



SENSORSAN

Sensing Technologies

SENS-DINC

DATASHEET

Revision: 0.3

The SENSORSAN dynamic inclinometer (SENS-DINC) is a MEMS-based Digital Tilt Sensor with a compact strapdown design. SENS-DINC provides reliable integrated inertial solutions to their customers. It measures angular rates and linear acceleration with its MEMS-based gyroscopes and accelerometers. The measurements can be used in both static and dynamic applications with high accuracy and reliability.

The primary applications that SENS-DINC is designed for are listed below:



Figure 1: Land Vehicles Navigation Systems



Figure 2: Autonomous Vehicles



Figure 3: Unmanned Aerial Vehicle (UAV)



Figure 4: Remote Weapon Stations (RWS)

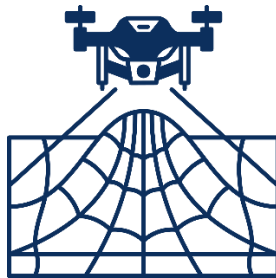


Figure 5: Remote Sensing (Mapping)



Figure 6: Antenna Stabilization



Figure 7: Precision Agriculture



Figure 8: Aerospace



Figure 9: Motion Control of Autonomous Combat Vehicles

The SENS-DINC has the following features which make it practical and easily adaptable for various applications:

- Electromagnetic Interference (EMI) protection
- Wide range of supply voltage
- Configurable communication protocols
- Continuous Built-in Test (BIT)

Parameter	Units	SENS-DINC
Output signals		Accelerations, Angular Rates, Temperature, Synch
Update rate and data rate	Hz	2000
Start-up time	s	< 1
Full Accuracy Data (Warm-up Time)	s	<5 (max)
Gyroscopes	Units	SENS-DINC
Measurement range	deg/s	±450
Bandwidth (-3dB)	Hz	260
Data update rate	Hz	2000
Bias instability (Allan Variance, RMS)	deg/hr	3
SF accuracy (over temperature range)	ppm	2500
Noise. Angular Random Walk (ARW)	deg/vhr	0.5
Non-linearity	ppm	500
Axis misalignment	mrاد	1
Accelerometers	Units	SENS-DINC
Measurement range	g	±15
Bandwidth (-3dB)	Hz	260
Bias instability (RMS, Allan Variance)	mg	0.025
Noise. Velocity Random Walk (VRW)	m/s/vhr	0.1
Non-linearity	ppm	300
Axis misalignment	mrاد	1
Environment	Units	SENS-DINC
Mechanical shock	g, s	40, 0.011 half-sine pulse
Vibration	g, Hz	7, 20 – 2000
Environmental Protection	-	IP67
Operating temperature	deg C	-40 to +85
Storage temperature	deg C	-50 to +90
Low pressure	Pa, min	1750, 30
Humidity	%	up to 95
MTBF (GM @+65degC, operational)	hours	100,000
Electrical		SENS-DINC
Supply voltage	V DC	5 to 30
Power consumption	Watts	0.8 @ 5V
Output Interface	-	RS-422/RS-232/RS-485
Output data format	-	Binary, ASCII output format
EMC/EMI/ESD		STD-461G
Mechanical	Units	SENS-DINC
Size	mm	39 x 45 x 22
Weight	gr	70
Custom enclosure and connector	custom	Available

SENS-DINC Electrical Interface

Pin	Name	Description
1	STxD-	RS422 inverted output
2	SRxD-	RS422 inverted input
3	NC	Do not connect
4	TOV	Time of Validity output. Leave floating if not used. Open drain output pulled up to VDD via 10K.
5	RESET	Reset input. Leave floating if not used. Active low input, pulled up to VDD.
6	NC	Do not connect
7	NC	Do not connect
8	VDD	Power input
9	STxD+	RS422 non-inverted output
10	SRxD+	RS422 non-inverted input
11	EXTRIG	External trigger input. Pulled up to VDD via 10K, leave floating if not used.
12	Rx232	RS-232
13	Tx232	RS-232
14	NC	Do not connect
15	GND	Supply and signal ground

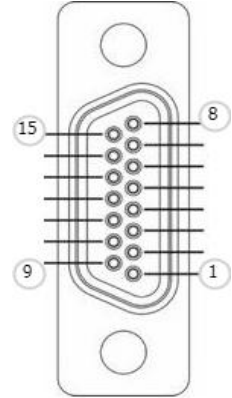
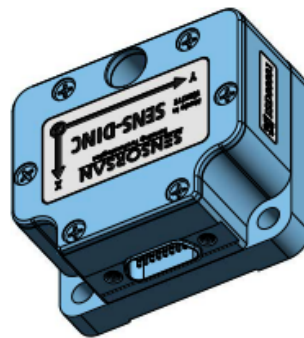
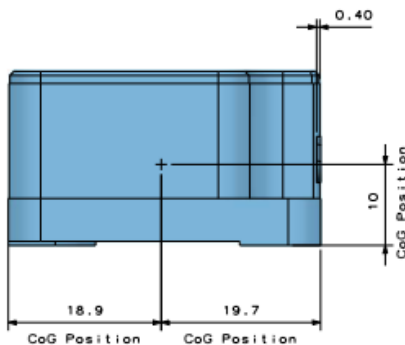
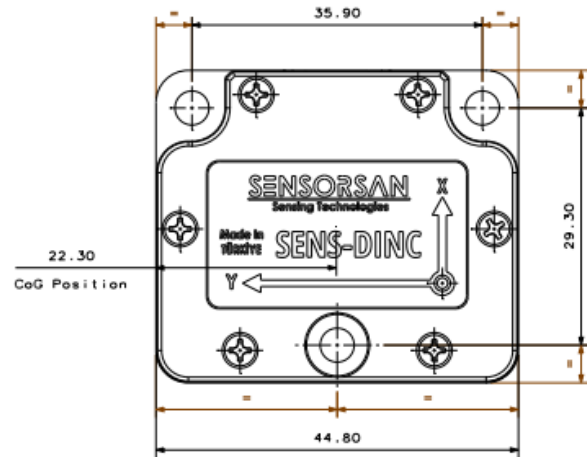
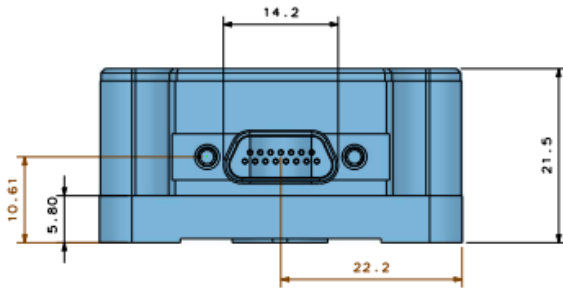


Figure 10 SENS-DINC port configuration

SENS-DINC Mechanical Interface

Note: All dimensions are in millimeters



SENS-DINC Part Number Description

Model	Gyroscope Dynamic Range	Accelerometer dynamic range	Color of enclosure	Interface Type
SENS-DINC-	GR450-	AR15-	SG-	IT4

Model	SENS-IMU	Inertial Measurement Unit
Gyroscopes dynamic range	GR450	±450 deg/sec measurement range
Accelerometers dynamic range	AR15	±15g measurement range
Color of enclosure	SG	Silver Grey (default)
Interface	IT4	RS-232 and RS-422