



4648/4648R is based on a silicon piezoresistive pressure sensor. The pressure measurements are sampled and temperature compensated by an advanced Digital Signal Processor.

The sensor application areas are in fixed installations, either deployed in a seabed installation in shallow waters, or mounted onto a fixed structure in the upper water column. Typical applications for the sensor are measurements of wave and tide in Ports and Harbors, Marine operations, Weather forecast and Climate studies.

The tide measurement is an average of the hydrostatic pressure measured over a time period of 10 sec. to 8 min. (Integration time configurable by the user). The update interval is between 1 sec. and 255 min.

The wave measurements are based on the pressure time series measured over a time period of 64 sec. to 17 min. (configurable by the user). The update interval is between 1 sec. and 255 min.

The wave and tide sensor output parameters are Pressure, Tide level, Tide pressure, Temperature, Significant wave height, Maximum wave height, Mean period, Peak period, Energy wave period, Mean zerocrossing

WAVE and TIDE SENSOR 4648/4648R

is a compact fully integrated sensor for measuring the wave and tide conditions. The 4648 sensor is designed to be mounted on the Aanderaa SeaGuard or connected to SmartGuard using AiCaP CANbus or in other measurement Zsystems using RS-232 interface. The 4648R sensor is designed for use with long cables by means of an RS-422 full duplex interface. The R-version can not be used in SeaGuard applications.

Advantages:

- Smart Sensor technology-plug and play
- Sensor calibration coefficients are stored in the sensor
- Low maintenance needs
- Low current drain
- Output formats 4648: AiCaP CANbus, RS-232
- Output formats 4648R: RS-422
- Short update interval: 1 sec. to 255 min.
- 2Hz and 4Hz sampling frequency
- 256, 512, 1024 and 2048 samples
- New updated wave parameters every 1 sec.
- Output parameters: see overleaf
- Real-time XML output
- Measurement range: 0 - 400 kPa
- Max operating depth: 30m
- Real-time XML Output on RS-422(optional)
- For use in sea and fresh water
- 3 Measurement ranges:
0 - 300m, 0 - 2000m, 0 - 6000m

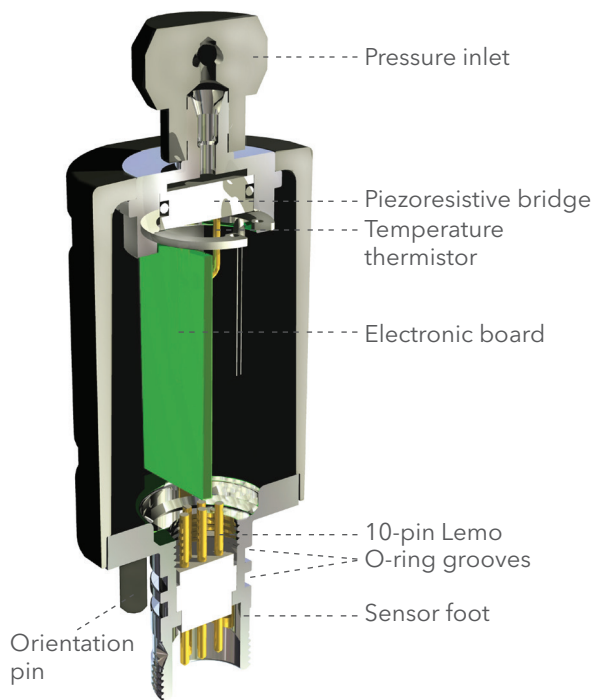
period, Wave steepness and irregularity of sea-state. Since all calibration and temperature compensation data are stored inside the sensor, the parameters are by default presented directly in engineering units without any external calculation. The sensor also provides raw data of the pressure and the temperature measurements.

4648 is a compact yet intelligent sensor designed to be used with Aanderaa SmartGuard or SeaGuard as well as in other measuring systems.

The SmartGuard/SeaGuard and the Smart sensors are interfaced by means of a reliable CANbus interface using an XML based protocol (AiCaP). The Smart sensors can be mounted directly on the top end plate of the Aanderaa or SeaGuard and are automatically detected and recognized.

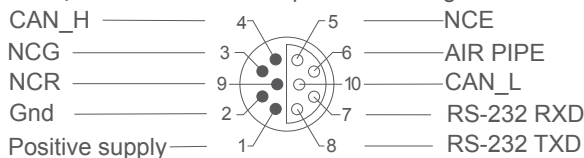
The output format of 4648 are AiCaP CANbus and RS-232, while the output format of the 4648R version is RS-422. The sensor version must be specified when ordered as the two versions are not interchangeable. The R-version can not be used in orSeaGuard applications.

The WTS can be used as stand-alone sensor with Aanderaa Real-Time Collector for real-time data.



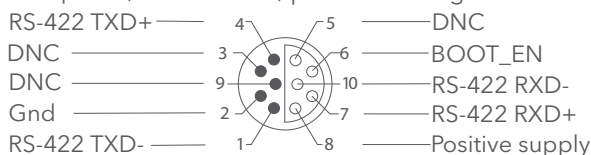
PIN CONFIGURATION FOR 4648

Receptacle, exterior view; pin = • bushing = ◦



PIN CONFIGURATION FOR 4648R

Receptacle, exterior view; pin = • bushing = ◦



Output Interval	2 sec	1 min	10 min	30 min	
2 Hz:	AiCaP	7.9 mA	4.8 mA	4.2 mA	1.6 mA
	RS-232	19.5 mA	6.0 mA	4.7 mA	1.7 mA
	RS-422	19.5 mA	6.0 mA	5.2 mA	2.4 mA
4 Hz:	AiCaP	11.7 mA	9.3 mA	4.2 mA	1.6 mA
	RS-232	24 mA	10.5 mA	4.7 mA	1.7 mA
	RS-422	24 mA	10.5 mA	5.2 mA	2.4 mA

Table 1: 1024 samples, 40 seconds tidal average

Pressure:

4648/4648R Range: 0 - 400kPa (58 psia) ~30m depth
 Resolution: <0.0001% FSO
 Accuracy: ±0.02% FSO
 Output parameters: Pressure in kPa, Pressure raw data in LSB

Tide:

Sampling rate: 2 Hz, 4 Hz
 Integration time: 10second - 8 minutes
 Output Parameters: Tide pressure in kPa, Tide level in meter

Wave:

Sampling rate: 2 Hz, 4 Hz
 Number of samples: 256, 512, 1024, or 2048
 Output Parameters: Significant wave height, Maximum wave height, Mean period, Peak period, Mean zero-crossing period, Energy period, Steepness, Irregularity of sea-state, Cut-off frequency, Pressure series, Last pressure sample index, Wave spectrum

Temperature:

Range: 0 - 36°C (32 - 96.8°F)
 Resolution: <0.001°C (0.0018°F)
 Accuracy: ±0.4°C/0.2°C ¹⁾ (±0.72°F/0.36°F ¹⁾)
 Response Time (63%): 2 minutes

Temp. parameters: Temp.in °C, Temp. raw data in LSB
 4648 version: AiCaP CANbus, RS-232²⁾
 4648R-version: RS-422²⁾

Output format:

Output interval:

RS232/RS422: 1sec.- 255 min.
 AiCaP: Controlled by data logger

Supply voltage:

5 to 14Vdc

Current drain(@ 9V)³⁾:

Max. RS-232/RS-422): 50 mA

Quiescent: 0.4 mA

Average: See table 1

Operating temp.: -5 - +40°C (23 - 104°F)

Operating depth: Within pressure range

Electrical connection: 10-pin receptacle mating plug CSP

Pressure connection: Swagelok™ 1/8 inch

Dimensions: OD: 36 x 101mm (OD:1.4"x3.9")

Weight: 138g (4.86oz)

Materials: Titanium, ABS/PC, pom, epoxy casting

ACCESSORIES

not included: RS-232 Sensor Cable 4762⁴⁾/4865⁵⁾
 RS-422 Sensor Cable 4763⁴⁾/4799⁵⁾

¹⁾ Wave and Tide disabled and output interval ≥ 2 seconds

²⁾ 9600 baud, 8 data bits, 1 stop bit, no parity, Xon/Xoff Flow control

³⁾ With wave enabled. See D381 and D382 for Pressure and tide current drain

⁴⁾ CSP Cable with free end for Real-time data

⁵⁾ CSP Cable to PC with 9pin D-sub for Real-time data

The above specifications are for the stand-alone sensor only, not the installation it is utilized with. Specifications subject to change without prior notice.



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