HOBO® MX2001 Data Logger

Bluetooth Low Energy Water Level Data Logger

The HOBO® MX2001 is the industry's first water level data logger designed for convenient wireless setup and download from mobile devices via Bluetooth Low Energy. The logger dramatically simplifies and lowers the cost of field data collection by providing wireless access to high-accuracy water level and temperature measurements right from a mobile phone or tablet. The MX2001 logger consists of a top-end unit and a water level sensor which are sold as a set, plus a direct read cable to connect them. Cables can be ordered in lengths from 0.2 to 500m for deployment in a wide range of wells.

Supported Measurements:

Absolute Pressure, Barometric Pressure, Differential Pressure, Temperature, Water Level and Water Temperature

Key Advantages:

- Wireless data offload to mobile devices using Bluetooth Low Energy
- Integrated barometric pressure sensor enables direct water level readout
- Direct read cable connects sensor to top-end logger/transmitter
    - The cable includes Kevlar strength member
    - Cables are interchangeable so loggers are easy to redeploy in future applications
    - The logger and sensor add 0.39 meters to the length of the cable
    - Cable length can vary up to 3% from the length ordered
    - The 1, 5, 10, 15, 30 and 60 meter cable lengths are in stock; custom cable lengths have a 2 to 4 week lead time
- Reference water level can be entered at the start of the deployment
- Use HOBOmobile for setup, data viewing and data sharing
- Powered by two user-replaceable AA batteries in the top-end unit
- Several logging modes: normal, multi-rate logging and event-triggered burst-logging
- Durable ceramic sensor
- Available with stainless steel or titanium sensor ends
- 3-point NIST-traceable calibration certificate included for the water pressure sensor

HOBO MX2001 Data Logger Specifications

Pressure (Absolute) and Water Level Measurements MX2001-01-S and MX2001-01-Ti-S - 9 Meter (30') range	
Operation Range	0 to 207 kPa (0 to 30 psia); approximately 0 to 9 m (0 to 30 ft) of water depth at sea level, or 0 to 12 m (0 to 40 ft) of water at 3,000 m (10,000 ft) of altitude
Factory Calibrated Range	69 to 207 kPa (10 to 30 psia), 0° to 40°C (32° to 104°F)
Burst Pressure	310 kPa (45 psia) or 18 m (60 ft) depth
Water Level Accuracy*	Typical error: ±0.05% FS, 0.5 cm (0.015 ft) water Maximum error: ±0.1% FS, 1.0 cm (0.03 ft) water
Raw Pressure Accuracy**	±0.3% FS, 0.62 kPa (0.09 psi) maximum error
Resolution	<0.02 kPa (0.003 psi), 0.21 cm (0.007 ft) water
Pressure Response Time (90%)***	1 second at a stable temperature

Pressure (Absolute) and Water Level Measurements MX2001-02-S - 30 Meter (100') range	
Operation Range	0 to 400 kPa (0 to 58 psia); approximately 0 to 30.6 m (0 to 100 ft) of water depth at sea level, or 0 to 33.6 m (0 to 111 ft) of water at 3,000 m (10,000 ft) of altitude
Factory Calibrated Range	69 to 400 kPa (10 to 58 psia), 0° to 40°C (32° to 104°F)
Burst Pressure	500 kPa (72.5 psia) or 40.8 m (134 ft) depth
Water Level Accuracy*	Typical error: ±0.05% FS, 1.5 cm (0.05 ft) water Maximum error: ±0.1% FS, 3.0 cm (0.1 ft) water
Raw Pressure Accuracy**	±0.3% FS, 1.20 kPa (0.17 psi) maximum error
Resolution	0.04 kPa (0.006 psi), 0.41 cm (0.013 ft) water
Pressure Response Time (90%)***	1 second at a stable temperature

Pressure (Absolute) and Water Level Measurements MX2001-03-S - 76 Meter (250') range	
Operation Range	0 to 850 kPa (0 to 123.3 psia); approximately 0 to 76.5 m (0 to 251 ft) of water depth at sea level, or 0 to 79.5 m (0 to 262 ft) of water at 3,000 m (10,000 ft) of altitude
Factory Calibrated Range	69 to 850 kPa (10 to 123.3 psia), 0° to 40°C (32° to 104°F)
Burst Pressure	1,200 kPa (174 psia) or 112 m (368 ft) depth
Water Level Accuracy*	Typical error: ±0.05% FS, 3.8 cm (0.125 ft) water Maximum error: ±0.1% FS, 7.6 cm (0.25 ft) water
Raw Pressure Accuracy**	±0.3% FS, 2.55 kPa (0.37 psi) maximum error
Resolution	<0.085 kPa (0.012 psi), 0.87 cm (0.028 ft) water
Pressure Response Time (90%)***	1 second at a stable temperature

Pressure (Absolute) and Water Level Measurements MX2001-04-S and MX2001-04-Ti-S - 4 Meter (13') range	
Operation Range	0 to 145 kPa (0 to 21 psia); approximately 0 to 4 m (0 to 13 ft) of water depth at sea level, or 0 to 7 m (0 to 23 ft) of water at 3,000 m (10,000 ft) of altitude
Factory Calibrated Range	69 to 145 kPa (10 to 21 psia), 0° to 40°C (32° to 104°F)
Burst Pressure	310 kPa (45 psia) or 18 m (60 ft) depth
Water Level Accuracy*	Typical error: ±0.075% FS, 0.3 cm (0.01 ft) water Maximum error: ±0.15% FS, 0.6 cm (0.02 ft) water

Raw Pressure Accuracy**	±0.3% FS, 0.43 kPa (0.063 psi) maximum error
Resolution	<0.014 kPa (0.002 psi), 0.14 cm (0.005 ft) water
Pressure Response Time (90%)***	<1 second at a stable temperature

Barometric Pressure (MX2001-TOP)	
Operation and Calibrated Range	66 to 107 kPa (9.57 to 15.52 psia); -20° to 50°C (-4° to 122°F)
Accuracy	±0.2 kPa (±0.029 psi) over full temperature range at fixed pressure; maximum error ±0.5% FS
Water Level Accuracy*	Typical error: ±0.075% FS, 0.3 cm (0.01 ft) water Maximum error: ±0.15% FS, 0.6 cm (0.02 ft) water
Resolution	0.01 kPa (0.0015 psi)
Response Time	1 second at stable temperature
Stability (Drift)	0.01 kPa (0.0015 psi) per year

Temperature Measurements (All Sensor End Models MX2001-0x-S and MX2001-0x-Ti-S)	
Operation Range	-20° to 50°C (-4° to 122°F)
Accuracy	±0.44°C from 0° to 50°C (±0.79°F from 32° to 122°F), see Plot A
Resolution	0.1°C at 25°C (0.18°F at 77°F), see Plot A in manual
Response Time (90%)	5 minutes in water (typical)
Stability (Drift)	0.1°C (0.18°F) per year

Logger	
Operation Range	-20° to 50°C (-4° to 122°F)
Radio Power	1 mW (0 dBm)
Transmission Range	Approximately 30.5 m (100 ft) line-of-sight
Wireless Data Standard	Bluetooth Low Energy (Bluetooth Smart)
Logging Rate	1 second to 18 hours
Logging Modes	Fixed interval, multiple intervals with up to 8 user-defined logging intervals and durations, or event-triggered burst
Memory Modes	Wrap when full or stop when full
Start Modes	Immediate, date & time, or next interval
Stop Modes	When memory full, stop with HOBOmobile, date & time, or after a set logging period
Time Accuracy	±1 minute per month 0° to 50°C (32° to 122°F)
Battery	Two AA, 1.5 V alkaline batteries, user replaceable
Battery Life	1 year, typical with logging interval of 1 minute. Faster logging and/or statistics sampling intervals, entering burst logging mode, excessive readouts, checking of Full Status Details, and remaining connected with HOBOmobile will impact battery life.
Memory	256 KB memory (30,000 sets of measurements)
Full Memory Download Time	Approximately 2 minutes; may take longer the further the device is from the top end of the logger

Dimensions	Top end (MX2001-TOP): 2.54 cm (1.0 inches) diameter, 28.9 cm (11.4 inches) length; mounting hole 7.6 mm (0.3 inches) diameter Sensor end (MX2001-0x-S and MX2001-0x-Ti-S: 2.54 cm (1.0 inches) diameter, 9.91 cm (3.9 inches) length **Note:** The length of the water level logger cable (CABLE-DR-xxx) can vary -0% to +3% +10 cm (3.9 inches) from the length ordered. The logger adds 38.8 cm (15.3 inches) to the length of the cable ordered.
Weight	Top end (MX2001-TOP): Approximately 136 g (4.78 oz) in air Stainless sensor end (MX2001-0x-S): Approximately 106 g (3.74 oz) in air; approximately 53.9 g (1.9 oz) in fresh water Titanium sensor end (MX2001-0x-Ti-S): Approximately 80 g (2.83 oz) in air; approximately 37 g (1.3 oz) in fresh water
Wetted Materials	Top end (MX2001-TOP): Acetal housing, Polycarbonate end caps, Polycarbonate collar nut; Viton and Buna-N O-rings Stainless sensor end (MX2001-0x-S): Acetal housing, PVC end cap, Polycarbonate collar nut; Viton and Buna-N O-rings; ceramic sensor in stainless steel end cap Titanium sensor end (MX2001-0x-Ti-S): Acetal housing, PVC end cap, Polycarbonate collar nut; Viton and Buna-N O-rings; ceramic sensor in Titanium end cap
Environmental Rating	Top end: NEMA 6, IP67 Sensor end: IP68
The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).	

*Water Level Accuracy: With accurate reference water level measurement, known water density, and a stable temperature environment. System Water Level Accuracy equals the sum of the Barometric Water Level Accuracy plus the selected sensor end Water Level Accuracy.

**Raw Pressure Accuracy: Absolute pressure sensor accuracy includes all sensor drift, temperature, and hysteresis-induced errors.

***Changes in Temperature: Allow 20 minutes in water to achieve full temperature compensation of the pressure sensor. There can be up to 0.5% of additional error due to rapid temperature changes. Measurement accuracy also depends on temperature response time.

DATA LOGGER INDONESIA

www.dataloggerindonesia.com

Our Office	:	Jl. Radin Inten II No. 61B Duren Sawit - Jakarta 13440
Phone	:	+62-21 2956 3045, 2956 3046, 2956 3047
Fax	:	+62-21 2956 3052
E-mail	:	sales@dataloggerindonesia.com
Website	:	http://www.dataloggerindonesia.com