

Industrial Automation Guide 2016



Industrial Products & Systems

industrial.omron.eu

Targeted Technologies

Creating maximum output with minimum input

By identifying the many ways of innovation in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples on our website.

industrial.omron.eu/technologies



PROplus Line

If you have a complex application or one where you need to address special needs, then the PROplus Line is the answer. That's because PROplus is a product line that is designed to meet a wide range of customer needs. The PROplus Line is a family of products that are designed to meet a wide range of customer needs. The PROplus Line is a family of products that are designed to meet a wide range of customer needs.

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The 361° Approach

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Technologies

Creating maximum output with minimum input. Whatever type of automated machinery you are specialized in, you know that there are many ways to innovate. You are already aware that there are many possible areas for improvement. But where do you start? Where do you focus your efforts? Where can you make the biggest difference with the least amount of effort?

At Omron, we asked ourselves these questions too. And by identifying the answers in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples below.

Technologies

Sysmac: the all-in-one platform

We know that machine builders prefer different product solutions for different challenges. But this can cause hierarchy headaches and communications issues. That's why we developed Sysmac: a single unified platform that is open, scalable, flexible, and totally focused on maximising the speed and flexibility of machines. A platform that integrates robotic, motion and sequential logic control into a single multitasking system.

[Learn more](#)



361°: the perfect match

When it comes to sensors and components, we know that our customers all have different needs. That's why our product development in this area is driven by the 361° Approach. It produces product families that offer a total all-round choice. From quality products suited to standard environments to specialist devices that can handle extremes. A full circle of choice, all with an extra degree of quality and proven reliability.

[Learn more](#)



The 361° portfolio

PROplus Line
PROplus products are designed for specific applications or customer segments.

[Learn more](#)



LITE Line

LITE sensors are the effective solution for many applications in quality control.

[Learn more](#)



Related product news



With new G2B sensors, you only pay for what you need. Optimizing relative placement sensors in the new G2B range have been specifically designed to offer a cost-effective sensing solution in standard industrial conditions, making it unnecessary to buy more sensors than you actually need.

[Learn more](#)

Related product news



ES16 - Omron's new photo sensors combine simplicity with performance.

Drawing on our experience of manufacturing over a million production sensors a year, we have developed a new generation of high-precision products that combine simple selection, installation with reliability, versatility, rugged construction and value for money.

[Learn more](#)

Related product news



RS-485 Control: New step towards the full integration of automation equipment.

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Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find on the attached DVD. For more information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
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- Knowledge Base - "myOmron"
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- Contact information

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Industrial Automation Guide 2016

	Omron at a glance	3
	The 361° Approach	4
	Sysmac: A fully integrated platform	6
	Product selection table	8
Automation systems	Machine automation controller	12
	Programmable logic controllers (PLC)	26
	Remote I/O	54
	Human machine interfaces (HMI)	68
	I/O cables and terminal blocks	82
	Ethernet cables and accessories	91
Motion & Drives	Motion controllers	96
	Servo systems	112
	Robots	170
	Frequency inverters	202
Sensing	Photoelectric sensors	236
	Mark and Color sensors	278
	Lightcurtains and area sensors	284
	Fiber optic sensors and amplifiers	292
	Inductive sensors	324
	Mechanical sensors/Limit switches	344
	Rotary encoders	358
	Cable connectors	366
Quality control & Inspection	Inspection & Ident systems	370
	Measurement sensors	426
Safety	Emergency stop and control devices	462
	Safety limit switches	472
	Safety door switches	480
	Safety sensors	506
	Safety logic control systems	544
	Safety outputs	566
Control components	Temperature controllers	574
	Power supplies	596
	Uninterruptible power supplies (UPS)	614
	Timers	622
	Counters	632
	Programmable relays	642
	Digital panel indicators	650
	Energy monitoring devices	660
	Photovoltaic	674
Switching components	Electromechanical relays	682
	Solid state relays	696
	Low voltage switchgear	706
	Monitoring products	722
	Pushbutton switches	750
Software	Software	766
	Outline of Major Standards	772
	Index	775

“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

	Quality	Line-up	Application	Customization	Global availability	Specs
PRO^{plus}	Premium	Tailored	Special	Yes	Yes	Application oriented
PRO	Premium	Complete	Advanced	Yes	Yes	Above Standard
LITE	Premium	Standard	Basic	No	No	Basic
	'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability	'Line-up' refers to the number of model types	'Application' indicates the complexity of the automation	'Customization' is the possibility to modify the product		'Specs' refers to the choice of performance levels

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.



Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL

Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque

Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

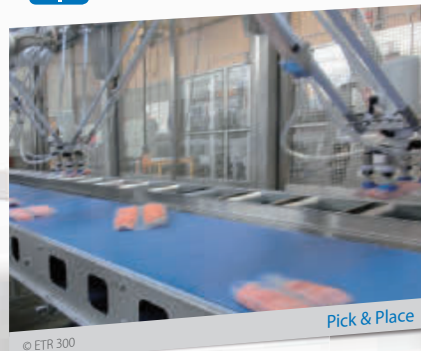
The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

Vision



- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

Sensing



- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

Product selection table

Automation systems				
	12 Machine automation controller	26 Programmable logic controllers (PLC)	54 Remote I/O	68 Human machine interfaces (HMI)
				
	96 Motion controllers	112 Servo systems	170 Robots	202 Frequency inverters
Sensing				
	236 Photoelectric sensors	278 Mark and Color sensors	284 Lightcurtains and area sensors	292 Fiber optic sensors and amplifiers
				
	370 Inspection & Ident systems	426 Measurement sensors		
Safety				
	462 Emergency stop and control devices	472 Safety limit switches	480 Safety door switches	506 Safety sensors
				
	574 Temperature controllers	596 Power supplies	614 Uninterruptible power supplies (UPS)	622 Timers
Switching components				
	682 Electromechanical relays	696 Solid state relays	706 Low voltage switchgear	722 Monitoring products
				
	766 Software			
Software				

Sensing

Find information fast!

Quick Links shortens your search. Quick Links are unique codes assigned to Omron products listed in this guide. Enter Quick Link codes in the search box on industrial.omron.eu to access detailed information on products in this guide.



Quick Link

Sensing

Photoelectric sensors	236	Fiber optic sensors and amplifiers	292
Selection table	238	Selection table	294
Compact square		Fiber sensor heads	
Multi-purpose		E32 Standard cylindrical	296
E3Z	241	E32 Square shape	298
E3ZM	243	E32 Miniature	300
E3Z-Laser	245	E32 Longer distance	302
Special applications		E32 Chemical resistant	304
E3Z-G	246	E32 Heat resistant	305
E3ZM-B	247	E32 Vacuum resistant	307
E3Z-B	248	E32 Robot application	309
E3S-CL	249	E32 Precision detection	310
E3S-LS3	250	E32 Special application	312
E3S-DB	251	Fiber amplifiers	
E3ZM-C	239	E3X-HD	314
Miniature and Photomicro		E3X-SD	317
Multi-purpose		E3X-NA	318
E3T	253	E3NX-FA	320
E3H2	264	E3X-DAC-S	282
Special applications		E3X-NA_F	293
EE-SX47/67	255	E3X-MDA	293
Cylindrical		E3X-DAH-S	293
Multi-purpose		Fiber accessories	
E3FA/E3FB	257	E39/E32	323
E3F1	260	Inductive sensors	324
Special applications		Selection table	326
E3F_-B/-V	261	Compact – cylindrical	
E3FC	262	E2A	328
E3H2	264	E2A-S	330
E3T-C	265	E2A3	331
Square type		E2B	332
Multi-purpose		μPROX E2E Small Diameter	334
E3G-M	266	Square/block style	
E3JK	267	TL-W	335
E3JM	269	E2S	336
Special applications		E2Q5	337
E3G-M	266	Special models	
Separated amplifier		E2EH	338
E3NC	270	E2E_-U	339
Reflectors		E2FM	340
E39	274	E2C-EDA	342
Accessories		E2Q6	343
AS	276	E2FQ	326
E39/Y92E-B	277	Mechanical sensors/Limit switches	344
Mark and Color sensors	278	Selection table	347
Selection table	280	Limit switches	
Mark detection		D4N	348
E3ZM-V	281	D4B	475
E3X-DAC-S	282	WL-N	350
FQ	279	D4C	352
FZ	279	ZC	354
Color detection		Z	356
Xpectia lite	279	EE-SX47/67	255
Lightcurtains and area sensors	284	ZX-T	451
Selection table	286	D4C, D4E, X, Z, ZC	345
Lightcurtains and area sensors		D4MC, HL, WL	345
F3ET2	287	D4E, SHL, WL	345
F3E	288	D5B	347
E32 Area monitoring	289	Rotary encoders	358
E32-M21	289	Selection table	361
F3EM2	290	Rotary encoders	
E3Z	241	E6A2-C, E6B2-C	362
ZX-GT	457	E6C2-C/E6C3-C, E6F-C	363
		E6H-C	364
		E6C3-A, E6F-A	365
		Cable connectors	
		Cable connectors	
		XS2, XS3, Y92E	366

Lightcurtains and area sensors

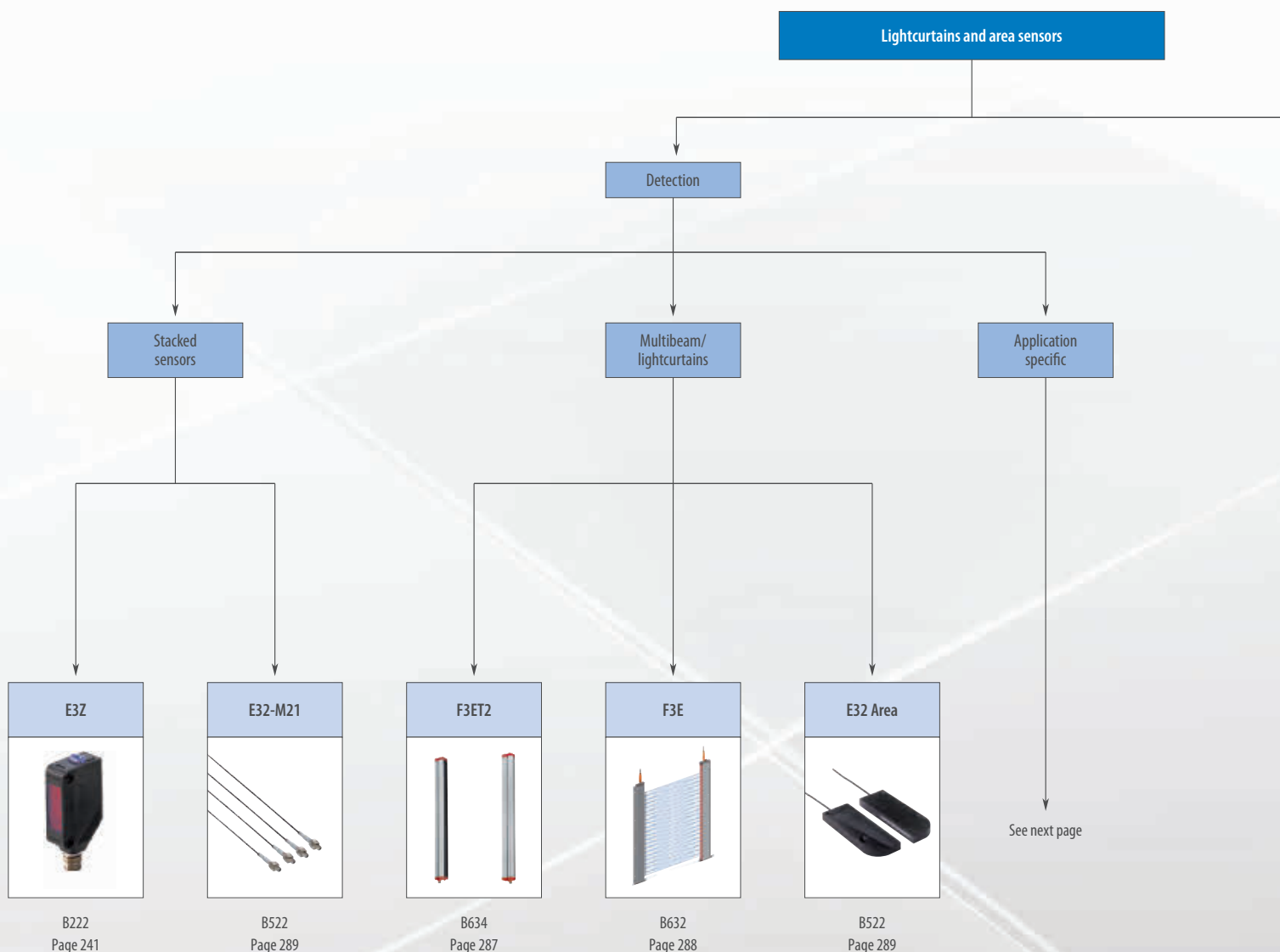
PRESENCE, HEIGHT OR PROFILE ...

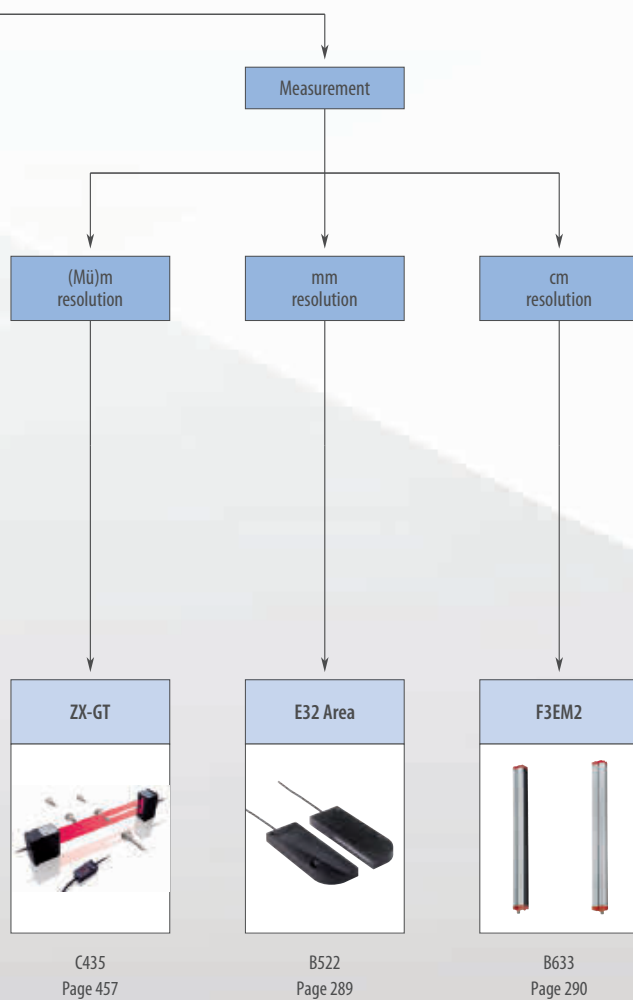
... choose the accuracy you need




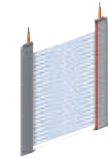


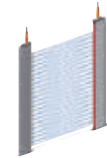
Objects with varying positions or heights or objects with holes can create multiple signals or stay undetected when using single beam sensors. These objects (e.g. parcels, bikes or natural products like ham or fish) are then wrongly classified as multiple smaller items or are not detected correctly.




Detecting these objects over their whole length or acquiring the more detailed object profile can be realized using multiple sensors or light curtains.

Omron offers a wide range of models with varying max detection heights, different resolutions and with digital, analog or serial outputs to provide the best performance match fitting your application.





Type	Stacked sensors		Multibeam sensors/lightcurtains			Application specific lightcurtains	
							
Model	E3Z	E32-M21	F3ET2	F3E	E32 area	Safety lightcurtains	F3E Elevator lightcurtains
Key features	Mutual interference prevention	4 × M3 heads combined in one fiber	Models with 5 and 18 mm pitch	Thin aluminum housing	Teachable sensitivity	Type 2, type 4 or application specific	Fulfills EN81-70
Max. sensing distance	60 m	1.3 m	15 m	5 m	4 m	50 m	5 m
Max. detection height	n. a.	4 m	2.1 m	1.8 m	70 mm	2.4 m	1.8 m
Page/Quick Link	241/B222	289/B522	287/B634	288/B632	289/B522	506	288/B632

Type	Measuring lightcurtains		
			
Model	F3EM2	E32 area	ZX-GT
Key features	cm accuracy	mm accuracy	µm accuracy
Max. sensing distance	15 m	4 m	0.5 m
Max. measurement height	2.1 m	70 mm	28 mm
Page/Quick Link	290/B633	289/B522	457/C435



Lightcurtain in robust aluminum housing

The F3ET2 lightcurtains provide a reliable area monitoring in a robust housing. The optical synchronisation between emitter and receiver allow a fast and simple installation without special requirements.

- Optical synchronisation for reliable operation without additional wiring
- Robust aluminum housing
- NPN/PNP and Light ON/Dark ON selectable

Ordering information

Sensor type	Detection area (mm)	Pitch	Sensing distance	Channels	Connection method				Output	Order code*1
Through-beam 	150	5 mm	3 m	30	—	5 pin	—	—	PNP/NPN	F3ET2-005-150
		18 mm	15 m	8	—		—	—		F3ET2-018-150
	300	5 mm	3 m	60	—		—	—		F3ET2-005-300
		18 mm	15 m	16	—		—	—		F3ET2-018-300
	450	5 mm	3 m	90	—		—	—		F3ET2-005-450
		18 mm	15 m	24	—		—	—		F3ET2-018-450
	600	5 mm	3 m	120	—		—	—		F3ET2-005-600
		18 mm	15 m	32	—		—	—		F3ET2-018-600
	900	5 mm	3 m	180	—		—	—		F3ET2-005-900
		18 mm	15 m	48	—		—	—		F3ET2-018-900
	1200	5 mm	3 m	240	—		—	—		F3ET2-005-1200
		18 mm	15 m	64	—		—	—		F3ET2-018-1200
	1500	5 mm	3 m	300	—		—	—		F3ET2-005-1500
		18 mm	15 m	80	—		—	—		F3ET2-018-1500
	1800	5 mm	3 m	360	—		—	—		F3ET2-005-1800
		18 mm	15 m	96	—		—	—		F3ET2-018-1800
	2100	18 mm	15 m	112	—		—	—		F3ET2-018-2100

*1 Light-ON/Dark-ON selectable

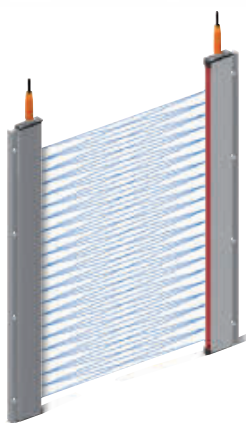
Connector cables

Type	Features	Material		Order code	
		Nut	Cable	Straight	Angled
M12	5 wires	CuZn	PVC 2 m	XS2F-M12PVC5S2M-EU	XS2F-M12PVC5A2M-EU
			PUR 2 m	XS2F-M12PUR5S2M-EU	XS2F-M12PUR5A2M-EU
			PVC 5 m	XS2F-M12PVC5S5M-EU	XS2F-M12PVC5A5M-EU
			PUR 5 m	XS2F-M12PUR5S5M-EU	XS2F-M12PUR5A5M-EU

Specifications

Item	Through-beam	
	F3ET2-005_	F3ET2-018_
Sensing distance	0 to 3 m	0 to 15 m
Vertical detection area	0 to Max _M mm; Max _M : 150, 300, 450, 600, 900, 1200, 1500, 1800*1	0 to Max _M mm; Max _M : 150, 300, 450, 600, 900, 1200, 1500, 1800, 2100
Minimum detectable object size	10 mm	30 mm
Pitch	5 mm	18 mm
Response time	4 ms + 80 μs × number of beams	
Light source (wave length)	Infrared LED (880 nm)	
Power supply voltage	24 VDC±20%	
Operating temperature	-10 to 55°C	
Degree of protection	IEC 60529 IP65	
Material	Case	Aluminum

*1 Models with different detection ranges are available in 150 mm intervals. Please contact your OMRON representative.





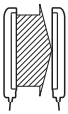


Lightcurtain in thin aluminum housing

The crossing of the multiple sensor beams provides a reliable area monitoring in a thin, easy to install housing. The thin housing makes the light curtain ideal for the installation where space is crucial.

- Thin 9 mm shape for easy design-in in elevator constructions
- High ambient light immunity
- Robust aluminum housing
- Fulfills requirements of EN81-70 (1800 mm models) for mounting in elevators

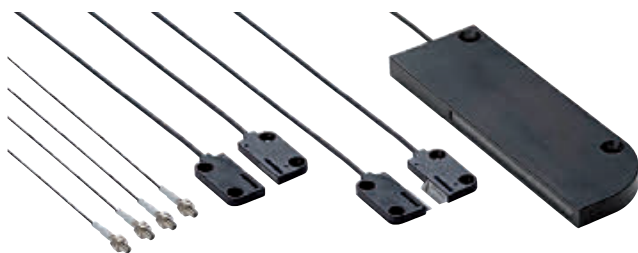
Ordering information

Sensor type	Detection area	Pitch	Sensing distance	Channels	Number of optical axis	Connection method				Order code* ¹ Potential free output
										
Through-beam 	200 mm	40 mm	5 m	6	16	–	–	5 m	–	F3E-06-T1 5M
						■	–	–	–	F3E-06-T6
	1320 mm	120 mm		12	34	–	–	5 m	–	F3E-12-T1 5M
						■	–	–	–	F3E-12-T6
	1800 mm	120 mm		16	46	–	–	5 m	–	F3E-16-T1 5M
						■	–	–	–	F3E-16-T6
		40 mm		46	136	–	–	5 m	–	F3E-46-T1 5M
						■	–	–	–	F3E-46-T6

*¹ Light-ON/Dark-ON settable. Common operation is Dark-ON

Specifications

Item		Through-beam			
		F3E-06-T_	F3E-12-T_	F3E-16-T_	F3E-46-T_
Number of LEDs		6	12	16	46
Number of optical axes		16	34	46	136
Pitch		40 mm	120 mm	120 mm	40 mm
Vertical detection range		20 to 200 mm	20 to 1320 mm	20 to 1820 mm	
Response time		max. 110 ms (signal interruption)			
Light source (wave length)		Infrared LED (880 nm)			
Power supply voltage		10 to 30 VDC			
Ambient temperature	Operation	–20 to 60°C			
	Storage	–40 to 70°C			
EMC conformity/standards		73/23/EWG; 89/336/EWG; 95/16/EG; EN81-1; EN81-2; EN12015; EN12016; EN61000-6-x			
Degree of protection		IEC 60529 IP54			
Dimensions		400 × 40.7 × 9 mm	1590 × 40.7 × 9 mm	2070 × 40.7 × 9 mm	2000 × 40.7 × 9 mm
Material	Case	Aluminum			



Area monitoring fiber sensor heads

When mounting space is crucial or the objects are very small, the area monitoring fibers provide a reliable object detection even when the object position varies within the monitored range.

In combination with the window monitoring function or the serial transmission of the received light level values of the fiber amplifiers, simple height comparison or measuring applications can be realized.

- Area monitoring up to 70 mm height
- Multi-beam sensor with 4 separate heads for flexible detection points
- Standard or high flex fibers

Ordering information

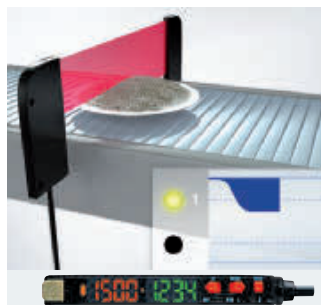
Sensor type	Sensing height (in mm)	Sensing distance (in mm) ^{*1}				Order code	
		Standard fiber		High-flex fiber		Standard fiber	High-flex fiber
		E3X-HD	E3NX-FA	E3X-HD	E3NX-FA		
	10	4000	4000	–	–	E32-T16	–
	11 ^{*2}	2200	3300	1700	2550	E32-T16P	E32-T16PR 2M
	30	3600	4000	2600	3900	E32-T16W 2M	E32-T16WR 2M
	50	–	–	3000	4000	–	E32-ET16WR-2 2M
	70	–	–	3500	4000	–	E32-ET16WR-1 2M
	11	2000	3000	1500	2200	E32-T16J 2M	E32-T16JR 2M
	4 x separate M3 heads	1300	1900	–	–	E32-M21	–
	11	–	–	300	450	–	E32-D36P1 2M

^{*1} Sensing distance measured with Standard mode

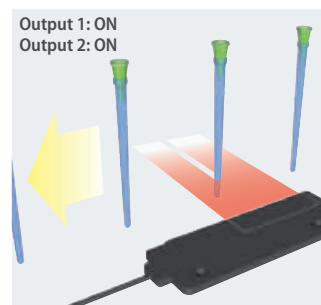
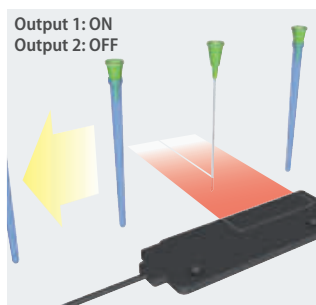
^{*2} Sensing area aligned to top of housing.

Specifications

Item	Standard			High-flex			
	E32-T16	E32-M21	E32-T16J E32-T16P E32-T16W	E32-D36P1	E32-ET16WR-1 E32-ET16WR-2	E32-T16JR E32-T16PR E32-T16WR	
Permissible bending radius	R25		R10	R4	R1		
Cut to length	Yes						
Ambient temperature	−40°C to 70°C						
Material	Head	ABS	Stainless steel	ABS	Brass-nickel plated	Aluminium	ABS
	Fiber	PMMA					
	Sheath	Polyethylene coating		PVC coating	Polyethylene coating		PVC coating
Degree of protection	IEC 60529 IP67		IEC 60529 IP50		IEC 60529 IP54		IEC 60529 IP50



The two outputs of the E3NX-FA can be used to detect two different light levels



In combination with the twin output function of the E3NX-FA amplifier, the diffuse reflective area monitoring fibers can detect very small objects (e.g. needles) and a second state (e.g. cover present). The area beam compensates for position variations at high speed.



Measuring lightcurtain in robust aluminum housing

The F3EM2 provides easy to install and set up height and profile measurement. The analog output provides a simple overall height detection and the serial output models provide single beam evaluation for profile measurements.

- Robust aluminum housing
- Analog output for simple height detections
- Serial output with single beam evaluation for profile measurement
- Various output modes to adapt output data to the given application

Ordering information

Sensor type	Measurement range (mm)	Pitch* ¹	Sensing distance	Channels	Connection method				Order code	
									RS-232-C serial/ analog output models* ²	Analog output models
Through-beam (measuring) 	150	5 mm	3 m	30	—	M12 8-pin/ M12 5-pin	—	—	F3EM2-005-150	F3EM2-005-150-AV
		18 mm	15 m	8	—		—	—	F3EM2-018-150	F3EM2-018-150-AV
	300	5 mm	3 m	60	—		—	—	F3EM2-005-300	F3EM2-005-300-AV
		18 mm	15 m	16	—		—	—	F3EM2-018-300	F3EM2-018-300-AV
	450	5 mm	3 m	90	—		—	—	F3EM2-005-450	F3EM2-005-450-AV
		18 mm	15 m	24	—		—	—	F3EM2-018-450	F3EM2-018-450-AV
	600	5 mm	3 m	120	—		—	—	F3EM2-005-600	F3EM2-005-600-AV
		18 mm	15 m	32	—		—	—	F3EM2-018-600	F3EM2-018-600-AV
	900	5 mm	3 m	180	—		—	—	F3EM2-005-900	F3EM2-005-900-AV
		18 mm	15 m	48	—		—	—	F3EM2-018-900	F3EM2-018-900-AV
	1200	5 mm	3 m	240	—		—	—	F3EM2-005-1200	F3EM2-005-1200-AV
		18 mm	15 m	64	—		—	—	F3EM2-018-1200	F3EM2-018-1200-AV
	1500	5 mm	3 m	300	—		—	—	F3EM2-005-1500	F3EM2-005-1500-AV
		18 mm	15 m	80	—		—	—	F3EM2-018-1500	F3EM2-018-1500-AV
	1800	5 mm	3 m	360	—		—	—	F3EM2-005-1800	F3EM2-005-1800-AV
		18 mm	15 m	96	—		—	—	F3EM2-018-1800	F3EM2-018-1800-AV
	2100	18 mm	15 m	112	—		—	—	F3EM2-018-2100	F3EM2-018-2100-AV

*¹ Models with 7.5 mm pitch are available. Contact your OMRON representative.

*² Models with RS-485 serial output are available. Contact your OMRON representative.

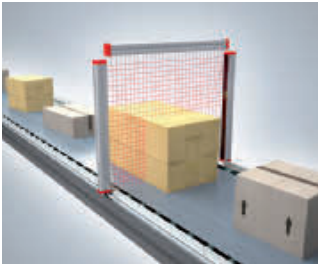
Connector cables

Type	Features	Material		Order code	
		Nut	Cable	Straight	Angled
M12	8 wires	CuZn	PUR 2 m	Y92E-M12PURSH8S2M-L	
			PUR 5 m	Y92E-M12PURSH8S5M-L	
	5 wires	CuZn	PVC 2 m	XS2F-M12PVC5S2M-EU	XS2F-M12PVC5A2M-EU
			PUR 2 m	XS2F-M12PUR5S2M-EU	XS2F-M12PUR5A2M-EU
			PVC 5 m	XS2F-M12PVC5S5M-EU	XS2F-M12PVC5A5M-EU
			PUR 5 m	XS2F-M12PUR5S5M-EU	XS2F-M12PUR5A5M-EU

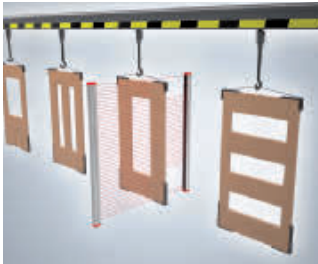
Specifications

Item	Through-beam	
	F3EM2-005_	F3EM2-018_
Sensing distance	0 to 3 m	0 to 15 m
Vertical measurement range	0 to Max _M mm; Max _M : 150, 300, 450, 600, 900, 1200, 1500, 1800 ^{*1}	0 to Max _M mm; Max _M : 150, 300, 450, 600, 900, 1200, 1500, 1800 ^{*1}
Minimum detectable object size	10 mm	30 mm
Pitch	5 mm	18 mm
Response time	4 ms + 80 μs × number of beams (+ transmitting time for serial operation)	
Light source (wave length)	Infrared LED (880 nm)	
Power supply voltage	24 VDC±20%	
Ambient temperature	-10 to 55°C	
Degree of protection	IEC 60529 IP65	
Material	Case	Aluminum

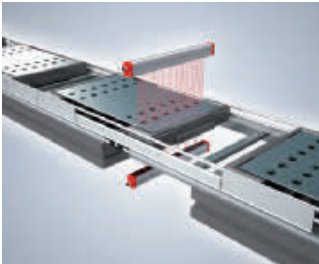
^{*1} Models with different measurement ranges are available in 150 mm intervals. Please contact your OMRON representative.



Volume measurement



Profile scan



Hole detection



Position control