detection in textile industry.

NEW PRODUCTS

E3NT-L – One of the most advanced sensors in the world

The E3NT-L is a distance-setting photoelectric sensor whose ease-of-use, robustness and intelligence make it one of the most advanced sensors around. It has a detection range of up to 2 meters, it features background and foreground suppression, and its patented optic design enables it to reliably detect objects regardless of their direction.

Built for every environment

The E3NT-L is a sealed unit, with a robust aluminium housing and smooth body design that prevents dirt from attaching to it. It is teachable and can be operated via just three keys. It is fully digital for stable, reliable information, and can be adapted to operate in the harshest of environments. These features make the E3NT-L suitable for applications in the material warehousing and food processing industries, where long yet precise distance sensing is required.

F210 – Compact hardware, highend software

High End software functionality including Edge code and macro programming

The F210 general-purpose vision system is designed for a wide range of quality inspection applications in automated production processes. It contains powerful algorithms that ensure the inspection performance is fast and ultra-precise. These algorithms include Edge Code technology, Fine Matching tool and QUEST OCR/OCV. A trend-monitoring feature is also available for inspection analysis.

The F210's flow-menu configuration software enables standard inspection tasks to be easily configured via the user-friendly GUI. In addition, a Macro Functions software option is available for OEMs and system integrators who wish to create their own application-specific vision systems. Customized operation flows can also be created in which nearly every system function can be accessed and manipulated.

Z 300/Z 500 - High-precision, high-stability measurement on any surface

Omrons Z300 high-precision displacement sensor system is designed to provide very stable measurement on a wide variety of objects with surfaces that vary from transparent glass and highly reflective stainless steel to black rubber tyres. What?s more, the Z300 can measure the thickness between layers in multi-layered transparent objects!

The ability to offer such highly accurate measurements on such a variety of surfaces is thanks to Omrons innovative two-dimensional CCD sensor, which is combined with an enhanced controller running a powerful algorithm that ensures optimal sensitivity, no matter how varied the reflected light. The Z300 also offers a choice of four high-resolution, long-distance sensor heads.
These features make the Z300 the perfect measurement system for those in the glass, automotive, semiconductor and electronics industries who require high-precision visual measurements for solving application requirements that up to now simply couldn´t be done using a normal displacement sensor!

Omrons Z500 high-precision displacement sensor system is designed to provide a very accurate, stable measurement of an objectXs profile, no matter how complex the surface of the object. It does this by emitting a band of laser light (line beam) onto an object which reflects this beam onto a two-dimensional CCD sensor. A dedicated controller processes the CCD output to provide measurement data and a visual display of the objectXs profile on a monitor for evaluation.

The ability of the Z500 to offer extremely accurate measurements and on such a variety of surfaces is thanks to Omrons innovative two-dimensional CCD sensor.

Omron also has an optional sensor system (the Z510) that is dedicated to the inspection of welding beads. Both the Z500 and Z510 offer a choice of three sensor heads. These features make the Z500/Z510 the perfect measurement system for those in the automotive and aerospace industries, where high-precision glue bead, gap and weld inspections are required.

PRODUCT SELECTION TABLE

Photoelectric Sensors

- E3Z
- E3T
- E3NT-L
- E3S-C
- E3S-CL
- E3G
- E3G-L1/L3
- E3F2
- E3JK
- E3M-V
- E3MC
- E3X-NL
- E3S-CR62/67
- E3S-R
- E3S-LS3
- F3UV
- E39-L150/L151/L93
- E39-L97/98
- E39-L/S/R
- E3C-LDA
- F3C-AL

▶ Page A-1

Fiber Optics

- Fiber E32 Serie
- E3X-DA-S
- E3X-MDA
- E3X-DA-N
- E3X-NA
- E3X-DRT21
- E3X-SRT21
- E3X-CIF11

▶ Page A-230

Displacement Sensors/ Width-measuring Sensors

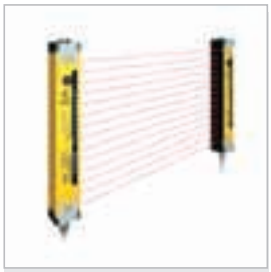
- ZX-L Series
- ZX-E Series
- Z300
- Z500
- Z510
- Z4LB V2

▶ Page B-1

Vision Sensors

- F10
- F150
- Vision Composer
- F400
- F160
- F210
- F250
- Accessories
- V530-R150
- V530-R160

▶ Page C-1



Safety Sensors/ Components

- F3SN-A
- F3SH-A
- F3SL • F3S-B
- F3S-TGR
- F3G-C
- F3SS
- E3FS
- F3SP-TGR
- G9SA • G9SB
- G7S • G7SA
- CQM1-/CS1-SF200
- D4NS
- D4BS
- D4GS-N
- D4NL
- D4GL
- D4BL
- D4DH • D4D_N
- D4B_N
- D4F
- D4DR
- A22E
- A165E
- A4E
- F3W-D
- F3Z-N

▶ Page D-1

Proximity Sensors

- E2A
- E2E
- E2EL
- TL
- E2EQ
- E2FQ
- E2S
- TL-W
- TL-N
- E2K-_
- E2KQ-X
- Y92 Accessories

▶ Page E-1

Rotary Encoders

- E6A2-C
- E6B2-C
- E6C2-C/E6C3-C
- E6F-C/-A
- E6H-C
- E6C3-A
- E6L

▶ Page F-1

Pressure Sensors

- E8F2
- E8MS/E8M

▶ Seite G-1

Power Supply

Selection Guide

▶ Seite H-1

Dexamethason 0,4 P
Dexamethason 0,4 P
Dexamethason 0,4 P
bela-pharm
bela-pharm
OMRON F160-LTC20
LIGHTING EQUIPMENT

Table of Contents

OMRON

Introduction			
Table of Contents			17
Sensing Guide			19
Applications			89

Photoelectric Sensors				
General Purpose		Miniature	E3Z	A-2
		Slim, Subminiature	E3T	A-28
		Distance-setting	E3NT-L	A-38
		Oil Resistance, Long Distance (Metal Case)	E3S-C	A-54
		Distance-settable (Metal Case)	E3S-CL	A-64
		Long Distance	E3G	A-72
		Distance-settable (Miniature)	E3G-L1/L3	A-88
		M18 Cylindrical Housing	E3F2	A-100
Built-in Power Supply		AC/DC-switchable	E3JK	A-120
Application	Mark Sensor	Green light	E3M-V	A-128
	Color Mark Sensor	RGB Color	E3MC	A-142
	Glossy Objects	Glossy Objects	E3X-NL	A-164
	Transparent Objects	Clear Bottles	E3S-CR62/67	A-174
		Transparent Objects	E3S-R	A-182
	PCB	PCB	E3S-LS3N	A-190
	UV	UV Power Monitors	F3UV	A-194
Accessories		Sensor Adjustors	E39-L150 E39-L151 E39-L93	A-212
		Covers	E39-L97/L98	
		Accessories	E39-L/S/R	A-216
Fiber optics	Fiber E32 Series	Fiber E32 Series	E32	A-230
		General purpose		A-238
		Long-distance		A-244
		Area sensing		A-248
		Small fiber head		A-251
		Fiber for Robot Application R4 (Strong against repeatable bending)		A-255
		Side view		A-258
		Coaxial fiber		A-263
		Chemical resistant		A-265
		Heat resistant		A-267
		Grooved		A-271
		Narrow Vision Field		A-272
		Limited-reflective		A-273
		Fluid-level Detection Fiber Units		A-276
		Mapping sensors		A-276
		Retroreflective		A-277
		Liquid level, Contact	E32-D82F	A-302
		Liquid level, Pipe Mounting	E32-L25T	A-304
		Vacuum	E32-V	A-306
		Accessories for E32		A-310
	Amplifier	Digital Amplifier with APC + Power Tuning Function	E3X-DA-S	A-318
		Digital Amplifier with APC	E3X-DA-N	A-340
		2-Channel Digital Amplifier	E3X-MDA	A-362
		Manual Amplifier	E3X-NA	A-382
		Fiber Amplifier Communication Units	E3X-DRT21 E3X-SRT21 E3X-CIF11	A-394
Photoelectric Laser Sensor		Small Spot Type Laser	E3C-LD11	A-396
		Line Beam Type Laser	E3C-LD21	A-396
		Area Beam Type Laser	E3C-LD31	A-396
		Digital Amplifier with Power Tuning Function	E3C-LDA	A-396
		Distance-settable	F3C-AL	A-402

Displacement Sensors/Width-measuring Sensors			
Displacement Sensors	Smart Sensors Laser	ZX-L Series	B-2
	Smart Sensors Inductive	ZX-E Series	B-22
	Laser CCD-Measurement System	Z300	B-38
	Profile Laser CCD-Measurement System	Z500	B-52
	Welding Bead Sensor	Z510	B-60
Width-measuring Sensors	Parallel Beam Linear Sensors	Z4LB V2	B-64

Vision Sensors			
General purpose Vision Systems	Pattern Matching Sensor	F10	C-2
	Vision Sensor	F150-3	C-26
	Integrated Control Software for F150-3	Vision Composer	C-40
	Color Vision Sensor	F400	C-44
	Vision Sensor	F160	C-54
	Vision Sensor	F210	C-66
	High-performance Vision Sensor	F250	C-74
Application Specific Vision Systems	2D code Readers	V530-R150	C-82
		V530-R160	C-92
Accessories	Cameras, Lenses, Lighting		C-98

Safety Sensors / Components			
Safety Sensors	Safety Light Curtain Type 4 Multibeam Safety Sensor Type 4	F3SN-A F3SH-A	D-2
	Safety Light Curtain Type 4 High sensing range	F3SL	D-26
	Safety Light Curtain Type 2	F3S-B	D-30
	Safety Perimeter guard type 4 and type 2	F3S-TGR	D-48
	Safety Laser Scanner type 3	F3G-C	D-50
	Single Beam Safety Sensor type 4	F3SS	D-56
	Single Beam Safety Sensor type 2	E3FS	D-60
Safety Sensor Controller	Muting Controller for E3FS	F3SP-U1P F3SP-U3P F3SP-U5P	D-70 D-74 D-76
	Muting Controller for F3S series	F3SP-U2P F3SP-U4P	D-78 D-82
	Controller for automatic reinitiation (PSDI / single, double break)	F3SP-P1P	D-86
Safety Relays	Safety Relay Unit	G9SA G9SB	D-92 D-106
	Safety Relay	G7S G7SA	D-114 D-120
	Safety Relay Unit	CQM1-SF200 CS1W-SF200	D-128

Table of Contents

OMRON

Safety Switches	Safety Door Switches	D4NS	D-134
		D4BS	D-146
		D4GS-N	D-156
	Safety Guard Lock Switches	D4NL	D-166
		D4GL	D-184
		D4BL	D-200
	Non-contact switches	D40B	D-212
	Safety Hinge Switches	D4DH	D-222
	Safety Limit Switches	D4D_N	D-232
		D4B_N	D-252
		D4F	D-268
	Manual Reset Limit Switches	D4D-_R	D-276
	Emergency Stop Pushbuttons	A22E	D-290
		A165E	D-308
	Enabling Switch	A4E	D-316
Precaution			D-322
Standards			D-335
Approvals			D-338
Non safety line Sensor for picking applications	Picking Sensor	F3WD	D-346
	Area sensor	F3ZN	D-360

Proximity Sensors

Cylindrical	Standard	E2A	E-6
		E2E	E-22
		E2EL	E-44
		TL	E-52
	Antispatter	E2EQ	E-56
	Chemical Resistance	E2FQ	E-64
Rectangular	Subminiature	E2S	E-68
	Flat	TL-W	E-76
	Standard	TL-N	E-84
Capacitive	Liquid Level	E2K-L	E-92
	Long Distance	E2K-C	E-98
	Flat	E2K-F	E-104
	Chemical Resistance	E2KQ-X	E-108
Peripheral Equipment	Accessories	Y92□	E-111

Rotary Encoders

Incremental	25 dia.	E6A2-C	F-2
	40 dia.	E6B2-C	F-3
	50 dia.	E6C2-C/ E6C3-C	F-5
	60 dia.	E6F-C	F-7
	40 dia. (Hollow Shaft)	E6H-C	F-8
Absolute	50 dia.	E6C3-A	F-9
	60 dia.	E6F-A	F-11
Easy Scale	Linear Encoder	E6L	F-13

Pressure Sensors

LED Digital Display	E8F2	G-2
Ultra-small, Ultra-light (LED Digital Display)	E8MS/E8M	G-4

Accessories: Power Supply

Selection Guide Power Supply	H-2
Contact Information	
Index	