Ultrasonic Sensor

Diffuse reflective, analog output

UA12ASDxAPM1IO

- Ultrasonic sensor configurable as a sensor or barrier with IO-Link
- M12 nickel plated brass housing
- Sensing range: 20 … 400 mm
- 3 different teach modes
- Outputs: 0-10 VDC or 4-20 mA (0-20 mA IO-Link)
- Supply voltage: 18 to 30 VDC
- Linear accuracy <0.4%
- Small blindzone
- Resistant to dirt
- Switching hysteresis by IO-Link
- Protection degree IP67
- M12 connector



Product description

A family of diffuse ultrasonic sensors with IO-Link in nickel-plated brass housing and with sensing ranges from 20-200 mm or from 40-400 mm and a resolution as low as 1.0 mm.
The output is either 0-10V or 4-20 mA and the digital output NPN or PNP, NO or NC which forms a window detection.
The sensor is the ideal choice for distance measurement, level measurement, diameter measurement or loop control.
Microprocessor controlled digital filtering makes the sensor immune to most electromagnetic interferences.

Part selection key

U	-	Ultrasonic sensor
A	-	Cylindric housing
12	-	M12 housing
A	-	Nickel plated brass housing
S	-	Short housing
D	-	Diffuse reflective
X	02	Rated operating distance: 200 mm
	04	Rated operating distance: 400 mm
A	-	Analog output
P	-	Switching output: Push-pull, NPN, PNP, 150 mA, NO/NC
M1	-	Connector, M12
IO	-	IO-Link version

Part selection

Rated operating distance	Output	Code
200 mm	Analog output	**UA12ASD02APM1IO**
400 mm	Analog output	**UA12ASD04APM1IO**

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Features

Main operation data

Functional principle	Ultrasonic sensor , Ultrasonic barrier
Functional principle details	• Teach • Out 1 • IO-Link • Multiplex (master/slave function) • Synchronization • 0…10V / 4…20mA / 0…20mA (IO-Link)
Switching modes	• Push-pull • 150 mA • NO/NC • NPN/PNP (IO-Link)
Max. switch current	150 mA
Sensing	
Sensing range	20 - 200 mm (UA12ASD02) 40 - 400 mm (UA12ASD04)
Rated operating distance (S_n)	200 mm, standard plate 100 x 100 mm (UA12ASD02) 400 mm, standard plate 200 x 200 mm (UA12ASD04)
Adjustment range (Teach-in)	20 - 200 mm (UA12ASD02) 40 - 400 mm (UA12ASD04)
Blind zone	20 mm (UA12ASD02) 40 mm (UA12ASD04)
Resolution	1.0 mm
Sensitivity adjustment	Teach by wire
Reference object	100 x 100 mm or Ø10 mm (UA12ASD02) 200 x 200 mm or Ø10 mm (UA12ASD04)
Hysteresis	Adjustable via IO link: **2 ***…20 mm
Frequency of operating cycles (f)	20 Hz (UA12ASD02) 10 Hz (UA12ASD04)
Response times	≤ 300 ms
Temperature drift	≤ 0.2%/S_n (uncompensated) ≤ 1%/S_n (compensated)
Ultrasonic information	
Osciliation frequency	400 kHz (UA12ASD02) 300 kHz (UA12ASD04)
Modulation frequency	400 Hz (UA12ASD02) 250 Hz (UA12ASD04)
Linear accuracy	< 0.4 %
Reproducibility	< 0 .5 mm
Beam angle	± 4.5° (UA12ASD02) ± 10.0° (UA12ASD04)

* **Factory settings** - see options in “Smart functions - IO-Link selectable”

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Electrical data

Power supply	
Rated operational voltage (U_B)	18 - 30 VDC
Ripple (U_{rpp})	≤ 10%
No load supply current (I_o)	≤ 40 mA (24 VDC)
Power-ON delay	≤ 300 ms
Outputs	
Selectable by wire	• 0…10 VDC • 4…20 mA
Selectable by IO-Link	• 0…10 VDC • **4…20 mA *** • 0…20 mA
Swithing outputs	• **Push-pull ***, NPN, PNP • 150 mA • N.O. / N.C.
Rated operational current (I_e)	≤150 mA
Voltage drop (U_d)	≤ 2 VDC
Load	
4…20 mA	< 400 Ω
0…10 VDC	> 10 kΩ

*** Factory settings** - see options in “Smart functions - IO-Link selectable”

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Environmental data

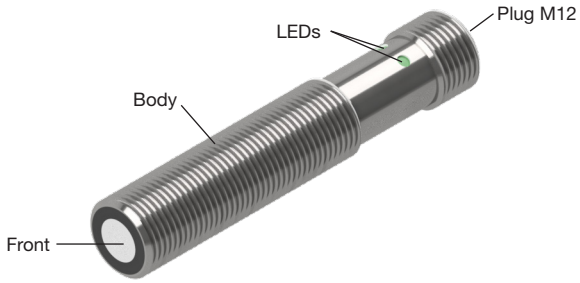
Ambient temperatures	
Operating	-25°C…+70°C (-13°F…+158°F)*
Storage	-25°C…+70°C (-13°F…+158°F)*
Mechanical influences	
Vibration	10…55 Hz,1.0 mm/15 g (EN IEC 60068-2-6)
Shock	30 gn / 11 ms, 3 pos, 3 neg pr axis (EN IEC 60068-2-27)
Categorization	
Overvoltage category	III (EN IEC 60664; EN IEC 60947-1)
Degree of protection	IP67(EN IEC 60529; EN IEC 60947-1)
Safety (electrical)	
Protections	Short circuits and reverse polarity (except for the analog output PIN2)
Rated insulation voltage (U_i)	500 VDC
Dielectric insulation voltage	≥ 500 VAC rms, 50/60 Hz for 1 min
EMC immunity standard	EN IEC 60947-5-2 / EN IEC 61000-6-2
EMC immunity test	
Electrostatic discharge	± 8 kV @ air discharge ± 4 kV @ contact discharge (IEC 61000-4-2)
Electromagnetic field	10V/m (IEC 61000-4-3)
Fast transient	± 2 kV / 5 kHz (IEC 61000-4-4)
Wire conducted noise	3 Vrms (IEC 61000-4-6)

* Do not bend the cable in temperatures below -10°C

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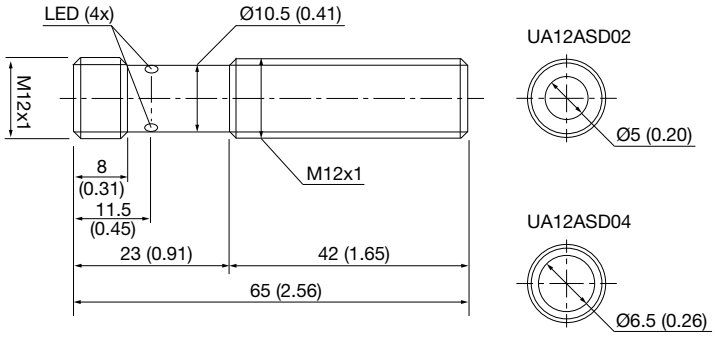
Structure

Housing



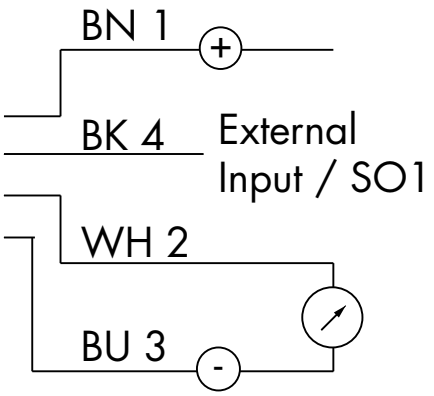
Body	Nickel plated brass
Front	Epoxy resin
Sealing front	PUR
Thread	M12 x 1
Dimensions	M12 x 65 mm
Weight	18 g
Plug	M12, 4 pin male connector

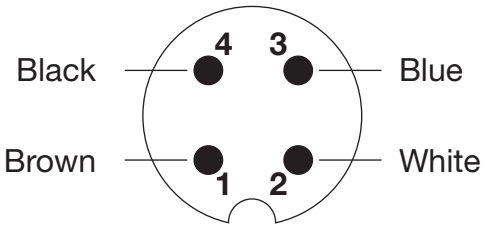
Dimensions in mm (inch)



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Connection and wiring





LED indication

Green LED	Status
Yellow LED	Switching output

Detection diagram

UA12ASD02

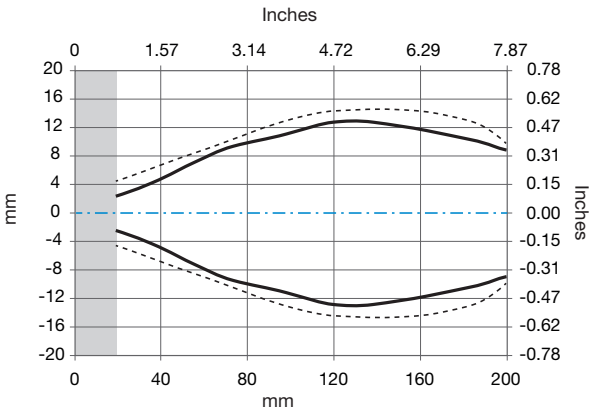


Plate 100 x 100 mm
Round bar Ø 10 mm

UA12ASD04

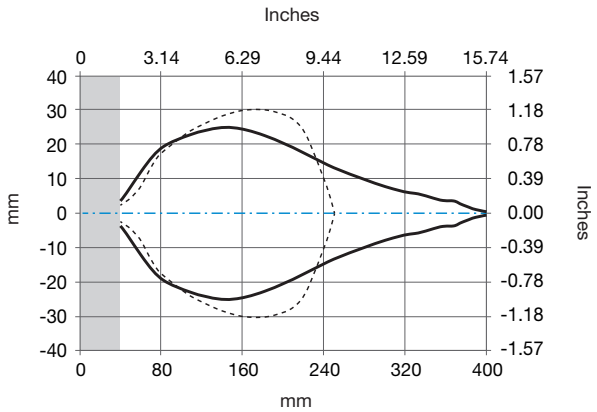
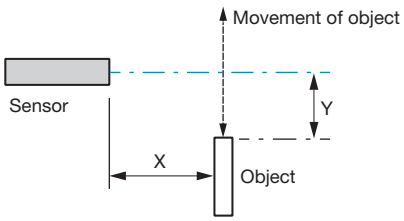


Plate 200 x 200 mm
Round bar Ø 10 mm



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Compatibility and conformity

Approvals and markings

General reference	Sensor designed according to EN IEC 60947-5-2
MTTFd	110.1 years (EN ISO 13849-1, SN 29500)
CE-marking	CE
Approvals	c UL us LISTED (IND. CONT. EQ. 29W7) UKCA

IO-Link

IO-Link information	
Revision	1.1
Transmission rate	COM2 (38.4 kbaud)
SDCI-Norm	EN IEC 61131-9
Profile	Smart sensor profile, common profile
Min. cycle time	8 ms
SIO mode	Yes
Min. master port class	A (4-pin)
Process data lenght	16 bit

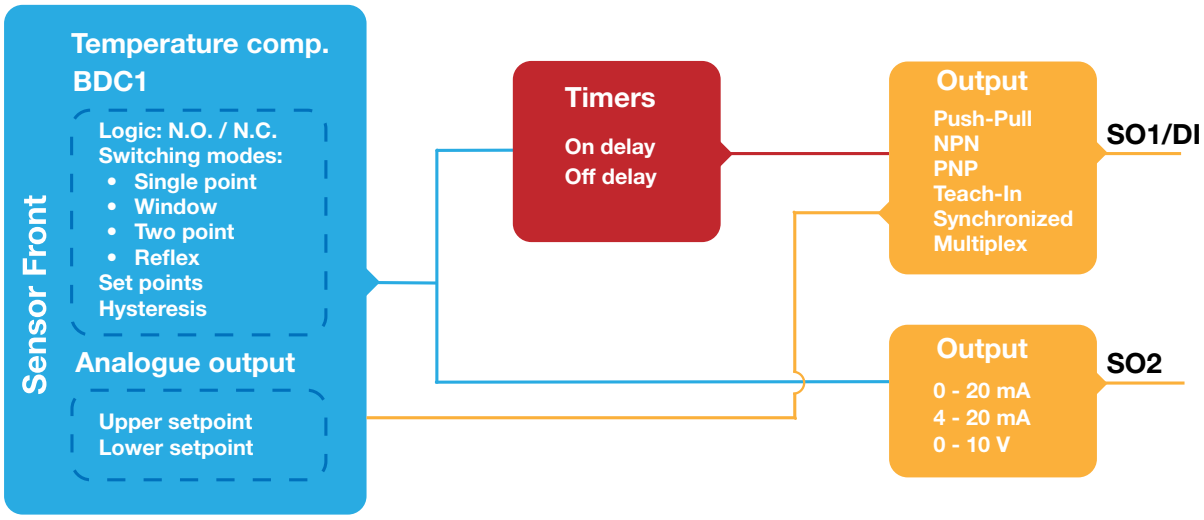
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IO-Link Functions

Smart functions - IO-Link selectable

Input selector (BDC1)	• Deactivated • Single point • Window • Two point • Reflex • Set points • Hysteresis
Timer mode (SO1)	• **Disabled *** • ON delay • OFF delay
Output Inverter	• N.O. • N.C.
Sensor output SO1	• PNP • NPN • Push-pull • **Teach-In *** • Synchronized • Multiplex
Sensor output SO2	• 0 - 20 mA • **4 - 20 mA *** • 0 - 10 V
Diagnostic parameters	• Sensor diagnostics • Temperature diagnostics • Operating diagnostics: Operating hours, Number of power cycles • Error count • Device status
Events	Maintenance, temperature and short circuit events
Observations	Readable via IO-link: Analog values, Switching outputs, Switching channels

*** Factory settings**



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Delivery contents and accessories

Delivery contents

- Ultrasonic sensor: UA12ASDxAPM1IO
- 2 x M12 nuts
- Packaging: Carton box

Accessories

- Mounting bracket: AMB12-A or AMB12-S to be purchased separately
- Connector type: CON.14NF... series to be purchased separately

Further information

User manual	http://cga.pub/?b02216	
Mounting brackets	http://cga.pub/?68adbc	
Connectors	http://cga.pub/?d91364	
Carlo Gavazzi website	www.gavazziautomation.com	

Please refer to the manual for in-depth explanations.

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