

# ac-s

SPECTRAL ABSORPTION & ATTENUATION  
SENSOR WITH LED LIGHT SOURCE

## Overview

The ac-spectra (ac-s) is a top tier optical instrument with no equal in the market. Based on the highly successful ac-9, the ac-s offers almost an order of magnitude increase in spectral resolution of in-situ absorption and beam attenuation coefficients. The ac-s features a proven flow-through system, compact size, and excellent stability.

The updated LED light source provides a longer lifetime at 10,000 hours coupled with a 55% power reduction at 12 VDC. Field deployments demonstrate signal-to-noise ratio improvements for  $a(\lambda)$  and  $c(\lambda)$  for  $\lambda < 550$  nm, improving data quality in the blue region.

The simpler, faster service and calibration on a 2-year cycle means more time collecting data that matters.

The ac-s 5000 retains the same performance as the ac-s in a titanium housing deployable to 5000 meters.



ac-s

ac-s 5000

## Features

- Dual path, flow-through measurement, beam attenuation acceptance angle = 0.93°
- $80 \pm 5$  wavelengths of absorption (a) and attenuation (c) from 400 -730 nm
- Linear variable filter monochromator
- 4 nm resolution, 15 nm bandpass
- 10 or 25 cm path lengths
- LED light source
- 4 Hz sampling rate
- 500 m / 5000 m rating

## Field Specifications

The specifications below represent the expected performance of the instrument when deployed in the field. Under controlled circumstances in a lab, we would expect the instrument to outperform these specifications.

We have chosen to display field specifications to give our users a true measure of how Sea-Bird Scientific instruments perform in harsh environments and applications. It is critical to keep this in mind when comparing specifications with instruments from other manufacturers.

### Optical

Spectral Range	400 - 730 nm
Bandpass	15 nm/channel
Pathlength	10 (ac-s) or 25 cm
Beam Cross-Section	8 mm dia. (nominal)
Linearity	$\geq 99\% R^2$
Output Wavelengths	80 $\pm$ 5 (nominal)
Resolution	4 nm
Precision	
(400-449 nm)	$\pm 0.005 \text{ m}^{-1}$ typ., 0.012 $\text{m}^{-1}$ max @ 4 Hz
(450-730 nm)	$\pm 0.000 \text{ m}^{-1}$ typ., 0.006 $\text{m}^{-1}$ max @ 1 Hz $\pm 0.001 \text{ m}^{-1}$ typ., 0.003 $\text{m}^{-1}$ max @ 4 Hz $\pm 0.005 \text{ m}^{-1}$ typ., 0.0015 $\text{m}^{-1}$ max @ 1 Hz
Accuracy	$\pm 0.01 \text{ m}^{-1}$
Dynamic Range	0.001-10 $\text{m}^{-1}$
Light Source	LED

### Electrical

Input	10 - 35 VDC
Current Draw	0.37 A @ 12 VDC
Serial Output	RS-232, -422, or -485
Connector	MCBH6M
Sample Rate	4 scans/sec., nominal

### Mechanical

Diameter	10.4 cm 9.9 cm (5000)
Length	77 cm 75.8 cm (5000)
Weight in Air	5.9 kg 10.3 (5000)
Weight in Water	0.8 kg 5.3 kg (5000)

### Environmental

Temperature Range	0 - 30 $^{\circ}\text{C}$
Depth Rating	500 m   5000 m

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