AXYS TECHNOLOGIES INC.

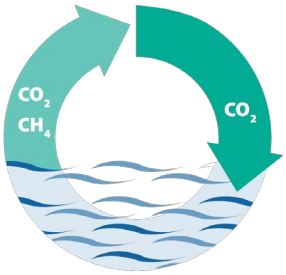
GHG SENTINEL™

Automated Greenhouse Gas Monitoring System

FEATURES & BENEFITS:

- Field deployable
- Simultaneously monitor concentrations of CO_2, CH_4 and O_2 in freshwater
- Gather accurate and reliable time-series data without water samples
- For use in hydropower plants, reservoirs and tail race
- User friendly set-up/ servicing
- Scalable and expandable for additional in-situ sensors

A continuous automated monitoring system for greenhouse gas concentrations in freshwater environments.



GHG Sentinel™
AUTOMATED GHG SYSTEM

A Revolution in Greenhouse Gas Measurement

GHG SENTINEL™

The GHG Sentinel™ is a continuous automated greenhouse gas monitoring system. This field deployable device performs time-series measurement of Carbon Dioxide (CO2), Methane (CH4) and Oxygen (O2) in freshwater environments without taking water samples to the laboratory for costly analysis. The GHG Sentinel™ can be deployed on a floating platform in a reservoir, within the powerhouse of a hydroelectric facility and also as a shore station in the tail race. As the system is designed with multiple air and water flow sensors and the powerful WatchMan500™ controller, the system can run for months without servicing. The GHG Sentinel™ can also be controlled remotely for real-time data display as well as station management and system diagnostics.

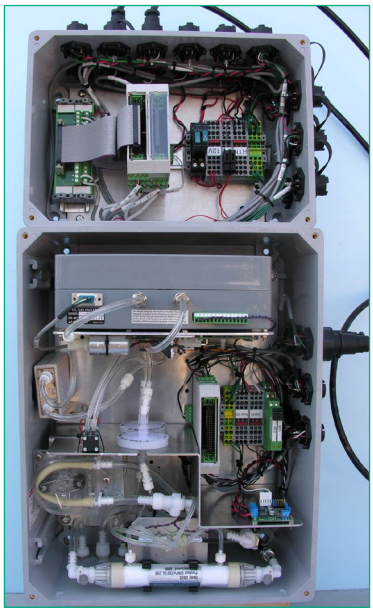
The GHG Sentinel™ Data Management System (DMS) Software facilitates complete control over the GHG Sentinel™. Features include intuitive remote configuration, diagnostics and archiving of the data acquired by the GHG Sentinel™ into a SQL database and/or ASCII text files. The AXYS DMS includes WebView™ functionality which is an intuitive data presentation tool to allow users the ability to easily generate tables, graphs and regular reports with their GHG Sentinel™ data. Data can also easily be exported to a variety of formats.

The GHG Sentinel™ product is based on the research and prototype developed by the Department of Fisheries and Oceans Canada. Since then continuous monitoring systems have been installed in hydro generating stations in the provinces of Manitoba and Québec. AXYS has refined the core system design and utilized its years of remote environmental monitoring experience and expertise to optimize the unit for longer term field deployments. The most significant improvements include remote system management with greater control of flow rates, as well as the flexibility to add new sensors to the system with the available spare sensor ports.

Multiple telemetry options are available including VHF radio, Inmarsat D+, Iridium, GSM and CDMA cellular phone. The data from the GHG Sentinel™ can include the time-series measurements of GHG concentrations from freshwater, system health status data, system configuration information and threshold alarm messages. Data from additional optional sensors can also be transmitted. All data is stored on the internal data logger and can be downloaded onto a computer directly on site or remotely.

GHG Sentinel™ Controller Processor

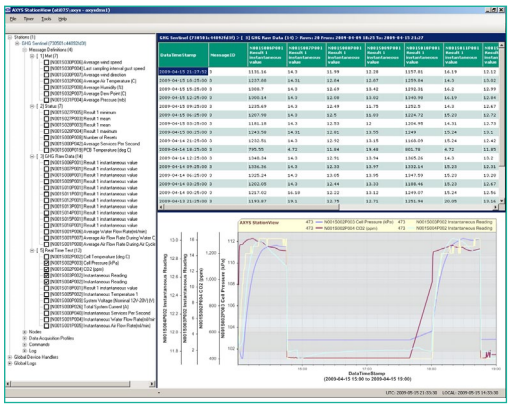
The AXYS proprietary WatchMan500™ is the core technology for the GHG Sentinel™. The WatchMan500™ controls and operates the complete system and provides the interface to the sensors and telemetry (for remote operation), system health monitoring, data logging, and data acquisition. Processing algorithms to calculate GHG flux are handled by the GHG Sentinel™.



GHG Sentinel™ system components

Specifications

- **Dimensions**
  Control Box: 30cm x 22cm x 18cm
  GHG Box: 41cm x 32cm x 22cm
- **Weight** (excluding power supply)
  31.0kg (68.3lbs)
- **Materials**
  NEMA Type 4X Fiberglass Enclosure
  Nygon® ultra chemical-resistant tubing
  Quick-Disconnect and Luer Lock Connectors
- **Power System Options**
  12VDC
  120/240VAC
  Solar/battery power
- **Peristaltic Pump**
  Permanent magnet 12VDC, 2 roller rotor
  Flow Rates: Up to 250ml/min
  Flow Measurement: Pulse output, rotating turbine on sapphire bearings with chemically resistant magnets
- **Air Pump**
  3-5VDC Diaphragm Pump
  Flow Rates: Up to 250ml/min
  Flow Measurement: Microbridge Mass Airflow Sensor; range: 0-1000ml/min
- **Pump Control**
  DC motor controller, variable speed/direction, RS232 Communications to WatchMan500™
- **Datalogging**
  Compact Flash 1GB
- **Additional Sensor Parameter Options**
  Meteorological, Wind Speed/Direction, Air Tem/Relative Humidity, Solar Radiation, Barometric Pressure, Current Speed/Direction, GPS, Water Conductivity (salinity), Chlorophyll Fluorescence, Dissolved Oxygen, pH, CDOM, Turbidity, Water Depth, Nutrients such as: ammonia, nitrogen, phosphates
- **Telemetry Options**
  VHF
  CDMA, GSM (cellular)
  Inmarsat D+
  Iridium



Data Management System (DMS) display

Sensor Specifications

Standard	Range	Resolution	Accuracy
Carbon Dioxide CO_2	0-20,000ppm	1ppm	< than 2.5% w/ 14cm bench
Methane CH_4	0-1000ppm	1ppm	+/- 5ppm
Oxygen O_2	0-100%, 0-75mV	0.01mV	+/- 0.35mV
Water Temp	-30° to +50° C	0.01° C	+/- 0.15° C

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