# PRODUCT CATALOG

STEVENS

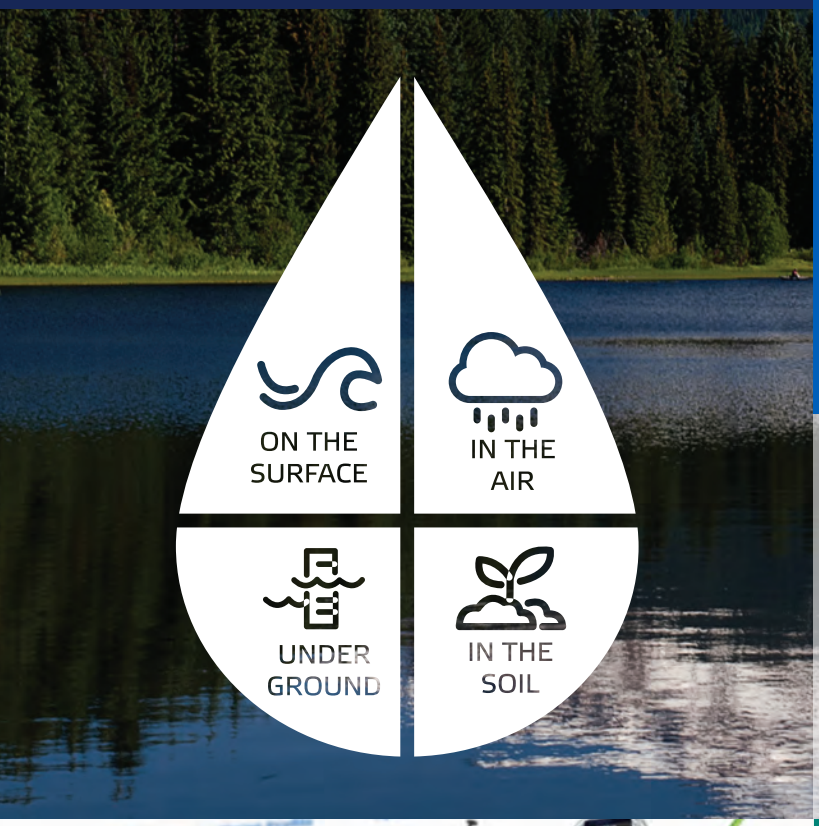
MEASUREMENTS TO MIND

STEVENS

With a focus on simplicity, innovation and efficient solutions, Stevens Water are experts in hydrological and environmental monitoring.

We've been innovating water monitoring solutions since 1911.

- First remote, unattended water level monitoring instrument—standard for today's water level measurements
- First with a water resource data book used by many professionals and universities (6th edition)
- First with a telemetry instrument for water level monitoring ("Telemark")
- First to develop a standard of visual water level measurement using staff gages
  - now today's public domain (and USGS) standard Style A, B, C, E and M gages.
- First to transmit environmental monitoring data over the ORBCOMM LEO system
- First to develop a Bluetooth product targeted at the Environmental Monitoring market's demands
- First data logger for the environmental monitoring market with more than 1GB memory




# WE KNOW WATER

## THERE'S MORE ON THE WEB!



1-800-452-5272 | 1-503-445-8000

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Look for this symbol for best-in-class products designed and manufactured in the USA by Stevens.

This catalog contains only a subset of our current product offering.
For more products, and additional information, visit:

**www.stevenswater.com**

Telemetry / Remote Communications

# What is MEASUREMENTS TO MIND?

## UNIQUE DATA PROCESSING AND NETWORK CONNECTIVITY, FOR TRUE DIRECT CLOUD CONNECTIVITY.

Getting environmental data to the point of actionable information has historically compartmentalized the data flow path into separate components—sensors, datalogger, telemetry, power management, software.

**MEASUREMENTS TO MIND (M2M)** is a growing suite of Stevens products that embraces cloud-computing with an all-inclusive vision of shortening the communication path from the sensors to data on-line. That is, what the sensors MEASURE the MIND sees. Cloud computing and the rapidly expanding "Internet of Things" is merging this communication path into a complete, integrated system that is all configured, controlled, and interacted with on-line, from one central point.

**M2M is:**

- meticulous dedication to **RELIABILITY** through power conservation
- commitment to unrivalled **SIMPLICITY**
- advanced engineering that dramatically **LOWERS THE COST** of installing and maintaining an environmental monitoring station.


### SIMPLE.

Just add sensors and go. Configure the station and access insightful information—not just data—any time from any device via the cloud software.

### FLEXIBLE.

Any sensors. Any type of system. Any application.

### RELIABLE.

Smart data verification, redundancy and status reporting built in. Unheard-of power efficiencies and 2-way communication for inexpensive remote station access and control.



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# ALL-IN-ONE SENSORS-TO-CLOUD CELLULAR GATEWAY

Avo is a complete monitoring station platform. It includes all hardware, software and services needed for data acquisition, cloud-based data storage, viewing and analysis. It makes any sensor data easily accessible and the station remotely configurable.

- All-in-one integrated system for quick, reliable deployments.
- Waterproof and weatherproof packaging for deployment in harsh environments.
- Mounts directly to a pole, or it can be placed inside another enclosure with an externally mounted antenna.
- Supports SDI-12, analog, and pulse sensors, providing flexible deployment options.
- Integrated cellular transceiver with intelligent network connection management ensures low-power, extremely reliable data acquisition.
- Data logged locally on an SD flash storage card as redundant backup.
- Pre-provisioned for instant cellular network connection and simple, reliable setup (use user-supplied SIM cards outside USA).
- No software installation, simplifying your IT infrastructure.
- One year subscription to Stevens-Connect cloud hub software is included.

User-installable sensor connectors available to adapt your existing sensors to work with Avo.

Sensor expansion adapter permits multiple sensors to connect to Avo's sensor port

Enclosure suitable for year-round outdoor use


Sensor connector port (expandable via sensor expansion adapter)

IP67-rated connectors

Connector port for solar panel (or AC/DC adapter)

**Inside:**

- 10 Ah Li-ion battery
- SD card storage for data backup
- Cellular antenna (optional external high-gain antenna available)
- Solar charge regulator and power manager

# Cell-Net

Reliable, 2-way cellular modem that's easy to set up.

Cell-Net is a simple cellular telemetry solution for new or existing remote monitoring stations. **Stevens-Connect** is used to configure Cell-Net once installed, and set up forwarding of remote data to any destination.

Unlike typical cellular modems which have a continual high power draw, Cell-Net operates almost entirely in an ultra-low power mode yet still provides the benefits of 2-way communications, and optimizes successful transport of data for maximum reliability.

- Designed specifically for easy configuration and provisioning for remote sites that are costly to visit.
- Approximately 20X typical improvement in power consumption vs. typical cellular telemetry.
- Provides the benefits of a 2-way connection without high power consumption.
- Intelligent data management, data buffering, and network verification to ensure successful transmission of critical data.
- Can be used with your choice of cellular carriers (3G GSM or 3G CDMA).
- Integrated GPS for time, longitude and latitude.

## Unique features

- **Easy configuration:** Configure via the web-based portal or by connecting to a PC and using an intuitively designed Windows program. No custom programming or scripts required.
- **Smart power management:** Cell-Net features an ultra-low-power mode that consumes just 1.6mA at idle (that's less than 1% of a typical cell modem). When transmitting, power draw is similar to other modems, but this is only for very short periods at user-controlled transmission intervals.
- **Data Management:** Cell-Net will listen for a connected logger or smart sensor to recieve data in the buffer before transmitting. Once received, data can either be transmitted immediately, or a er the bu er exceeds a defined size, or transmitted based on a user- defined interval.
- **Redundancy:** Data is transmitted for current reporting cycle and the last reporting cycle.
- **Reliability:** Cell-Net verifies connection with cell network and HTTP server connection before data is sent. If no connection is available or if data reception is not confirmed, data is saved and sent the next scheduled transmission.
- **Data flexibility:** Forward your data to any destination to access with any so ware platform, like Aquarius or our own cloud- based Stevens-Connect.
- **Connect directly to the cloud:** Provides direct IP connectivity to data loggers and smart sensors through a standard RS-232 serial port. No other interface hardware required.
- **Predict and prevent problems:** In addition to internal diagnostics, station and transmission health and performance data can be included in each transmission.


All M2M products feature

## DEAD SIMPLE SETUP AND CONFIGURATION

### Anywhere, anytime, any device.

All configuration and programming of remote M2M communications hardware is done online via a web-based management portal.

Setup in **3** steps:

1. connect to sensors, data logger or logging sensor(s)
2. connect to power source
3. configure data handling (frequency, redundancy, destination) with a simple online GUI


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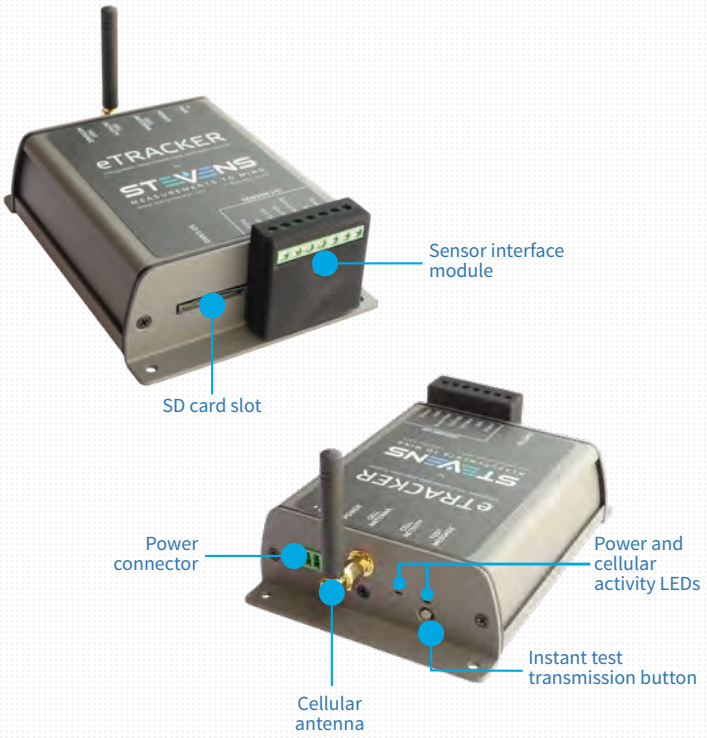
# eTracker

True cloud-based sensor configuration, logging, reporting and data analysis all-in-one.




**eTracker** is the gateway of cloud-computing in merging sensors, communications, and information technology infrastructure under one user interface experience. eTracker was designed from the ground up to embrace the current and future trends of cloud-based remote data acquisition and the Internet of Things (IoT) revolution. This paradigm shift centralizes all the historically isolated processes of remote configuration, programming, logging, and telemetry. Configuration, logging, data processing and analysis is now done in the cloud, eliminating time and cost in programming and maintaining expensive, complex data loggers and communication devices at each remote location.

- Cellular-based telemetry (GSM or CDMA) and station controller.
- Direct Internet compliant data stream using HTTP/HTTPS.
- Sensor measurements stored on easily-accessible SD card.
- Cloud logging: all sensor data is forwarded to the cloud for processing, logging, retrieval and resulting action.
- Integrated sensor interface with ports: 4 analog, 4 pulse, SDI-12 (up to 62 SDI-12 sensors).
- Approximately 20X typical improvement in power consumption vs. typical cellular telemetry.
- Intelligent data management, data buffering, and network verification to ensure successful transmission of critical data.

**All configuration, data logging, data storage, custom algebraic equations, custom data formats and forwarding, control, analysis, alarm notifications, data visualization, and reporting is done in the cloud.**

## Unique Features

- **Link sensors to the cloud**: Sensor data is linked directly to the cloud-based Amazon service or user's server via the cellular network using HTTP or HTTPS (optional FTP available).
- **One cloud-based management experience**: Sensor configuration, data storage, custom algebraic equations, custom data formats and forwarding, control, analysis, alarm notifications (email, SMS), reporting and actions all done in the cloud.
- **Easy configuration**: Configure with any device connected to the Internet via the cloud-based Stevens-Connect. No custom programming or scripts required.
- **Automated updates**: Updates to firmware and cloud-based application can be automatic.
- **Security**: Three user accessibility levels for configuration, data management interface and visualization. Also, data is saved on SD card and on the secured and redundant Amazon Cloud Services. Optional data encryption.
- **Reliable connection**: eTracker verifies connection with cell network and server connection before data is sent. If no connection is available or if data reception is not confirmed, data is saved and sent the next scheduled transmission.
- **True cloud data service experience**: Your data is sent directly and securely to the Amazon cloud-based service. No back-end database hosting or web server controlled by Stevens in which data flow takes a detour to the cloud.
- **Data format flexibility**: Optionally forward data in various formats for third party so ware platforms, like Aquarius or WISKI, and in other formats such as binary, pseudo-binary, SHEF, and more.
- **Power control**: Power cycle commands automatically initiated with the Stevens' SOLO power management system.

# Stevens SatComm

## GOES CS2/v2.0 Transmitter



Stevens SatComm uses a TCXO (temperature compensated crystal oscillator) to provide exceptional **power efficiency, minimal frequency aging and unsurpassed longevity.**

Unlike OCXOs (oven-controlled crystal oscillator) typically used, a TCXO:

- reduces the overall power consumption by eliminating a high current oven, eliminating the time and need for warm-up
- is not vulnerable to breaking due to power cycling
- maintains frequency over time without drift
- minimizes the risk of station failure due to constant power-cycling, and ensures that transmissions always occurs within assigned timeslot.

# RELIABILITY

## for your most critical data

The Stevens SatComm GOES transmitter sends data via the GOES Data Collection System (DCS) at both 300 and 1200 baud data rates. It can operate with any data logger capable of exporting data packets through a serial port in any format designated by the logger and permitted by NOAA/NESDIS.

For even simpler and more cost-effective remote GOES-based monitoring stations, Stevens SatComm is also available with an optional internal data logger (both CS2/v.2.0 certified), adding the ability for sensors to be directly connected for data collection, storage and transmission with a single low-power device.

## Long-term Reliability

- NESDIS CS2/v2.0 certified
- Compatible with most 3rd party data loggers
- Two data logger input modes:
  - Continuous listen to data logger mode
  - Trigger mode using CTS “clear to send”, with programmable advance turn-on time
- Two-way communication port
- Available with integrated data logger (4 analog, 1 pulse and 12 SDI-12 sensor inputs, 1 control output)
- Built-in self test and failsafe functions provide communication of common metrics and flags users when an anomaly occurs.
- VSWR measurement ensures good connection and signal path from the SatComm’s RF output to the antenna before the technician leaves the remote station. VSWR is continuously monitored as well, to protect expensive equipment in the event of damage to the RF connections, cabling, or antenna.

User-selectable station **health status** information can be appended to each transmission (battery voltage, message number, VSWR, lat/long, internal temperature, etc.), allowing remote alerting of potential problem conditions.

**Data redundancy** allows previous data set to accompany the current data set, increasing the chance of data retrieval even if a transmission is lost.

Two secondary COM ports (touchscreen port and DCP Command port) allow LCD display option and **dual telemetry** (cellular, Inmarsat, Iridium, etc.) for redundancy and 2-way remote station configuration, control and diagnosis.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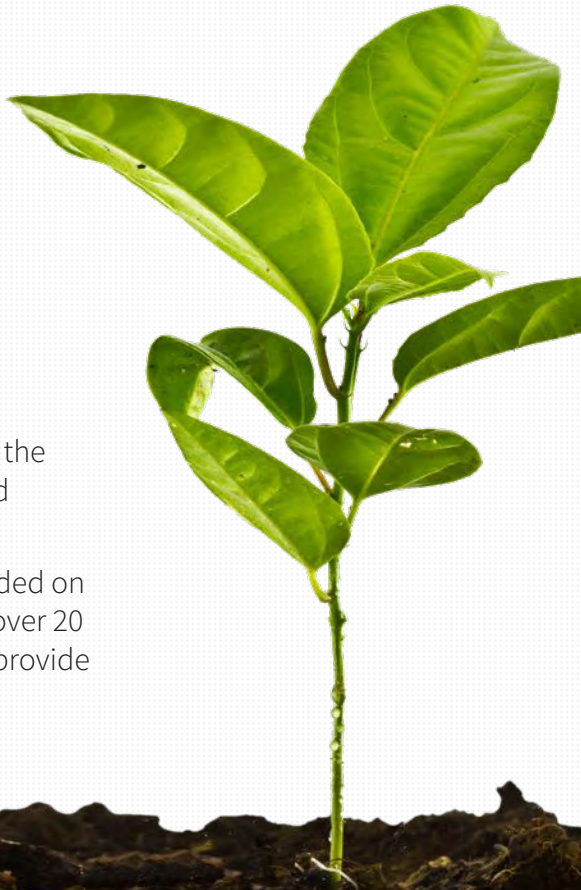
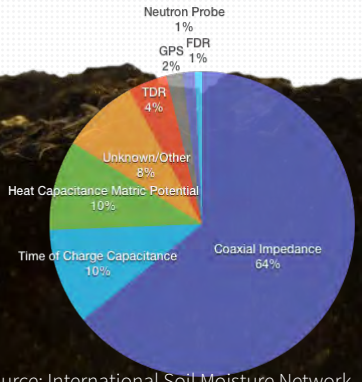
# HydraProbe



HydraProbe is a rugged soil sensor with patented technology that provides continual, consistent accuracy measuring a number of parameters including the three most significant soil parameters simultaneously—moisture, salinity and temperature.

As the most scientifically researched soil sensor available, it has been depended on by the USDA, NOAA, leading irrigation companies, and many universities for over 20 years. HydraProbe has been engineered to be exceptionally rugged and will provide data you can trust year after year.




Source: International Soil Moisture Network

**Used in more water supply forecast and climatological networks than any other soil sensor.**


## RELIABLE: Continual, long-term data without calibration.

- Stable—no sensor drift, ensuring continual accuracy.
- Uses unique "Coaxial Impedance Dielectric Reflectometry" to provide consistent long-term accuracy of moisture, bulk EC and temperature in any soil type. This also provides low inter-sensor variability, so every sensor measures the same without the need to calibrate.
- Soil moisture calibration has been rigorously peer-reviewed, making it one of the most trusted soil sensors available.

## RUGGED: Durable stainless steel tines, fully potted components, compact sealed design and a 5-year warranty.

- Can remain in-situ indefinitely, or relocated and redeployed without worry.
- Ideal for remote locations, harsh environments and applications where data is critical.
- Enables measurement of native (undisturbed) soil, even hard-packed clay.
- 5-year warranty.

## SIMPLE: Set it and forget it.

- Repeatable accuracy in virtually any soil type without the need for calibration, ever.
- Digital sensor using the SDI-12 or RS485 protocol—no setup, just connect to data logger. Compatible with any SDI-12 or RS485 capable data logger.
- Zero maintenance required.

## ACCURATE: Consistent research-grade accuracy every season, every location.

- Unparalleled spatial and temporal measurement consistency. No sensor-to-sensor variations across locations, seasons, soil types or moisture range.
- Instant measurement of the 3 most significant soil parameters simultaneously—moisture, salinity and temperature.
- Unlike other soil moisture sensors, performs equally well in high salinity soil.


# HydraGO

Rugged, accurate and easy-to-use portable soil data collection

Take soil measurements anywhere for those applications not requiring a permanent soil monitoring system. Your Apple or Android device communicates wirelessly with the HydraGO using bluetooth.

Simply insert the probe into the soil, and tap the "Sample" button in the HydraMon app. The app will display soil moisture content, temperature, conductivity, and dielectric permittivity on-screen for immediate viewing. The date and time of each measurement is recorded along with the soil measurement data and the GPS location measured by your smartphone's GPS receiver.

All data can be saved and emailed as a .CSV file for analysis in Excel. Notes and location names can be added to the data records.

The HydraGO features a rugged, engineered resin housing that contains a rechargeable battery good for a full day's heavy use. It comes with a detachable ergonomic pole so it can be inserted without bending over.

## Stevens GroPoint Profile

Multi-Segment Soil Moisture Profiling Probe

The Stevens GroPoint Profile provides cost-effective measurement of volumetric water content over multiple depths using a single probe, eliminating the cumbersome excavation required for multiple sensors placed at different depths.

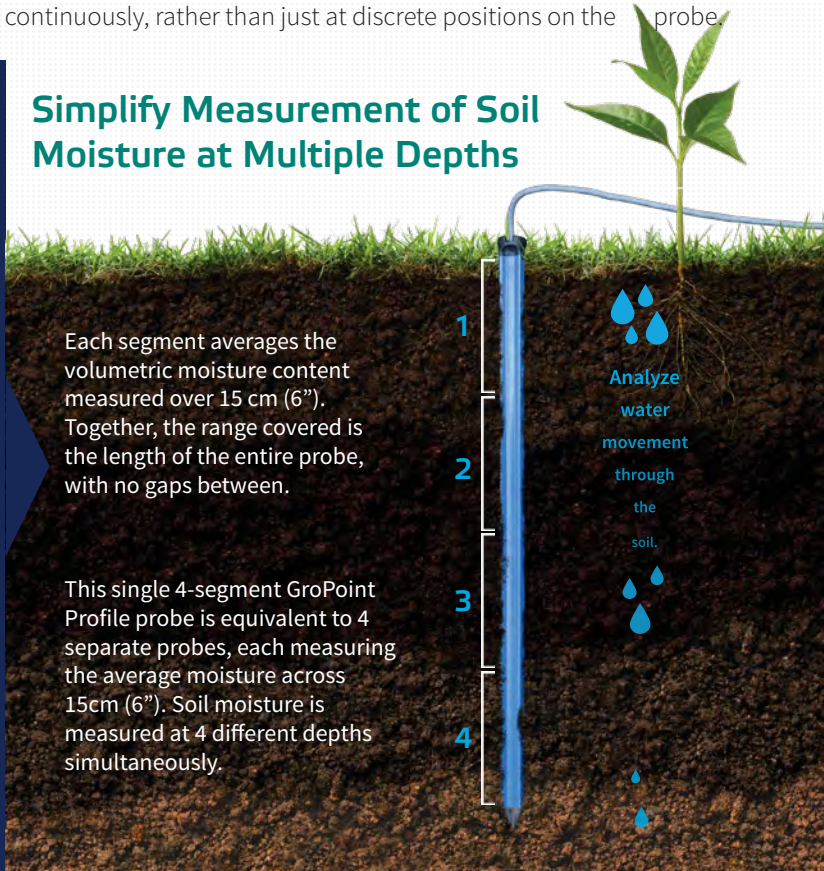
The sleek, lightweight design installs quickly with minimal soil disruption using a pilot rod and slide hammer tool. Designed for vertical installation, the sensor takes measurements over multiple soil layers, with each measurement zone (segment) providing the average volumetric soil moisture content over a 15 cm range (approximately 6 inches).

Unlike any other soil profiling probe, GroPoint Profile provides true soil profiling quantification, measuring the average moisture across the entire length of each segment. This unique feature allows measuring the water movement through the soil continuously, rather than just at discrete positions on the probe.

### An Accurate and Cost-Effective Soil Profiling Solution

- Eliminates need for multiple sensors and cabling systems.
- Installs quickly and easily without excavating.
- Available in six different multi-segment lengths (2 segments to 8 segments), suitable for a wide range of agricultural crop monitoring.
- Measures across the entire length of the probe, averaging the soil moisture and temperature in each segment
- One SDI-12 address is used to read all segments, providing for simplified installations. Optional RS-485 output.
- Moisture readings can be user-calibrated with 3rd-order polynomials to meet custom requirements.
- Low power requirements—suitable for remote, autonomous applications.
- Patented TDT$^5$ technology for scientific-grade accuracy and excellent long-term stability of measurements.
- Fully potted electronics for excellent durability.

### Simplify Measurement of Soil Moisture at Multiple Depths



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# HydraGO Field Version

Wireless Sensor-to-Smartphone Interface for HydraProbe

The HydraGO Field Version features a rugged, anodized aluminum housing that contains a rechargeable battery that powers the connected HydraProbe and built-in wi-fi radio. It comes with a carry strap for easy on-the-go measurements.

HydraGO Field Version communicates wirelessly with your smartphone or tablet using an ad-hoc wi-fi network created by the device itself.

The HydraGO Field Version is available with and without a survey-quality, sub-meter GPS receiver. When using a unit without an integrated GPS, the (less accurate) position measured by the smartphone is used when logging data.

The app will display soil moisture content, temperature, conductivity, and dielectric permittivity on-screen for immediate viewing. The GPS location, date and time of each measurement is recorded along with the soil measurement data.


# SOIL MATRIC POTENTIAL

The soil matric potential (also called water potential) represents the energy it takes to pull water out of soil where the water is held within the soil by capillary and absorptive forces. The drier the soil, the more energy that is required to pull the water out. Because the pressure can get very high in drier soils, a unit called pF is often used. The pF is the log of the matric potential in hPa.

The matric potential is important for understanding soil water dynamics, such as measuring when crops can become stressed for water, and for determining infiltration rates.

The TensioMark bases its measurement on the heat capacitance of the soil.

## ecoTech Tensomark

Matric Potential Sensor

The TensioMark measures the soil water potential or matric potential, the pressure it takes to pull water out of the soil. Water equilibrates with the ceramic tip portion of the sensor where the heat capacitance is measured. The matric potential is then calculated from the thermal storage properties of the soil, based on a sensor specific calibration.

Because the TensioMark bases its measurements on the thermal properties of the soil, it does not need to be calibrated by the user, and does not need to be filled with water. It has excellent accuracy and stability, and has a much larger range than any conventional tensiometer.

### TENSIOMARK FEATURES

- SDI-12 protocol.
- Completely maintenance-free (no filling required).
- Spontaneous reaction to moisture changes.
- Full measuring range—no measurement gaps in the summer due to dehydration.
- No frost damage, no influence of salinity.
- Also measures soil temperature.
- Excellent performance in very dry and very wet conditions.

# Water Level Sensors

## SMART PT

Smart SDI-12 / RS-485 Pressure, Temperature, and Digital Crest Gauge Sensor


Stevens' Smart PT is a ceramic membrane pressure and temperature sensor that delivers accurate results for a wide range of fluid level measurement applications. In addition to simple instantaneous measurements, this smart sensor features the ability to capture peak crest levels, and to automatically sample and report basic statistics on a configurable time interval.

A corrosion-resistant stainless steel housing and potted electronics make Smart PT extremely durable and long lasting for submersible water applications.

Smart PT is available with a vented or absolute pressure sensing module. Both versions come equipped with user specified length of cable. The vent tube provides an atmospheric reference which compensates for variations in barometric pressure.

In addition to programmable corrections for local variations in Earth's gravitational field, Smart PT also compensates automatically for the water temperature-density dependency.

Every Smart PT provides both SDI-12 and RS-485 digital interfaces. Compatible with existing power and data logging instruments, the sensor can easily be deployed for data collection at remote monitoring sites.

### Features

- < ± 0.1% full scale accuracy
- Aluminum oxide ceramic membrane
- Depth scales available from 2 meters (6.6 feet) up to 200 meters (660 feet)
- Rugged housing and fully potted electronics – no risk of leaking
- Compact size
- Not damaged by freezing water
- Vented or non-vented cable, user specified length
- Direct pipe connection option
- Low power consumption
- Lightning protection
- Overpressure tolerant

### Unique Abilities

- Average and standard deviation outputs on up to 3600 autosampled data points over configurable time window. Data is stored until requested using the M2 command.
- Crest gauge function automatically captures minimum and maximum level and number of seconds since the event.
- Smart autosampling can provide smoothing and oversampling.
- Custom offsets.
- Environmental corrections for local gravitational field and changes in fluid density due to temperature.

## SDX

Analog Pressure Transducer

Extremely rugged design—potted electronics, high-impact PVC housing—make the SDX an excellent cost-effective choice for hostile environments and applications that may put more expensive sensors at risk of damage or loss.

- Will not be damaged by freezing water
- Vented cable provides an atmospheric reference
- 4-20 mA output
- Accuracy (0.2% to 0.3% depending on range (0-5 ft, 0-10 ft, 0-35 ft, 0-50 ft options), 0.1% typical

## IRU-2420

Non-Contact Level Sensor

The IRU-2420 series provides a non-contact method of detecting level, presence/absence detection, volume, proximity and distance. With built in technology to compensate for unpredictable variables such as humidity, temperature and agitators, the IRU-2420 is the right sensor for your application.

- AutoSense Software for hassle-free setup
- Internal temperature compensation
- Works on solids and liquids



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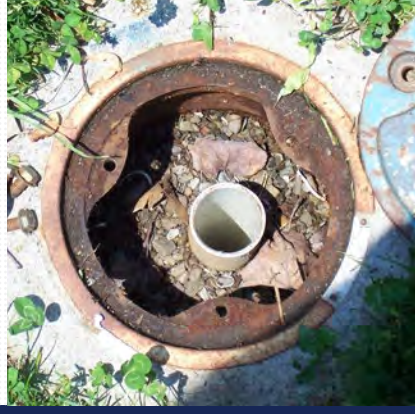
## Van Essen Instruments TD-Diver

Pressure Transducer with Integrated Logger


- Up to 10 years of use.
- Solid enclosure to make borehole deployments easier.
- Spend less time in the field with fast download speeds.
- Large memory enables user to take a sample every 15 minutes for 2 years.
- Enhanced data integrity with backup memory feature.



# VAN ESSEN DIVER FAMILY

Van Essen Diver logging sensors are submersible pressure transducers and data loggers for long-term uninterrupted, real-time water level monitoring when submerged at a fixed level under the water surface. The pressure sensor measures the equivalent hydrostatic pressure of the water above the sensor diaphragm to calculate the total water depth. The Diver autonomously measures pressure and temperature and records them in its internal memory. The Diver is ideal for ground and surface water level applications.

In addition to internal data storage, the Divers can be connected to an external data logger, such as the **Stevens DataLogic 3000**, or data telemetry systems like **Avo** with the Diver-SDI SDI-12 output adapter, allowing the Diver to be used for real-time data monitoring applications.

Manual data download in the field from a Diver's internal storage can be done by utilizing the optional USB Interface Cable and connecting the diver directly to a desktop or laptop PC.

**All Divers have a 3 year warranty, up to 10 years battery life, and can be used from 300 m below to 5000 m above sea level.**


**Micro-Diver**
For small diameter wells


**Cera-Diver**
For saline environments


**Baro-Diver**
Accurate barometric compensation


**CTD-Diver**
Corrosion-proof housing

## OTT RLS

Radar Level Sensor

The RLS offers a large measurement range with a small blanking distance and narrow beam width. Compatible with most SDI-12 capable data loggers. The RLS has extremely low power consumption and is ideal for remote or solar powered sites.

- ±0.01 ft accuracy for water level measurements, will not drift over time
- measurements available every 20 seconds
- unaffected by air temperature, wave action, humidity, flood events, floating debris, or contaminated water
- requires only 12 mA @ 12V
- can be mounted to slanted surfaces

# PAT (Position Analog Transmitter)

Shaft Encoder

The PAT consists of a float pulley shaft coupled through a pair of gears to a precision potentiometer.

When operated with Stevens instruments, the PAT obtains its power from the receiving device. If operated as a stand-alone transmitter, the user must provide power, typically 13 - 40 VDC.

- 4-20 mA, 0.2 VDC to 1 VDC or 1 VDC to 5 VDC output
- Imperial or metric ranges (compatible with 18" and 375 mm pulleys)
- Housed in an aluminum enclosure, which may be removed for access to zero and span adjustments as well as the gears for major range changes.

# SDI-12 Shaft Encoder

Float-Operated Level Sensor

The SDI-12 Shaft Encoder is available with an optional internal data logger. Without the internal logger, it can easily interface with data loggers and/or other equipment that have SDI-12 communication ports.

An LCD readout screen for quick display of current level and level offset adjustment is integrated into a NEMA-4 weather proof enclosure.

- Available with or without internal data logger
- Compatible with 12", 18", or 375 mm circumference pulleys
- Accuracy: avg. 0.25%, depending on float size

# AquaTrak 5000

Absolute, Non-Contact Liquid Level Sensor


The AquaTrak 5000 sensor provides accurate measurement of absolute liquid level in all weather conditions. Designed for rugged, unattended operation, the sensor has been field proven in adverse environments around the world for hydrology, oceanography, and hostile environment chemical and nuclear tank control systems.

The AquaTrak's technology uses ratiometric time comparisons of sequential sonic/pressure pulses that travel inside an environmentally protected PVC tube between the sensor transducer to the liquid. The AquaTrak 5000 controller, which is connected to the data logger, can be located up to 1000 feet from the AquaTrak transducer. The AquaTrak transducer combined with the controller calculates the true average level even in the presence of waves and surging liquid surfaces. The sample rates, number of samples averaged and data requested are selectable. Continuous measurement or exclusive data sets without outlier bias are standard operating routines. Self-calibrated measurement correction for ambient temperature, atmospheric pressure and gas density within the calibrated range(s), yields an accuracy of ± 3mm.

The AquaTrak also uses the US NOS (National Oceanographic Services) standard algorithm to determine the standard deviation for each data set used, which is used in turn to calculate the average wave height during the sample period.

# OTT CBS

Bubbler


The OTT CBS Compact Bubble Sensor is a compact, accurate, efficient, robust, and easy-to-use SDI-12 bubbler sensor for water level monitoring, which meets and exceeds USGS guidelines for accuracy. The CBS is low maintenance, with no desiccant required. A 5 year life is expected based on 1 minute intervals—no pump maintenance or lubrication required.

The CBS is contained in a compact ABS plastic housing and all programming can be completed using DIP switches on the back of the unit; connect into existing platforms using 3/8" O.D. or 4mm O.D. measuring tube.

Perfect for remote applications that require low power, the CBS's intelligent pumping strategy compares the previous measurement to the actual pressure at the current measurement, and optimizes the pumping time depending on the difference (i.e., small changes in level are measured with very short pump cycles), saving on critical battery power.

- Exceeds USGS guidelines for accuracy (±0.02 ft.). Higher accuracy version also available.
- Measuring range: 0-50 ft (0-15 m)
- Power consumption: 25 mAh/day @ 15 min. measurement intervals
- Integrated purge function


SMART Temp

Rugged SDI-12
Temperature Sensor


The Smart Temp sensor is available in two versions: one with a durable marine-grade stainless steel tine for easy soil insertion and another with a compact housing that fits through standard 1" conduit with 8" factory bend corners.

It also offers a loop hole which can be used to mount weights or pull the sensor through pipes or other small areas.

- Built-in calculations: automatically sample temperature and calculate minimum, maximum, and average temperatures with a flexible sampling period and window
- SDI-12 v 1.4 and RS485 interfaces (auto-detecting)
- NIST certification available
- Fully-potted components and robust PVC Type II housing, making the sensor ideal for harsh environments
- Extremely low current draw
- Works in water, soil, or air
- Suitable for freshwater or marine applications
- Firmware updates through RS-485

# Selecting the right water quality sensor for your application

Stevens works with a variety of top sensor manufacturers when building a water quality system. Whether you have a preference or opt to let our many years of expertise guide the choice, we will integrate the right sensor to accomplish your goals.

- SDI-12, RS-232, and RS-485 communication options
- Available sensors:
  - LDO (luminescent dissolved oxygen)
  - Temperature
  - Dissolved Oxygen
  - Conductivity
  - pH
  - Turbidity
  - ORP (Oxygen Redox Potential)
  - Chlorophyll A
  - Blue-Green Algae
  - Rhodamine WT
  - Total Dissolved Gas
  - Ion-Selective Electrodes (Ammonia/Ammonium, Nitrate, Chloride)
  - PAR (sunlight intensity)

eureka water probes

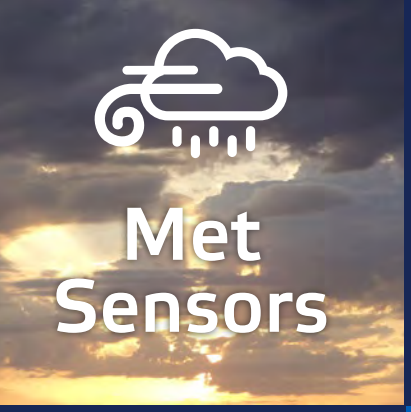

HYDROLAB

AQUAMONIX
Measure. Monitor. Master.


YSI

In-Situ

CAMPBELL SCIENTIFIC



# Met Sensors

## Met One Instruments 370/380 Series
All Metal Rain Gauge

The 370 and 380 series measures rain and/or snow in all environments using a tipping bucket mechanism. The economical tipping bucket design allows accurate, repeatable measurements, requiring no regular maintenance. Optimized to meet particular site and sampling requirements and exceeds EPA specifications.

- 8” diameter (model 370/375), 12” diameter (model 380)
- Self-emptying, dual chambered tipping bucket
- Jeweled bearings reduce wear and friction
- Funnel screen system prevents debris from clogging gauge
- Stainless steel, Teflon coated bucket
- Corrosion-resistant materials throughout
- Bubble level & adjustable feet assure proper mounting
- Optional heating elements for frozen conditions (model 375)

## OTT Pluvio²
All-Season Rain Gauge

Recognized worldwide for its precision and performance, the OTT Pluvio² is an all-weather precipitation gauge featuring High precision precipitation accumulation and intensity measurement in virtually any climate. It uses superior weight-based technology to measure rainfall, snow or hail.

- Large collection capacity - 750 mm or 1500 mm
- Precipitation accuracy within 0.004” with accumulation and intensity readings and filter algorithms to compensate for wind, temperature, and evaporation

- Virtually maintenance-free: lifetime factory calibration, drift-free measurements, and robust protective housing eliminate field visits for instrument service
- Multiple communication interfaces: SDI-12, RS-485, and Pulse Output options

- Wind protection shield available for particularly exposed locations
- Heated ring option available to prevent the accumulation of snow on the sensor
- Easy installation onto 4” pipes
- Complies with WMO guideline No. 8

## Apogee SP-212
Solar Radiation Sensor

The Apogee SP-212 is an accurate, reliable, and durable pyranometer featuring a silicon-cell photodiode with excellent cosine response and measures total solar radiation to within ±5%.

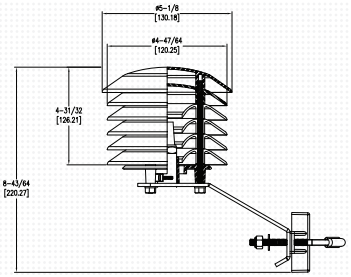
The SP-212 is fully potted with a domed-shaped head making the sensor fully weatherproof, self-cleaning, and impervious to thermal based accuracy fluctuations.

Each SP-212 pyranometer is carefully pre-calibrated in controlled conditions and traceable to ISO class reference standards so the sensor is ready to go right out of the box.

## SMART BHT

Smart barometric pressure, humidity and temperature sensor


The Smart BHT is an integrated barometric pressure, relative humidity, and temperature sensor that meets WMO specifications. In addition to instantaneous measurements, this smart sensor can sample measurements every second and output the average, min/max levels and standard deviation of those sample over logging intervals. The Smart BHT also computes the dew point.



- Meets WMO guidelines.
- Digital output that autodetects SDI-12 or Modbus RTU commands.
- 279 micron, 316T stainless steel mesh for insect and dust protection.
- Dew point calculation.
- One-second sampling with output average of samples over logged interval.
- Min / max of samples over log interval.
- Standard deviation output of samples.
- Robust lightning protection
- Replaceable sensor board for rapid recalibration replacement.
- Optional solar radiation shield.

## Met One Instruments 50.5

Ultrasonic Wind Speed/ Direction Sensor

The 50.5 Solid State Wind Sensor is a continuation of the development work started with NOAA on sonic wind sensors over 25 years ago. This sensor design contains the same wind distortion algorithm and factoring that has been proven and accepted in applications around the world.

- Digital and analog outputs
- 16-point wind tunnel calibration with each sensor
- Data output is field set to user requirements
- Optional heating unit allows continuous operation in ice and snow
- Maintenance-free—no moving parts to wear out

## Lufft WS500-UMB / WS800-UMB

Multiparameter Weather Sensor

Integrated design with ventilated radiation protection. The WS-500 measures air temperature, relative humidity, air pressure, wind direction and wind speed. The WS-800 adds precipitation intensity, precipitation type, precipitation quantity, solar radiation, and lightning detection. One external temperature or rain sensor is connectable.

- All-in-one housing concept of a compact weather sensor combining multiple measurement parameters in one housing with only one cable connection
- First and only all-in-one compact weather sensor with lightning detection
- Built-in data pre-processing, universal interfaces and selectable output protocols
- SDI-12 and RS485 interfaces
- Maintenance-free operation – no moving parts to wear out
- Suitable for all climate zones; also for solar-powered automatic meteorological stations
- Integrated heater that can be switched on if there is danger of frost

## R.M. Young 05103

Mechanical Wind Speed/ Direction Sensor

The 05103 Wind Monitor is a high performance wind sensor. Rugged, corrosion-resistant construction makes it ideal for a wide range of wind applications.

The wind speed sensor is a four blade helicoid propeller. Propeller rotation produces an AC sine wave voltage signal. The wind direction sensor is a rugged yet lightweight vane; angle is sensed by a precision potentiometer. Constructed of UV stabilized plastic with stainless steel and anodized aluminum fittings, the sensor mounts on 1" pipe.

- Accuracy - wind speed: ±0.3 m/s (0.6 mph) or 1% of reading, wind direction: ±3°
- Operating temperature: -50° C to 50° C

# Data Loggers

## DataLogic 3000 & DLight

Flexible, versatile, economical dataloggers ideal for most applications


The Stevens DLight and DL3000 data loggers are flexible and versatile, ideal for many remote monitoring applications. Data is stored internally and also backed up on a removable SD Card (up to 2GB) for additional redundancy and easy transfer to your computer.

Each sensor input port has isolated lightning protection. A 24 VDC loop power supply provides sufficient current to drive sensors.

Windows software allows easy programming of logging and the reporting of sensors and telemetry interface, offsets, basic math, and alarm conditions—all with a graphical interface.

The DataLogic 3000 is a full-featured logger that will meet the data acquisition, processing, control and communication requirements of even complex stations.

It is available with an optional touchscreen display integrated into a NEMA-4 enclosure, which can also accomodate a SOLO power management controller and 9 aH battery.

DLight has fewer inputs than the DataLogic 3000 or other high-end loggers, but an attractive price. It's ideal for small to medium-complexity stations.

| Feature | DataLogic 3000 | DLight |
|---|---|---|
| **Sensor inputs** | 9 analog (0-5V & 4-20mA) / 1 pulse / SDI-12 | 4 analog (0-5V & 4-20mA) / 1 pulse / SDI-12 |
| **Sensor power** | 24 VDC, 12 VDC, 5 VDC, (12VDC & 24VDC under firmware control) | |
| **Memory** | Internal 2 GB flash / removable 2 GB SD Card | |
| **Serial port** | 2 RS-232 / 1 USB 2.0 | 1 RS-232 / 1 USB 2.0 |
| **Output** | 1 control output 0 – 5 V (steady state or pulse) | |

## Is your station within cellular range?

## Log your data in the cloud.

Not only will you eliminate the cost and power consumption of a separate data logger, you'll be able to access your data anywhere, anytime.

- automatic processing of data and custom calculations
- alarms triggered on measured conditions
- integration of 3rd-party data in calculations
- remote configuration of data acquisition and sensors


PAGE 5




**eTracker**

PAGE 7


## MEASUREMENTS TO MIND

The shortest path from a sensor (measurement) to insightful decisions (mind)

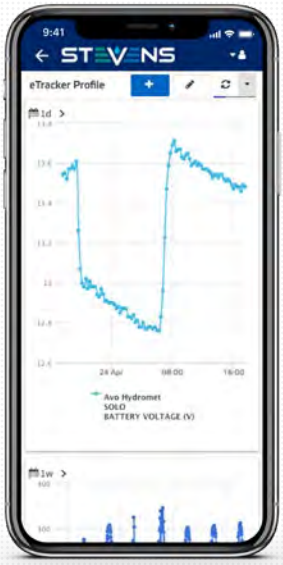
**It's the evolution of remote data collection.**

# Software

STEVENS CONNECT

Data Integration Hub

## Turn Your Data Into Useful Information




Stevens-Connect is a cloud-based application that is as much at home on your smartphone as it is on your laptop. You don't need to install an app, just go to stevens-connect.com.

Stevens-Connect is a cloud-based data acquisition and management software system that enables the collection, analysis, reporting, and storage of data from remote monitoring locations. As a cloud-based software-as-a-service (SaaS), Stevens-Connect streamlines the data management process and can be accessed from any computer or smartphone with Internet connectivity.

Our cloud-based data integration hub is incredibly powerful and incredibly intuitive. It's used to configure your sensors' logging and reporting settings. It stores and analyzes your data, notifies your smartphone when conditions are met, allows you to visually create custom calculations and "virtual sensors", and it can receive and/or forward data from/to 3rd-party systems.

Stevens-Connect manages data from multiple locations and reduces the need for a localized data management software and data collection hardware.

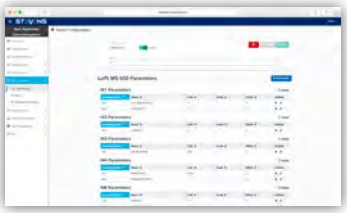
- Immediate access to data, anywhere, any device.
- Reduced IT requirements: no need for upgrades, transfer to other PCs, uptime maintenance, security.
- No special hardware required, other than a modem at each monitoring location.
- No software to install or reinstall.
- Easily scalable: add additional station data collection when needed. Access data from any number of computers, even simultaneously.
- Data received via cellular (CDMA and GSM) or satellite communications (GOES, Iridium, Inmarsat)
- Selectable calculations
- Custom math functions and calculations
- Data output in XML, Excel, .CSV and other formats
- Alarms
- Map view and integration of external data feeds
- Integrated Report Writers
- REST API supports integration with 3rd-party apps


### Drag-and-drop Customizable Dashboard

Customizable dashboard lets each user configure what at-a-glance data to show, and how. Drag-and-drop widgets, place them where you want and stretch to resize. High-visibility single data values, line graphs, bar charts, fuel-gauge style graphs, 360° directional graphs and more, for any parameter your station is measuring.

### Custom Calculations and Data Transformations

Use the visual formula builder to create simple to complex math functions using any sensor data as variables. Create a "virtual sensor" from this data to create new graphs or serve as inputs to other calculations.



### Remotely Configure Hardware

Provides an straightforward interface for configuring your remote Stevens M2M hardware. Control all aspects of the station including logging and reporting intervals and all analog, pulse and SD-12 sensors. Make changes at any time, even if the station is in low-power (sleep) mode.

NRCS USGS science for a changing world
AQUATIC INFORMATICS KISTERS

### Pull From and Forward to 3rd-Party Systems

Use data from 3rd-party sources to create graphs or custom calculations.

Forward data in various formats for 3rd party software platforms, like Aqaurius or WISKI, or in other formats such as pseudo-binary, SHEF, and more.

# Accessories

## Smart SDI-12 Power Management Control

A power sensor, controller and management first-of-its-kind innovation

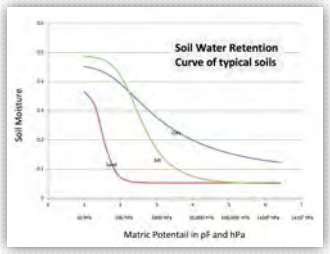

Much more than a solar charge regulator, SOLO can receive commands via SDI-12 or remote pulse commands to control power to other connected devices (sensors, data loggers, radios.) With 2-way telemetry, this allows you to power cycle your station remotely when needed, or program a data logger to power cycle on a regular schedule as a preventative measure. It can automatically power cycle if SDI-12 queries stop being received.

In addition to remote power management control, SOLO can log various power system status data as an SDI-12 sensor. This permits logging of power health data and retrieving it via remote telemetry which can help in understanding the efficient management of the power demands of a remote location.

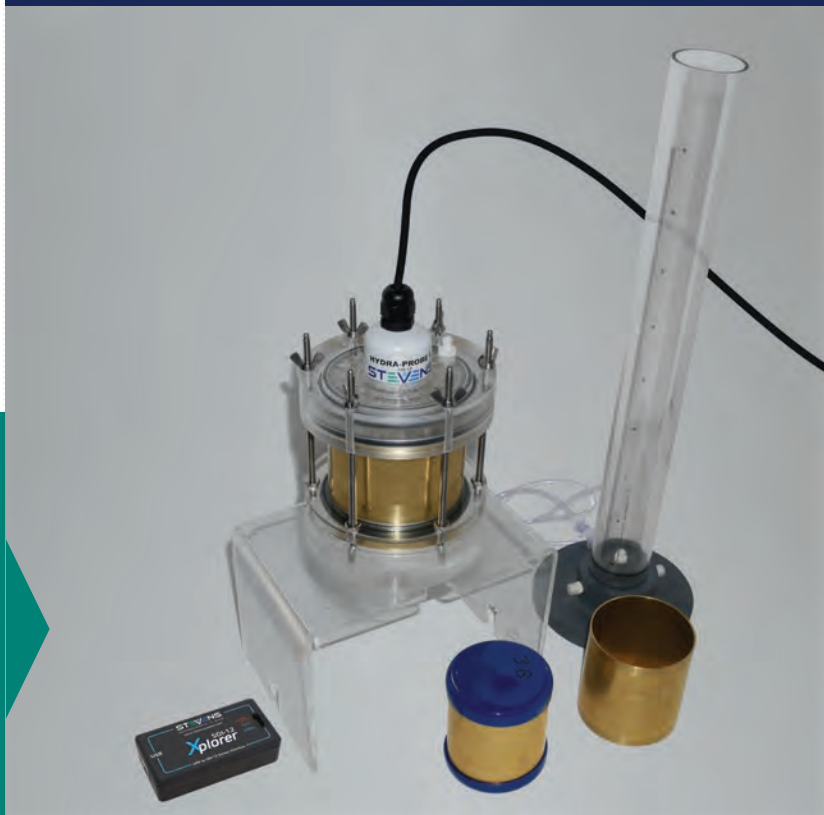
- Measures battery voltage, load current, and solar panel voltage output during solar cycle at a point in time or based on programmable sampling average.
- Remotely or automatically power-cycle the whole station via SDI-12 or pulse commands
- Efficiently regulates power from solar panel to battery to extend life of battery by float control of power and temperature monitoring of the battery to avoid excess battery heating
- Selectable setting of gel cell or lead acid batteries using an extended SDI-12 command

## Stevens Tempe Cell System

Soil Moisture Analysis System




The Stevens Tempe Cell System can employ five different methods to eliminate the uncertainties from soil moisture measurements and achieve the highest level of accuracy. This system uses an enhanced gravimetric method to measure soil moisture to obtain the actual volumetric water content and develop a soil moisture calibration equation to validate and/or program into soil moisture sensors. In addition, the system's outputted data can be used to develop a soil-specific calibration curve, and to develop an algorithm to determine the soil's matric potential using the HydraProbe.



## SDI-12 Xplorer

USB to SDI-12 interface


The Stevens SDI-12 Xplorer enables easy programming of any SDI-12 sensor simply by connecting the sensor to a computer's USB port.

Configuration of the sensor can be done using any terminal program or Stevens Windows-based Xplorer software that includes an expanding library of SDI-12 sensor and their respective commands.

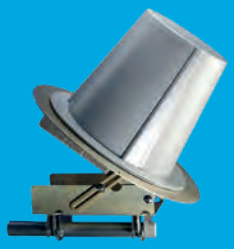
The USB power output is transformed to +12 V out and GND for directly powering connected SDI-12 sensors.

The Xplorer software also includes a feature that will log sensor readings to a computer file based on user selectable interval, which is useful for testing SDI-12 sensors.

- Easily configure any SDI-12 sensor directly from a computer
- No data logger needed
- Easy-to-use Windows GUI
- Sensor power provided via USB connection—up to 150 mA

## V2TH / V4TH Rugged GOES Antennas

Rugged, reliable, and cost-effective antennas for GOES and other satellite networks in all climates



The Stevens V4TH and V2TH satellite antennas provide a cost effective, high performance geostationary satellite data telemetry link for hydrological and meteorological data transmissions. The helix design virtually eliminates all existing problems that occur with other available antenna technology. The antennas were designed to operate through high winds, snow and ice load, woody debris entanglement, wildlife nests, etc.

The V2TH features a +5.5dB gain, while the V4TH features a +10 dB gain.

Both antennas utilize the same mounting hardware, which can be suspended or mounted inside nonmetallic protective structures, or mounted outside on a building, post or tower.

- Rugged and durable polycarbonate housing
- Versatile and easy to mount
- Reliable signal transmission through obstructions
- Uniform antenna beam pattern
- For geostationary satellite communications using 401MHz

## Shark

RS232/RS485 Bluetooth serial adapter

The Shark converts your data logger or industrial equipment into a Bluetooth wireless-enabled communications instrument. It's a RS232/RS485 serial port adapter that uses Bluetooth SPP (serial port profile) protocol to replace RS232 or RS485 cables.

The Shark is a Class 1 Bluetooth radio technology and achieves at least a 100-meter range of communication. Unlike other RS232 adapters with Bluetooth wireless technology that simply establish a Bluetooth wireless connection to allow sending of serial data, the Shark emulates the behavior of a serial port that has a serial cable connection. The Shark achieves this by turning the COM port on only when a Bluetooth wireless connection is established.

- Standard antenna attachment allows multiple configurations for longer range
- LEDs indicate connection, power status
- Turn off "power" LED for power savings
- Internal rechargeable battery
- Collect data from 100 meters away with Smartphone or laptop
- Built-in power management
- Programs in minutes with Windows-based software
- Use internal or external power supply

# Staff Gages

Stevens is one of the world's leading producer of staff gages

Style A

Style C

Style E

Style I

Style M

Figure Plates

Stevens' environmentally rugged staff gages provide a quick and easy visual indicator of water level and flow. Every water level monitoring station should include a staff gage from which the height of the water may be visually and easily compared to any data logger's reported measurement.

Enamelled iron gages are preferred over other type gages (such as painted gages) since they resist rust, corrosion or discoloration and will last almost indefinitely with proper installation and maintenance. Any algae, organic/marine growth or other dirt build up on the gage is easily washed off.

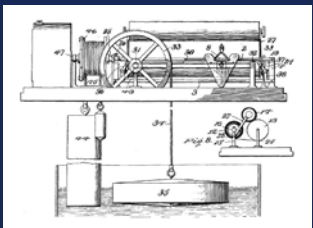
Staff gages are typically placed on a redwood, cypress, cedar or synthetic board of suitable width and the board itself it then attached or embedded to the wall. Mounting a staff gage directly to concrete or metal structures is also done, but care should be taken so that the mounting screws are not excessively tightened since this could chip or fracture the porcelain. In order to prevent this, rubber grommets should be placed immediately under the screw head before installing the gage. Stevens staff gages are designed to accept a #8 ¾" round head brass wood screw. Each staff gage includes pre-drilled mounting holes with a brass grommet ring to help avoid any porcelain chipping or fracturing from over-tightening.

Custom staff gages can also be designed by Stevens. They are individually designed for large size, slopes or flow measurements or for other unique mounting angles that an off-the-shelf staff gage cannot measure.


**Purchase products online!**

**www.stevenswater.com**

# OVER 100 YEARS OF **INNOVATION**



**1911** — JC Stevens invents the Type A chart recorder, the first continuous stage recording device. This original design is the basis for today's Type A and Type F recorders.

**1911** — Stevens Water Monitoring Systems was originally founded as "Leupold & Voelpel" in 1907 by brothers-in-law Marcus Friedrich (Fred) Leupold and Adam Voelpel. The firm, located in Portland, Oregon was primarily focused on the repair and manufacture of surveying equipment.

**1914** — JC Stevens joins Marcus Leupold and Adam Voelpel's company, firm renamed to "Leupold, Volpel & Company".

**1937** — The Telemark, the first remote water level reporting device, was introduced by JC Stevens. The product was patented two years later in 1939.

**1942** — The company was renamed "Leupold and Stevens Instrument Company" after the death of founder Adam Volpel and to better reflect the company's current focus.

**1944** — JC Stevens helps found the Oregon Museum Foundation, which would later become the Oregon Museum of Science and Industry (OMSI) in 1949. JC Stevens would serve as president of OMSI for 13 years.

**1947** — Leupold and Stevens Instruments designs and sells their first hunting sight, setting the future for the "Leupold" side of the business to focus on sport optics while "Stevens" continues to pioneer the water measurement business.

**1968** — The continued growth of Leupold and Stevens Instruments is cause for a move to new, larger manufacturing facilities in Beaverton, Oregon. The new 66,000 square feet headquarters was built to handle 20 years of expansion—instead, the space was used up within four short years, necessitating further expansion.

**1998** — The optics side of the company and the water monitoring side of the company are separated from each other, with Stevens becoming "Stevens Water Monitoring Systems, Inc.", a privately-held company with its primary focus on monitoring water in the environment.

**2000** — The original (analog) Stevens Hydra Probe, based on patented technology is released to the market, soon becoming a best-seller for Stevens as a way to quickly measure water content, salinity, and temperature of soil.

**2004** — Stevens releases The Shark, the first Bluetooth radio transmitter specifically designed for the environmental monitoring and testing market. It can link devices from up to 300 feet apart, and features true RS232/RS485 serial cable emulation.

**2007** — Stevens moves to its new corporate headquarters in Portland, Oregon near Portland International Airport, affording more room to grow as the company expands its business.

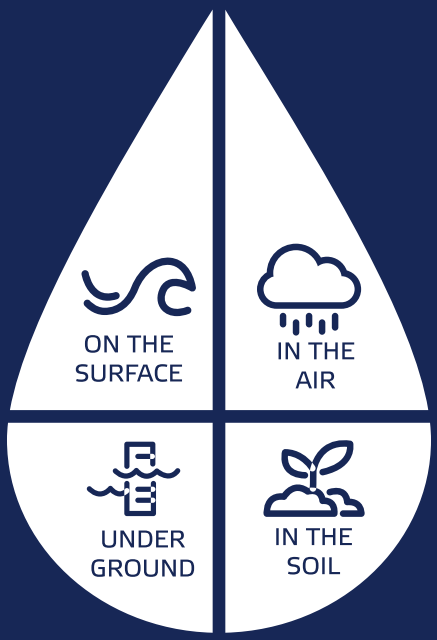
**2011** — Stevens Water Monitoring Systems celebrates its 100 year anniversary of monitoring the Earth's environmental resources.

**2015** — Signalling the beginning of a new chapter of innovative product development, Stevens completely re-brands the company. Our new tagline "Measurements to Mind" shows how invested we are in the concept of cloud computing—we believe there will be a fundamental shift in how the industry collects data, and we intend to lead the charge.

# ABOUT STEVENS WATER

Stevens Water Monitoring Systems, Inc. is a manufacturer of integrated hydrological, meteorological and oceanographic monitoring instrumentation, accessories and information systems that help optimize water resource management and enhance forecasting.

Our focus is the earth's valuable water resources, in every form it occurs:




| S | T | E | V | E | N | S |
|---|---|---|---|---|---|---|
| STRONG | TECHNICAL | ENTHUSIASTIC | VERSATILE | ENGAGING | NURTURING | SUCCESSFUL |
| Do what's right, not what's easy | Engineers, technologists, innovators | Have fun and love what we do | Proactive in ALL aspects | Professional with ALL | Easy to do business with | Grow big, or go home! |

STEVENS

**Stevens Water Monitoring Systems, Inc.**

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