



The right choice for your application: inductive sensors from ifm

Position sensors



ifm.com/gb/inductive

Inductive sensors for all application areas



**Kplus sensors
for detection of all metals**



**Full-metal sensors
for applications in
harsh environments**



**Sensors for
standard applications**



**Sensors in a wide
selection of housings**



**Sensors for
ATEX applications**



**Sensors for
safety-related applications**



**Sensors for
IO-Link applications**



**Connection technology
Accessories**

Even more choice?
See the complete
range at ifm.com



	Housing					Connection							
	M8	M12	M18	M30	Ø3	Ø4	Ø5	Ø6.5	Ø100	Rectan- gular	Cable	Connc- tor	
Factory automation Automotive industry Body-in-white Automotive industry Material handling Machine tools	✓	✓	✓	✓								✓	4 - 5
Machine tools Mobile machines Food industry	✓	✓	✓	✓								✓	6 - 7
Factory automation Machine tools Mobile machines		✓	✓	✓							✓	✓	8 - 9
Factory automation					✓	✓	✓	✓	✓	✓	✓	✓	10 - 11
Hazardous and ATEX areas	✓	✓	✓	✓						✓	✓	✓	12 - 13
Factory automation		✓	✓	✓						✓		✓	14 - 15
Factory automation Machine tools Mobile machines		✓	✓	✓						✓		✓	16 - 17

Cables Mounting accessories Switching amplifiers for NAMUR sensors Safety relays 24 V power supplies	18 - 19
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Kplus sensors for detection of all metals



Constant:

Be it steel or aluminium:
The same sensing range on all kinds of metals.

Noise immune:

Electromagnetic field immune
sensor technology prevents
incorrect switching.

Space-saving:

Compact dimensions for use in
the smallest of spaces.

Universal:

Wide temperature range of
-40...85 °C.

Non-stick:

Anti-spatter coating for welding
applications.

Fast:

High switching frequencies for
fast changing switching states.

Protected:

Sealed to the highest protection
ratings up to IP 68 / IP 69K.

Design / housing length [mm]	Sensing range [mm]	Order no.
PNP normally open · M8 connector		
Stainless steel housing		
M8 / 40	3 f	IES200
M8 / 40	6 nf	IES201
Welding · anti-spatter		
M8 / 40	3 f	IEW200
M8 / 40	6 nf	IEW201

Design / housing length [mm]	Sensing range [mm]	Order no.
PNP normally open · M12 connector		
Stainless steel housing		
M12 / 45	4 f	IFS297
M12 / 45	8 nf	IFS298
M12 / 45	10 nf	IFS299
M12 / 60	4 f	IFS304
M12 / 60	8 nf	IFS305
M12 / 60	10 nf	IFS306
M18 / 45	8 f	IGS287
M18 / 45	12 nf	IGS288
M18 / 45	15 nf	IGS289
M18 / 60	8 f	IGS290
M18 / 60	12 nf	IGS291
M18 / 60	15 nf	IGS292
M30 / 45	15 f	IIS281
M30 / 60	15 f	IIS282
M30 / 60	22 nf	IIS283
M30 / 60	30 nf	IIS284

Design / housing length [mm]	Sensing range [mm]	Order no.
PNP normally open · M12 connector		
Plated brass housing		
M12 / 45	4 f	IFS289
M12 / 45	10 nf	IFS290
M12 / 60	4 f	IFS285
M12 / 60	10 nf	IFS286
M18 / 45	8 f	IGS279
M18 / 45	15 nf	IGS280
M18 / 60	8 f	IGS277
M18 / 60	15 nf	IGS278
M30 / 45	15 f	IIS269
M30 / 60	15 f	IIS267
M30 / 60	30 nf	IIS268
Welding · anti-spatter		
M12 / 60	4 f	IFW204
M18 / 60	8 f	IGW202
M30 / 60	15 f	IIW202

f: flush installation nf: non-flush installation



For industrial applications



For oils and coolants



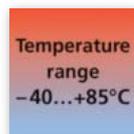
For electro-magnetic fields



More than 45 years of know-how integrated into one sensor

In 1969 ifm launched the first inductive sensor under the name "efector".

With a novel, patented coil structure and electronics optimised for noise immunity the new "Kplus" sensors today again set new standards for inductive sensors in factory automation and welding.



Positioning

Clamps hold the workpiece in place during machining. Inductive sensors monitor the position of the levers. The constant correction factor $K=1$ ensures a consistently high sensing range on aluminium and on all other kinds of metals.



Metal working

A high protection rating and a wide temperature range allow installation of the sensors in areas which are in constant contact with oils or coolants.



Welding robots / welding machines

Strong magnetic fields occur during welding. The new sensor technology prevents incorrect switching. The sensor housing and the fixing nuts have a non-stick coating to prevent sticking of weld slag.

Full-metal sensors for applications in harsh environments



For oils
and coolants

Resistant to:

Aggressive cleaning agents in the food industry as well as oils and coolants.

Robust:

Variants for temperatures up to 100 °C.

Protected:

Protection rating IP 65 to IP 69K.

Non-stick:

Anti-spatter coating for welding applications.

Unbeatable:

Resistant to impacts on the active face of up to 1 joule.
Housing completely made of stainless steel.



Design / housing length [mm]	Sensing range [mm]	Temperature range [°C]	Switching frequency [Hz]	Order no.
PNP normally open · M12 connector				
Oils and coolants · mobile machines				
M8 / 50	2 f	-25...70	100	IEC200
M12 / 45	4 f	-40...85	100	IFC275
M18 / 45	8 f	-40...85	100	IGC258
M30 / 50	15 f	-40...85	50	IIC233
Hygienic and wet areas				
M12 / 45	4 f	0...100	100	IFT257
M12 / 70	6 nf	0...100	500	IFT245
M18 / 45	8 f	0...100	100	IGT258
M18 / 70	12 nf	0...100	500	IGT249
M30 / 50	15 f	0...100	50	IIT243
M30 / 70	25 nf	0...100	250	IIT231
Welding · anti-spatter				
M12 / 45	4 f	-40...85	2	IFR207
M18 / 45	8 f	-40...85	2	IGR207
M30 / 50	15 f	-40...85	2	IIR207

f: flush installation nf: non-flush installation



Absolutely sealed

The connectors of the ecolink series are ideally compatible with the full-metal inductive sensors and together form a sealed system.

Connection technology see page 18



**For hygienic
and wet areas**



**For electro-
magnetic fields**



**Systems for
mobile machines**



High reliability even under extreme conditions

Full-metal sensors are used wherever an application presents particular challenges to the mechanical design. In the food industry, for example, not only rapid changes of temperature but also aggressive media used for daily cleaning stress the housing material. The same applies to applications in machine tools and plants where the sensors are permanently exposed to coolants and lubricants. In the steel industry or in the automotive industry, however, weld spatter is not only a strain on the sensing face but also on the threaded sleeve.

In this context the full-metal design with non-stick coating and the robust sensing face are the ideal solution to ensure a safe operation. The high shock and vibration resistance allows reliable use of the sensors in mobile machines.

Moreover, the robust stainless steel design offers optimum protection against abrasive parts in metal-cutting machining. Additionally, the compact and short design permits use even in the smallest of spaces.



Increased sensing ranges

Reliable detection of end positions has to be guaranteed even in case of increased vibration and shock impacts. If mechanical parts wear there can be unintentional contact. Full-metal sensors withstand this mechanical strain.



Resistant to external influences

Even permanent contact with coolants, e.g. on machine tools, does not impair the reliable functioning of the sensors.

Sensors for standard applications



Universal:

Use in applications of -40...85 °C.

Reliable:

Protection rating IP 65 to IP 69K.

Variety:

Different housing lengths, NO or NC, connectors or cables.

Long service life:

Vibration and shock resistant.

Powerful:

Very good performance in industrial applications.

Design / housing length [mm]	Sensing range [mm]	Order no.	Order no.	Order no.	Order no.
M12 connector		DC PNP NO	DC NPN NO	DC PNP NC	DC NPN NC
M12 / 45	4 f	IFS244	IFS246	IFS260	IFS262
M12 / 45	7 nf	IFS245	IFS247	IFS261	IFS263
M12 / 60	4 f	IFS240	IFS242	IFS248	IFS250
M12 / 60	7 nf	IFS241	IFS243	IFS249	IFS251
M18 / 45	8 f	IGS236	IGS238	IGS252	IGS254
M18 / 45	12 nf	IGS237	IGS239	IGS253	IGS255
M18 / 60	8 f	IGS232	IGS234	IGS240	IGS242
M18 / 60	12 nf	IGS233	IGS235	IGS241	IGS243
M30 / 50	15 f	IIS230	IIS232	IIS246	IIS248
M30 / 50	22 nf	IIS231	IIS233	IIS247	IIS249
M30 / 60	15 f	IIS226	IIS228	IIS234	IIS236
M30 / 60	22 f	IIS227	IIS229	IIS235	IIS237

f: flush installation nf: non-flush installation



For industrial applications



For oils and coolants



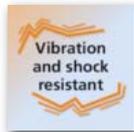
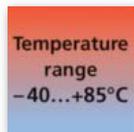
Systems for mobile machines



Universal use

The technical data of the inductive sensors for universal use cover many applications. The large temperature range and the high protection ratings allow use in industrial environments as well as in mobile machines. Increased sensing ranges provide sufficient excess gain. The targets are still reliably

detected even if the mechanical tolerances increase in the course of time. Different housing lengths enable adjustment to the correct distance. The short housing lengths can even be fitted where space is at a premium.



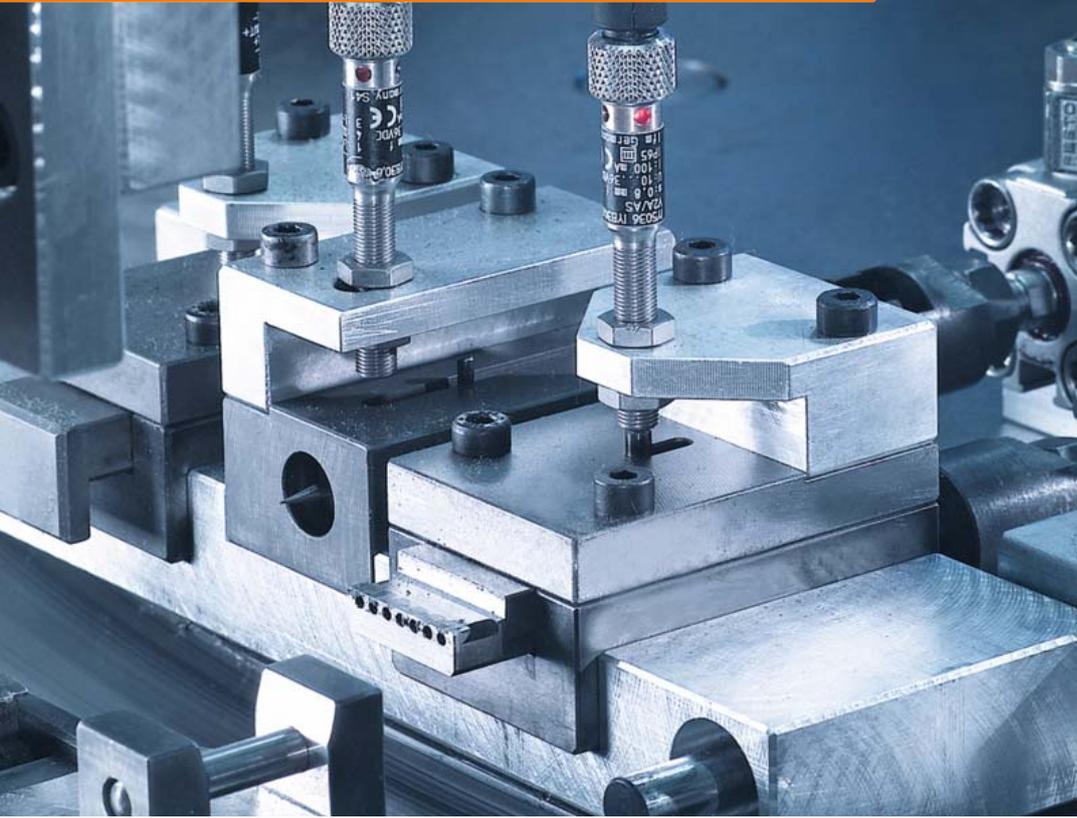
Indispensable in industrial use

Inductive sensors detect the pipes to be cut. The parts are reliably detected despite vibration or mechanical tolerances.

Design / housing length [mm]	Sensing range [mm]	Order no.	Order no.	Order no.	Order no.
Cable PUR 2 m		DC PNP NO	DC NPN NO	DC PNP NC	DC NPN NC
M12 / 40	4 f	IFS256	IFS258	IFS701	IFS702
M12 / 40	7 nf	IFS257	IFS259	IFS705	IFS706
M12 / 60	4 f	IFS252	IFS254	IFS280	IFS281
M12 / 60	7 nf	IFS253	IFS255	IFS282	IFS283
M18 / 40	8 f	IGS248	IGS250	IGS701	IGS706
M18 / 40	12 nf	IGS249	IGS251	IGS704	IGS707
M18 / 60	8 f	IGS244	IGS246	IGS269	IGS271
M18 / 60	12 nf	IGS245	IGS247	IGS270	IGS272
M30 / 45	15 f	IIS242	IIS244	IIS705	IIS706
M30 / 45	22 nf	IIS243	IIS245	IIS703	IIS707
M30 / 60	15 f	IIS238	IIS240	IIS263	IIS265
M30 / 60	22 f	IIS239	IIS241	IIS264	IIS266

f: flush installation nf: non-flush installation

Sensors in many different housings



Far-sighted:

Sensing ranges of 120 mm guarantee safe detection, e.g. hot metals in the steel industry.

Versatile:

The rotatable active face of type IMC allows different mounting positions.

Precise:

Miniature designs for the fast detection of tiny targets.

Connectable:

Connection is made via plug, terminals or connection cable.

Small cylindrical designs

Type [mm]	Sensing range [mm]	Order no.
M8 connector		
DC PNP		
Ø 4	0.8 f	IZ5035
Ø 4	1.5 nf	IZ5046
M5	0.8 f	IY5036
M5	1.5 nf	IY5048
Ø 6.5	1.5 f	IT5034
Ø 6.5	2 f	IT5040
Ø 6.5	4 nf	IT5044

f: flush installation nf: non-flush installation

Type [mm]	Sensing range [mm]	Order no.
Cable connection		
DC PNP		
Ø 3	1 nf	IZ5048
Ø 4	0.8 f	IZ5051
Ø 4	1.2 f	IZ5052
Ø 4	1.5 nf	IZ5047
M5	0.8 f	IY5029
M5	1.2 f	IY5052
M5	1.5 nf	IY5049
Ø 6.5	1 f	IT5001
Ø 6.5	2 f	IT5042
Ø 6.5	4 nf	IT5043

Even more choice?
More articles at
ifm.com



For industrial applications

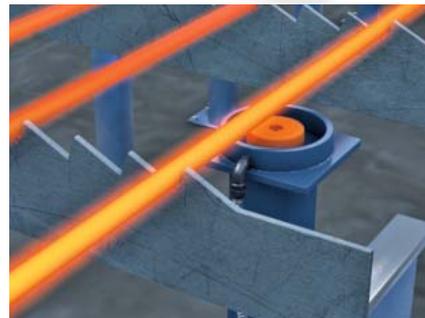


Small designs with precise switching characteristics

Different applications require different sensors. The sensing range increases with the housing size. Small types such as the IZ, IY and IT series, are suited for the very precise detection of tiny targets.

Large designs with long sensing ranges

Units with long sensing ranges are used in applications with high mechanical tolerances or if the target has to be detected from a sufficiently long distance.



Distance creates safety

The I2 series is the ideal choice, e.g. for the detection of hot metal strings. With a sensing range of 120 mm the sensors are far enough from the target and are not damaged by the dissipated heat.



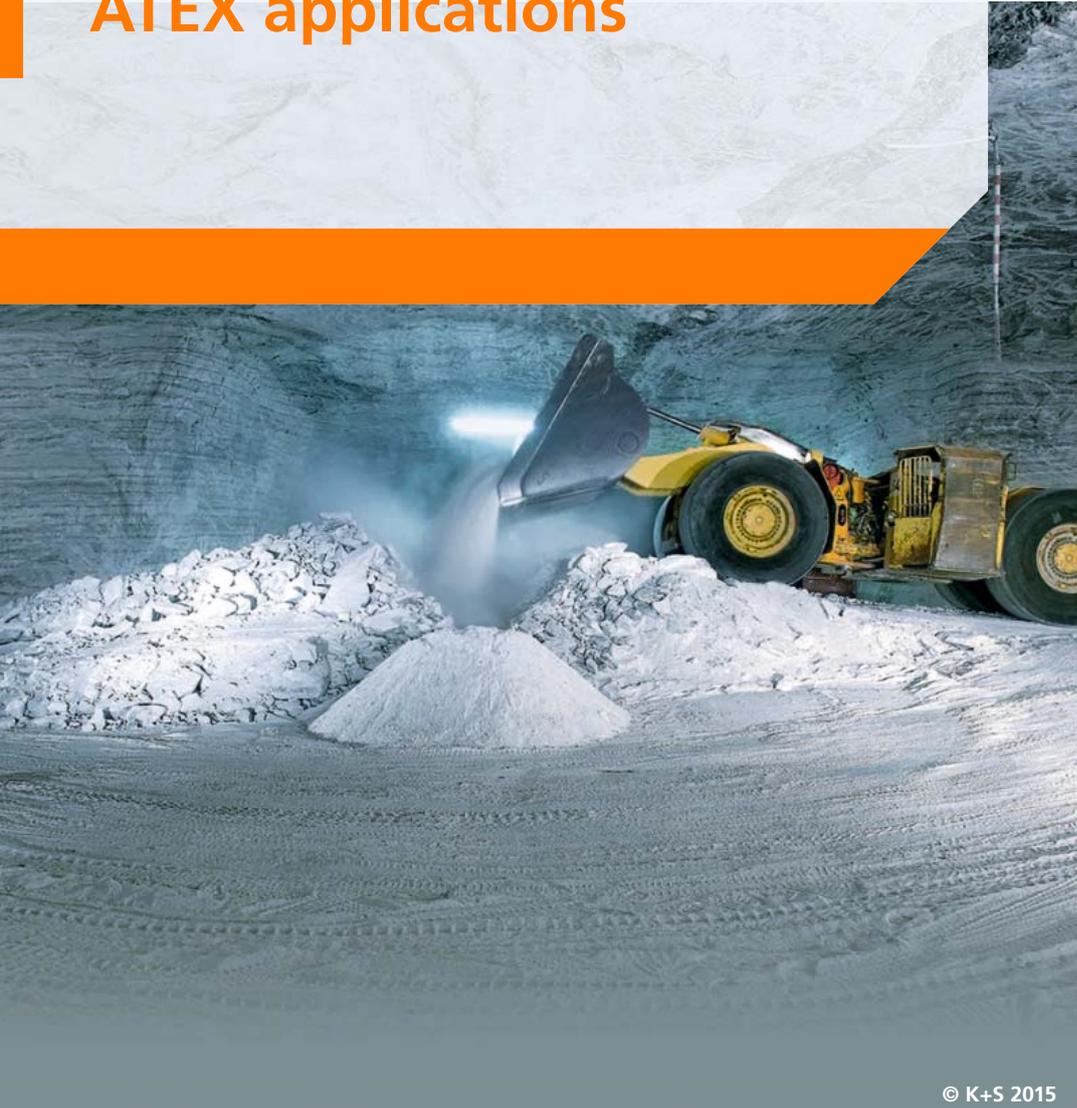
Large rectangular and cylindrical designs

Housing / Dimensions [mm]	Sensing range [mm]	Order no.
M12 connector		
DC normally open		
rectangular 66 x 40	20 f	IM5115
rectangular 66 x 40	40 nf	IM5117
rectangular 112 x 80	50 f	ID5055
DC NC/NO		
rectangular 66 x 40	20 f	IM5123
rectangular 112 x 80	50 f	ID5058
DC NC/NO programmable		
rectangular 121 x 80	60 nf	ID5046
AC/DC NO		
rectangular 112 x 80	50 f	ID0049
Terminal chamber		
DC NC/NO programmable		
rectangular 121 x 80	60 nf	ID5005
AC/DC NC/NC programmable		
rectangular 121 x 80	60 nf	ID0013

Type [mm]	Sensing range [mm]	Order no.
Cable connection		
AC		
∅ 100	20...70 nf	I12001
∅ 100	20...70 nf*	I12003
∅ 100	30...120 nf	I22001
∅ 100	30...120 nf*	I22003
DC PNP		
∅ 100	20...70 nf	I17001
∅ 100	20...70 nf*	I17003
∅ 100	30...120 nf	I27001
∅ 100	30...120 nf*	I27003
DC NPN		
∅ 100	20...70 nf	I17002
∅ 100	20...70 nf*	I17004

f: flush installation nf: non-flush installation
*with adapter plate 150 x 100 mm

Sensors for ATEX applications



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Protected:

Inductive sensors for use in dust and gas areas.

Robust:

Robust full metal and plastic housings with 4 joules shock test.

Simple:

Simple connection using connector or terminals.

Informative:

Clearly visible LED-switching status indication.

Unbeatable:

Special mechanical stability ensures high plant safety.

Design [mm]	Sensing range [mm]	Approval	Order no.
M12 connector			
NAMUR			
M12	4 f	1G/1D	NF501A
M12	7 nf	1G/1D	NF500A
M18	12 nf	1G/1D	NG500A
M30	15 f	1G/2G/1D	NI501A
M30	22 nf	1G/2G/1D	NI500A
rect. 40 x 40	20 f	2G/1D	NM500A
rect. 40 x 40	35 nf	2G/1D	NM501A
DC PNP NO			
M12	3 f	3G/3D	IF503A
M12	6 nf	3G/3D	IF505A
M18	5 nf	3G/3D	IG510A
M18	12 f	3G/3D	IG511A
M30	10 f	3G/3D	II502A
M30	25 nf	3G/3D	II503A
DC PNP NO/NC			
rect. 40 x 40	20 f	3G/3D	IM512A
rect. 40 x 40	40 nf	3G/3D	IM511A

Design [mm]	Sensing range [mm]	Approval	Order no.
Cable connection			
NAMUR			
M8	1 f	1G/1D	NE5001
M12	2 f	1G/1D	NF5001
M12	4 nf	1G/1D	NF5003
M18	5 f	1G/2G/1D	NG5002
M18	8 nf	1G/2G/1D	NG5004
M30	10 f	1G/2G/1D	NI5002
M30	15 nf	1G/2G/1D	NI5003
rect. 40 x 26	2 f	1G/2G/1D	NN5001
rect. 40 x 26	4 nf	1G/2G/1D	NN5002

f: flush installation nf: non-flush installation

Switching amplifiers for NAMUR sensors page 19





For hazardous areas



EU-wide explosion protection

The ATEX directive 94/9/EC (ATEX) sets out detailed rules for explosion prevention.

The ifm ATEX sensor family passed a very demanding test series of artificial ageing, 4 joules impact test and subsequent protection rating test. The result: The sensor housings are designed to ensure that, even in the toughest conditions, they will not become an ignition source in explosive dusts or gaseous atmospheres.

This guarantees maximum protection in hazardous areas.



Maximum protection in hazardous dust areas

Any risk from sensors must be excluded by special test methods. Selected materials and the special design ensure that prevention of ignition sources is guaranteed even in long-term use.



Only safe with the matching connection
ifm ecolink series connectors also comply with the strict requirements of the standard and are therefore allowed for use in hazardous areas of the categories 2D, 3D and 3G.

Sensors for safety-related applications



Direct detection:

Switching when metal is present, no special target needed.

Flexible:

M12, M18, M30 and rectangular housings.

Certified:

Conformity to IEC 62061 / ISO 13849 and IEC 60947-5-3 safety standards as certified by the German TÜV.

Safe output signal:

Two OSSD outputs or clocked output for the series connection of up to 10 sensors.

Evaluation:

Evaluation and diagnosis with SIL 3 / PL e via safety relays or easily via AS-i Safety at Work.

Design [mm]	Enable zone [mm]	Approval	Order no.
M12 connector			
OSSD outputs			
M12	0.5...4 nf	PL d / SIL 2	GF711S
M18	1...5 f	PL d / SIL 2	GG712S
M18	1...8 nf	PL d / SIL 2	GG711S
M30	1...10 f	PL d / SIL 2	GI712S
M30	6...12 nf	PL e / SIL 3	GI701S
rectangular 40 x 26	10...15 nf	PL e / SIL 3	GM701S
rectangular 40 x 26	4...20 nf	PL e / SIL 3	GM705S
Clocked outputs			
M18	1...4 f	PL e / SIL 3	GG507S
M18	3...6 nf	PL e / SIL 3	GG505S
M30	6...12 nf	PL e / SIL 3	GI505S¹⁾
M30	6...12 nf	PL e / SIL 3	GI506S²⁾
rectangular 40 x 40	10...15 nf	PL e / SIL 3	GM504S
rectangular 40 x 40	10...20 nf	PL e / SIL 3	GM505S

f: flush installation nf: non-flush installation
For use in ¹⁾food applications ²⁾coolant applications



More information about safety technology from ifm at ifm.com



For industrial applications



Fail-safe inductive sensors:
Detect metals without contact – robust and wear-free.

Unlike conventional safety switches, the ifm safety sensors do not require any special target. Direct detection of metallic workpiece carriers, for example, is no longer a problem.

ifm fail-safe sensors can be connected to safety evaluation units, e.g. to safety relays, programmable logic modules or safe controllers.

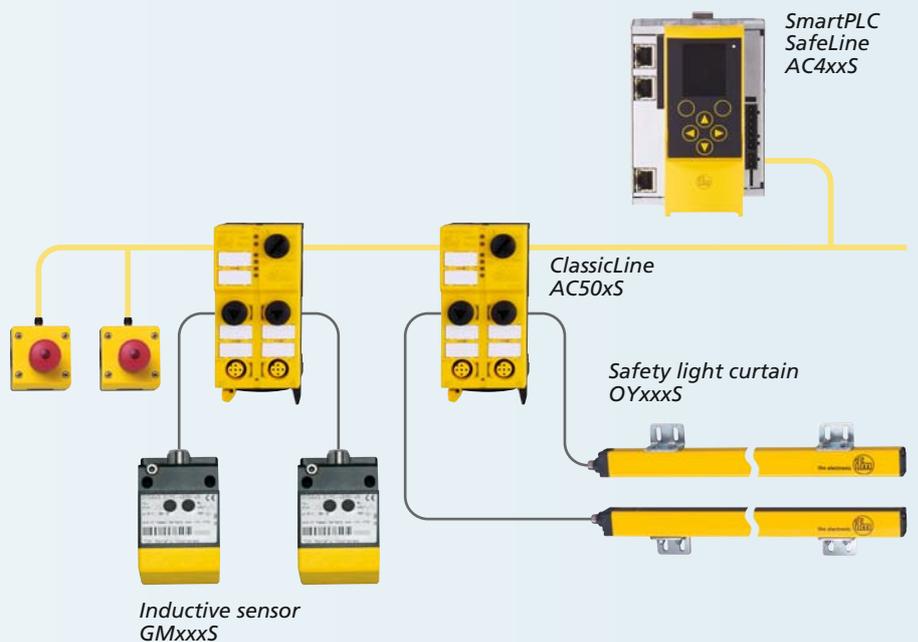
The safety relays of the G150 x S series allow the connection of sensors for series connection with clocked output.

The safety sensors are simply connected via standard M12 connectors of the ecolink series.



Safe power off

Faults such as coil break or coil short circuit are diagnosed and the sensor passes into the defined safe state. Even a cross fault between the supply voltage and one of the two outputs does not affect the safety function of the sensor.



Safety relays accessories page 19



Sensors for IO-Link applications



Anticipate:

An increased sensing range caused by wear is detected and signalled.

Controlling:

Changed distances to the target are continuously supplied as precise measured value.

Variety:

Switch point to be configured, NC or NO, PNP or NPN versions.

Flexible:

Use in a wide range of applications thanks to the large temperature range and the high protection rating.

Design [mm]	Detection range [mm]	Switching frequency [Hz]	Order no.
M12 connector			
DC PNP/NPN NC/NO selectable			
M12	0,375...3,75 f	600	IF6123
M12	0.75...7.5 nf	600	IF6124
M18	0.75...7.5 f	300	IG6615
M18	1.3...13 nf	300	IG6616
M30	1.3...13 f	100	II5973
M30	2.3...23 nf	100	II5974
rect. 40 x 40	2.3...23 f	100	IM5172
rect. 40 x 40	2.6...26 nf	100	IM5173

f: flush installation nf: non-flush installation



DEVICE



24 V DC
fuse
DF22xx

24 V DC
power supply
DN4014



For industrial applications



For oils and coolants



Systems for mobile machines

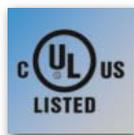
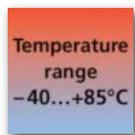


More than just a switching signal

If so far, the binary connection of the inductive sensors has only been rated for pure switching information, IO-Link can even transfer distance information – and that without loss. This allows the user to monitor his process continuously and thus react to deviations, e.g. caused by wear, in time. Moreover, the new inductive ifm sensors with IO-Link can be integrated into almost any individual application.

With IO-Link to ERP

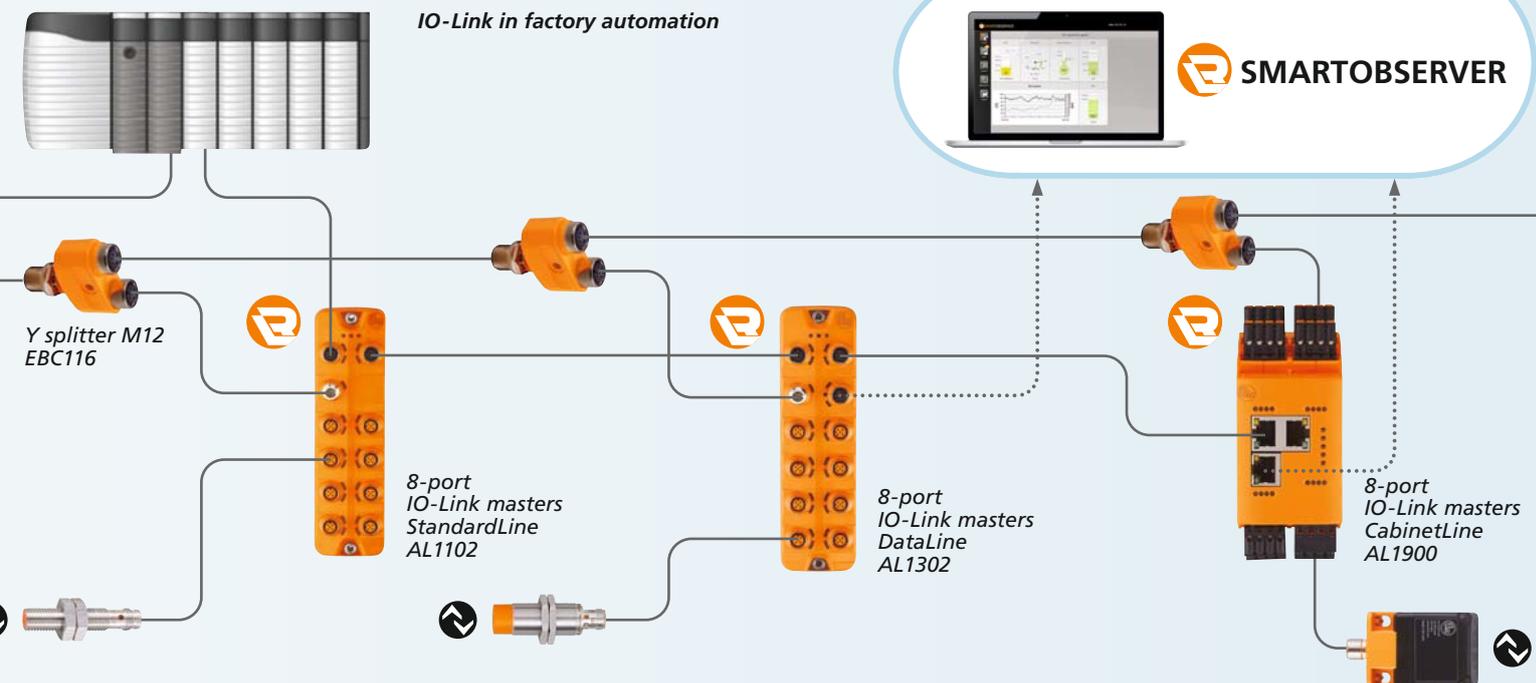
Inductive sensors with IO-Link interface measure the distance to the target permanently and transfer it to the controller and the ERP system via the ifm IO-Link master. A deviation for example starts a service order. A replacement can be ordered and a service visit be planned. Unplanned downtime can be prevented efficiently.



Everything runs smoothly

Monitoring of the radial runout of a belt pulley. The sensor supplies continuous distance information via IO-Link. The output function can be set freely by means of switch point configuration so that a switched signal is provided in case of deviations.

IO-Link in factory automation



Connection technology

Accessories

Cable



Design	Cable / material [m]	Order no.
Factory automation · Oils and coolants		
Connection cables with socket, straight, M12, 4 poles	2 / PUR	EVC001
Connection cables with socket, angled, M12, 4 poles	2 / PUR	EVC004
Welding		
Connection cables with socket, straight, M12, 4 poles	2 / PUR	EVW001
Connection cables with socket, angled, M12, 4 poles	2 / PUR	EVW004
Hygienic and wet areas		
Connection cables with socket, straight, M12, 4 poles	2 / MPPE	EVF064
Connection cables with socket, angled, M12, 4 poles	2 / MPPE	EVF088
ATEX zone		
Connection cables with socket, angled, M12, 4 poles; II 3G Ex / II 2D Ex	2 / PUR	EVC04A
Connection cables with socket, angled, M12, 4 poles; II 1G Ex / II 1D Ex	2 / PUR	ENC04A

Mounting accessories



Version	Order no.
For sensors in rectangular housing	
Spacer for rectangular housing 40 x 40 x 10 mm	E12528
For sensors in cylindrical housing	
Mounting sleeve M8 with end stop	E12587
Mounting sleeve M12 with end stop	E12452
Mounting sleeve M18 with end stop	E12453
Mounting sleeve M30 with end stop	E12454
Mounting clamp M8 with end stop	E11521
Mounting clamp M12 with end stop	E11047
Mounting clamp M18 with end stop	E11048
Mounting clamp M30 with end stop	E11049
Mounting clip stainless steel M12	E11533
Mounting clip stainless steel M18	E11534
Mounting clamp Ø 12 mm / M12	E10015
Mounting clamp Ø 20 mm / M18	E10076
Mounting clamp Ø 34 mm / M30	E10077



Even more choice?
More accessories at
ifm.com

Mounting accessories



Design	Order no.
For sensors in cylindrical housing	
Protective cover M12 PTFE	E10209
Protective cover M18 PTFE	E10243
Protective cover M30 PTFE	E10180
Angle bracket M8 stainless steel / 304	E10734
Angle bracket M12 stainless steel / 304	E10735
Angle bracket M18 stainless steel / 304	E10736
Angle bracket M30 stainless steel / 304	E10737
For sensors in cylindrical Kplus housing	
Angle bracket M12 stainless steel / 304	E12488
Angle bracket M18 stainless steel / 304	E12486
Angle bracket M30 stainless steel / 304	E12487

Switching amplifiers for NAMUR sensors



Design	Approval	Order no.
2 channels relay (1 changeover contact per channel)	ATEX group II, category (1) G D	N0533A
2 channels 2 transistor outputs PNP (100 mA, short-circuit proof)	ATEX group II, category (1) G D	N0534A

Safety relays



Version	Approval	Order no.
2 safety-related NO contacts, 1 signal output	PL e / SIL 3	G15015
3 safety-related undelayed NO contacts, 2 non safety-relevant undelayed signal outputs, 2 safety-relevant NO contacts with switch-off delay, 1 signal output with delay	PL e / SIL 3	G15025
2 fail-safe short-circuit proof semiconductor outputs, 1 signal output	PL e / SIL 3	G15035

24 V switched-mode power supplies



Design	Order no.
AC 100...240 V; 3.3 A	DN4011
AC 100...120 V / 200...240 V; 5 A	DN4012
AC 100...120 V / 200...240 V; 10 A	DN4013



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