

## 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 =  $0.93^\circ$
- $80 \pm 5$  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	$0.001\text{-}10 \text{ m}^{-1}$
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 °C
Depth Rating	500 m   5000 m

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