

# ALPHAtracka II

Transmissometer for suspended & dissolved solids



## APPLICATIONS

- Turbidity measurements
- Suspended mass transport
- Visibility measurements
- Light attenuation



## FEATURES

- Dual beam, ratiometric, digitally controlled signal nulling servo gives excellent long term calibration stability with a very small temperature coefficient.
- Output linearity inherently defined by digital circuitry only.
- Minimal excitation & detection beam divergences to enhance significance of particulate measurements.
- Extremely rigid external optical chassis machined from solid titanium, which is also used for the pressure housings to give low weight and excellent corrosion resistance.
- 6000m depth rated with sapphire windows.
- Interfaces easily to a wide range of oceanographic instrumentation.
- Surface mount circuitry gives small overall diameter.
- Versions with optical path length of 5, 10 or 25cm.
- Low power consumption (150mW); accepts wide supply voltage range.
- Wavelengths 470, 565, 590, 660nm available.

# ALPHAtracka

## INSTRUMENT DESCRIPTION

ALPHAtracka II uses identical electronic circuitry to that in our well received Mark I version but it is now implemented with surface-mount technology; this has enabled a much smaller diameter pressure housing to be used while retaining exactly the same optical train. Data from the Mark II version is thus fully compatible with that already obtained with the Mark I.

As before, the transmissometer still yields its full performance even when exposed to full sunlight at any angle, thereby easing deployment constraints. This capability, together with excellent long term calibration stability and very low temperature coefficient, is achieved with a modulated LED source, an internal optical reference beam and photodiode detector in a configuration giving ratiometric signal processing. The performance of this already powerful scheme is further enhanced by the two new proven developments from Chelsea Technologies Group - firstly, all items are now locked in a signal nulling loop of near infinite gain and, secondly, the signal output linearity is inherently defined by digital circuitry only.

Among other advantages noted above, these features ensure that the optical intensity, indicated by the output voltage, is accurately represented by a straight line interpolation between a reading near full-scale under known conditions and a zero reading when blanked off. The efficacy of the control servo is such that the ageing of the LED source produces a reduction of less than 0.01% of full-scale reading per 1000 hours usage.

ALPHAtracka II is available with optical path lengths of 5, 10 and 25cm, so that optimum results can be obtained in waters with widely differing amounts of absorption, whether caused by solutes or by suspended solids. Moreover, these latter conditions were particularly borne in mind when designing the well collimated optics, so that there is minimum possible pick-up of scattered light which would otherwise cause the amount of particulate matter to be underestimated from the apparent optical obscuration caused.

The signal beam diameter is 15mm and a source peak wavelength of 660nm (red) is provided as standard. Optional wavelengths of 470nm (blue), 565nm (green), 590nm (yellow) are available. All typically have a source-line half-width of 20nm.

The transmissometer draws 20mA (typically) at all voltages between its rated limits of 7V to 18V DC and is protected against reverse polarity connection of the supply. Full-scale output voltage of +2.5V or +5.0V is optionally available; in both cases the output can deliver at least 5mA without perceptible performance degradation and is safe against indefinite short-circuit to ground potential; supply & signal 'lo' are internally connected. The 'warm-up' time from switch-on to rated performance is 10 sec; the step response time to 63% of final value is typically 0.2 sec. The overall temperature coefficient is <0.05%/ deg C of f.s. and calibration of the clear water reading is established to better than 0.3% accuracy in water purified and filtered by a reverse osmosis/ion exchange column.

## SPECIFICATION

### Physical

	<b>5 cm</b>	<b>10 cm</b>	<b>25cm</b>
Optical path length:	5 cm	10 cm	25cm
Overall length:	320 mm	370 mm	520 mm
Overall diameter:	65 mm	65 mm	65 mm
Weight in water:	3.55 kg	3.6 kg	3.75 kg
Weight in air:	1.9 kg	1.95 kg	2.1 kg
Rated temperature:	1deg C to 30 deg C		
Storage temperature:	-40 deg C to +70 deg C		



**Chelsea  
Technologies  
Group Ltd**

55 Central Avenue  
West Molesey  
Surrey KT8 2QZ  
United Kingdom  
Tel: +44 (0)20 8481 9000  
Fax: +44 (0)20 8941 9319  
sales@chelsea.co.uk  
www.chelsea.co.uk