

# Ultrasonic Diffuse, Analogue and Digital Output Types UA18CAD.....TI

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- Cylindrical M18 PBT housing
- Sensing distance: 50-2200 mm
- Power supply: 15 to 30 VDC
- Outputs: 0-10 VDC or 4-20 mA and one switching output NPN or PNP, NO or NC.
- Linearity error 1%
- Repeatability 0.5%
- Beam angle.  $\pm 7^\circ$  or  $\pm 8^\circ$
- Protection: Short-circuit, reverse polarity and overvoltage
- Protection degree IP 67
- 2 m cable or M12 plug

## Product Description

A family of diffuse ultrasonic sensors with sensing range from 50-400 mm, 100-900 mm and 200-2200 with a resolution as low as 1.0 mm. The sensor contains both an analogue and a digital output. The output is either 0-10V or 4-20 mA and the digital output NPN or PNP, NO or NC which forms a win-

dow detection. The sensor is the ideal choice for distance measurement, level measurement, diameter measurement or loop control. Due to use of microprocessor control the digital filtering makes the sensor immune to most electromagnetic interferences.

## Ordering Key

**UA18CAD04NGM1TI**

Ultrasonic sensor	_____
Housing style	_____
Housing size	_____
Housing material	_____
Housing length	_____
Detection principle	_____
Sensing distance	_____
Output type	_____
Output configuration	_____
Connection	_____
Teach-in	_____

## Type Selection

Housing diameter	Conne- ction	Rated operating dist. (S <sub>n</sub> )	Analog Output	Digital output NPN/PNP	Ordering no.
M18	Plug M12	50-400 mm	4-20 mA	NPN	UA 18 CAD 04 NG M1 TI
M18	Cable	50-400 mm	4-20 mA	NPN	UA 18 CAD 04 NG TI
M18	Plug M12	50-400 mm	0-10 V	NPN	UA 18 CAD 04 NK M1 TI
M18	Cable	50-400 mm	0-10 V	NPN	UA 18 CAD 04 NK TI
M18	Plug M12	50-400 mm	4-20 mA	PNP	UA 18 CAD 04 PG M1 TI
M18	Cable	50-400 mm	4-20 mA	PNP	UA 18 CAD 04 PG TI
M18	Plug M12	50-400 mm	0-10 V	PNP	UA 18 CAD 04 PK M1 TI
M18	Cable	50-400 mm	0-10 V	PNP	UA 18 CAD 04 PK TI
M18	Plug M12	100-900 mm	4-20 mA	NPN	UA 18 CAD 09 NG M1 TI
M18	Cable	100-900 mm	4-20 mA	NPN	UA 18 CAD 09 NG TI
M18	Plug M12	100-900 mm	0-10 V	NPN	UA 18 CAD 09 NK M1 TI
M18	Cable	100-900 mm	0-10 V	NPN	UA 18 CAD 09 NK TI
M18	Plug M12	100-900 mm	4-20 mA	PNP	UA 18 CAD 09 PG M1 TI
M18	Cable	100-900 mm	4-20 mA	PNP	UA 18 CAD 09 PG TI
M18	Plug M12	100-900 mm	0-10 V	PNP	UA 18 CAD 09 PK M1 TI
M18	Cable	100-900 mm	0-10 V	PNP	UA 18 CAD 09 PK TI
M18	Plug M12	200-2200 mm	4-20 mA	NPN	UA 18 CAD 22 NG M1 TI
M18	Cable	200-2200 mm	4-20 mA	NPN	UA 18 CAD 22 NG TI
M18	Plug M12	200-2200 mm	0-10 V	NPN	UA 18 CAD 22 NK M1 TI
M18	Cable	200-2200 mm	0-10 V	NPN	UA 18 CAD 22 NK TI
M18	Plug M12	200-2200 mm	4-20 mA	PNP	UA 18 CAD 22 PG M1 TI
M18	Cable	200-2200 mm	4-20 mA	PNP	UA 18 CAD 22 PG TI
M18	Plug M12	200-2200 mm	0-10 V	PNP	UA 18 CAD 22 PK M1 TI
M18	Cable	200-2200 mm	0-10 V	PNP	UA 18 CAD 22 PK TI

## Specifications

<b>Rated operating distance (S<sub>n</sub>)</b>	Reference target: 1 mm metal rolled finish. CAD04: 100 x 100 mm CAD09 and CAD22: 200 x 200 mm	<b>Operating frequency digital output (f)</b>	
UA18CAD04	50 - 400 mm	UA18CAD04...	≤ 10 Hz
UA18CAD09	100 - 900 mm	UA18CAD09...	≤ 4 Hz
UA18CAD22	200 - 2200 mm	UA18CAD22...	≤ 1 Hz
<b>Blind zone</b>		<b>Response time OFF-ON digital output (t<sub>ON</sub>)</b>	
UA18CAD04...	≤ 50 mm	UA18CAD04...	≤ 50 mS
UA18CAD09...	≤ 100 mm	UA18CAD09...	≤ 125 mS
UA18CAD22...	≤ 200 mm	UA18CAD22...	≤ 500 mS
<b>Repeatability</b>	0.5%	<b>Response time ON-OFF digital output (t<sub>OFF</sub>)</b>	
<b>Linear Accuracy</b>	1%	UA18CAD04...	≤ 50 mS
<b>Beam angle</b>		UA18CAD09...	≤ 125 mS
UA18CAD04...	±8°	UA18CAD22...	≤ 500 mS
UA18CAD09...	±7°	<b>Response time analog output</b>	≤ 500 mS
UA18CAD22...	±7°	<b>Power ON delay</b>	≤ 500 mS
<b>Sensitivity</b>		<b>Output function, open collector</b>	
Push-button	P1 (farthest setpoint) P2 (nearest setpoint)	By sensor type	NPN or PNP
Resolution	1 mm	<b>Output switching function</b>	One open collector transistor and one analogue output to be configured as: Window function with N.O or N.C. output. Analogue output with positive or negative slope.
<b>Temperature drift</b>	0.1%/°C @ -20° to +60° C	<b>Indication Output ON</b>	Yellow LED
<b>Temperature compensation</b>	Yes	<b>Environment</b>	
<b>Hysteresis (H)</b>	Min. 1%	Installation category	III (IEC 60664/60664A; 60947-1)
<b>Rated operational voltage (U<sub>B</sub>)</b>	15 to 30 VDC (ripple included)	Pollution degree	3 (IEC 60664/60664A; 60947-1)
<b>Ripple (U<sub>pp</sub>)</b>	≤ 5%	Degree of protection	IP67 (IEC 60529; 60947-1)
<b>No-load supply current (I<sub>o</sub>)</b>		<b>Ambient temperature</b>	
UA18CAD04...	45 mA @ U <sub>B</sub> max	Operating	-20° to +60°C (-4° to +140°F)
UA18CAD09...	45 mA @ U <sub>B</sub> max	Storage	-35° to +70°C (-31° to +158°F)
UA18CAD22...	50 mA @ U <sub>B</sub> max	<b>Vibration</b>	10 to 55 Hz, 1.0 mm/6g (IEC/EN 60068-2-6)
<b>Output current continuous digital output (I<sub>o</sub>)</b>		<b>Shock</b>	30 g / 11 ms, 3 directions (IEC/EN 60068-2-27)
Max. load capacity 100 nF UL508 specification	500 mA 100 mA	<b>Rated insulation voltage</b>	< 500 VAC (rms)
<b>Output current short-time digital output (I)</b>		<b>Housing</b>	
Max. load capacity 100 nF UL508 specification	500 mA 100 mA	Material body	PBT
<b>Minimum operational current digital output (I<sub>m</sub>)</b>	0.5 mA	Material front	Epoxy-glass resin
<b>OFF-state current digital output (I<sub>o</sub>)</b>	10 μA	Material back, plug	Grilamid
<b>Voltage drop digital output (U<sub>d</sub>)</b>	≤ 2.2 VDC @ I <sub>g</sub> max.	Material back, cable	Grilamid
<b>Protection digital output</b>	Short-circuit, overvoltage and reverse polarity	Material trimmer	POM
<b>Output analog output</b>		Sealing around trimmer	TPE
NG.. or PG.. types	4 to 20 mA	Material sealing front	
NK.. or PK.. types	0 to 10 VDC	UA18CAD04...	TPE
<b>Load</b>		UA18CAD09...	TPE
4 to 20 mA	max. 500 Ω	UA18CAD22...	PBT
0 to 10 VDC	min. 3 kΩ	<b>Connection</b>	
<b>Carrier frequency</b>		Cable	PVC, grey, 2 m, 4 x 0.32 mm <sup>2</sup> , Ø = 4.7 mm M12, 4-pin (CON. 14-series)
UA18CAD04...	400 kHz	Plug	
UA18CAD09...	300 kHz	<b>Tightening torque</b>	≤ 1 Nm
UA18CAD22...	200 kHz		

## Specifications (cont.)

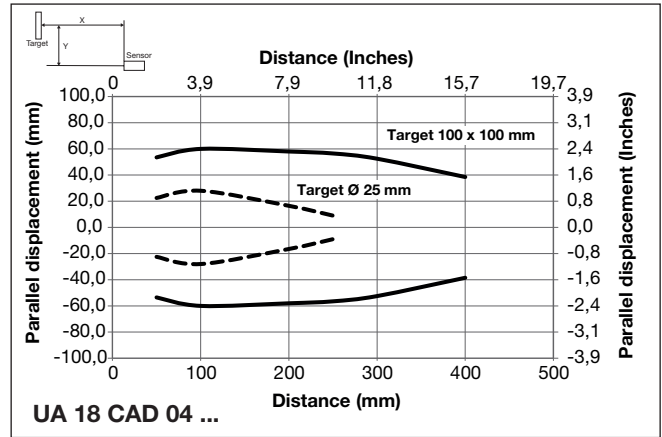
<b>Weight</b>	
Cable version	98 g
Plug version	35 g

<b>CE-marking</b>	Yes
<b>Approvals</b>	cULus (UL508)

## Wiring Diagram



## Detection Range



## Dimensions

