



Ocean Sensor Systems, Inc.

Wave Staff III, OSSI-010-008

With 0-5V & RS232 Output and A Self Grounding Coaxial Staff

General Description

The OSSI-010-008 Wave Staff III is a water level sensor that combines a rugged, sealed, waterproof package, low power microprocessor and a temperature stable, sensing circuit. The Wave Staff III operates from 5.5V to 40VDC and has analog and RS232 serial data outputs. The serial data output string contains the water level & temperatures in ASCII or binary format. The Wave Staff II can be programmed to free run or sample on demand. It is easily programmed via a PC serial port using our Wave Staff Interface Software. The Wave Staff III has two new features. The Coaxial Cable Staff eliminates the need for a separate water ground wire and both Staff & electrical cord are changeable.

Features

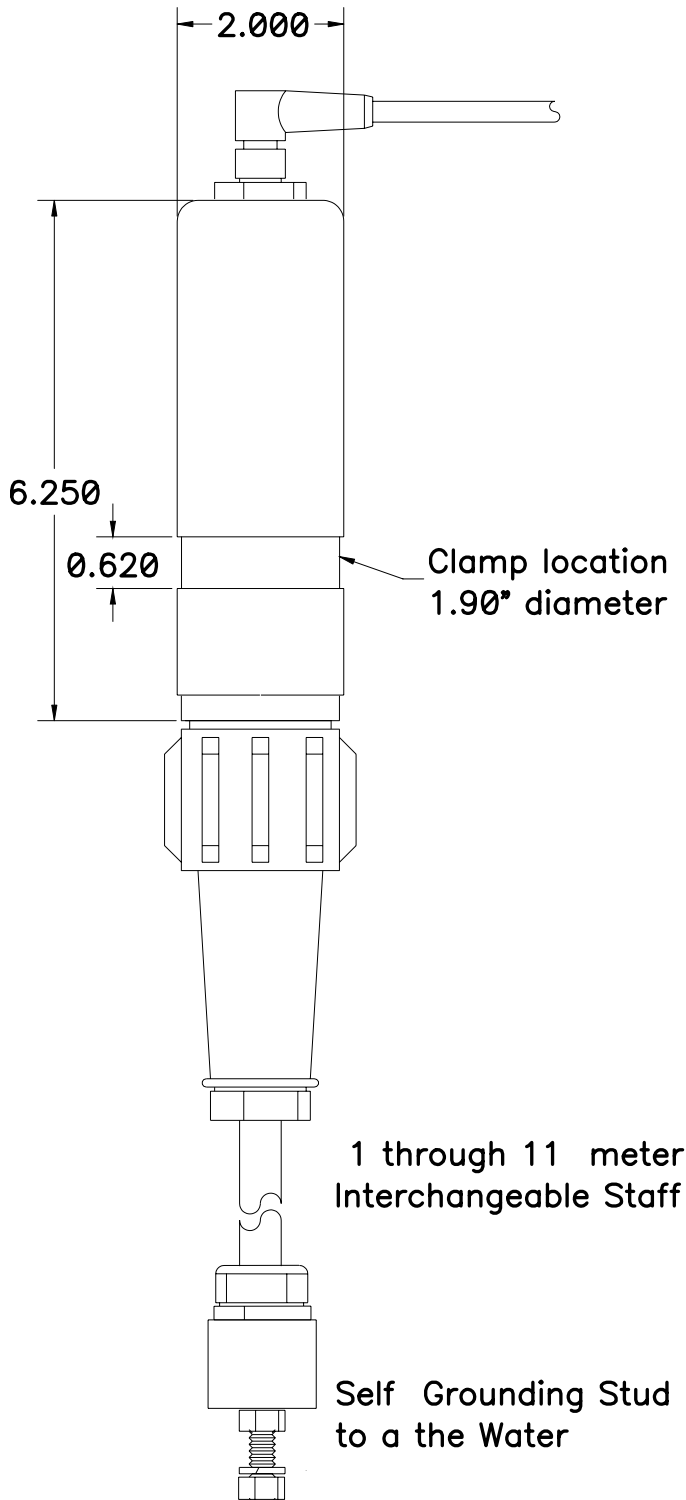
- Accurate Wave, Tide and Water Level Sensor
- Programmable 0-5V or RS232 Data Out
- Programmable Sample Rate Up to 30Hz
- Sample on Command for Simultaneous Sampling
- Programmable Air Temperature Serial Data Out
- Rugged Sealed Waterproof Design
- Changeable Teflon Coated Sensor Cable up to 11 meters
- Wide Input Voltage 5.5V to 40VDC
- Low Power Consumption 18 mA
- Data Accuracy $\pm 0.25\%$, 20-80% of Full Scale
- Data Accuracy $\pm 1.0\%$, 0-100% of Full Scale
- Data Resolution 0.025%
- Data Linearity $\pm 0.5\%$

Ordering Information



Item Description	Staff Type	Part Number
1/2 Meter Rod Staff III	Teflon Coaxial Rod	OSSI-010-008-0.5R
1 Meter Rod Staff III	Teflon Coaxial Rod	OSSI-010-008-1R
1.5 Meter Rod Staff III	Teflon Coaxial Rod	OSSI-010-008-1.5R
1/2 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-0.5C
1 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-1C
1.5 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-1.5C
2 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-2C
3 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-3C
4 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-4C
5 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-5C
6 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-6C
7 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-7C
8 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-8C
9 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-9C
10 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-10C
11 Meter Cable Staff III	Teflon Coaxial Cable	OSSI-010-008-11C

Dimensions and Wire Configuration



WIRE COLOR CODE	
Black / Red	Signal and Power Ground
Green/Yellow	0 to 5V Analog Output
Red	Power In 5.5V - 40V
White / Red	Receive Data to PC
Yellow / Red	Transmit Data from PC

Electrical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage		5.5		40	V
Input Current			18	23	mA
Data Accuracy	20-80% of Full Scale (3)			0.25	±%
Data Accuracy	0-100% of Full Scale			1.0	±%
Data Resolution	Percent of Full Scale			0.025	%
Data Linearity	Percent of Full Scale			0.5	± %
Analog Out	(Note 1)	0		5	V
Analog Out Noise, Peak	% FS (Note 2) 0-1MHz		5		mV
RS232 Data Out Noise, Peak	% FS		0.025		%

Note 1: Accuracy is guaranteed from 8mV to 4.9V with => 5K ohms load.

Note 2: Serial Data deselected.

Note 3: The unit may need to be calibrated in-situ to meet the Data Accuracy

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Environment	Waterproof		30		meters
Cable Tension		0	50	500	Newtons

Data and Timing Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Sync Sample Delay	Command to Start of Data Returned		6	7	ms
Free Run Sample Frequency		10		30	Hz
Serial Data Baud Rate			9.6		Kbaud
Serial Data	0 to Full Scale 1 thru. 11 Meter Staff	0000		4095	counts
Temperature Resolution	Per 8 counts (Note 4)		0.50		°C
Temperature Range		-10		+65	°C
Temperature Accuracy	-10°C to 65°C -40°C to 65°C			0.5 2.0	± °C
Temp. Update Rate			1		Hz.

Note 4: Example: (8 counts = 0.5 Deg. C)

-10 Deg. C = -0160 counts

- 1 Deg. C = -0016 counts

- 0.5 Deg. C = -0008 counts

0 Deg. C = +0000 counts

+ 0.5 Deg. C = +0008 counts

+ 1.0 Deg. C = +0016 counts

+ 65.0 Deg C = +1040 counts

Communications and Configuration:

The Wave Staff III may be configured with a PC's RS232 serial port. Use our convenient programming software or a Hyper Terminal with the following commands. The serial port settings on your computer are as follows: 9600 baud, 8 data bits, parity none, 1 stop bit, and no flow control.

Commands are two bytes and Acknowledgements are 4 bytes

Commands:

st = Stop running sample routine and wait for command instructions.

w = Write configuration data to Wave Staff from PC.

r = Read back configuration data to PC.

i = Read back ID number to PC.

g = Go run main sampling routine.

Acknowledgements:

STOK = Acknowledge Stop running command and wait for command instruction.

WOK = Acknowledge Write configuration and wait to receive data from PC.

ROK = Acknowledge Transmit configuration and transmit configuration data to PC.

IOK = Acknowledge ID Command and transmit ID (serial) number to PC.

GOK = Acknowledge go command and go run main sample and store data routine.

BAD = Receive failure or check sum on configuration data error

DOW = Do, write configure Wave Staff. (Wave Staff has not been configured)

DOK = Data Ok, Received configuration string with correct check sum

Monitoring the sampled data:

The sampled data may be monitored via the RS232 serial port if the configuration control byte is set to enable the RS232 port:

Example with Air Temperature enabled:

2345 +0416

2345 +0416

: :

2345 +0416

Example without Air Temperature enabled:

2345

2345

:
2345

Sync Mode Operation:

In Sync Mode the unit will transmit a dot when ready to receive a sample command. The Sample Commands may be either g or any two characters other than g.

1. The g command returns the sensor data first, a line end character second and a dot to indicate it's ready for the next sample command third.
2. The any character command initiates a sample with any key. Then a > is returned indicating the sampled data is ready. A second character must now be sent to receive the sampled data.

Control Byte	
Bit 7	0 = N.A.
Bit 6	1 = Sync mode: sensor waits for command via RS232
	0 = Free Run: Sensor samples at selected sample frequency
Bit 5	1 = Enable analog output 0 - 5V
	0 = Disable analog output
Bit 4	1 = Air Temp. enabled
	0 = Air Temp disabled
Bit 3	0 = N.A.
Bit 2	0 = 9600 baud, default
Bit 1	1 = RS232 output enabled
	0 = RS232 output disabled
Bit 0	1 = BIN Data format
	0 = ASCII Data format.