



## Top product features!

- Encoders with programmable resolution from 2 to 10,000 and selectable HTL / TTL output
- Additional features such as plug-and-play replacement, real-time recipe changes and diagnostic feedback
- Functions as an encoder, counter or speed/direction monitor
- Dual color digital display for at-a-glance monitoring
- Solid or hollow shaft designs of varying diameters and flange options
- Industry standard M12 connectors

## Intelligent incremental encoder with digital display and IO-Link

**NEW!** Incremental encoders provide accurate feedback of the position of rotating shafts on machinery. ifm now introduces a versatile line of intelligent encoders that can perform in three capacities: as an encoder, counter or speed / direction monitor. Evaluating pulses in the encoder reduces the burden on your controller. These encoders incorporate features that are ideal for applications found in the material handling, packaging, automotive, wood and print / paper industries.

### Easy setup via pushbuttons or IO-Link

A simple pushbutton menu allows the encoder resolution to be programmed from 2 to 10,000 and the output is selectable for either HTL or TTL. Parameters may also be set via ifm's LineRecorder Device software or IO-Link. There's no need to stock multiple encoders!

### Two color digital display for easy monitoring and troubleshooting

These intelligent encoders are designed with a two color (red / green) integrated digital display for indicating if process values are in an acceptable range or if limits have been exceeded. The display values can also be electronically rotated 180° increasing installation flexibility.

### Reliable performance in various options

ifm's incremental encoders operate using magnetic technology and provide the accuracy of traditional optical encoders with the robustness of magnetic encoders. They withstand shock and vibration, offer high switching frequencies and are available with a 6 mm or 10 mm diameter solid shaft or 12 mm diameter hollow shaft. These encoders have a rotatable industry standard M12 connector that may be positioned radially or axially.



ifm's intelligent encoders feature a dual color (red / green) digital display for indicating if process values are in an acceptable range or if limits have been exceeded.



ifm's intelligent encoders include a 32-bit microprocessor. With a resolution of 16-bits, a precision <math>< 0.1\%</math> (12 bits) can be reached. Signal transmission is fast!

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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## Product + accessory selector

Housing Diameter (mm)	Shaft Diameter (mm)	Flange	Resolution (pulse/revolution)	Connection	No. of stators	Part No.	List Price (USD)
<b>Hollow shaft with integrated stator coupling</b>							
58	12	Direct	Max. 10,000 (adjustable)	M12 Micro DC	1	<b>ROP520</b>	<b>\$250.00</b>
58	12	Direct	Max. 10,000 (adjustable)	M12 Micro DC	2	<b>ROP521</b>	<b>\$260.00</b>
<b>Solid shaft</b>							
58	6	Servo	Max. 10,000 (adjustable)	M12 Micro DC	N/A	<b>RUP500</b>	<b>\$238.00</b>
58	10	Clamp	Max. 10,000 (adjustable)	M12 Micro DC	N/A	<b>RVP510</b>	<b>\$238.00</b>

### Accessories

Type	Description	Part No.	List Price (USD)
	Spring disc coupling, Ø 6 mm / 10 mm, die-cast zinc; PA	<b>E60117</b>	<b>\$51.00</b>
	Spring disc coupling, Ø 10 mm / 10 mm, die-cast zinc; PA	<b>E60118</b>	<b>\$51.00</b>
	Fastening clamp for synchro flange, steel	<b>E60041</b>	<b>\$2.00</b>
	Flexible coupling with clamp connection, Ø 6 mm / 10 mm, aluminum	<b>E60066</b>	<b>\$48.00</b>
	Flexible coupling with clamp connection, Ø 10 mm / 10 mm, aluminum	<b>E60067</b>	<b>\$48.00</b>
	Flexible coupling with adjusting screws, Ø 10 mm / 10 mm, aluminum	<b>E60022</b>	<b>\$48.00</b>
	Flexible coupling with adjusting screws, Ø 6 mm / 10 mm, aluminum	<b>E60028</b>	<b>\$48.00</b>
	Aluminum measuring wheel, 500 mm cir., 10 mm bore, smooth plastic tread	<b>E60110</b>	<b>\$69.00</b>
	Aluminum measuring wheel, 500 mm cir., 10 mm bore, pimpled plastic tread	<b>E60076</b>	<b>\$69.00</b>
	Aluminum measuring wheel, 200 mm cir., 10 mm bore, grooved plastic tread	<b>E60138</b>	<b>\$57.00</b>
	Aluminum measuring wheel, 200 mm cir., 10 mm bore, knurled aluminum tread	<b>E60095</b>	<b>\$57.00</b>
	Aluminum measuring wheel, 200 mm cir., 6 mm bore, grooved plastic tread	<b>E60137</b>	<b>\$57.00</b>
	Aluminum measuring wheel, 200 mm cir., 6 mm bore, knurled aluminum tread	<b>E60006</b>	<b>\$57.00</b>
	Angle bracket for RUP design, aluminum, black anodized	<b>E60033</b>	<b>\$63.00</b>
	Angle bracket for RVP design, aluminum, black anodized	<b>E60035</b>	<b>\$63.00</b>
	Square flange for RUP5xx encoders	<b>UD0004</b>	<b>\$25.00</b>
	Square flange for RVP5xx encoders	<b>UD0005</b>	<b>\$25.00</b>

### Accessories

Type	Description	Part No.	List Price (USD)
	LineRecorder Device, software for parameter setting (requires E30390 cable)	<b>QA0011</b>	<b>\$110.00</b>
	USB IO-Link master for parameter setting and analysis of units	<b>E30390</b>	<b>\$367.00</b>
	Adapter cable for the connection between USB IO-Link master E30390 and encoder	<b>E12432</b>	<b>\$40.00</b>
	Memory plug to store sensor's parameters for easy upload without a computer	<b>E30398</b>	<b>\$51.00</b>

### Cordsets, shielded

Type	Description	Part No.	List Price (USD)
	M12 Micro DC, 2 m, PUR cable	<b>E12402</b>	<b>\$44.00</b>
	M12 Micro DC, 5 m, PUR cable	<b>E12403</b>	<b>\$53.00</b>
	M12 Micro DC, 10 m, PUR cable	<b>E12404</b>	<b>\$70.00</b>

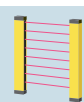
### Technical Specs

Operating voltage	4.75...30 V DC
Current consumption	< 350 mA
Switching frequency	1000 kHz
Reverse polarity protection	yes
Short circuit protection	yes
Protection	housing: IP 65, IP 67; shaft: IP 64
Connection	M12 connector, 8-pin (rotatable)

For more information on IO-Link, see pages 6 - 21.

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Safety products



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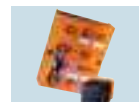
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Power supplies



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Cordset solutions



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## Top product features!

- Encoders with programmable resolution from 2 to 10,000 and selectable HTL / TTL output
- Additional features such as plug-and-play replacement, real-time recipe changes and diagnostic feedback
- Digital transmission of shaft position value (single turn)
- Robust magnetic sensing principle
- Solid or hollow shaft designs of varying diameters and flange options
- Industry standard M12 connectors or prewired 2 meter cable

## Programmable incremental encoder with IO-Link

### Programmable encoders for industrial applications

Incremental encoders provide accurate feedback of the position of rotating shafts on machinery. ifm now introduces a versatile line of encoders. These encoders incorporate features that are ideal for applications found in the material handling, packaging, automotive, wood and print / paper industries.

### Easy setup via IO-Link

Parameters may be set via ifm's LineRecorder Device software or IO-Link. The resolution can be programmed for 2 to 10,000 and the output is selectable for either HTL or TTL. There's no need to stock multiple encoders!

### Reliable performance in various options

ifm's incremental encoders operate using magnetic technology and provide the accuracy of traditional optical encoders with the robustness of magnetic encoders. They withstand shock and vibration, offer high switching frequencies and are available with either a 6 or 10 mm diameter solid shaft or with a 6 or 12 mm diameter hollow shaft. These encoders are available with a rotatable industry standard M12 connector or 2 meter cable.



*ifm's programmable encoders include a 32-bit microprocessor. With a resolution of 16-bits, a precision < 0.1% (12 bits) can be reached. Signal transmission is fast!*



*ifm's programmable incremental encoders allow you to select resolution and output type via IO-Link.*

For more information on IO-Link, see pages 6 - 21.

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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# Product + accessory selector

	Housing Diameter (mm)	Shaft Diameter (mm)	Flange	Resolution (pulse/revolution)	Connection	No. of Stators	Part No.	List Price (USD)
Hollow shaft with integrated stator coupling	36.5	6	direct	Max. 10,000 (adjustable)	M12 Micro DC	1	RA3100	\$186.00
	36.5	6	direct	Max. 10,000 (adjustable)	M12 Micro DC	2	RA3101	\$193.00
	36.5	6	direct	Max. 10,000 (adjustable)	2 m cable	1	RA3500	\$186.00
	36.5	6	direct	Max. 10,000 (adjustable)	2 m cable	2	RA3501	\$193.00
	58	12	direct	Max. 10,000 (adjustable)	M12 Micro DC	1	RO3100	\$186.00
	58	12	direct	Max. 10,000 (adjustable)	M12 Micro DC	2	RO3101	\$193.00
	58	12	direct	Max. 10,000 (adjustable)	2 m cable	1	RO3500	\$186.00
	58	12	direct	Max. 10,000 (adjustable)	2 m cable	2	RO3501	\$193.00
Solid shaft	36.5	6	universal	Max. 10,000 (adjustable)	M12 Micro DC	N/A	RB3100	\$178.00
	36.5	6	universal	Max. 10,000 (adjustable)	2 m cable	N/A	RB3500	\$178.00
	58	6	servo	Max. 10,000 (adjustable)	M12 Micro DC	N/A	RU3100	\$178.00
	58	6	servo	Max. 10,000 (adjustable)	2 m cable	N/A	RU3500	\$178.00
	58	10	clamp	Max. 10,000 (adjustable)	M12 Micro DC	N/A	RV3100	\$178.00
	58	10	clamp	Max. 10,000 (adjustable)	2 m cable	N/A	RV3500	\$178.00

Accessories	Description	Part No.	List Price (USD)
	Spring disc coupling, Ø 6 mm / 10 mm, die-cast zinc; PA	E60117	\$51.00
	Spring disc coupling, Ø 10 mm / 10 mm, die-cast zinc; PA	E60118	\$51.00
	Fastening clamp for synchro flange, steel	E60041	\$2.00
	Flexible coupling with clamp connection, Ø 6 mm / 10 mm, aluminum	E60066	\$48.00
	Flexible coupling with clamp connection, Ø 10 mm / 10 mm, aluminum	E60067	\$48.00
	Flexible coupling with adjusting screws, Ø 10 mm / 10 mm, aluminum	E60022	\$48.00
	Flexible coupling with adjusting screws, Ø 6 mm / 10 mm, aluminum	E60028	\$48.00
	Aluminum measuring wheel, 500 mm cir., 10 mm bore, smooth plastic tread	E60110	\$69.00
	Aluminum measuring wheel, 500 mm cir., 10 mm bore, pimpled plastic tread	E60076	\$69.00
	Aluminum measuring wheel, 200 mm cir., 10 mm bore, grooved plastic tread	E60138	\$57.00
	Aluminum measuring wheel, 200 mm cir., 10 mm bore, knurled aluminum tread	E60095	\$57.00
	Aluminum measuring wheel, 200 mm cir., 6 mm bore, grooved plastic tread	E60137	\$57.00
	Aluminum measuring wheel, 200 mm cir., 6 mm bore, knurled aluminum tread	E60006	\$57.00
	Angle bracket for RUP design, aluminum, black anodized	E60033	\$63.00
	Angle bracket for RVP design, aluminum, black anodized	E60035	\$63.00

Accessories	Description	Part No.	List Price (USD)
	LineRecorder Device, software for parameter setting (requires E30390 cable)	QA0011	\$110.00
	USB IO-Link master for parameter setting and analysis of units	E30390	\$367.00
	Memory plug to store sensor's parameters for easy upload without a computer	E30398	\$51.00
	Square flange for RB3xxx encoders	UD0003	\$25.00
	Square flange for RU3xxx encoders	UD0004	\$25.00
	Square flange for RV3xxx encoders	UD0005	\$25.00

### Cordsets, shielded

Type	Description	Part No.	List Price (USD)
	M12 Micro DC, 2 m, PUR cable	EVC544	\$29.00
	M12 Micro DC, 5 m, PUR cable	EVC545	\$36.00
	M12 Micro DC, 10 m, PUR cable	EVC546	\$47.00

### Technical Specs

Operating voltage	4.75...30 V DC
Current consumption	< 150 mA
Switching frequency	1000 kHz
Reverse polarity protection	yes
Short circuit protection	yes
Protection	housing: IP 65, IP 66, IP 67; shaft: IP 64
Connection	M12 connector, 5-pin (rotatable)

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Process Sensors

Industrial Networks

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Machine Condition

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AS-i network

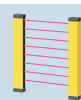
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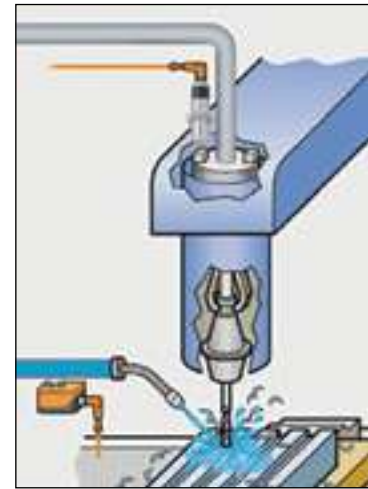
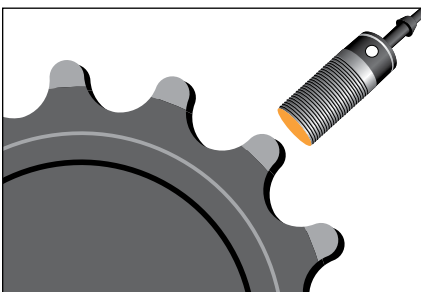
## Top product features!

- 18 and 30 mm diameter speed monitors detect under-speed and over-speed conditions
- For rotational speed applications
- 18 mm quick disconnect offers 3-LED status display
- 30 mm units feature easy-to-adjust sensor setpoint
- Time delay eliminates nuisance trips

## Evaluation system for self-contained speed applications

The compact speed monitor is an evaluation system for monitoring rotational speed, particularly over- or under-speed conditions. The sensor and evaluation electronics are integrated into a compact 18 and 30 mm diameter metal housing. The 3-wire version includes a "target-present" LED to simplify set up. The unit senses the speed of the rotating target and provides a digital output when the speed exceeds a customer-programmed set point.

Positioned to sense a bolt head, cam, or other target on a rotating shaft, the DI series speed monitor generates an internal pulse each time the target passes. Counting the pulse train determines if the shaft speed is above or below the set point.



Speed monitors can be used to detect under-speed conditions on spindle applications.

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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## Product + accessory selector

Dimensions (mm)	Range (mm)	Mounting	Output	Setting Range (Imp/min)	Supply Voltage (V)	Sensor Termination	Part No.	List Price (1-pc.)
M18 / L = 68	12	Nonflush	PNP, N.O. / N.C.	3...6000	10...36 DC	M12 Micro DC	<b>DI6001</b>	<b>\$162.00</b>
M30 / L = 82	10	Flush	PNP, N.O.	5...300	10...36 DC	M12 Micro DC	<b>DI5009</b>	<b>\$196.00</b>
M30 / L = 80	10	Flush	N.O.	5...3600	20...250 AC/DC	2 m cable	<b>DI0101</b>	<b>\$185.00</b>
M30 / L = 80	10	Flush	PNP, N.O.	5...3600	10...36 DC	2 m cable	<b>DI5020</b>	<b>\$185.00</b>

### Optional Accessories

Type	Description	Part No.	List Price (1-pc.)
	Snap clamp for 18 mm sensor	<b>E11048</b>	<b>\$8.00</b>
	Snap clamp for 30 mm sensor	<b>E11049</b>	<b>\$8.00</b>
	Quick-mount sleeve for 18 mm sensor	<b>E11115</b>	<b>\$14.00</b>
	Quick-mount for 30 mm sensor	<b>E10808</b>	<b>\$17.00</b>
	L-bracket for 18 mm sensor	<b>U20302</b>	<b>\$6.00</b>
	L-bracket for 30 mm sensor	<b>U20303</b>	<b>\$6.00</b>

### Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	<b>EVC001</b>	<b>\$11.00</b>
	M12 Micro DC (4-pin) 5 m, PUR	<b>EVC002</b>	<b>\$15.00</b>
	M12 Micro DC (4-pin) 2 m, PUR	<b>EVC004</b>	<b>\$11.00</b>
	M12 Micro DC (4-pin) 5 m, PUR	<b>EVC005</b>	<b>\$15.00</b>

Can't find the right speed monitor for your application, call 800-441-8246 or visit [www.ifm.com/us](http://www.ifm.com/us)

### Technical Specs

Leakage current: <1.5 mA (DI0101)  
Housing material: Brass; PBT (Pocan); 316 stainless steel, PBT (DI6001)  
Operating temperature: -13...176 °F (-25...80 °C)  
Protection: IP67

### Simple and comprehensive website



Data sheets, application examples, software downloads, virtual product demos... just one click away.

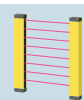
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Safety products



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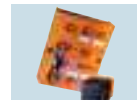
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Power supplies



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## Top product features!

- Monitoring of two limit values with separate output relays
- High input frequency of up to 60,000 pulses / minute
- Configurable functions, speed-proportional analog output
- Clearly readable, luminous OLED display
- Extended operating temperature range down to -40 °F

## Versatile rotational speed monitoring and standstill detection

**NEW!** The speed monitors calculate the rotational speed by evaluating pulses. The transistor and relay outputs switch when adjustable limit values are exceeded or not reached. This allows, for example, reliable overspeed and standstill detection.

The DD2503 monitors the rotational speed of one channel with two separately adjustable limit values. A separate output is assigned to each limit value. The DD2505 monitors two separate input channels, each having one switchpoint.

### Overspeed monitoring

Centrifuges, carousels or wind turbines are monitored for exceeded maximum rotational speed. The speed monitor gives a switch-off signal as soon as the speed is too high. This makes sure that the resulting centrifugal forces will not destroy the system.

### Standstill monitoring

Standstill monitoring is used to detect torn conveyor belts, to monitor the V-belts of ventilators or to detect blocked screw conveyors. The speed monitor signals a dysfunction in case of unexpected standstills of the non-driven side of the machine.

### Configurable output functions

The relay outputs are switched on or off in case the limit values are exceeded or not reached. They may also remain switched until they are manually reset. Optionally, the reset can take place automatically after an adjustable period of time.

The transistor outputs that can be used alternatively are switched to the relays simultaneously. These can, for example, be connected directly to a plc in order to transmit status messages.



Speed monitors switch when critical rotational speeds are exceeded or not reached.

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

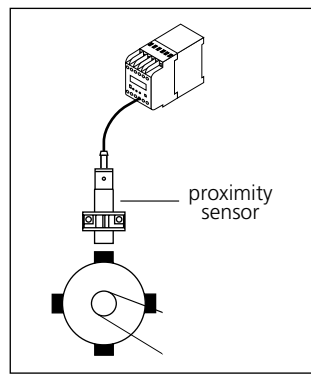
Operating Voltage (V)	Inputs	Input Function	Setting Range (pulse / min.)	Setting Range (Hz)	Analog Outputs	Relay Outputs	Transistor Outputs	Part No.	List Price (1-pc.)
110...240 AC/DC; 24 DC	1	PNP / NPN / NAMUR*	1...60,000	0.1...1,000	1	2	2	<b>DD2503</b>	<b>\$365.00</b>
110...240 AC/DC; 24 DC	2	PNP / NPN / NAMUR*	1...60,000	0.1...1,000	–	2	2	<b>DD2505</b>	<b>\$413.00</b>

\*Note: NAMUR input is not intended for intrinsically safe applications in hazardous locations.

▶ Can't find the right sensor for your application, call 800-441-8246 or visit [www.ifm.com/us](http://www.ifm.com/us)

## Technical Specs

- Relay outputs: 2 changeover contacts  
6 A (250 V AC)
- Transistor outputs: 2 x PNP; externally supplied  
24 V DC / max. 150 mA;  
short-circuit protection
- Ambient temperature: -40...140 °F (-40...60 °C)
- Housing protection rating: IP 50
- Terminal protection rating: IP 20
- Function display: OLED display;  
128 x 64 pixels luminous
- Input signal indication: yellow LED
- Switching status indication : green LED



Inductive and capacitive proximity sensors or photoelectric sensors are ideal devices for an input signal to the speed evaluation system.



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Safety Technology	Process Sensors					Industrial Networks	ID Systems	Machine Condition	Power Supplies	Wiring Technology
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