



## INC 110 INCLINOMETER (TILT SENSOR)

- Measuring range up to  $\pm 90^\circ$  inclination
- Single or Dual Axis option
- CANopen output
- Analog outputs: 0-10 V<sub>DC</sub>, 4-20 mA
- Optional Redundant output
- Compensated cross sensitivity between axes
- High and stable accuracy  $\pm 0.1^\circ$
- Re-determinable  $0^\circ$  point
- Shock/Vibration resistant
- Insensitive to moisture/temperature changes
- Easy to fit and mount
- High protection class: IP67
- Robust and compact metal housing

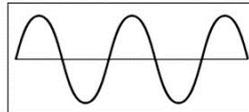
Tilt Sensors are sensors that measure the tilt of all objects in a plane in the X and Y axes (+) and (-) directions. For these sensors with ONE or DOUBLE axis characteristic, up to  $\pm 90^\circ$  tilt measurement information can be taken. Analogue output options 0.1-10VDC, 4-20mA, these sensors with CANopen signal output options can measure up to  $\pm 0.1^\circ$  degree of sensitivity. Due to the integrated axis sensitivity, the influence of the axes to each other is reduced to the minimum level.

Especially used in machinery and crane industries, these sensors can be operated in outdoor environment thanks to their high IP protection class. Sensors with dual output redundant capability can also be made on request.

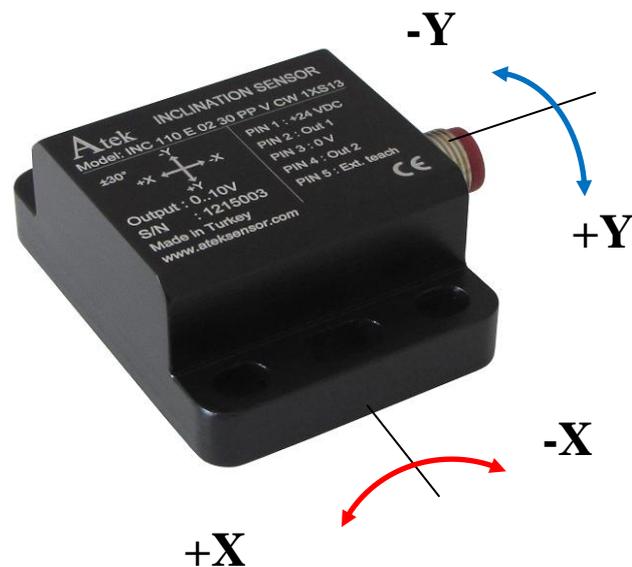
## Applications

- Cranes
- Excavators
- Forklifts
- Fire trucks
- Solar Panels Movement Tracking Systems
- Automation solutions
- Shipbuilding
- Robotics
- Marine transfer ballasts
- Construction machinery
- Camera Systems
- Wind Turbines
- Aviation
- Aerial Lift platform leveling
- Wheel alignment systems
- Precise laser cutting machines
- Aerospace engineering

## ANALOG



## CANopen®



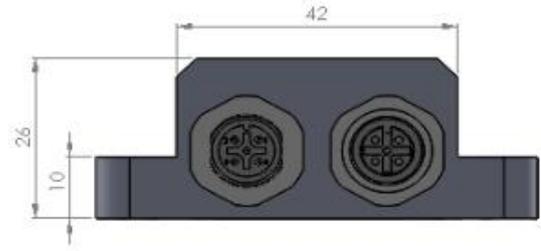
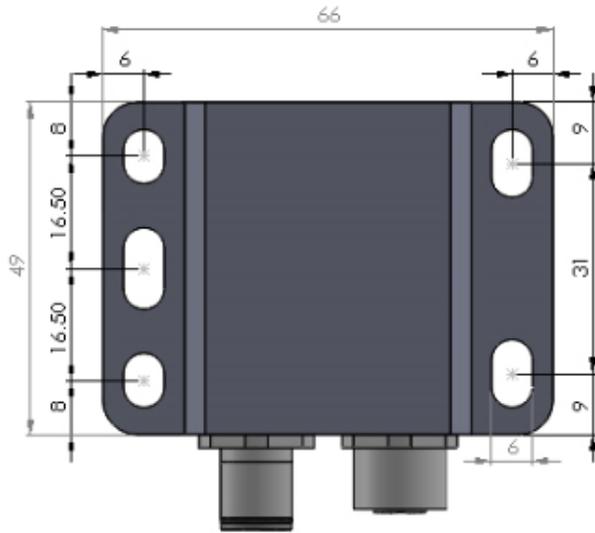
# 1. TECHNICAL PROPERTIES

## GENERAL CHARACTERISTICS

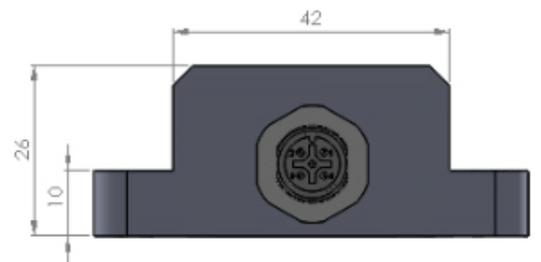
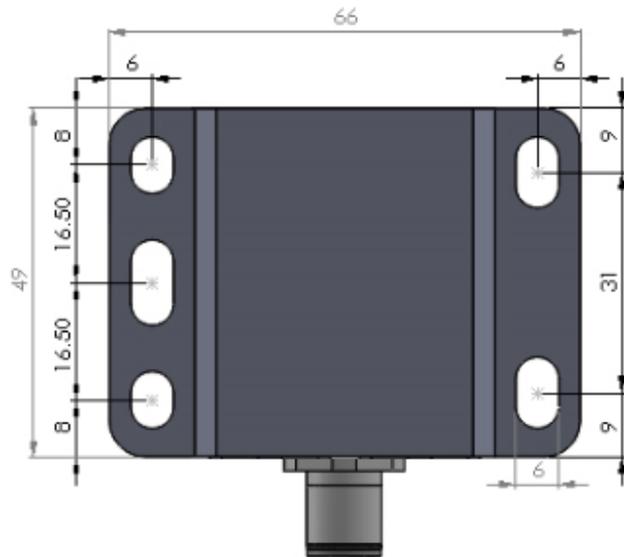
Measuring Range	Different options between -90° ... +90°
Supply Voltage	12...30 V <sub>DC</sub>
Axes	X , XY
Output	Analog outputs 4-20mA or 0.1-10V <sub>DC</sub> CANopen **Optional redundant output
Accuracy	±0,1°
Resolution	Analog outputs: 12 bit CANopen output: 0.05°
Protection Class	IP 67
Humidity	%10 ... %90
Temperature Range	-30 °C ... +70 °C
Electrical Connection	Analog models: M12 5 pins ( male ) or with cable CANopen models: M12 Connector 5 pins (male and/or female)
Housing	Black nickel plating on Aluminum
Weight	140 grams

## CANopen PROPERTIES

Communication Protocol	CiA 301
Resolution	23 bit
Response Rate Frequency	100 Hz
Type	CANopen, CiA DS410
Node ID	Default: 1 Can be arranged by LSS and SDO between 1 and 127
Baud Rate	10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 Mbit/s
PDO Data Rate	500 ms
Error Messages	Heartbeat, Emergency Message
PDO	1 Tx PDO
PDO Modes	Event/Time triggered, Synch/Asynch
SDO	1 server



**CANOPEN**

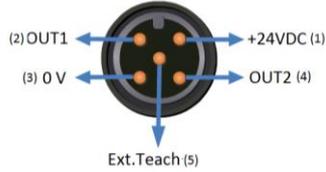


**ANALOG**

## ELECTRICAL CONNECTIONS

### ANALOG

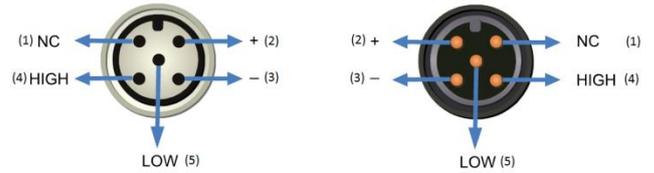
Signal	M12 connector	Cable color
U+ (12..30V <sub>DC</sub> )	Pin 1	Red
Output 1: 0.1-10V <sub>DC</sub> / 4-20mA	Pin 2	Yellow
GND (0V)	Pin 3	Black
Output 2: 0.1-10V <sub>DC</sub> / 4-20mA	Pin 4	Green
Reset	Pin 5	Pink



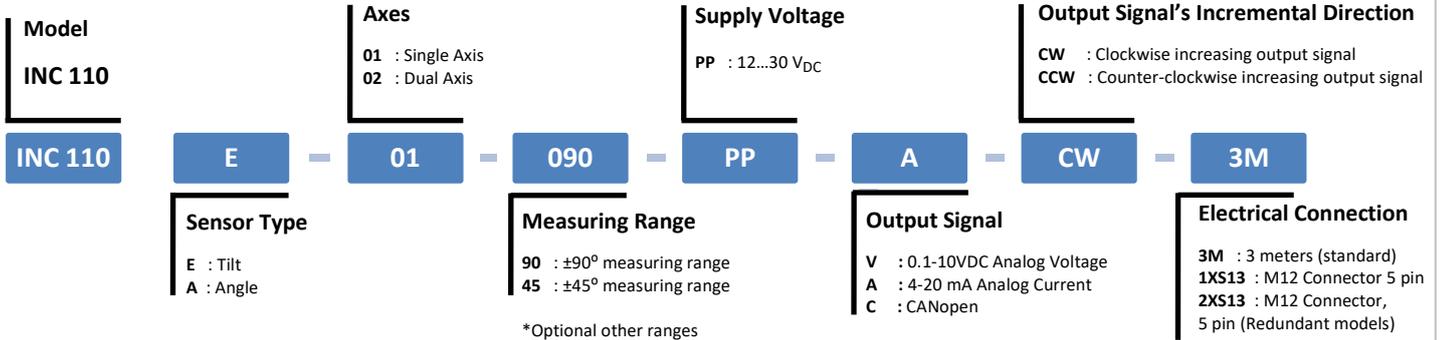
Reset function is to determine 0° point. When pin 5 is activated 1st time, reset function occurs and 0° becomes where the sensor is at that moment. When pin 5 is activated for 2nd time, factory settings are applied for 0° point.

### CANOPEN

Signal	M12 connector	Cable color
CAN_SHIELD	Pin 1	Shield
U+ (12..30V <sub>DC</sub> )	Pin 2	Red
GND (0V)	Pin 3	Black
CAN_H	Pin 4	Yellow
CAN_L	Pin 5	Green



## ORDERING CODE



**"YOUR SOLUTION PARTNER IN CRANE SYSTEMS"**



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