



## Manta+ Water Quality Probes Model 5001

**Manta+** Probes are multiparameter sondes designed for monitoring water quality in fresh, brackish, and marine environments.

The Manta+ water quality probe family offers flexible configurations, from standard to custom, with the largest probe accommodating up to 14 sensors.

Each Manta+ unit includes a weighted sensor guard, storage/calibration cup, temperature sensor, internal data logging memory, marine connector, electronic manual, Windows-compatible Manta Control Software, maintenance kit, data cable, and RS-232 to USB adaptor for PC connection.

Measuring 19–21" (or 26.5–28.5" with the optional external battery pack for autonomous logging), Manta+ Probes can log over 1,000,000 readings at a rate of 1 Hz.

All Manta+ Probes feature anti-corrosive housings and sensors, robust marine bulkhead connectors, and anti-fouling options. LED status indicators on each sonde provide essential diagnostic information.

Add a battery pack to convert a probe to a logging device. A wiper system is available for extended deployments. A standard three-year factory warranty is included.

## Manta+ Water Quality Probe Benefits

- **Wide Sensor Selection:** Access to the largest selection of water quality sensor technologies in the industry. Can accommodate up to 14 sensors in one probe.
- **Comprehensive Monitoring:** Measure multiple water quality parameters simultaneously, providing a complete picture of water health.
- **Versatile Use:** Suitable for various applications, from spot checking to continuous monitoring.
- **Real-time Data:** Connect to telemetry stations for immediate access to water quality data in the cloud.
- **Durable:** Features anti-corrosive housings and sensors, robust marine bulkhead connectors, and anti-fouling options.
- **Easy to Use:** One touch and automatic data capture, simple calibrations, collect and manage data with mobile apps, LED status indicators
- **Reliable:** Each probe comes with an industry-leading 3 year warranty



**Manta+20**

- temperature
- pH
- conductivity
- dissolved oxygen (optical)



**Manta+25**

- temperature
- pH
- conductivity
- turbidity (or any fluorometer)



**Manta+30**

- temperature
- pH
- conductivity
- dissolved oxygen (optical)
- turbidity (or any fluorometer)



**Standard on Manta+35, +F35, and +40**

- temperature
- pH
- conductivity
- dissolved oxygen (optical)
- turbidity
- anti-fouling wiper



**Additional Options (see Sensors chart)**

- fluorometers (medium sensors)
- ISEs (small sensors)
- TDG

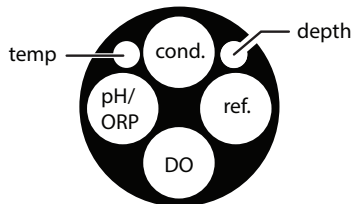
\*Depth (vented or absolute) and ORP (must have pH) are optional on any probe.

See the Solinst Eureka Manta+ Standard Sensor Configurations for all possible combinations, based on sensor size.

## Manta+ Standard Sensor Configurations

2"

Manta+20



Standard models are shown. Please call for a quote for custom configurations.

**Temperature sensor is included on every probe.**

**ANY sensor is optional.** However, compensation factors must be considered.

Any fluorometer may be substituted for turbidity.

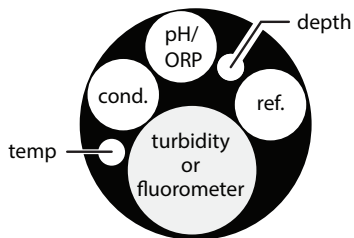
For a probe with a turbidity sensor, the turbidity wiper extension brush wipes the fluorometer and DO sensor.

For M+35 and 40 models with no turbidity, a wiper system is available.

Any sensor may be removed and the port plugged, but compensation factors should be considered.

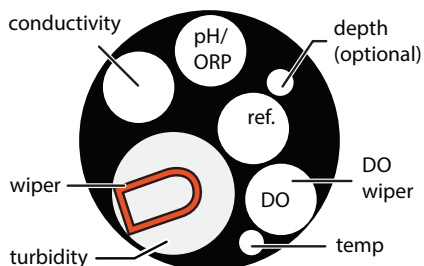
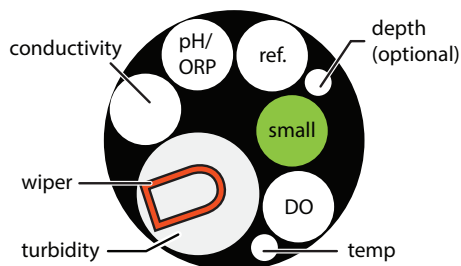
2.5"

Manta+25



3"

Manta+30A

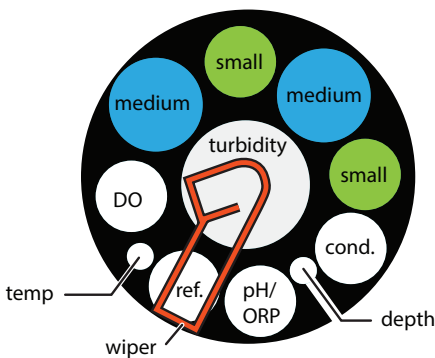
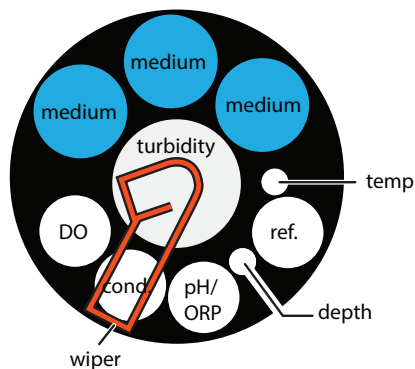


3"

Manta+30B

3.5"

Manta+35A

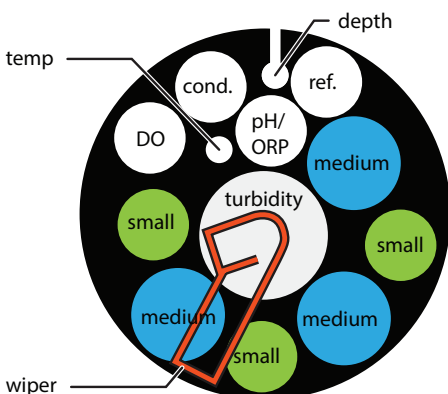


3.5"

Manta+35B

4"

Manta+40



| Small    | Medium              |
|----------|---------------------|
| nitrate  | chlorophyll a       |
| ammonium | blue green algae    |
| chloride | CDOM/FDOM           |
| sodium   | tryptophan          |
| calcium  | optical brighteners |
| bromide  | rhodamine           |
| TDG      | fluorescein         |
|          | PTSA                |
|          | crude oil           |
|          | refined oil         |

- A small sensor may be substituted for any medium sensor.
- TDG sensor cannot be wiped.
- +F35 only: optional depth occupies one medium port.

## **Manta+ Multiprobe Sensor Configuration**

In addition to the latest technology for measuring standard parameters such as temperature, pH, conductivity, dissolved oxygen, turbidity, and depth, Solinst Eureka provides speciality sensors including PAR (Photosynthetically Active Radiation), Total Dissolved Gas, as well as a long list of fluorometers.

Manta+ optical dissolved oxygen sensors feature a long-lasting (5+ years) replaceable cap, and Manta+ pH sensors use a refillable reference solution. This design minimizes consumable costs and ensures low long-term ownership expenses.

**The Manta+20** comes standard with temperature, pH, conductivity, and dissolved oxygen sensors, with optional sensors for ORP and depth.

**The Manta+25** comes standard with temperature, pH, conductivity, a wipered turbidity sensor, and optional ORP and depth sensors.

**The Manta+30** is available in two configurations, the M+30A and M+30B. Both models have wipered turbidity, temperature, pH, conductivity, dissolved oxygen, and optional ORP, depth sensors and DO wiper. The M+30B accommodates the addition of an ISE sensor (small sensor).

**The Manta+35** is available in two configurations, the M+35A and M+35B. Both come standard with turbidity, temperature, pH, conductivity, and dissolved oxygen sensors, with the option to add ORP and depth sensors. In addition to these standard sensors, the M+35A model will accommodate two fluorometers (medium sensors) plus two ISE sensors (small sensors); the M+35B will accommodate three fluorometers (medium sensors).



**The Manta+F35** includes the same standard sensors as the +35, with the option to add up to three fluorometers. The +F35 features an anti-fouling copper-infused “nose cone” covering the sensor bodies. A central wiper system keeps the exposed sensor surfaces clean during continuous deployments. These features mean better data and less overall cleaning is required. PAR, CO<sub>2</sub>, TDG, and ISE sensors are unavailable on the +F35.



**The Manta+40** comes standard with turbidity, temperature, pH, conductivity, and dissolved oxygen sensors, with the option to add ORP and depth sensors. In addition to these standard sensors, the M+40 will accommodate three fluorometers (medium sensors) plus three ISE sensors (small sensors).



## Manta+ Water Quality Probe Specifications

|                                                                                                 |                                         | Manta+20                                     | Manta+25 | Manta+30 | Manta+35 | Manta+F35 | Manta+40  |
|-------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------|----------|----------|----------|-----------|-----------|
| <b>Diameter</b>                                                                                 |                                         | 1.95"                                        | 2.45"    | 2.95"    | 3.5"     | 3.5"      | 4.0"      |
| <b>Length with guard</b>                                                                        | no battery pack                         | 19"                                          | 19"      | 19"      | 21"      | 21"       | 21"       |
|                                                                                                 | with IBP (internal battery pack)        | 27.75"                                       | 27.75"   | 27.75"   | 22.5"    | 22.5"     | 22.5"     |
|                                                                                                 | with EBP (external Li-ion battery pack) | 26.5"                                        | 26.5"    | 26.5"    | 28.5"    | 28.5"     | 28.5"     |
| <b>Weight with guard</b>                                                                        | no battery pack                         | 2.7 lbs                                      | 3.95 lbs | 5.7 lbs  | 7.75 lbs | 7.75 lbs  | 10.65 lbs |
|                                                                                                 | with IBP                                | 3.45 lbs                                     | 6.55 lbs | 6.8 lbs  | 8.75 lbs | 8.75 lbs  | 11.65 lbs |
|                                                                                                 | with EBP                                | 4.95 lbs                                     | 6.2 lbs  | 7.95 lbs | 10 lbs   | 10 lbs    | 12.9 lbs  |
| <b>IBP configuration</b>                                                                        |                                         | 3 "D"                                        | 3 "D"    | 8 "C"    | 6 "C"    | 6 "C"     | 6 "C"     |
| Weight of disposal lead acid batteries not included in total probe weight with IBP compartment. |                                         |                                              |          |          |          |           |           |
| <b>Operating temperature</b>                                                                    |                                         | -5 to 50°C                                   |          |          |          |           |           |
| <b>Depth rating</b>                                                                             |                                         | 200 m (15 m maximum for ISE and TDG sensors) |          |          |          |           |           |
| <b>Communication</b>                                                                            |                                         | RS-232, SDI-12, MODBUS, USB or Bluetooth     |          |          |          |           |           |
| <b>Sample rate</b>                                                                              |                                         | 1 Hz                                         |          |          |          |           |           |
| <b>Data memory</b>                                                                              |                                         | >1,000,000 logged readings                   |          |          |          |           |           |

## Comprehensive Applications of Manta+ Water Quality Sondes

Solinst Eureka's water probes are used to collect water quality data in any kind of water—lakes, rivers, groundwater, stormwater, estuaries, streams, ponds, near-shore oceanographic, process waters, waste waters, and for laboratory research. They can be used for discrete sampling and profiling, unattended datalogging and remote monitoring with telemetry. Applications include:

### Environmental Monitoring:

- Baseline water quality assessments and long-term monitoring of aquatic ecosystems
- Monitoring wetland health and restoration projects
- Assessing the effects of runoff from agricultural



### Drinking Water Monitoring:

- Source water protection and monitoring
- Treatment plant optimization and process control
- Distribution system monitoring
- Detecting and responding to contamination events



### Stormwater Monitoring:

- Monitoring the effects of storm events on local waterways
- Monitoring the effectiveness of stormwater controls and treatment systems



**Hydrology and Hydrogeology:**

- Groundwater monitoring for aquifer characterization
- Surface water and groundwater interaction studies
- Monitoring saltwater intrusion in coastal aquifers

**Dredging and Construction:**

- Monitoring turbidity during dredging operations
- Assessing the impact of construction projects
- Monitoring runoff from construction sites

**Mining:**

- Monitoring runoff and discharge
- Monitoring the effects of mining on ground and surface water
- Monitoring the effects of acid mine drainage

**Wastewater Management:**

- Monitoring effluent quality for compliance
- Optimizing wastewater treatment processes
- Tracking the impact of wastewater discharges

**Oceanography and Marine Research:**

- Monitoring coastal water quality and ocean acidification
- Studying the health of coral reefs, marine ecosystems and biodiversity
- Tracking the movement of masses and currents

**Aquaculture:**

- Maintaining optimal water quality for fish and shellfish farming
- Preventing disease outbreaks and optimizing growth

**Industrial Applications:**

- Process water monitoring and control
- Cooling water monitoring and treatment
- Monitoring environmental impact of industrial activities and effluents

**Research and Education:**

- Conducting scientific research on water quality and aquatic ecosystems
- Providing hands-on learning experiences for students in environmental science



## Flexible Communication

All sondes can be used for discrete sampling and profiling or self-powered datalogging, and data station connectivity. Real-time data is available through cloud-based software when connected to a telemetry station.

Users can operate the Manta+ Probes with various display options via a direct or *Bluetooth®* connection. Intuitive control software, compatible with Windows, is included at no additional cost with every probe. The MantaLink™ app is a free download for iOS and Android™ devices. Our sondes communicate via RS-232, and optionally, SDI-12, or MODBUS, allowing flexibility in connecting to various dataloggers and PLCs.



## Accessories for Added Convenience

Many accessories are available for the Manta+ line of multiparameter probes, including underwater cables from 3 to 200 meters in length, flow-cells, copper-gauze anti-fouling sensor guards, cable reels for extra-long cables, SDI-12 and MODBUS adaptor cables, carry cases, pipe kits to protect probes used for continuous deployments, attachable rechargeable battery packs for powering probes used for continuous deployment, and a full line of calibration standards including secondary calibration standards for fluorimeters.

## Manta Control Software

Use the Manta+ data cable with RS-232 to USB adapter, to connect your water probe via USB, for operation with the Manta Control Software for Windows PC's and laptops.

This software for the Manta+ family of probes features simple to use, intuitive menus for data capture, sensor calibrations and configuration, file management, and more.

It also includes a feature for use by software developers and end users for communication with external data loggers. This feature is also used by the Solinst Eureka Support Team to guide the user through troubleshooting routines.

## Wireless Bluetooth Communication

The mantaMobile™ is a rechargeable, high-capacity lithium battery with a Bluetooth transceiver in a water-resistant case. The mantaMobile communicates via Bluetooth to Android or Apple® devices, including tablets and smartphones.

MantaLink is the software app used to access functions and data from your Manta+ probe. Installing MantaLink on your display device takes just a few minutes. Connecting the Manta+ probe to your device only takes seconds.

Use MantaLink's simple menu structure to perform essential functions like data capture, calibration, and sensor parameter selection. The email feature allows quick transfer of field data to your home computer. Advanced features like geofencing make your sampling job even easier. The apps black background and large white text ensure that information is easily readable in sunlight.



The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Solinst Eureka is under license.

®Apple and the Apple logo are trademarks of Apple Inc., registered in the U.S. and other countries.

iOS is a trademark or registered trademark of Cisco in the U.S. and other countries and is used under license.

Android and Google Play are trademarks of Google Inc.

## Manta+ Sensor Specifications

### Common Parameters

| Sensor                            | Parameter                    | Range                | Resolution | Accuracy                                                   | Comments                                                                                                                                |
|-----------------------------------|------------------------------|----------------------|------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| temperature                       | temperature                  | -5 to 50°C           | 0.01       | ±0.1                                                       | Calibration not required                                                                                                                |
| pH/ORP                            | pH                           | 0 to 14 units        | 0.01       | ±0.1 within 10 C of calibration; or 0.2                    | Refillable reference electrode; corrected for temperature; typical sensor life >6 years; optional ORP sensor is combined with pH sensor |
|                                   | ORP                          | -999 to 999 mV       | 0.1        | ±20 mV                                                     |                                                                                                                                         |
| turbidity                         | turbidity                    | 0 to 1000 FNU        | 0.01       | ±0.3 FNU or ±2% of reading w.i.g.                          | Filtered for non-turbidity spikes; includes wiper to clean the optics; FNU and NTU are interchangeable                                  |
|                                   |                              | 1000 to 4000 FNU     |            | ±4% of reading                                             |                                                                                                                                         |
| dissolved oxygen (optical sensor) | concentration                | 0 to 20 mg/l         | 0.01       | ±0.1                                                       | Compensated for temperature and salinity; EPA approved "lifetime" luminescence method; typical sensor cap life > 6 years                |
|                                   |                              | 20 to 30 mg/l        | 0.01       | ±0.15                                                      |                                                                                                                                         |
|                                   |                              | 30 to 50 mg/l        | 0.01       | ±5% of reading                                             |                                                                                                                                         |
|                                   | % saturation                 | 0 to 500% saturation | 0.1        | Corresponds with the accuracy of the concentration reading |                                                                                                                                         |
| conductivity                      | specific conductance, µS/cm  | 0 to 5000 µS/cm      | 0.1        | ±0.5% of reading or ±1 w.i.g.                              | Corrected for temperature; four easy-to-clean graphite electrodes; optional sensor provides ±0.5% of reading accuracy to 100 mS/cm.     |
|                                   | specific conductance, mS/cm  | 0 to 100 mS/cm       | 0.001      | ±1% of reading ±0.001                                      |                                                                                                                                         |
|                                   |                              | 100 to 275 mS/cm     | 0.001      | ±2% of reading                                             |                                                                                                                                         |
|                                   | salinity                     | 0 to 70 PSU          | 0.01       | ±2% of reading                                             | Calculated from conductivity and temperature, PSU is equivalent to ppt                                                                  |
| pressure                          | total dissolved solids (TDS) | 0 to 65 g/l          | 0.1        | ±5% of reading                                             |                                                                                                                                         |
|                                   | depth                        | 0 to 25 m            | 0.01       | ±0.05                                                      | Compensated for temperature and salinity                                                                                                |
|                                   |                              | 0 to 200 m           |            | ±0.4                                                       |                                                                                                                                         |
|                                   | vented depth                 | 0 to 10 m            | 0.001      | ±0.003                                                     | Compensated for temperature, salinity, and barometric pressure                                                                          |
|                                   | barometric pressure          | 400 to 900 mm Hg     | 0.1        | ±1.5                                                       | Included with depth sensor                                                                                                              |
| total dissolved gas               | total dissolved gas (TDG)    | 400 to 1,400 mm Hg   | 0.1        | ±1                                                         | Compensated for temperature; maximum depth 15 m                                                                                         |

For best accuracy, always calibrate near the anticipated field readings, and near the temperature of the anticipated field readings.

## Fluorometers (Medium Sensors)

|              |                              |               |      |                                  |                                                                            |
|--------------|------------------------------|---------------|------|----------------------------------|----------------------------------------------------------------------------|
| fluorometers | chlorophyll a - blue         | 0 to 100 µg/l | 0.01 | linearity of 0.99 R <sup>2</sup> | Highest-quality fluorometric sensors, custom optics available upon request |
|              | chlorophyll a - red          | 0 to 500 µg/l |      |                                  |                                                                            |
|              | rhodamine dye                | 0 to 200 ppb  |      |                                  |                                                                            |
|              | Phycocyanin (freshwater BGA) | 0 to 4500 ppb |      |                                  |                                                                            |
|              | Phycoerythrin (marine BGA)   | 0 to 700 ppb  |      |                                  |                                                                            |
|              | CDOM/FDOM                    | 0 to 500 ppb  |      |                                  |                                                                            |
|              | optical brightener           | 0 to 300 ppb  |      |                                  |                                                                            |
|              | tryptophan                   | 0 to 5000 ppb |      |                                  |                                                                            |
|              | fluorescein dye              | 0 to 150 ppb  |      |                                  |                                                                            |
|              | PTSA                         | 0 to 650 ppb  |      |                                  |                                                                            |
|              | refined oil                  | 0 to 20 ppm   |      |                                  |                                                                            |
|              | crude oil                    | 0 to 300 ppb  |      |                                  |                                                                            |

## Ion-Selective Electrodes (Small Sensors)

|                                 |          |                           |     |                                 |                                                                                                                                                                                                                                                        |
|---------------------------------|----------|---------------------------|-----|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ion-selective electrodes (ISEs) | ammonium | 0 to 100 mg/l as nitrogen | 0.1 | ±10% of reading or 2mg/L w.i.g. | Corrected for ionic strength (via conductivity readings); the accuracy specification relies on non-trivial maintenance practice and frequent calibration near the temperature of measurement; sensors require periodic tip replacement, max depth 15 m |
|                                 | nitrate  | 0 to 100 mg/l as nitrogen |     |                                 |                                                                                                                                                                                                                                                        |
|                                 | chloride | 0.5 to 18,000 mg/l        |     |                                 |                                                                                                                                                                                                                                                        |
|                                 | sodium   | 0.05 to 20,000 mg/l       |     |                                 |                                                                                                                                                                                                                                                        |
|                                 | calcium  | 0 to 40,000 mg/l          |     |                                 |                                                                                                                                                                                                                                                        |
|                                 | bromide  | 0 to 80,000 mg/l          |     |                                 |                                                                                                                                                                                                                                                        |

## Other Parameters

|                 |                 |                        |      |                                  |                                                                                 |
|-----------------|-----------------|------------------------|------|----------------------------------|---------------------------------------------------------------------------------|
| photometric PAR | photometric PAR | 10,000 µmol/cm2        | 0.1  | ±5% of reading                   | LiCor spherical sensor                                                          |
| CO <sub>2</sub> | carbon dioxide  | 0 to 10,000 ppm        | 0.1  | ±3% of full scale                | ranges available: 0-50mg/L, 0-2000 ppm, 0-5000 ppm, 0-10,000 ppm; max depth 50m |
| transmittance   | transmittance   | 0 to 100% transmission | 0.01 | linearity of 0.99 R <sup>2</sup> | Transmissometer mounts externally to Manta                                      |

**CAUTION:** Never look directly at a fluorometer sensor. The UV rays emitted by the sensor can cause eye damage.