

SENTRY™

Real-time microbial performance monitoring
in wastewater treatment systems.

Monitor microbial bio-activity, optimize performance and
provide early warning of system imbalance.



Reduced risk of process failure by
preventing toxic events and system imbalance.



Detailed monitoring to identify patterns
in system performance (daily, weekly, monthly)



Increased efficiency by maximising
reactor performance.



Clearly monitor real-time performance
of resident microbiology from any device.



Receive early warning alarms
for system imbalance and toxic events.



Accurately diagnose poorly performing
systems and match to operational events.



Version: SENTRY-2.0

Probe Installation

The SENTRY probes are designed to be installed in various anaerobic and aerobic locations through the wastewater treatment process, including:

- Influent load/fluctuation monitoring
- Toxic shock monitoring and identification
- Conditioning tank optimization for biological phosphorous removal
- Nutrient bioreactor monitoring
- Monitoring of anaerobic digestion performance
- Effluent compliance monitoring

SENTRY probes can be installed easily with existing recirculation lines of a tank.

The probes install into a PVC in-line tee fitting with an 1.5" NPT thread. A suitable tee fitting will be supplied to fit each on-site application.

Recommended tee size : Sch 40/80 PVC 2" or larger



SENTRY probes can also be easily added to numerous open bio-reactor locations using drop-in installation options.



Figure 2.3
Protected drop-in mount



Figure 2.0
installed in 2" tee



Figure 2.1
Electrodes installed
parallel to flow path.



Figure 2.2
Open bio-reactor install



Figure 2.4
Drop-in mount option

Technology Description

SENTRY is a world-first, real-time sensor solution that provides direct monitoring of microbial activity of the microbes involved in the wastewater treatment process.

SENTRY leverages bio-electrochemical sensor technology to relay bio-activity (metabolic activity) of the microbiology to the wastewater system operator. This data allows operators to continually monitor the microbial stability (health) of their wastewater treatment process. Furthermore, this data can be leveraged with other water quality and operational data to improve/optimize system performance.

Bio-electrochemical systems (BES) are a novel technology that rely on bacteria that use insoluble metal deposits as electron sinks during the anaerobic consumption of organic substrates. By substituting an electrode for the metal deposits, electrical current can be recorded as it passes through an external resistor. The generated bioelectric current is the product of microbial metabolic activity of exoelectrogenic bacteria involved in the wastewater treatment process. The obtained biological data is instrumental in understanding the impact of water quality (pH, nutrient content) and operational parameters (temperature, flow rate, organic load) on the biological process's efficiency, and resulting system performance.

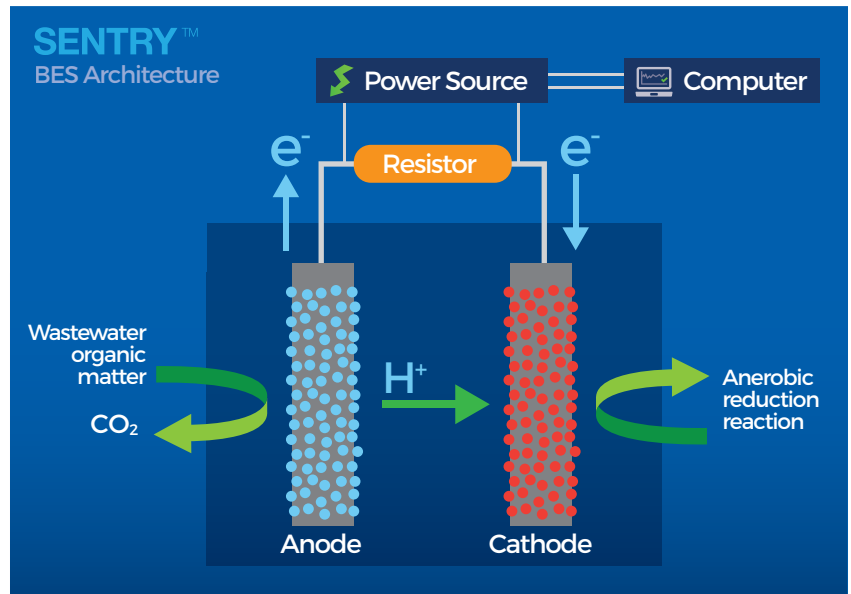


Figure 1.0 - BES Architecture Diagram

SENTRY includes an online dashboard for remote visualization and storage of real-time microbial performance data. SENTRY is a tool for system operators to help stabilize/optimize system performance and avoid costly system failures by providing early warning of biological instability.

The sensors are installed and connected through a 1.5" NPT fitting into a pipe with at least 2" in diameter. Typical installation for a single probe is in the recirculation line of the anaerobic tank, but if sequential tanks are present - for hydrolysis, acidogenesis etc. - a probe installation in each tank is recommended.

NOTE: Each SENTRY system can accommodate up to 4 probes.

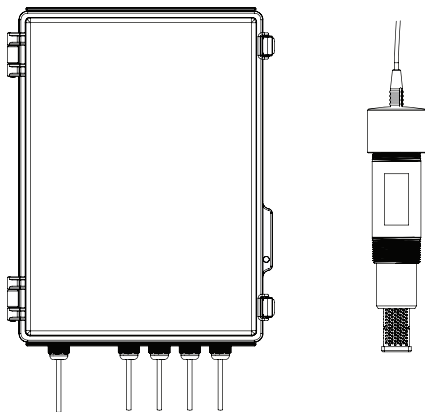
Data produced from the sensor can be used to:

1. Predict process upset via instability in microbial metabolism
2. Correlate fluctuating bio-electrode output to system input / process / operational events
3. Aggregate data to determine daily, weekly, and monthly performance patterns



SENTRY™

General Specifications



Dimensions
Enclosure
Inputs
Probe

15.9" x 12" x 5.2"
NEMA 4X/IP67 wall mounted
IWT SENTRY probes (up to 4)
In-line 1.5" NPT via IWT 2" Sch 80 Tee fitting.

Certification

UL/CSA 61010 certified

Power Supply
Communications

100-240 VAC 50/60Hz, 24vDC operating.
WiFi. Optional cell modem

Interface

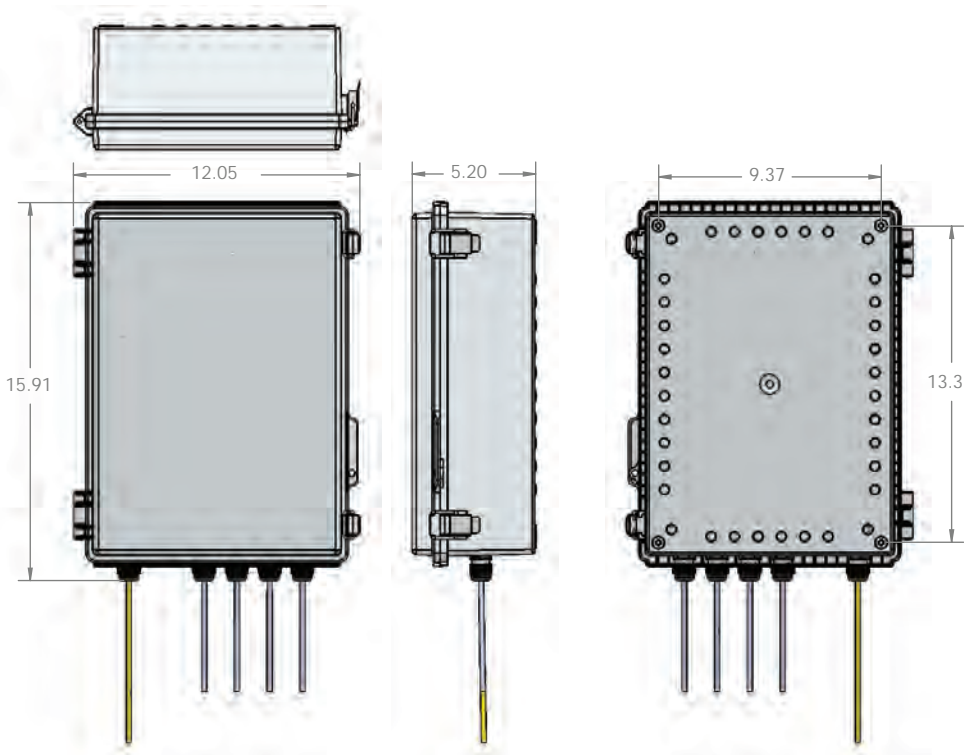
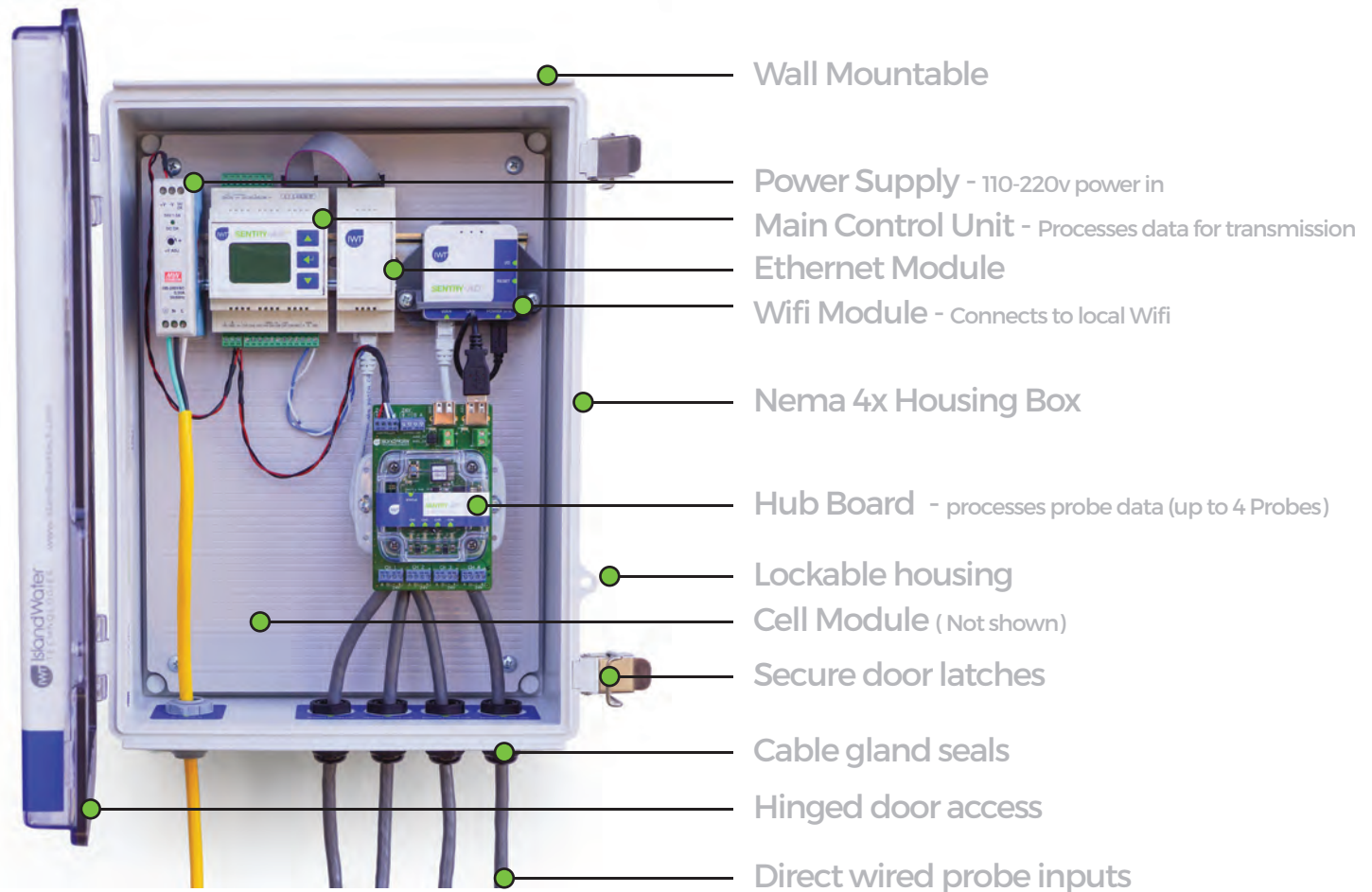
Onboard operational status indicators.
Touch panel on controller with display
for current reading and operational status

Data Management

Cloud storage provided – Online real-time
dashboard with graphs provided – Data
available for download for further analysis



Housing Features



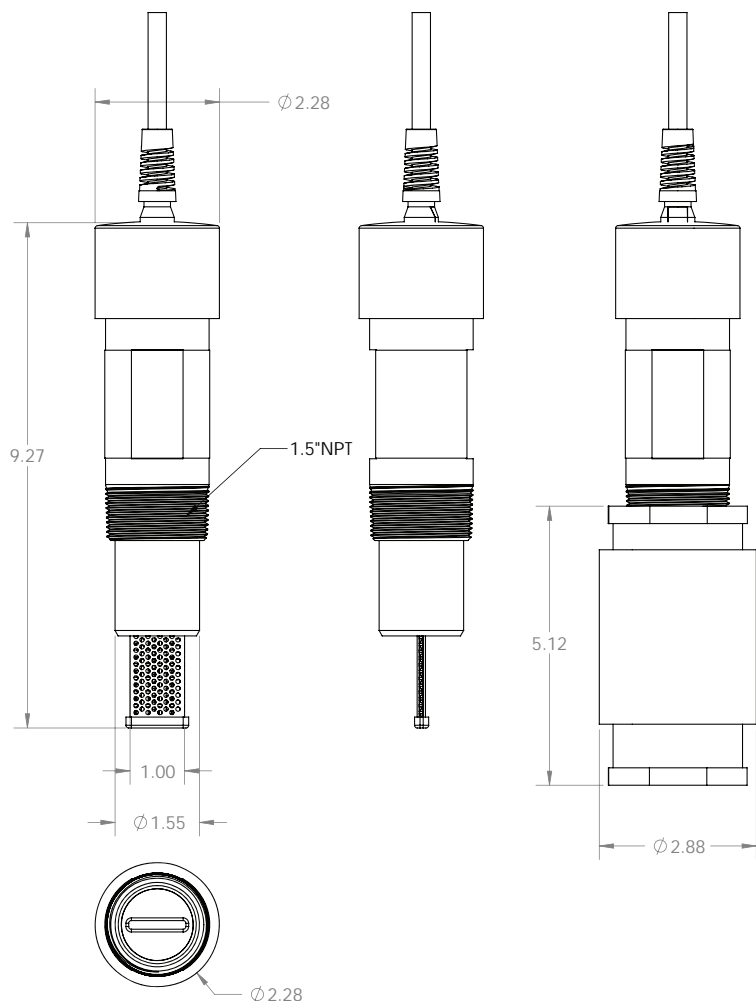
Housing Dimensions

Overall sizes, not including mounting brackets.

Dimensions in inches

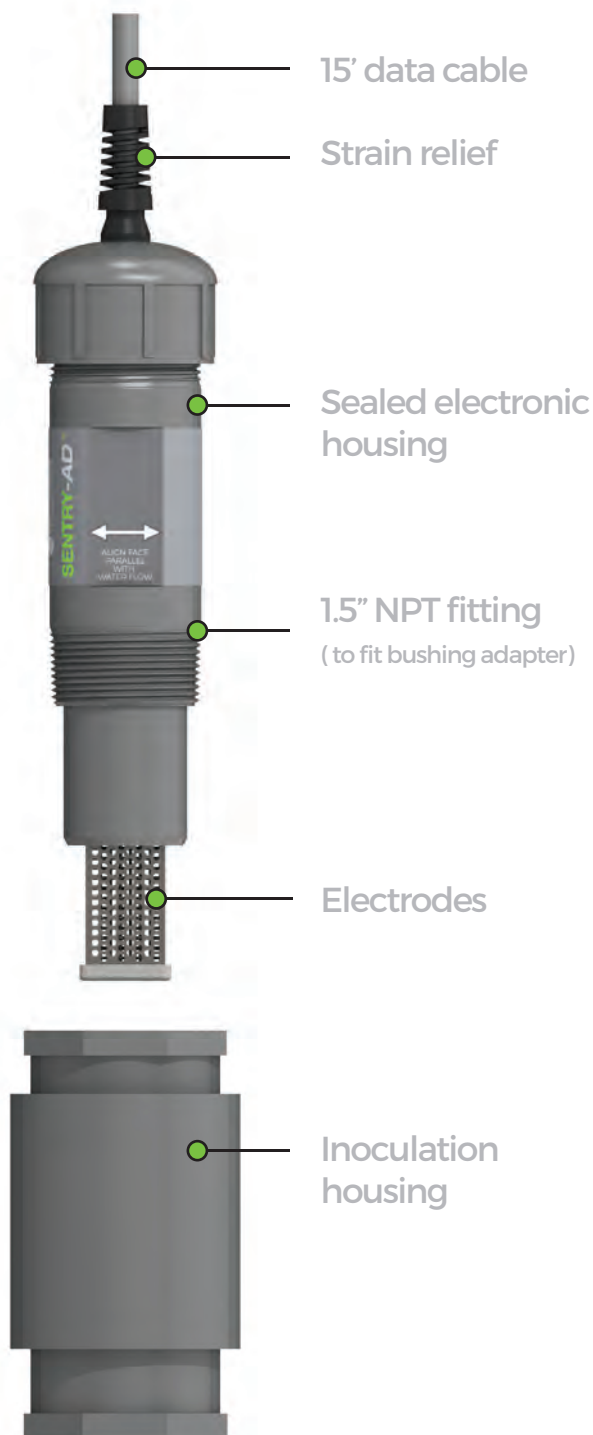
Probe Features

Bio-Electric Sensor Probe 1.0



Dimensions Cable Install

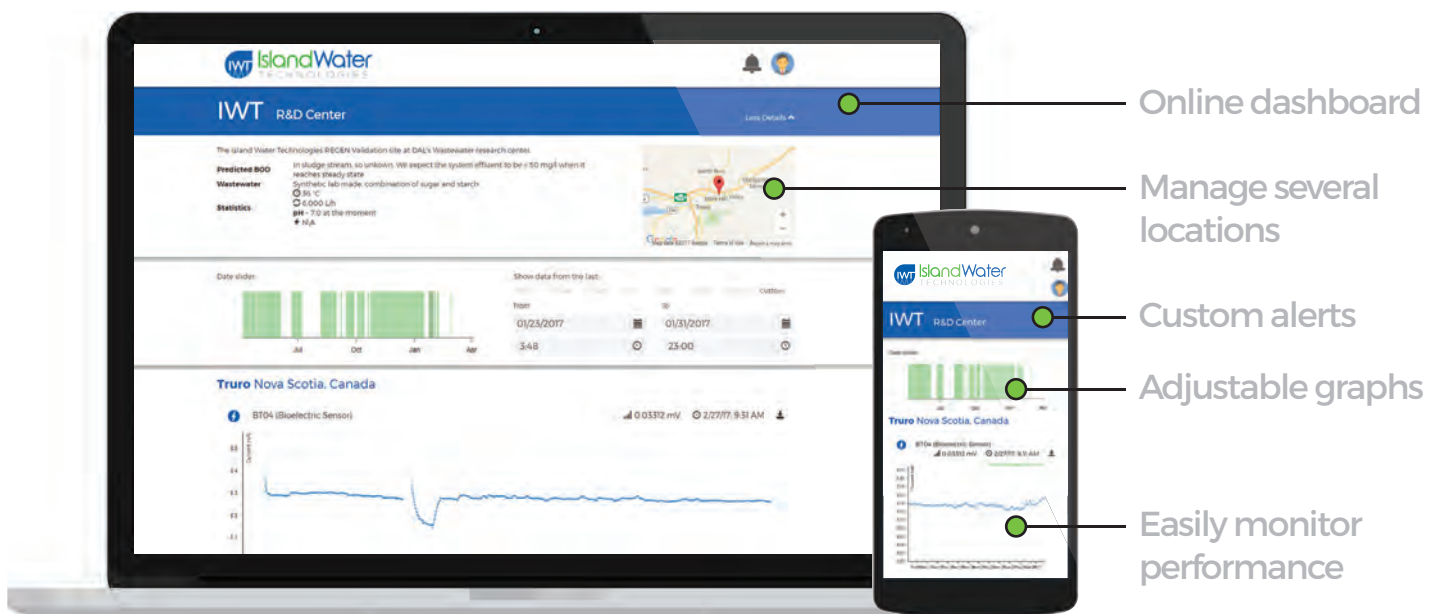
As above (Dims in INCHES)
Standard 50', other lengths available
Standard 1.5" NPT PVC fitting, other options available



Online Dashboard

The online dashboard allows users access to visualize microbial-electrode metabolic activity in real time. Data is presented with user options to view on hourly, daily, weekly, monthly or customized intervals. Customizable alerts can be setup for real-time operator notifications.

Data can be selected and downloaded in CSV format for off-line data analysis. Multiple installed electrodes can be visualized with the same login and dashboard allowing for a single location to visualize a network of installed probes or systems.



Microbial Performance Monitoring

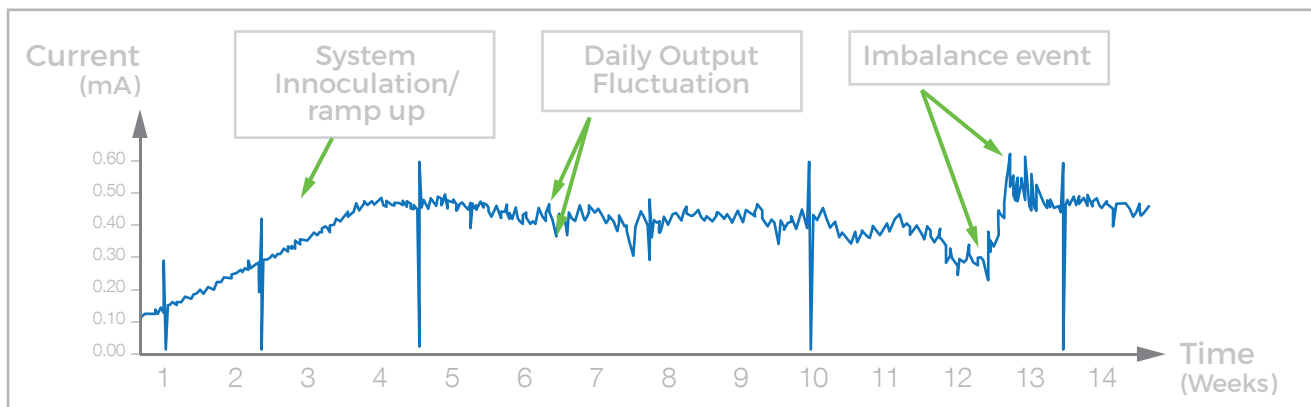


Figure 3.0 - Sensor data, as displayed on the dashboard, from a sensor installed as a commercial demonstration

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in anaerobic wastewater treatment systems.



For more information please contact:



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