ANGLE AND INCLINATION SENSOR USER MANUAL

INS 130

GENERAL INFORMATIONS



INS 130 two axis angle and inclination sensors are the sensors that show the inclination and angle of rotation of objects standing perpendicular to the earth. Angle measurement information between 0°-360° can be taken from these sensors. The measurement limits can be set according to the user request. These sensors which can offer both analog output and open collector output , can take measurement with ±0.15° accuracy.

INS 130 series sensors with high precision, compact design and durable construction offers suitable solutions for angle measurement in industrial areas like crane and lifting systems, construction machinery and special purpose vehicles, solar energy and photovoltaic systems, wind farms and so on. Thanks to their high IP protection class, they can work easily in outdoor environments.

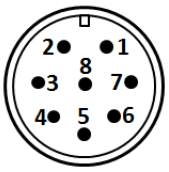
WARNINGS

- The installation of the product is carried out by the customer who purchases the product, according to the wiring diagrams, installation information, etc. in this manual.
- Maintenance and repair should be done by the technicians authorized by the manufacturer firm.
- There must be minimum distance between the sensor and control unit. Avoid additions except the suitable connector unless it needs.
- Keep away the sensor cable from as high power energy cables, contactor, motor, switched power supplies, inductive and capacitive noisy supplies.
- Not to damage the sensor, supply directions and voltage must be paid attention. Don't energize before all connections completed.
- Transport and storage should be at their original packaging and an ambient temperature of -30°C / +70°C in such a way that they will not be exposed to dust, humudity, impact, vibration, falling or water.
- Chemicals such as alcohol, thinner etc. should not be used for cleaning the product. The product should be wiped with a damp cloth.
- The product may be damaged and may become unusable if used outside of the specifications in the user manual.
- The product will be out of warranty if used outside of the specifications in the user manual and opened or repaired other than authorized services.

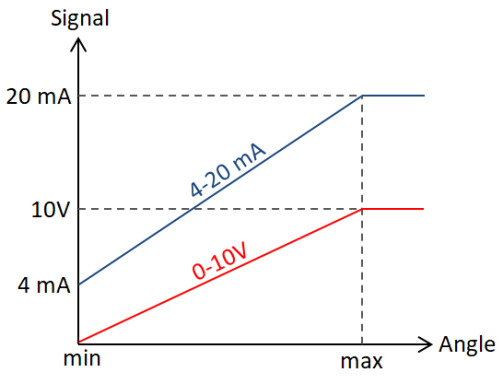
ELECTRICAL CONNECTION

Signal	M12-8 Pin Male Socket	Cable
V+	Pin 1	Red
Transistor Output X	Pin 2	Yellow
GND (0V)	Pin 3	Black
Transistor Output Y	Pin 4	Green
-	Pin 5	Blue
Analog Output X	Pin 6	Pink
Analog Output Y	Pin 7	White
-	Pin 8	Grey

M12 - 8 PIN MALE SOCKET

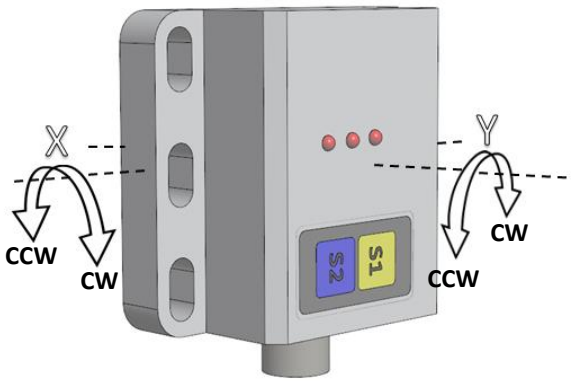


Analog Signal Output

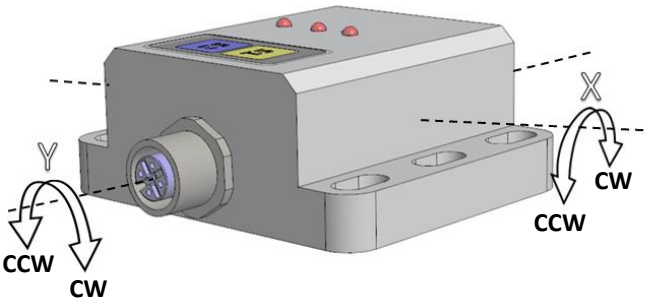


MEASUREMENT AXİS

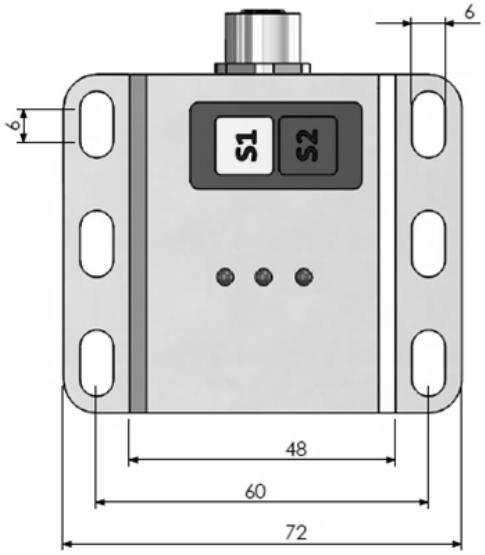
Angle Measurement Axis

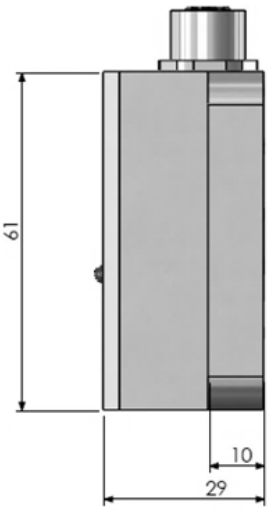


Inclination Measurement Axis

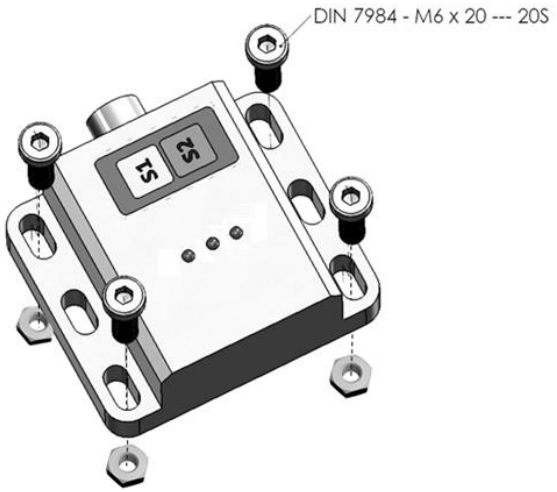


MECHANICAL DIMENSIONS (mm)





MECHANICAL MOUNTING



The product must be fixed to the area to be taken inclination measurement with 4 pcs M6 bolts and nuts.

Warning: All welding work in the relevant area must be completed before the product is installed. Otherwise, the device may be damaged during the welding process, and in this case, it will be out of warranty.

TECHNICAL SPECIFICATIONS

Supply Voltage (V)	4-20 mA & Transistor: 12…24 VDC 0-10 VDC & 0-5 VDC: 15…24 VDC		**Resolution**	0,05°
Measurement Range	0°…360°		**Accuracy**	±0,15°
			Protection Class	IP64
Output Type	PNP Open Collector or Analog Signal Output		**Operating Temp.**	- 30°C … +70°C
Open Collector Specifications	**Output Voltage**	~(V-1) Volt	**Relative Humudity**	%10 … %90
	Current Consumption	<200 mA	**Weight**	~200 gr
Analog Ouputs	0-10 VDC or 4-20 mA		**Body Material**	Aluminum
Response Time	10 Hz		***Electrical Connection**	8x0,14 mm² cable or M12 8 pin male socket

SETUP

Working Principle : If the sensor angle is within the selected range, switching output goes up to "Supply Voltage" level. Otherwise the output is 0 volts. The sensor has two switching outputs as well as two analog output. Analog output can be selected from 0,1…10V or 4…20mA. Switching ang analogue outputs are all programmable.(adjustable)

For example; *In case of the angle range for X is set to "+15°" and "+30°" ;*
Output X = "Supply Voltage" (+U)becomes and "Out X"LED is constanly ON. Otherwise the output is 0 volts and "Out X" LED goes OFF.
Analogue outputs and switching outputs can be indepently programmed (adjustable). For exampe, if the switching output is operating in this range fort he above example, the analog outputs can be programmed to work between different angle values(adjustable)

Switching Output Adjustment for X Axis :



1) S1 button is hold as pressed, When the "Out X" LED starts blinking, the buton is being left free.
2) The sensor is brought to limit position 1.
3) S1 button is pressed again, the "Out X" LED will light continuously for 2 seconds and the start flashing again, so 1st position is set.
4) The sensor is brought to 2nd limit position
5) S1 button is pressed again , so , 2nd position is being set.
6) Sensor returns to its normal operation.
The output is always in the active state between the 1st limit position and the 2nd limit position.
Example: : In case of the position 1 is +30 and the position 2 is +45; The output is active between +30°and +45°.

Switching Output Adjustment for Y Axis :



1) S2 button is hold as pressed. When the "Out Y" LED starts blinking, the buton is being left free.
2) The sensor is brought to limit position 1.
3) S2 button is pressed again, the "Out Y" LED will light continuosly 2 seconds and then starts flashing again, so 1st position is set.
4) The sensor is brought to 2nd limit position
5) S2 button is pressed again, so, 2nd position is being set..
6) Sensor returns to 1st normal position
The output is always in the active state between the 1st limit position and 2nd limit position.
Example: : In case of the position 1 is +30 and the position 2 is +45; The output is active between +30°and +45°.

Analog Output Adjustment for X Axis :

1) S2 button is hold as pressed. When the "Out Y" LED starts blinking, the buton is being left free.
2) The sensor is brought to limit position 1.
3) S2 button is pressed again, the "Out Y" LED will light continuosly 2 seconds and then starts flashing again, so 1st position is set.
4) The sensor is brought to 2nd limit position
5) S2 button is pressed again, so, 2nd position is being set..
6) Sensor returns to 1st normal position

Analog Output Adjustment for Y Axis :

1) At the same time S1 and S2 buttons are hold as pressed, When the "Out X" and "Out Y"LEDs starts blinking, the buttons are being left free.
2) The Sensor is brought to the position to receive the minimum analog signal output.
3) S1 buttons is pressed again , The "Out X" LED will light continuosly for 2 seconds and then start flashing again,so that the minimum values point is being set
4)The Sensor is brought to the position to receive the maximum analog signal output.
5) S1 button pressed again , The "Out X" LED will light continuously for 2 seconds and then start flashing again so that the maximum value point is being set.
6) Sensor returns to its normal operation.

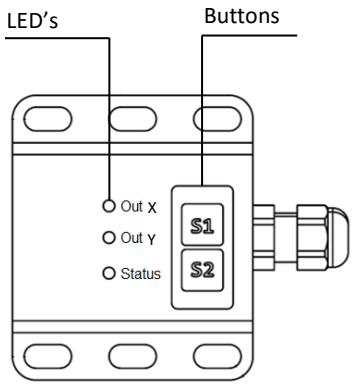
Reset to Factory Settings :

1) At the same time S1 and S2 buttons are hold as pressed, when the " Status" LED starts blinking, the buttons are being left free.
2) The "Status" LED stops blinking after 10 seconds, so the sensor returns to factory settings.

Note: During all adjustments, the output drops to 0 volts

LED FUNCTIONS

Working Status:	Blue LED Status	Yellow LED: Out X	Yellow LED: Out Y
During setting of switching output for X Axis	Light goes OFF	Starts blinking	Light goes OFF
During setting of switching output for Y Axis	Light goes OFF	Light goes OFF	Starts blinking
While switching to analogue setting mode	Light goes OFF	Starts blinking	Starts blinking
During setting of switching output for X Axis	Light goes OFF	Starts blinking	Light goes OFF
During setting of switching output for Y Axis	Light goes OFF	Light goes OFF	Starts blinking
During normal operation	Intermittent blinking	switching mode Status	switching mode Status
Reset to Factory settings : Between 5 seconds- 10 seconds	Light goes OFF	Starts blinking	Starts blinking
>10 seconds the end of the process of returning to factory setting, its continue is normal operating mode	Starts blinking	Light goes OFF	Light goes OFF



BOX CONTENTS

Product	Description
INS 130	Angle and Inclination Sensor
User Manual	1 pcs.

PRODUCT CODE

Model

Number of Axis
02: Two Axis

Supply Voltage(2)
PP: 12…24VDC / 15…24VDC

Transistor Output Type
OCP: PNP Open Collector
No Code: No transistor output

Electrical Connection (3)
3M: 3m cable(standard)
S14M: M12-8 pin male socket

INS 130	-	X	-	XX	-	XX	-	XX	-	XXX	-	XX	-	XX	-	XX

Sensor Type*
E: Inclination
A: Angle
*See: Page 2- Measurement Axis

Measurement Range (1)
*It can be produced at any desired value up to 360 °
Exmp: 030 : ±30°

Analog Output Type
A: 4-20 mA
V: 0-10 V
No Code: No analog output

Output Signal Direction
CW: Clockwise
CCW: Counter clockwise

(1) The angle and inclination measurement range can be selected differently for transistor output and analog output.
You need to specify your different measurement range requirements at the order stage
(2) The supply voltage is 12…24VDC for 4-20mA & transistor output models, and 15…24VDC for 0-10VDC and 0-5VDC output models.
(3) Different cable lengths can be requested upon user request.

Manufacturer Firm's and Authorized Service's Title, Address Details
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