



# Ocean Sensor Systems, Inc.

## Wave Staff, OSSI-010-002E, Water Level Sensor With 0-5V, RS232 & Alarm Outputs, 1 to 20 Meter Staff

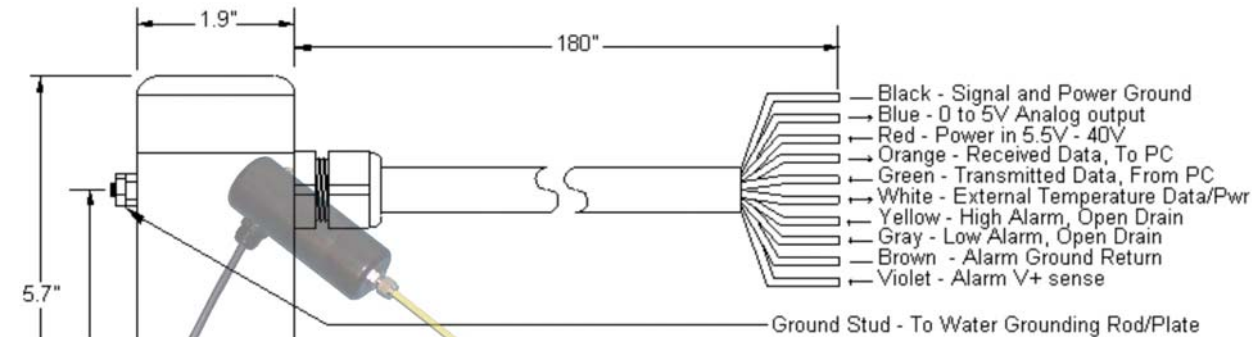
### General Description

The OSSI-010-002E Wave Staff is a water level sensor that combines a rugged, sealed, waterproof package, low power microprocessor and a temperature stable, sensing circuit. The Wave Staff operates from 5.5V to 40VDC and has analog, RS232 serial data & 2 Alarms outputs. The serial data output string contains the water level & temperatures in ASCII or binary format. The Alarm Outputs are 350mA Open Drain type with 60V inductive load clamps. The Wave Staff can be programmed to free run or sample on demand. The Wave Staff is easily programmed via a PC serial port using our Wave Staff Interface Software or a Hyper Terminal program.

### Features

- 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
- Programmable High/Low Alarm Set Points
- 2 Alarm outputs, 350mA OD w/60V Clamps
- Rugged Sealed Waterproof Design
- Interchangeable Teflon Staff s up to 20 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  $\pm 0.5\%$

### Wire Configuration and Dimensions



Item Description	Staff Type	Part Number
1 Meter Staff	Teflon Coated Rod	OSSI-010-002E-1
1.5 Meter Staff	Teflon Coated Rod	OSSI-010-002E-1.5
2 Meter Staff	Teflon Coated Rod	OSSI-010-002E-2
3 Meter Staff	Teflon Coated Rod	OSSI-010-002E-3
4 Meter Staff	Teflon Coated Rod	OSSI-010-002E-4
5 Meter Staff	Teflon Coated Rod	OSSI-010-002E-5
6 Meter Staff	Teflon Coated Cable	OSSI-010-002E-6
7 Meter Staff	Teflon Coated Cable	OSSI-010-002E-7
8 Meter Staff	Teflon Coated Cable	OSSI-010-002E-8
9 Meter Staff	Teflon Coated Cable	OSSI-010-002E-9
10 Meter Staff	Teflon Coated Cable	OSSI-010-002E-10
11 Meter Staff	Teflon Coated Cable	OSSI-010-002E-11
12 Meter Staff	Teflon Coated Cable	OSSI-010-002E-12
13 Meter Staff	Teflon Coated Cable	OSSI-010-002E-13
14 Meter Staff	Teflon Coated Cable	OSSI-010-002E-14

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Item Description	Staff Type	Part Number
15 Meter Staff	Teflon Coated Cable	OSSI-010-002E-15
16 Meter Staff	Teflon Coated Cable	OSSI-010-002E-16
17 Meter Staff	Teflon Coated Cable	OSSI-010-002E-17
18 Meter Staff	Teflon Coated Cable	OSSI-010-002E-18
19 Meter Staff	Teflon Coated Cable	OSSI-010-002E-19
20 Meter Staff	Teflon Coated Cable	OSSI-010-002E-20
Standard operating temperature range is -10 °C to +65 °C add suffix T to Wave Staff part number for special -40 °C to +65 °C version		

### 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 Voltage Out	(Note 1)	0		5	V
Analog Voltage Out Noise, Peak	Percent of Full Scale (Note 2) 0-1MHz		5		mV
RS232 Data Out Noise, Peak	Percent of Full Scale		0.025		%
Alarm Battery Supply Voltage	Absolute maximum Recommended Operation	5.5		60V 25V	V
Alarm On Current	rDS On=1Ω, Vbat=13V			350	mA
Alarm Shutdown V+ Sense Voltage	Alarms Open Drain Outputs are Disabled	30		38	V
Alarm Open Drain Voltage	Absolute Maximum Max. Operate			68 30	V

**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**

### Data and Timing Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Sync Sample Time	From End of command to Start of Data Returned		6	7	ms
Free Run Sample Frequency		2		30	Hz
Serial Data Baud Rate			9.6		Kbaud
Water Level Serial Data	0 to Full Scale 1 thru. 11 Meter Staff	0000		4095	counts
Temperature Resolution	Per count from 0°C		0.50		°C
Temperature Accuracy	-10°C to 65°C -40°C to 65°C			0.5 2.0	± °C
Temperature Update Rate			1		Per Sec.

## Communications and Configuration:

The Wave Staff 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 and Water Temperature enabled:

2345 +052 +048

2345 +052 +048

: :

2345 +052 +048

Example without Air or Water 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.



## Staff Length Configuration Values

Staff type	Staff Length Meters	Staff Length Counter Hex Value at offset address 03h	Staff Length Prescaler Hex Value at offset address 06h
Rod	0.25	DF	03
Rod	0.5	DF	02
Rod	1.0	DF	01
Rod	1.5	94	01
Rod	2.0	DF	00
Rod	2.5	B2	00
Rod	3.0	94	00
Rod	3.5	FE	08
Rod	4.0	DF	08
Rod	4.5	C6	08
Rod	5.0	B2	08
cable	5.5	7C	08
cable	6.0	71	08
cable	6.5	69	08
cable	7.0	61	08
cable	7.5	5B	08
cable	8.0	55	08
cable	8.5	50	08
cable	9.0	4C	08
cable	9.5	48	08
cable	10.0	44	08
cable	10.5	41	08
cable	11.0	3E	08
cable	12.0	39	08
cable	13.0	34	08
cable	14.0	31	08
cable	15.0	2D	08
cable	16.0	2B	08
cable	17.0	28	08
cable	18.0	26	08
cable	19.0	24	08
cable	20.0	22	08

