



## Top product features!

- Robust design and compact metal housings provide long life and reliability in industrial environments
- CMOS image sensor and Digital Signal Processor with no moving parts provide high performance and durability
- Easy-to-use Setup Wizard guides you step-by-step for simple installation
- Flexible connections with Ethernet interface
- Self-contained unit (internal lighting)

## The inspection sensor for error-proofing applications

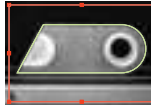
efector dualis provides reliable performance in production control. Fast processes or moving objects can be detected and precisely evaluated with the sensor's fast image capture and evaluation.

The sensor is an ideal solution for inspection and error-proofing applications such as right part / wrong part, correct orientation, missing component and object character verification.

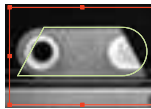
### Additional application examples



correct orientation



incorrect orientation



### Feeding technology

Feeder bowls are commonly used to constantly supply an assembly line with small parts. These parts, however, must be in the proper orientation to allow correct assembly.

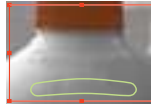
efector dualis can identify incorrect orientation of parts in a feeder bowl before they are applied.



test passed



test failed



### Object character verification

Even the smallest error, such as a missing date on a milk bottle, can cause large problems in a production line. The efector dualis is ideal for object character verification in a moving production line.

In this example, efector dualis detects a series of preset characters that indicate expiration date. In the following picture, efector dualis detects the missing characters and sends an alarm.

### Built-in intelligence



*Independent evaluation: efector dualis includes an image sensor, evaluation electronics and lighting integrated in one robust, industrial compatible housing.*




Company	IO-Link		Position Sensors					Motion Control	Vision Sensors	
	IO-Link		Inductive	Capacitive	Cylinder / valve position	Photoelectrics / lasers / fiber optics	Distance / Application specific	Ultrasonic	Encoders / Speed monitors	2D / 3D inspection
1 - 5	6 - 21		22 - 55	56 - 61	62 - 71	72 - 111	112 - 117	118 - 119	120 - 127	128 - 143





## Product + accessory selector

Dimensions	Output	Lighting	Max. Field of View Size	Detection Rate	Max. Motion Speed	Operating Voltage	Supply Current	Part No.	List Price (1-pc.)
80 x 42 x 59	PNP	infrared 850 nm	400 x 300 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D224</b>	<b>\$978.00</b>
80 x 42 x 53.5	PNP	infrared 850 nm	640 x 480 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D220</b>	<b>\$978.00</b>
80 x 42 x 53.5	PNP	infrared 850 nm	1320 x 945 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D222</b>	<b>\$978.00</b>
80 x 42 x 59	NPN	infrared 850 nm	400 x 300 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D225</b>	<b>\$978.00</b>
80 x 42 x 53.5	NPN	infrared 850 nm	640 x 480 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D227</b>	<b>\$978.00</b>
80 x 42 x 53.5	NPN	infrared 850 nm	1320 x 945 mm	20 Hz	1 m/s	24 VDC ± 10 %	< 300 mA	<b>O2D229</b>	<b>\$978.00</b>

### Accessories

Type	Description	Part No.	List Price (1-pc.)
	Mounting Set, 100 mm rod	<b>U60042</b>	<b>\$45.00</b>
	Mounting Set, 100 mm rod with rail mount cube	<b>U60043</b>	<b>\$51.00</b>
	Protective plastic cover	<b>E21166</b>	<b>\$102.00</b>
	Plastic lens for diffusing light	<b>E21165</b>	<b>\$119.00</b>
	Protective glass cover	<b>E21168</b>	<b>\$102.00</b>
	Ethernet cable, 2 m, M12 D-coded / RJ45, cross-link	<b>E11898</b>	<b>\$45.00</b>
	Ethernet cable, 5 m, M12 D-coded / RJ45, cross-link	<b>E18422</b>	<b>\$54.00</b>
	Ethernet cable, 10 m, M12 D-coded / RJ45, cross-link	<b>E18423</b>	<b>\$69.00</b>

### Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (8-pin) 2 m, PUR	<b>E11950</b>	<b>\$29.00</b>
	M12 Micro DC (8-pin) 5 m, PUR	<b>E11807</b>	<b>\$36.00</b>
	M12 Micro DC (8-pin) 10 m, PUR	<b>E11311</b>	<b>\$66.00</b>
	M12 Micro DC (8-pin) 2 m, PUR	<b>E11231</b>	<b>\$29.00</b>
	M12 Micro DC (8-pin) 5 m, PUR	<b>E11232</b>	<b>\$36.00</b>
	M12 Micro DC (8-pin) 10 m, PUR	<b>E11806</b>	<b>\$65.00</b>

See pages 140 - 141 for illumination.

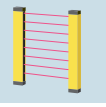






### Technical Specs

Maximum load current: 100 mA (per switching output)  
 Supply current: < 300 mA  
 Detection rate: 20 Hz  
 Maximum motion speed: 1 m/s  
 Lighting: infrared 850 nm  
 Operating voltage: 24 VDC ± 10 %  
 Operating temperature: 14...140 °F (-10...60 °C)  
 Protection rating: IP67  
 Material: Housing: die-cast zinc  
 Front pane: glass  
 LED window: polycarbonate  
 Trigger mode: External 24 V, PNP, NPN, continuous, TCP/IP  
 Parameter setting / process interface: Ethernet 10 Base-T, Ethernet TCP, Ethernet IP



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Safety Technology	Process Sensors	Industrial Networks	ID Systems	Machine Condition	Power Supplies	Wiring Technology
Safety products	Pressure	AS-i network	RF identification systems	Diagnostic systems	Power supplies	Cordset solutions
						
144 - 155	156 - 175	226 - 239	252 - 253	254 - 259	260 - 263	264 - 277



## Top product features!

- Uniform and shadow-free illumination of the object
- Permanent or pulsed light operation with optional high intensity light
- White light, red light and infrared versions
- Compact design and robust housing
- Diffuser accessory available for "cloudy day" illumination to balance light source



**NEW!** ifm's vision sensors include an on-board lighting element that illuminates the object and provides the correct amount of image brightness at various ranges.

Some applications, however, may require additional lighting. For example, detecting specific surface characteristics, such as a dot-peened code, scratches or nicks may require high intensity light. In contour sensing, sometimes there is not enough contrast between the object and the background. Additional backlighting may help emphasize the target against the background.

ifm's high-quality LED illumination units provide uniform lighting to solve a large

variety of applications. Models are available with white, red and infrared light in spot light, back light, ring light, bar illumination and dark field illumination units.

An assortment of mounting kits are provided and make installation quick and easy.

### Technical Specs

Light source:	LED
Operating voltage:	24 V DC
Ambient temperature:	-10...55 °C
Housing material:	aluminum
Lens material:	glass
Trigger:	5...24 V, PNP
Protected against reverse polarity:	yes
Short-circuit proof:	yes
Mounting:	M4 screws
Eye safety:	IEC 62471

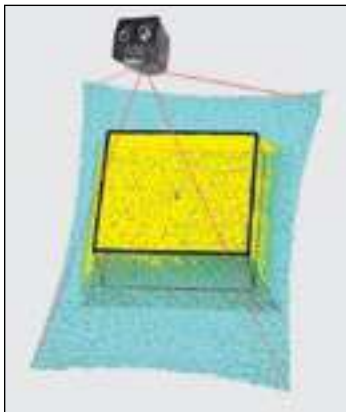
Company	IO-Link	Position Sensors					Motion Control		Vision Sensors
	IO-Link	Inductive	Capacitive	Cylinder / valve position	Photoelectrics / lasers / fiber optics	Distance / Application specific	Ultrasonic	Encoders / Speed monitors	2D / 3D inspection
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## Top product features!

- Robust industrial O3D Smart Sensor – Application Assistant adds 3rd dimension to machines
- Includes two on-board applications: case completeness and box dimensioning
- Objective lens housing protected behind Corning Gorilla glass defines large field of view
- 4 IR LEDs illuminate large field of view over the 0.3 to 5 meter range protected behind Corning Gorilla glass
- M12 Ethernet connection for parameterization and communication output data via industrial Ethernet networks (TCP/IP & ProfiNet)



**NEW!** Today's manufacturing and logistics environments are becoming more and more automated to meet customer demand. The tools being used, whether it be robots or machines, have to become faster and more flexible to maintain throughput. This requires them to "see" more. 2D is not enough. They must be able to perceive their environment the same as we do... in 3D. ifm's revolutionary O3D Smart Sensor for industrial automation enables automated machines to perceive their environment in 3D with human-like vision.

### Innovative pmd imager

ifm's patented pmd time-of-flight imager provides 176 x 132 pixel array to quickly and accurately measure the distance of 23,232 points within its field of view. The

distance to each pixel is calculated by comparing the phase shift of send and returned infrared light. Every measurement is collected simultaneously and made immediately available as a fully calibrated 3D point cloud, which can be sent to a PC or controller via Ethernet.

The technology also features a patented suppression of background illumination technology making it immune to changing lighting conditions in the application environment.

### Application Assistant adds third dimension!

The O3D Smart Sensor - your Application Assistant - adds a third dimension of sight to packaging and material handling machines. The Smart Sensor has four pre-built applications on board: case completeness, box dimensioning, palletizing / de-palletizing and level. The opportunities are endless.

An outstanding price/performance value, ifm's O3D Sensor can be applied in most areas throughout the plant!



To learn more, visit:  
[www.ifm.com/us/O3DSmartSensor](http://www.ifm.com/us/O3DSmartSensor)

Company	IO-Link		Position Sensors				Motion Control		Vision Sensors
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Search Bar



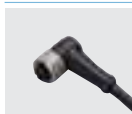


## Product + accessory selector

Dimensions	Operating Distance (mm)	Angle of Aperture	Max. Field of View (mm)	Weight (kg)	Part No.	List Price (1-pc.)
137 x 75 x 95	300... 10,000	40° x 30°	2,610 x 3,470	0.745	<b>O3D300</b>	<b>\$1,351.00</b>
	300... 8,000	60° x 45°	3,750 x 5,000	0.736	<b>O3D302</b>	<b>\$1,351.00</b>
	300... 8,000	60° x 45°	3,750 x 5,000	1.146	<b>O3D312</b>	<b>\$1,460.00</b>
	300... 10,000	40° x 30°	2,610 x 3,470	1.225	<b>O3D310</b>	<b>\$1,460.00</b>

### Accessories

Type	Description	Part No.	List Price (1-pc.)
	Mounting set for rod mounting Ø 14 mm	<b>E3D301</b>	<b>\$60.00</b>

### Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (8-pin) 2 m, PUR	<b>E11231</b>	<b>\$29.00</b>
	M12 Micro DC (8-pin) 5 m, PUR	<b>E11232</b>	<b>\$36.00</b>
	M12 Micro DC (8-pin) 2 m, PUR	<b>E11950</b>	<b>\$29.00</b>
	M12 Micro DC (8-pin) 5 m, PUR	<b>E11807</b>	<b>\$36.00</b>
	Ethernet cable, 2 m, M12 D-coded / RJ45, cross-link	<b>E11898</b>	<b>\$45.00</b>
	Ethernet cable, 5 m, M12 D-coded / RJ45, cross-link	<b>E18422</b>	<b>\$54.00</b>
	Ethernet cable, 10 m, M12 D-coded / RJ45, cross-link	<b>E18423</b>	<b>\$69.00</b>

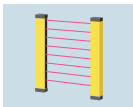










### Technical Specs

Maximum load current:	100 mA
Current consumption:	< 2400 peak current pulsed; typ. mean value 420; max. mean value 1600 mA
Image repetition rate:	≤ 25 Hz
Lighting:	infrared LED 850 nm; invisible radiation of light-emitting diodes
Operating voltage:	20.4... 28.8 DC; to EN 61131-2
Operating temperature:	14... 122 °F (-10... 50 °C)
Protection rating:	O3D300 and O3D302 IP65, IP67, O3D310 and O3D312 IP65, IP67 and IP69K
Material:	Lens window: corning gorilla glass Housing: O3D300 and O3D302 diecast aluminum O3D310 and O3D312 stainless steel
Parameter setting / process interface:	Ethernet TCP, Ethernet IP: 10BaseT / 100Base-TX



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Safety Technology	Process Sensors				Industrial Networks	ID Systems	Machine Condition	Power Supplies	Wiring Technology	
Safety products	Pressure	Flow	Level	Temperature	AS-i network	Safety systems	RF identification systems	Diagnostic systems	Power supplies	Cordset solutions
										
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