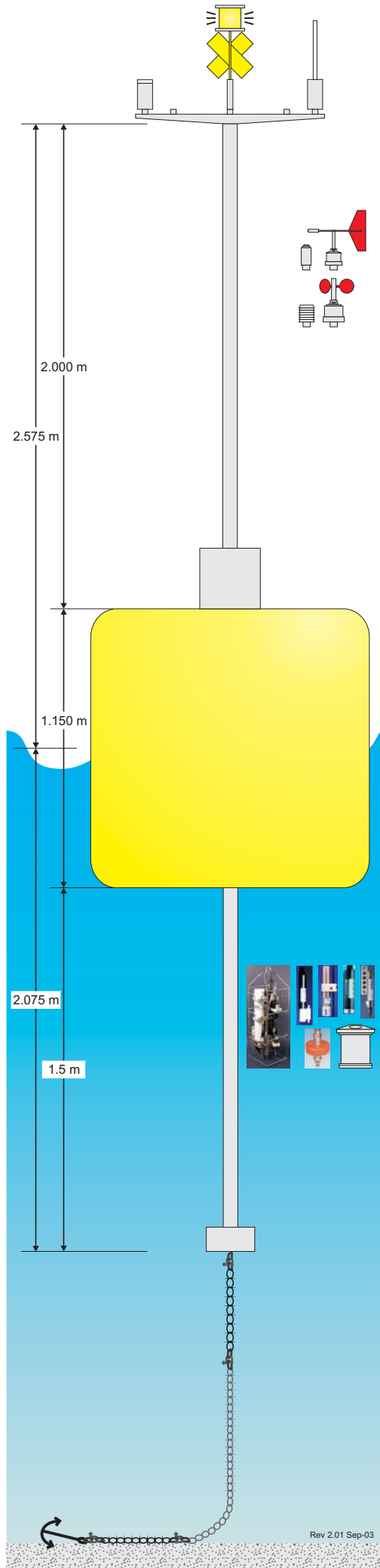


M⁴ Oceanographic Buoy

Modular Meteo-Marine Monitor

System Configuration

Communication Technology



Meteorological sensors

Up to 6 or 10 Aanderaa sensors can be installed on sensors arm.

Sensors Arm	Aluminium, 6 or 10 positions for Aanderaa sensors
Wind Speed & Gust	Aanderaa 2740 Wind Speed and Gust
Wind Direction	Aanderaa 3590 Wind Direction
Air Temperature	Aanderaa 3455 Air Temperature
Air Pressure	Aanderaa 2810 Atmospheric Pressure
Relative Humidity	Aanderaa 3445 Relative Humidity
Sunshine Duration	Aanderaa 3160 Sunshine Duration
Solar Radiation	Aanderaa 2770 Solar Radiation
Net Solar Radiation	Aanderaa 2811 Net Solar Radiation
Visibility	Aanderaa 3544 MIRA Visibility
Surface PAR	Biospherical QSR-2200 scalar, QCR-2200 cosine PAR

Signals

Flashing light	Carmanah 601 self powered with solar cells Different light colors and IALA flashing codes available
Radar reflector	Aluminium, X shaped

Positioning & Comms

GPS	Optional GPS module for position monitoring
GSM Link	GSM module for sites with GSM coverage
Satellite Link	Thuraya sat module for sites under Thuraya footprint

Hardware

Arm	Aluminium, wired
Mast section	Aluminium, length 2000 mm, OD 60 mm, wired

Central buoy module

Buoy	Foam filled polyethylene buoy Cylindrical, height 1150 mm, OD 1150 mm Weight 130 kg ca., Net buoyancy 1000 kg ca.
Control unit	LISC - Logical Intelligent System Control with: - "Event Detector" firmware - 512 MB internal non-volatile memory card - Buoy orientation and attitude sensor - 8 single ended or 4 differential 16 bit A/D inputs - 4 RS-232 I/O channels - 17 channels for Aanderaa sensors - Primary alkaline battery pack, 18 VDC, 132 A
Waves	Aanderaa 3595 Wave Height and Period

Oceanographic sensors modules

A sensors module can include any selection of sensors. Any number of sensors modules can be installed. A partial list of recommended sensors with proven and recognized accuracy follows.

CTD	SeaBird SBE-16plus, SBE-25, SBE-37, SBE-49
Flow control	SeaBird SBE-5T pump for data synch and anti-fouling
Temperature	SeaBird SBE-38, SBE-39
Dissolved oxygen	SeaBird SBE-43
PH	SeaBird SBE-18
pH & Redox	SeaBird SBE-27
Chlorophyll a	Turner Design Scufa fluorometer
Turbidity	Turner Design Scufa fluorometer with turbidity D&A OBS-3
PAR	Biospherical QSP-2200 scalar, QCP-2200 cosine PAR
ADCP Current Profiler	RDI Monitor ADCP 300 kHz, 600 kHz, 1200 kHz
Single Point Current	Aanderaa DCS-3900 single point current meter
Waves	RDI Multi-directional Waves Firmware on RDI ADCP

Standard Mooring hardware

UW Mast section	AISI 316 stainless steel, length 1500 mm, OD 60 mm
Counterweight	AISI 316 stainless steel, 25 kg
Mooring line	Termination: 2x 3/4" shackle, 7/8" weldless link Chain: 3 m, 3/4" galvanized steel, 25 kg Termination: 2x 3/4" shackle, 7/8" weldless link Chain: 20 m, 3/8" galvanized steel, 45 kg Termination: 2x 3/4" shackle, 7/8" weldless link Chain: 3 m, 3/4" galvanized steel, 25 kg Termination: 2x 3/4" shackle, 7/8" weldless link

The mooring line design follows the indications given in the paper:
Upper George, Waddington Ian and Ferrari Gabriele, 2000. Surface and subsurface moorings at Woods Hole - Line development and the results of long term exposure in ocean moorings. Proceedings Inmartech 2000.

Anchor

Due to the freight cost, the anchor is not supplied as a standard item.
Recommended Weight from 150 kg up to 450 kg