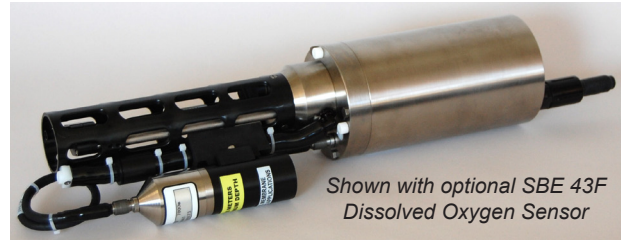


# Moored Profiler CTD & Optional DO Sensor



## SUMMARY

- Conductivity, Temperature, Pressure, optional Dissolved Oxygen, at 1 sample/sec (1 Hz).
- RS-232 or Logic Level interface, no batteries, small memory — for use on moored profiling vehicles that can supply power and acquire data.
- Pump-controlled, T-C ducted flow to reduce salinity spiking.
- Unique flow path, pumping regimen, and expendable anti-foulant devices, for maximum bio-fouling protection.
- Depths to 600 meters (plastic housing) or 7000 meters (titanium housing).



*Shown with optional SBE 43F  
Dissolved Oxygen Sensor*

## DESCRIPTION

The SBE 52-MP is a Conductivity, Temperature, Depth (pressure) sensor, designed for moored profiling applications in which measurements are made from a device that travels vertically beneath a buoy, or from a buoyant package that is winched up and down from a bottom-mounted platform. On typical slow-moving packages (20-50 cm/sec), its once-per-second sampling provides good spatial resolution of oceanographic structures and gradients. The 52-MP's pump-controlled, TC-ducted flow minimizes salinity spiking. The 52-MP can optionally be equipped with an SBE 43F Dissolved Oxygen sensor, a frequency-output version of our SBE 43 (same performance specifications).

The SBE 52-MP uses the same accurate and stable thermistor, conductivity cell, and pressure sensor used in the MicroCAT and Argo Float products. It is easy-to-use, compact, and ruggedly made of titanium and other low-maintenance (plastic) materials. Operating commands are easy to execute with a third-party data logger or your own acquisition system. EEPROM-stored calibration coefficients permit data upload in ASCII engineering units (mmho/cm, °C, decibars, ml/l). Alternatively, the user can upload hexadecimal or binary data. The 52-MP is externally powered, and temporarily stores data in static RAM memory. If/when power is removed, any data stored in memory is lost.

## SAMPLING MODES

The SBE 52-MP has two sampling modes:

- **Autonomous sampling** – On command, the 52-MP begins autonomous sampling, running continuously and sampling at 1 scan/sec (1 Hz). It stores the data in memory and can also transmit in real-time. It can bin average the data and store the averaged data in memory, *in addition to* the unaveraged data. On command (typically, at the end of each profile), data is uploaded to the moored profiler.
- **Polled sampling** – On command, the 52-MP takes one sample and transmits the data in real-time.

## PUMP

The SBE 52-MP's integral pump runs while the instrument is sampling, providing the following advantages over a non-pumped system:

- Improved conductivity and oxygen response – The pump brings a new water sample into the system at a constant flow rate, fixing the sensors' time constants to ensure maximum dynamic accuracy, and flushes the previously sampled water. For polled sampling, pump time for best DO accuracy is a function of temperature and pressure, and is automatically determined by the 52-MP (55 sec maximum).
- Reduced fouling – When not sampling, the U-shaped flow path and pump impeller restrict flow, maintaining an effective concentration of anti-foulant *inside* the conductivity cell to minimize fouling.

## CONFIGURATION

A standard SBE 52-MP is supplied with:

- Titanium housing for depths to 7000 meters (22,900 feet)
- Conductivity, temperature, and pressure (offered in eight full scale ranges from 20 to 7000 dbars) sensors
- Integrated T-C Duct and internal pump for flow-controlled conductivity, temperature, and dissolved oxygen sensor response
- Anti-foulant fittings and expendable anti-foulant devices
- RS-232 or logic level (0 - 3.3 V) interface (factory configured)
- XSG 4-pin I/O bulkhead connector, and IE-55 bulkhead connector for optional SBE 43F Dissolved Oxygen Sensor
- 3/8-16 locator/mounting hole in the sensor end cap, to assist in mounting to a McLane MMP moored profiler

Options include:

- Plastic housing for depths to 600 meters
- SBE 43F Dissolved Oxygen Sensor (frequency-output version of our SBE 43)
- Wet-pluggable MCBH connector in lieu of standard (XSG) I/O connector

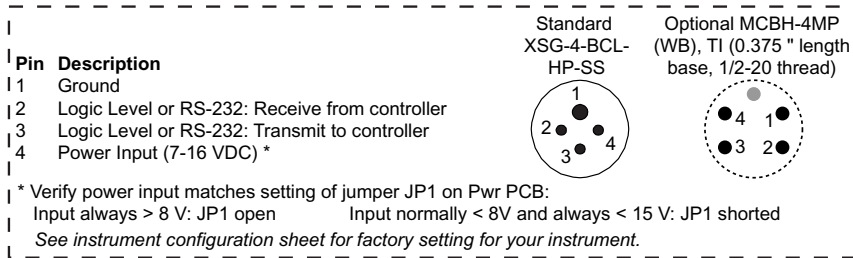
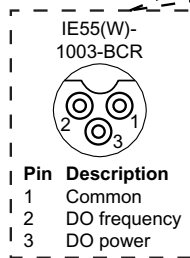
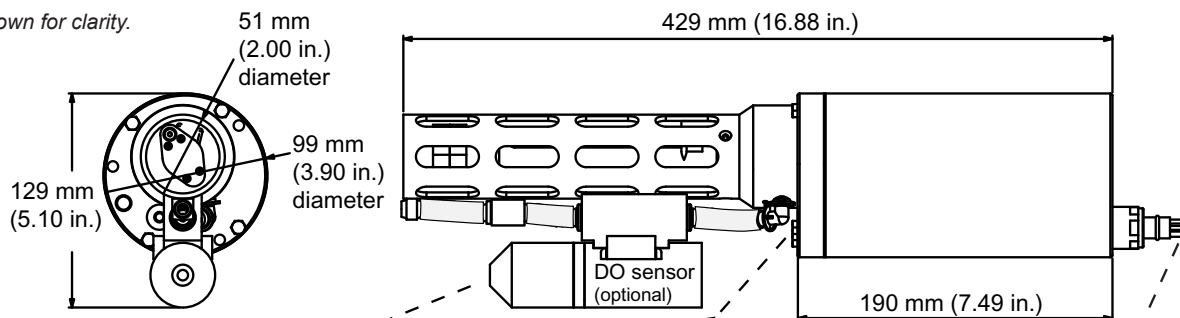
## SOFTWARE

The SBE 52-MP is supplied with a Windows software package, Seasoft<sup>®</sup> V2, which includes Seaterm, a terminal program for instrument setup and data display.

# Moored Profiler CTD & Optional DO Sensor



DO sensor cable not shown for clarity.



## SPECIFICATIONS

### Measurement Range

- T -5 to +35 °C
- C 0 to 90 mmho/cm (0 to 9 S/m)
- P 0 to 20/100/350/600/1000/2000/3500/7000 meters
- DO 120% of surface saturation (all natural waters, fresh & salt)

### Initial Accuracy

- T 0.002 °C
- C 0.003 mmho/cm (0.0003 S/m)
- P 0.1% of full scale range
- DO 2% of saturation

### Typical Stability

- T 0.0002 °C per month
- C 0.003 mmho/cm (0.0003 S/m) per month
- P 0.05% of full scale range per year
- DO 0.5% per 1000 hours (clean membrane)

### Resolution

- T 0.001 °C
- C 0.0005 mmho/cm (0.00005 S/m) (oceanic waters; resolves 0.4 ppm in salinity)  
 0.0007 mmho/cm (0.00007 S/m) (high salinity waters; resolves 0.4 ppm in salinity)  
 0.0001 mmho/cm (0.00001 S/m) (fresh waters; resolves 0.1 ppm in salinity)
- P 0.002% of full scale range
- DO 0.035% of saturation (corresponds to 0.003 ml/l at 0 °C & 35 PSU)

### Calibration

- T +1 to +32 °C
- C zero conductivity (air) plus 26 to 60 mmho/cm (2.6 to 6 S/m)
- P Ambient barometric to full scale range in 5 steps
- DO 1, 4, and 7 ml/l (approximate) at 2, 6, 12, 20, 26, and 30 °C (18 points)

### Housing Material, Depth Rating, and Weight

- Standard 3AL/2.5V Titanium, 7000 meters (22,900 feet), 5.3 kg (11.8 lbs) in air, 3.7 kg (8.2 lbs) in water
- Optional Plastic, 600 meters (1960 feet), 3.2 kg (7.0 lbs) in air, 1.5 kg (3.4 lbs) in water

### Power Requirements

- Input power 3 Watts at 7-16 VDC (consult factory for voltage outside this range)
- Turn-on transient 300 mA at 10V
- Quiescent (sleep) state 0.008 mA at 10V
- Awake but not sampling 5.2 mA at 10V
- Sampling (includes pump) 62 mA at 10V

### Memory

- Static RAM; stores up to 28,000 samples of C, T, P, & DO data.
- Note: If external power is removed, any data in memory is lost.**