SeaOWL UV-A150901

SeaOWL UV-A

User manual

09/2015, Edition 1

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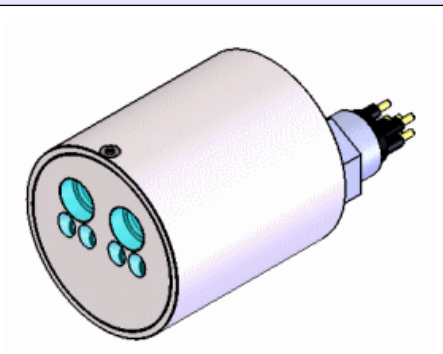
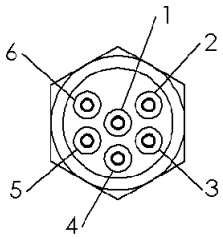
Section 1 Specifications

1.1 Mechanical

Diameter	5.66 cm	
Length	5.46 cm	
Depth rating	2000 m	
Temperature range	-2–38 °C	
Storage temperature range	-20–50 °C	
Weight in air	0.34 kg	
Displacement	137 ml	
Pressure housing	Titanium 6Al-4V	

1.1.1 6-contact connector

Contact	Function	MCBH-6-MP
1	Ground	
2	RS232 RX	
3	Reserved	
4	Voltage in	
5	RS232 TX	
6	Reserved	

1.2 Electrical

Input	7–15 VDC
Current draw	81 mA
Linearity	99%

1.3 Communications

Sample rate	1 Hz
RS232 output rate	19200 baud
Output resolution	14 bit

1.4 Optical

Parameter	Wavelength EX/EM	Range, Sensitivity
Chlorophyll (Chl)	470/695 nm	0.005–250, 0.005 µg/L
Fluorescent Dissolved Organic Matter (FDOM)	370/460 nm	0.03–900, 0.03 ppb QSDE
Backscattering	700 nm	0–0.04 m^{-1} sr^{-1}, 1E-06 m^{-1} sr^{-1}

Crude oil limit of detection, sensitivity	< 80, 3 ppb

Section 2 Operation and maintenance

2.1 Verify operation

⚠WARNING

DOM sensors use an ultraviolet LED light source. Do not look directly at a UV LED when it is on. It can damage the eyes. Keep products that have UV LEDs away from children, pets, and other living organisms. Wear polycarbonate UV-resistant safety glasses to protect the eyes when a UV LED is on.

⚠CAUTION

Do not supply more than 15 VDC to the sensor. More than 15 VDC will damage the sensor.

Make sure that the sensor operates before further setup and deployment.

1. Connect the sensor to a PC that has a terminal program such as Tera Term or HyperTerminal® installed. Refer to Get and install terminal program on page 7 for instructions to get, install, and use a terminal program.
2. Remove the cap that protects the sensor's optical face.
3. Connect the sensor to a regulated power supply set at 12 VDC.
4. Turn on the power supply.
   The sensor comes on.
5. Start the terminal program on the PC.
6. Select the appropriate "COM Port" in the terminal program.
7. Select the correct serial port settings in the terminal program.
   - baud rate: 19200
   - stop bits: 1
   - data bits: 8
   - flow control: none
   - parity: none.

   Data shows in the terminal window.
8. To stop the data, select **File**, then *Disconnect* (Tera Term).
   The data stops.
9. To close the program, select **File**, then *Exit*.

2.2 Set up for deployment

1. Refer to the previous section to make sure that the sensor operates correctly.
2. If necessary, remove the protective cap from the sensor.
3. Use an external power supply to supply power to the sensor for deployment.

2.3 Sensor maintenance

⚠CAUTION

Do not use acetone or other solvents to clean any part of the sensor.

1. After each cast or exposure to natural water, flush the sensor with clean fresh water.
2. Use soapy water to clean any grease or oil on the optical face of the sensor. It is made of plastic and optical epoxy and can be damaged if an abrasive cleaner is used.
3. Dry the sensor with a clean soft cloth.

2.3.1 Clean and lubricate bulkhead connector

Lubricate the contacts of bulkhead connectors at regular intervals with pure silicone spray only. Allow the contacts to dry before they are connected.

Make sure that the pins have no corrosion, which looks green and dull. Make sure that the rubber seals on the pins are not delaminated. Connectors should connect smoothly and not feel "gritty" or too resistant.

The manufacturer recommends 3M™ Silicone Lubricant spray (UPC 021200-85822). Other silicone sprays may contain hydrocarbon solvents that damage rubber.

DO NOT use silicone grease. **DO NOT** use WD-40®. The wrong lubricant will cause failure of the bulkhead connector and the sensor.

Section 3 Reference

3.1 Delivered items

- the sensor
- a lock collar
- a plastic protective cover for the optical face
- the CD, with:
  - this user manual
  - the characterization/calibration page for the sensor.

3.2 Calibration

The manufacturer calibrates all scattering sensors to make sure that the data that is collected meets the sensor's specifications. This information is on the sensor-specific calibration page that comes with the sensor.

3.3 Characterization

The manufacturer uses a fluorescent material to characterize all fluorescence sensors to make sure that the data that is collected meets the sensor's specifications. This information is on the sensor-specific characterization page that comes with the sensor.

3.4 Terminal program operation

Use Windows HyperTerminal®, Tera Term, or other terminal program to operate sensors.

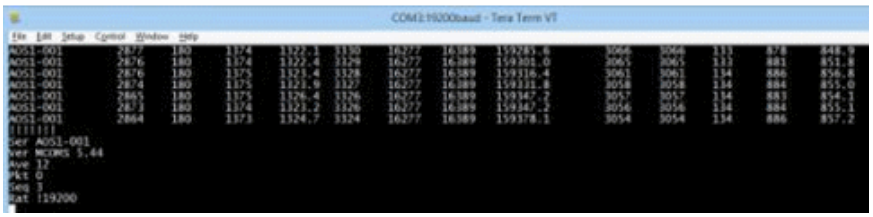
baud rate: 19200	stop bits: 1	data bits: 8	flow control: none	parity: none

3.4.1 Get and install terminal program

Get and install a terminal communications program to communicate between the PC and the sensor. The steps below refer to Tera Term, an open-source terminal emulator program, but the set up and protocols are similar for other terminal communications programs.

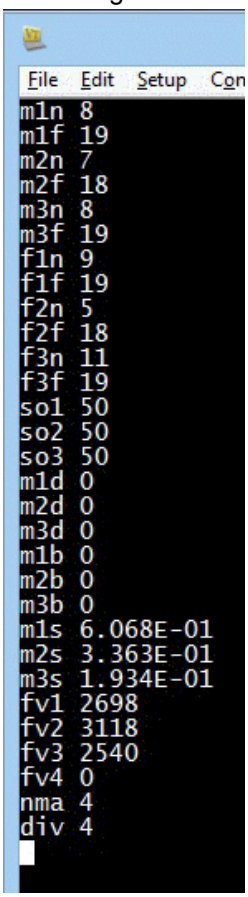
1. Do the steps on the web site www.ayera.com/teraterm/download.cfm to get the software.
   a. Enter the required information on the web site.
   b. Select "Save As" to save the software to a user-selected location on the PC.
   c. Right-click on the .zip file and select "Extract all..."
2. Go to the extracted files and double-click on the ttermpro.exe file.
3. Push **Run**.
4. Push **OK** in the **Tera Term: New connection** window.
5. In the **Tera Term Web 3.1 - COMx VT** window, go to **Setup**, then *Serial port...*
   - Port: user-selected COM x
   - Baud rate: 19200
   - Data: 8 bit
   - Parity: none
   - Stop: 1 bit
   - Flow control: none
   - Transmit delay, msec/char: 2
   - Transmit delay, 50 msec/line
6. Push **OK**.

7. To view commands as they are entered, go to the **Setup** menu, then *Terminal...* and put a check in the box next to "Local echo."
8. To save this setup, go to the **Setup** menu, then *Save setup...*.
9. Enter a new "File name," or push **Save** to save the default "teraterm.ini" setup file name.
10. Connect the sensor to a power supply set at 12 VDC and PC.
    Refer to Verify operation on page 5 for details.
11. Make sure that the terminal program is open.
12. Turn the power supply on.
13. Enter 5 exclamation points (! ! ! ! !) to put the sensor in an operational mode.
    The software shows 14 columns of data.
14. Enter ! ! ! ! ! to stop the sensor.
    The menu of the sensor shows below the collected data.



- ser: serial number of the sensor
- ver: version of installed firmware
- ave: the number of measurements that are averaged to make up one row of data.
- seq: the manufacturer-set sequence in which data is output.
- rat: baud rate

15. Enter **$par** to see the settings that are saved in the sensor.

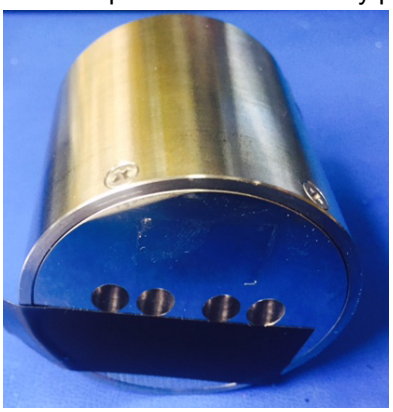


16. Enter **$run** to start the sensor.
    The sensor collects and shows data.
17. Find the offset, or dark counts value of the sensor for data correction.

3.4.1.1 Find sensor offset value

Use the power supply that the sensor will use for deployment to find the offset value of the sensor output. It is possible that the offset given by the manufacturer is different because the sensor is very sensitive in terms of both input and output.

1. Cover the detectors on the optical face of the sensor with Scotch 33™ electrical tape. Make sure that the tape does not cover any part of the LED optical bore holes.



2. If necessary, connect the sensor to the PC and power supply and start the terminal program.
3. Turn the power supply on.
4. Enter **$run**, then push **Enter** to start the sensor operation. Let the sensor operate for approximately 60 seconds.

5. Enter **! ! ! ! !** to stop the sensor.
6. Calculate the average each of column 4, 8, then 13.
   These averages are the offset ("dark counts") values to use for chlorophyll, scattering, and FDOM.
7. Save these values to use when the data from a deployment is processed.
8. Remove the electrical tape from the optical face of the sensor.
9. Use a lint-free wipe and isopropyl alcohol to gently clean any remaining adhesive from the optical face.
   The sensor is ready to deploy.

3.4.2 Common terminal commands

Command	Parameters	Description
!!!!!	none	Stops data collected by the sensor. Lets the user to enter setup values. If the sensor is in a low-power mode, turn the power supply off for one minute, then turn the power on and push the "!" key 5 or more times.
$ave	1–65535	The number of measurements that make up each row of collected data.
$mnu	—	Prints the menu of setup values to the host PC screen.
$pkt	0–65535	Sets the number of rows of data that are collected between the specified time intervals.
$run	—	Uses the current setup values to operate.
$sto	—	Saves the desired setup values to the sensor's flash memory.

3.4.3 SeaOWL UV-A-specific terminal commands

Command	Parameters	Description
$met	none	Prints a report of meta data for the current output sequence
$par	none	Prints the timing and conversion parameters
$rfd	none	Reloads the manufacturer's settings
$rls	none	Reloads the settings from the flash memory
$seq	0–3	Sets the sequence bank to use to define the output
$tst	none	Prints "test"

Section 4 General information

Revised editions of this user manual are on the manufacturer's website.

4.1 Warranty

This sensor is warranted against defects in materials and workmanship for one year from the date of purchase. The warranty is void if the manufacturer finds the sensor was abused or neglected beyond the normal wear and tear of deployment.

4.2 Service and support

The manufacturer recommends that sensors be sent back to the factory annually to be cleaned, calibrated, and for standard maintenance.
Refer to the website for FAQs and technical notes, or contact the manufacturer for support at:

support@sea-birdcoastal.com

Do the steps below to send a sensor back to the manufacturer.

1. Contact the manufacturer for a Return Merchandise Authorization (RMA).
   Note: *The manufacturer is not responsible for damage to the sensor during return shipment.*
2. Remove all anti-fouling treatment from the sensor before sending it back to the manufacturer.
   Note: *The manufacturer will not accept sensors that have been treated with anti-fouling compounds for service or repair. This includes tri-butyl tin, marine anti-fouling paint, ablative coatings, etc.*
3. Use the sensor's original ruggedized shipping case to send the sensor back to the manufacturer.
4. Write the RMA number on the outside of the shipping case and on the packing list.
5. Use 3rd-day air to ship the sensor back to the manufacturer. Do not use ground shipping.
6. The manufacturer will supply all replacement parts and labor and pay to send the sensor back to the user via 3rd-day air shipping.

4.3 Waste electrical and electronic equipment

Electrical equipment that is marked with this symbol may not be disposed of in European public disposal systems. In conformity with EU Directive 2002/96/EC, European electrical equipment users must return old or end-of-life equipment to the manufacturer for disposal at no charge to the user. To recycle, please contact the manufacturer for instructions on how to return end-of-life equipment, manufacturer-supplied electrical accessories, and auxiliary items for proper disposal.

4.4 Tera Term BSD license

Tera Term is used under a BSD open source license.

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