



# A850-D MEMS

Tuff Tilt Series ±5VDC Output

The A850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.



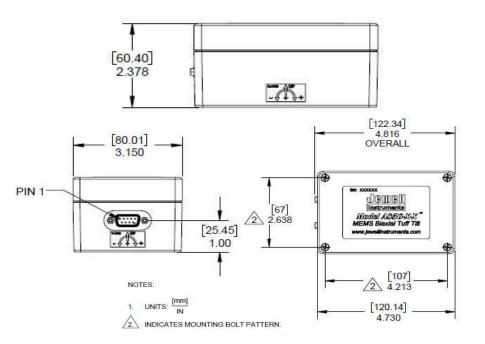
## FEATURES

- ±14.5°, ±30° and ±90° ranges
- Robust and Rugged Enclosure
- Uniaxial and Biaxial Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Dual Power Input
- Filtering Available
- ±5 VDC Output
- Temperature Sensor Option Available
- IP65 Seal

# APPLICATIONS

- Platform Leveling / Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

OUTLINE DIAGRAM



PIN OUT

DUAL SUPPLY 9-PIN CONNECTOR		
PIN	ASSIGNMENT	
1	+PWR	
2	PWR RTN	
3	-PWR	
4	X OUT	
5	YOUT	
6	N/C	
7	SIG RTN	
8	THRM +	
9	THRM -	



# ALTHEN SENSORS & CONTROLS

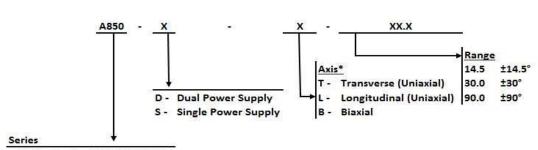
# PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC				
Measurement Range <sup>1</sup> (°)	±14.5	±30	±90	
Output Voltage Range (VDC)	±5.00	±5.00	±5.00	
Scale Factor Tolerance (%)	±1	±1	±1	
Scale Factor Temp. Coefficient (PPM/°C max)	150	150	150	
0° Output (Volts max)	±0.03	±0.03	±0.03	
0° Output Temp. Sensitivity (V/°C max)	±0.004	±0.004	±0.004	
Transverse Axis Misalignment (° max)	±0.5	±0.5	±0.5	
Resolution (° max)	0.002	0.002	0.004	
Threshold (° max)	0.002	0.002	0.002	
Non-linearity (% FRO max)	0.05	0.05	0.05	
Nonrepeatability, Hysteresis (% FRO max)	0.014	0.007	0.004	
Bandwidth (Hz nom) (-3 dB)	5	5	5	
Warm Up Time (Seconds max)	0.5	0.5	0.5	
Voltage to Radian conversion <sup>2</sup>	ASIN( <voltage>/20)</voltage>	ASIN( <voltage>/10)</voltage>	ASIN( <voltage>/5)</voltage>	
Temperature Sensor	PTC Thermistor, Nominal resistance is 1kohm, +/-2%, dissipation constant 2mW/C			

#### **ELECTRICAL AND ENVIRONMENTAL**

Number of Axes	1 or 2
Input Voltage Range (VDC)	±12 to ±18
Input Current (mA max)	±6
Output Noise (vrms max)	0.005
Output Impedance (Ohms nom)	1
Operating Temp. Range (°C)	-40 to +85
Storage Temp. Range (°C)	-40 to +95
Shock	100 g, 0.011 sec, ½ sine
Weight (grams)	165 (1 axis), 170 (2 axes)
Seal	IP65

Notes: 1 - Custom ranges available on request. 2 - Does not take into account any sources of error.



A850 - Analog MEMS Tuff Tilt

HOW TO ORDER



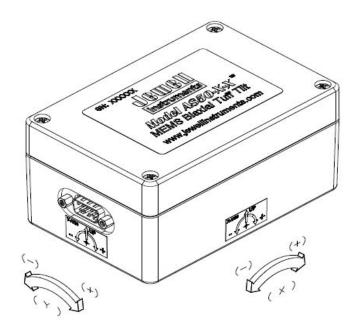
#### \*Call factory for customized axis configurations

Transverse Par	t Numbers	Longitudinal Part	t Numbers	Biaxial Part N	umbers
A850-D-T-14.5	98850-07	A850-D-L-14.5	98850-13	A850-D-B-14.5	98850-01
A850-D-T-30	98850-08	A850-D-L-30	98850-14	A850-D-B-30	98850-02
A850-D-T-90	98850-09	A850-D-L-90	98850-15	A850-D-B-90	98850-03





OUTLINE DIAGRAM:



X = Longitudinal Y = Transverse

Accessories

Model	Part Number	Description
84051	84051-01	Horizontal Mounting Plate Kit w/Mounting Hardware (See plate dimesions)
81439	81439-01	Vertical Mounting Plate Kit w/Mounting Hardware (see plate dimensions)
602-00013	602-00013	Extra Mounting Kit (Includes Allen Wrench, four (4) Mounting Studs, and Circular Bubble Level)
65050	65050	Mating Female D-sub Connector, 9 Pin
65052	65052-01	Connector Hood for a 9 Pin D-sub
70304	70304	Power/signal 10-conductor Cable, 24 AWG, Polypropylene Jacket (Specify total length on order)

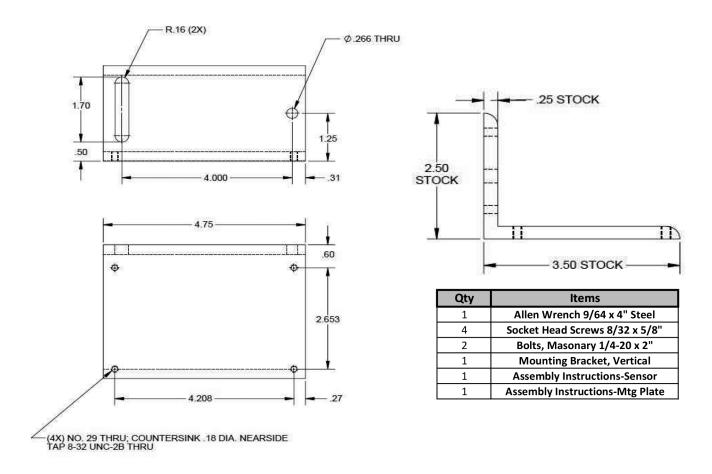
Extra Mounting Kit, Tuff Tilt, Part Number 602-00013

Qty	Items	Item Description
1	Allen Wrench	9/64" x 4", Alloy steel
1	Circular Bubble Level	Acrylic Circular Bubble Level
4	Stud Mounting Assys	2-Hex Nuts, 3-Flat Washers, 1-Socket Head Screw, & 1-Locknut
1	Assembly Instructions	Assembly Mounting Instructions

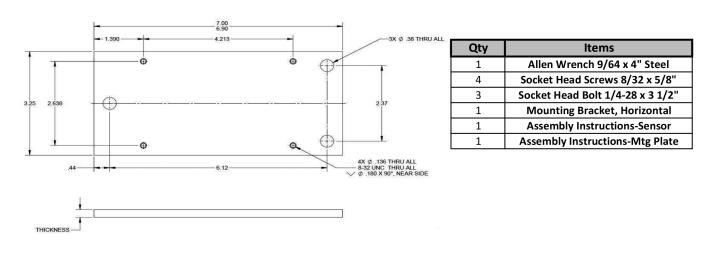




## RIGHT ANGLE MOUNTING BRACKET DIAGRAM - MODEL: 81439, PART NUMBER: 81439-01



HORIZONTAL MOUNTING PLATE DIAGRAM - MODEL: 84051, PART NUMBER 84051-01



Page 4/12

The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification. Althen – Your expert partner in Sensors & Controls | althensensors.com

Althen stands for pioneering measurement and custom sensor solutions. In addition we offer services such as calibration, design & engineering, training and renting of measurement equipment.

Germany/Austria/Switzerland info@althen.de **Benelux** sales@althen.nl France info@althensensors.fr Sweden info@althensensors.se USA/Canada info@althensensors.com Other countries info@althensensors.com





A850-S MEMS

Tuff Till Series 0-5VDC Output

The A850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.



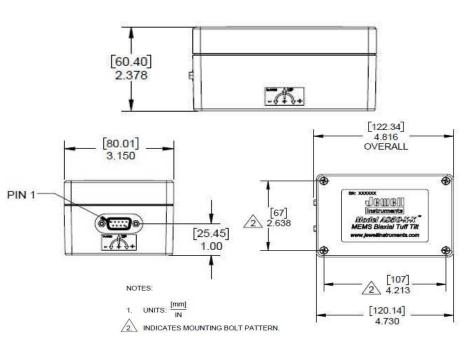
## FEATURES

- ±14.5°, ±30° and ±90° ranges
- Robust and Rugged Enclosure
- Uniaxial and Biaxial Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Single Power Input
- 0-5 VDC Output
- Temperature Sensor Option Available
- IP65 Seal

# APPLICATIONS

- Platform Leveling / Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

OUTLINE DIAGRAM



PIN OUT

	SINGLE SUPPLY 9-PIN CONNECTOR		
PIN	ASSIGNMENT		
1	+PWR		
2	PWR RTN		
3	N/C		
4	X OUT		
5	YOUT		
6	N/C		
7	SIG RTN		
8	THRM +		
9	THRM -		





# PERFORMANCE SPECIFICATIONS

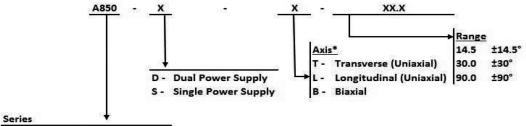
STATIC/DYNAMIC			
Measurement Range <sup>1</sup> (°)	±14.5	±30	±90
Output Voltage Range (VDC)	0-5	0-5	0-5
Scale Factor Tolerance (%)	±1	±1	±1
Scale Factor Temp. Coefficient (PPM/°C max)	150	150	150
0° Output (Volts max)	±0.03	±0.03	±0.03
0° Output Temp. Sensitivity (V/°C max)	±0.004	±0.004	±0.004
Transverse Axis Misalignment (° max)	±0.5	±0.5	±0.5
Resolution (° max)	0.002	0.002	0.004
Threshold (° max)	0.002	0.002	0.002
Non-linearity (% FRO max)	0.05	0.05	0.05
Nonrepeatability, Hysteresis (% FRO max)	0.014	0.007	0.004
Bandwidth (Hz nom) (-3 dB)	5	5	5
Warm Up Time (Seconds max)	0.5	0.5	0.5
Voltage to Radian conversion <sup>2</sup>	ASIN(( <voltage> - 2.5)/10)</voltage>	ASIN(( <voltage> - 2.5)/5)</voltage>	ASIN(( <voltage> - 2.5)/2.5)</voltage>
Temperature Sensor	PTC Thermistor, Nominal resistance	e is 1kohm, +/-2%, dissipat	ion constant 2mW/C

### **ELECTRICAL AND ENVIRONMENTAL**

Number of Axes	1 or 2
Input Voltage Range (VDC)	12 to 30
Input Current (mA max)	7
Output Noise (vrms max)	0.005
Output Impedance (Ohms nom)	1
Operating Temp. Range (°C)	-40 to +85
Storage Temp. Range (°C)	-40 to +95
Shock	100 g, 0.011 sec, ½ sine
Weight (grams)	165 (1 axis), 170 (2 axes)
Seal	IP65

Notes: 1 - Custom ranges available on request.





A850 - Analog MEMS Tuff Tilt

#### Example: A850-S-B-14.5 = A850 MEMS Tuff Tilt, Single Power Supply, Biaxial, ±14.5° range

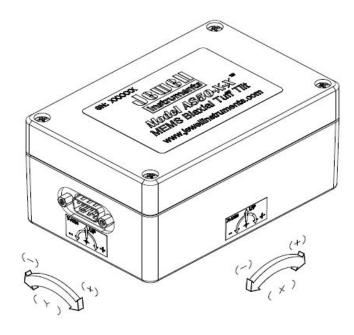
#### \*Call factory for customized axis configurations

Transverse Pa	rt Numbers	Longitudinal Par	rt Numbers	Biaxial Part	Numbers
A850-S-T-14.5	98850-10	A850-S-L-14.5	98850-16	A850-S-B-14.5	98850-04
A850-S-T-30	98850-11	A850-S-L-30	98850-17	A850-S-B-30	98850-05
A850-S-T-90	98850-12	A850-S-L-90	98850-18	A850-S-B-90	98850-06





OUTLINE DIAGRAM:



X = Longitudinal Y = Transverse

Accessories

Model	Part Number	Description
84051	84051-01	Horizontal Mounting Plate Kit w/Mounting Hardware (See plate dimesions)
81439	81439-01	Vertical Mounting Plate Kit w/Mounting Hardware (see plate dimensions)
602-00013	602-00013	Extra Mounting Kit (Includes Allen Wrench, four (4) Mounting Studs, and Circular Bubble Level)
65050	65050	Mating Female D-sub Connector, 9 Pin
65052	65052-01	Connector Hood for a 9 Pin D-sub
70304	70304	Power/signal 10-conductor Cable, 24 AWG, Polypropylene Jacket (Specify total length on order)

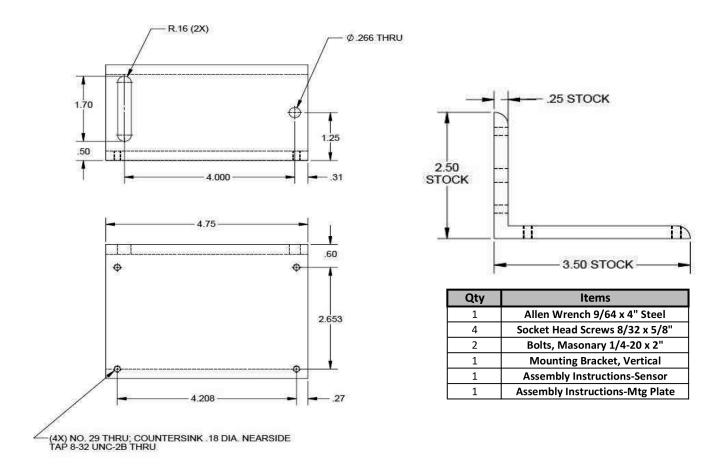
Extra Mounting Kit, Tuff Tilt, Part Number 602-00013

Qty	Items	Item Description
1	Allen Wrench	9/64" x 4", Alloy steel
1	Circular Bubble Level	Acrylic Circular Bubble Level
4	Stud Mounting Assys	2-Hex Nuts, 3-Flat Washers, 1-Socket Head Screw, & 1-Locknut
1	Assembly Instructions	Assembly Mounting Instructions

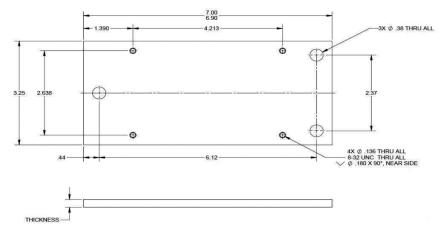




## RIGHT ANGLE MOUNTING BRACKET DIAGRAM - MODEL: 81439, PART NUMBER: 81439-01



HORIZONTAL MOUNTING PLATE DIAGRAM - MODEL: 84051, PART NUMBER 84051-01



Qty	Items		
1	Allen Wrench 9/64 x 4" Steel		
4	Socket Head Screws 8/32 x 5/8"		
3	Socket Head Bolt 1/4-28 x 3 1/2"		
1	Mounting Bracket, Horizontal		
1	Assembly Instructions-Sensor		
1	Assembly Instructions-Mtg Plate		

Page 8/12

The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification. Althen – Your expert partner in Sensors & Controls | althensensors.com

Althen stands for pioneering measurement and custom sensor solutions. In addition we offer services such as calibration, design & engineering, training and renting of measurement equipment.

**Germany/Austria/Switzerland** info@althen.de **Benelux** sales@althen.nl France info@althensensors.fr Sweden info@althensensors.se USA/Canada info@althensensors.com Other countries info@althensensors.com





# C850 MEMS

Tuff Tilt Series 4-20mA Output

The C850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.



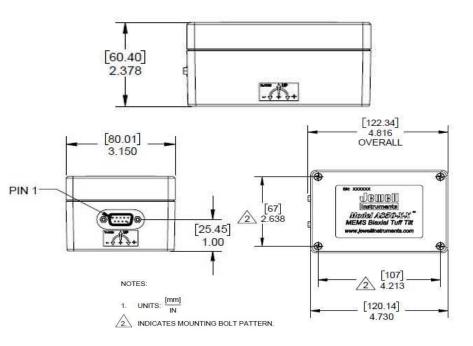
## FEATURES

- ±14.5°, ±30° and ±90° ranges
- Robust and Rugged Enclosure
- Uniaxial and Biaxial Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Single Power Input
- 4-20mA Output
- Temperature Sensor Option Available
- IP65 Seal

# APPLICATIONS

- Platform Leveling / Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

OUTLINE DIAGRAM



PIN OUT



Version | 09.2019



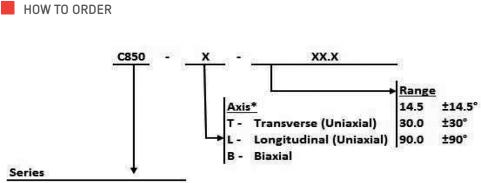


STATIC/DYNAMIC				
Measurement Range <sup>1</sup> (°)		±14.5	±30	±90
Output Current Range (mA)		4-20	4-20	4-20
Scale Factor Tolerance (%)		±1	±1	±1
Scale Factor Temp. Coefficient (PPM/°C ma	x)	150	150	150
0° Output (mA)	1	2 ±0.3	12 ±0.3	12 ±0.3
0° Output Temp. Sensitivity (mA/°C max)	±	0.004	±0.004	±0.004
Transverse Axis Misalignment (° max)		±0.5	±0.5	±0.5
Resolution (° max)	(	0.002	0.002	0.004
Threshold (° max)	(	0.002	0.002	0.002
Non-linearity (% FRO max)		0.05	0.05	0.05
Nonrepeatability, Hysteresis (% FRO max)	(	0.004	0.004	0.004
Bandwidth (Hz nom) (-3 dB)		5	5	5
Warm Up Time (Seconds max)		0.5	0.5	0.5
Current to Radian conversion <sup>2</sup>	arcsin(( <output> - 12mA) / 32mA</output>	) arcsin(( <output></output>	- 12mA) / 16mA)	arcsin(( <output> - 12mA) / 8mA)</output>
Temperature Sensor	PTC Thermistor, Nor	ninal resistance is 1	cohm, +/-2%, dissip	pation constant 2mW/C

### ELECTRICAL AND ENVIRONMENTAL

Number of Axes	1 or 2	
Input Voltage Range (VDC)	12 to 30	
Input Current (mA max)	28	
Output Noise (vrms max)	0.01	
Output Impedance (Ohms nom)	1	
Operating Temp. Range (°C)	-40 to +85	
Storage Temp. Range (°C)	-40 to +95	
Shock	100 g, 0.011 sec, ½ sine	
Weight (grams)	165 (1 axis), 170 (2 axes)	
Seal	IP65	

Notes: 1 - Custom ranges available on request. 2 - Does not take into account any sources of error.



C850 - Analog MEMS Tuff Tilt

### Example: C850-B-14.5 = C850 MEMS Tuff Tilt, Biaxial, ±14.5° range

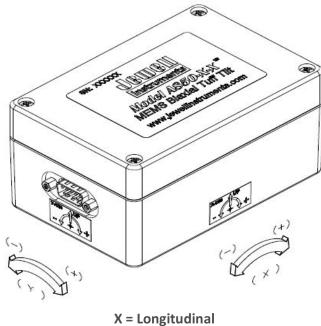
#### \*Call factory for customized axis configurations

Transverse Part Numbers		Longitudinal Pa	Longitudinal Part Numbers		<b>Biaxial Part Numbers</b>	
C850-T-14.5	98850-23	C850-L-14.5	98850-26	C850-B-14.5	98850-20	
C850-T-30	98850-24	C850-L-30	98850-27	C850-B-30	98850-21	
C850-T-90	98850-25	C850-L-90	98850-28	C850-B-90	98850-22	





OUTLINE DIAGRAM:



Y = Transverse

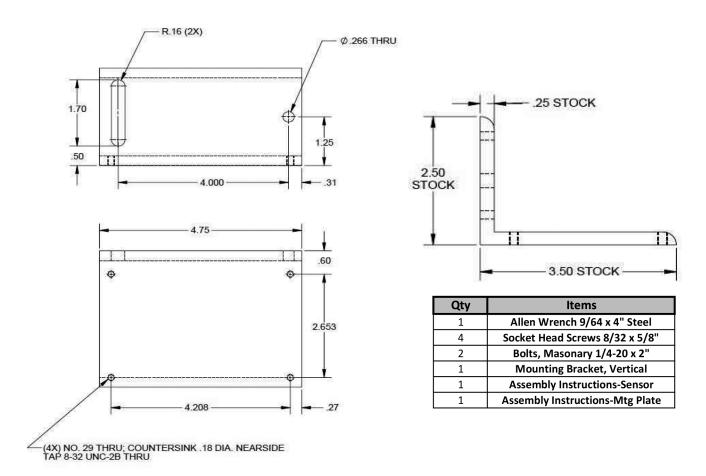
Model	Part Number	Description
84051	84051-01	Horizontal Mounting Plate Kit w/Mounting Hardware (See plate dimesions)
81439	81439-01	Vertical Mounting Plate Kit w/Mounting Hardware (see plate dimensions)
602-00013	602-00013	Extra Mounting Kit (Includes Allen Wrench, four (4) Mounting Studs, and Circular Bubble Level)
65050	65050	Mating Female D-sub Connector, 9 Pin
65052	65052-01	Connector Hood for a 9 Pin D-sub
70304	70304	Power/signal 10-conductor Cable, 24 AWG, Polypropylene Jacket (Specify total length on order)

Extra Mounting Kit, Tuff Tilt, Part Number 602-00013

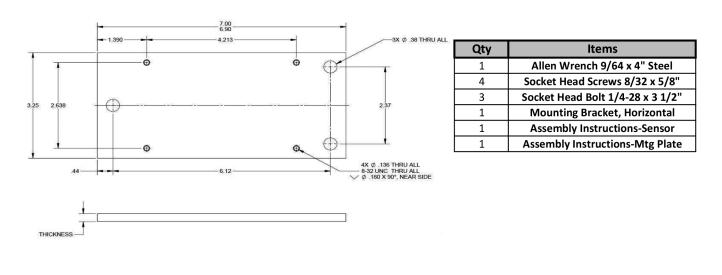
Qty	Items	Item Description
1	Allen Wrench	9/64" x 4", Alloy steel
1	Circular Bubble Level	Acrylic Circular Bubble Level
4	Stud Mounting Assys	2-Hex Nuts, 3-Flat Washers, 1-Socket Head Screw, & 1-Locknut
1	Assembly Instructions	Assembly Mounting Instructions



## RIGHT ANGLE MOUNTING BRACKET DIAGRAM - MODEL: 81439, PART NUMBER: 81439-01



HORIZONTAL MOUNTING PLATE DIAGRAM - MODEL: 84051, PART NUMBER 84051-01



Page 12 / 12

The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification. Althen – Your expert partner in Sensors & Controls | althensensors.com

Althen stands for pioneering measurement and custom sensor solutions. In addition we offer services such as calibration, design & engineering, training and renting of measurement equipment.

Germany/Austria/Switzerland Benelux info@althen.de sales@al

 Benelux
 France

 sales@althen.nl
 info@althensensors.fr

**Sweden** info@althensensors.se USA/Canada info@althensensors.com Other countries info@althensensors.com