

Moored Profiler CTD & Optional DO Sensor

SBE 52-MP


The SBE 52-MP is a conductivity, temperature, depth (pressure) sensor (CTD), designed for moored profiling applications in which the instrument makes vertical profile measurements from a device that travels vertically beneath a buoy, or from a buoyant sub-surface sensor package that is winched up and down from a bottom-mounted platform. The 52-MP incorporates pump-controlled, TC-ducted flow to minimize salinity spiking. On typically slow-moving packages (e.g., 20 - 50 cm/sec), its sampling rate of once per second provides good spatial resolution of oceanographic structures and gradients. The 52-MP can optionally be configured with a Dissolved Oxygen sensor module (SBE 43F), as shown in the photo. The SBE 43F is a frequency-output version of our SBE 43 Dissolved Oxygen Sensor, and carries the same performance specifications.



Shown with optional SBE 43F Dissolved Oxygen Sensor

The SBE 52-MP uses the same accurate and stable thermistor, conductivity cell, and pressure sensor that are 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. The 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, degrees C, decibars, ml/l). Alternatively, the user can select to upload data in hexadecimal or binary. 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. The 52-MP runs continuously, sampling at one scan per second (1 Hz). It stores the data in memory and can also transmit in real-time. It can bin average the data, and store the bin 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 (CTD, DO) 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 from the conductivity cell and oxygen sensor plenum. For polled sampling, pump run time for best DO accuracy is a function of temperature and pressure, and is automatically determined by the 52-MP (55 seconds, 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
- 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
- Wet-pluggable MCBH connector in lieu of standard (XSG) I/O connector

SOFTWARE

The SBE 52-MP is supplied with a Win 95/98/NT/2000/XP software package, SEASOFT[®]-Win32, which includes SEATERM, a terminal program for instrument setup and data display.



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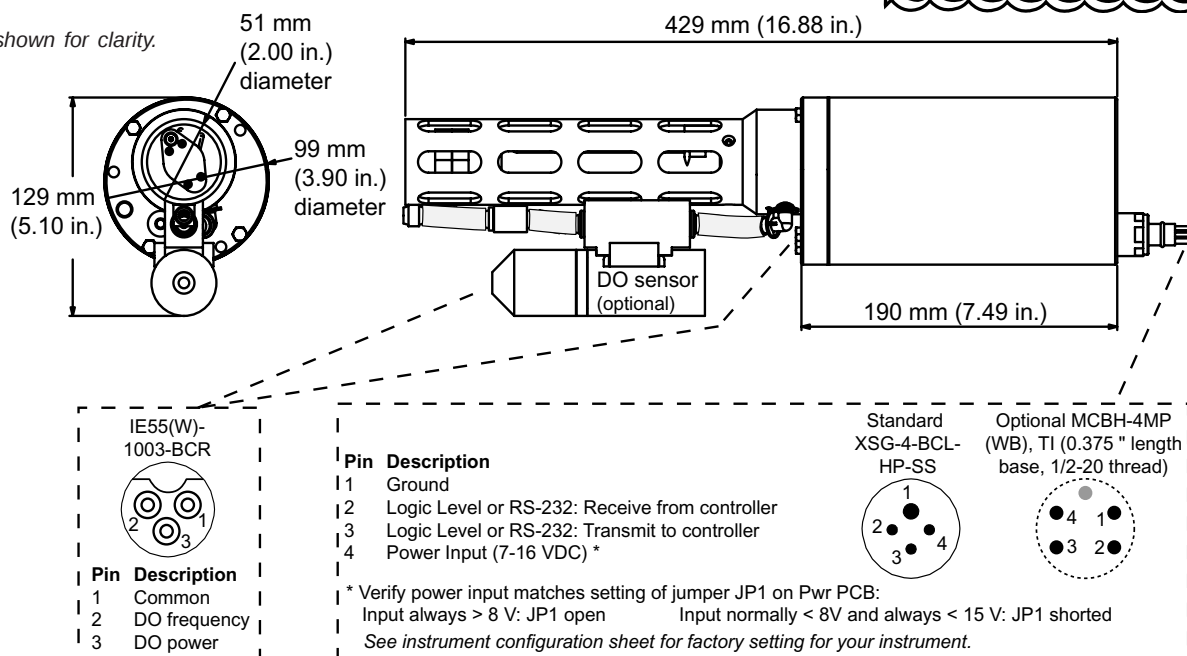
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SBE 52-MP



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	0.004% of full scale range per month
DO	2% per 1000 hours

Resolution

T	0.0001 °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

Standard	3AL/2.5V Titanium, 7000 meters (22,900 feet)
Optional	Plastic, 600 meters (1960 feet)

Weight

Titanium housing:	
In air	5.3 kg (11.8 lbs)
In water	3.7 kg (8.2 lbs)

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.



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