

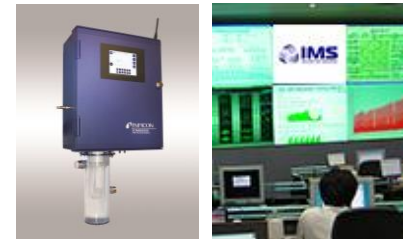
IMS Water Quality Monitoring Systems Integration and Support



IMS offers rapid, reliable, robust, and compatible systems integration and support for water quality monitoring. IMS can provide the entire end to end systems engineering and integration of your water quality monitoring system, provide instrument integration to existing systems to allow secure real time online monitoring, or provide specific telemetry operational software, analytical chemistry and/or systems engineering support. IMS provides the integration of industry sensors and specialty analyzers into water monitoring systems to enhance analytical data analysis, data reduction, and data reporting efficiency.

Systems Integration Offerings:

- **Systems Integration Service**
 - Real time state of environment telemetry, control, monitoring, water quality limits, and data trending
 - Rapid data acquisition and data analytics
 - Inline embedded analytical chemical analysis algorithm logic, data analysis, and data reduction
 - Modular integration of multiple sensors from various industry standard components and/or specialty analyzers into existing SCADA (Supervisory Command and Data Acquisition) systems, SCADA emulators or test beds, or an IMS developed contamination warning system
 - Provides on site installation and/or maintenance of water quality monitors as required
- **Water Quality Instrument Panel Suite of Surrogate Parameter Sensors and Specialty Analyzers**
 - Pre-fabricated Instrument Panel Suite tied together via embedded software and sensor interface module for near water locations
 - Monitoring of surrogate water quality such as pH, Chlorine, temperature, ORP, and Total Organic Carbon (TOC).
 - Integration of specialty analyzers or additional instrument "add-ons" to Instrument Panel Suite
 - Sensor integration and software configuration integration for data reduction efficiency and communication to customer interface or end user
- **Integrated Telemetry Monitoring System / Secure User Interface**
 - Web Based User Interface via Application Programming Interface (API) or SCADA implementation
 - Secure web server using Encryption and Password Authentication
 - System level software configuration integration for real time or scheduled remote telemetry and events monitoring via web browser
 - Custom user interface / dashboard designs where applicable
 - Real time and off-line data analysis tools including plots, raw telemetry dumps, and data capture
 - Capability to view real time telemetry points on mobile app
- **Instrument Systems Integration**
 - Integration of Instrument OEM into customer existing SCADA, Web Based User Interfaces, or Data Control Systems, Instrument Water Panels, M2M Sensor Interface Modules, test beds, and/or custom developed monitoring systems
 - IMS is an approved systems integrator for the INFICON CMS5000 Monitoring System which is used for remote, unattended monitoring of Volatile Organic Chemicals (VOCs) and Toxic Industrial Chemicals (TICs) in water streams. The CMS5000 Gas Chromatograph (GC) coupled with its purge and trap technology align with EPA protocols for water monitoring.
- **Engineering Services**
 - Software programming support for Contamination Warning Systems, SCADA interfaces, and data acquisition
 - Analytical Chemical Engineering Support for data analysis and reduction support, verification to EPA and other Federal regulatory levels, and software algorithm construction for requirements validation
 - Systems Engineering Support
 - Electrical, Software, and Mechanical Integration and Test Support
 - Custom configuration designs, assessments, and/or set-ups



Applications:

- Valued cost effective approach in automated real-time organic and biological monitoring at water location with cellular communications data link
- Automated water monitoring of VOCs and TICs using the INFICON CMS5000 Monitoring system GC with purge and trap technology
- Monitoring surrogate water quality such as pH, Chlorine, temperature, ORP, and Total Organic Carbon (TOC)
- Custom system design and integration of automated telemetry monitoring systems using Web Base User Interface API design or SCADA
- Sensor integration and software configuration integration for interface management, data reduction efficiency and communication
- State of environment telemetry, control, monitoring, water quality limits, and data trending
- Specialty analyzer development or enhancement for custom applications in the field of analytical chemistry and mass spectrometry
- Enhanced security protocol implementation into existing systems or newly developed systems
- Real time or scheduled monitoring with reports sent to FTP or email

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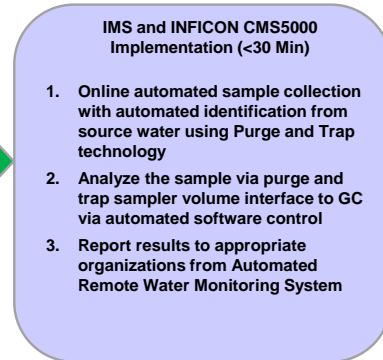
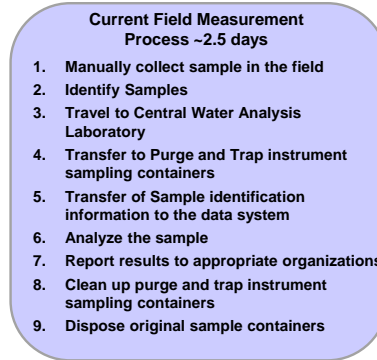
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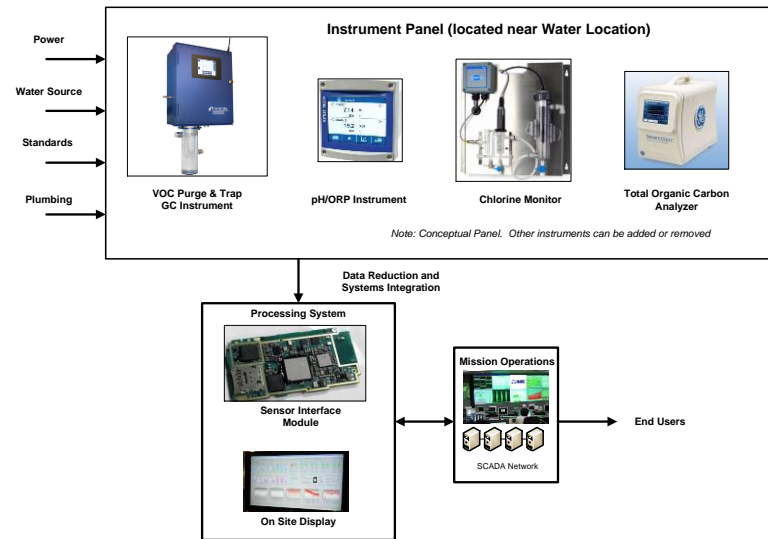
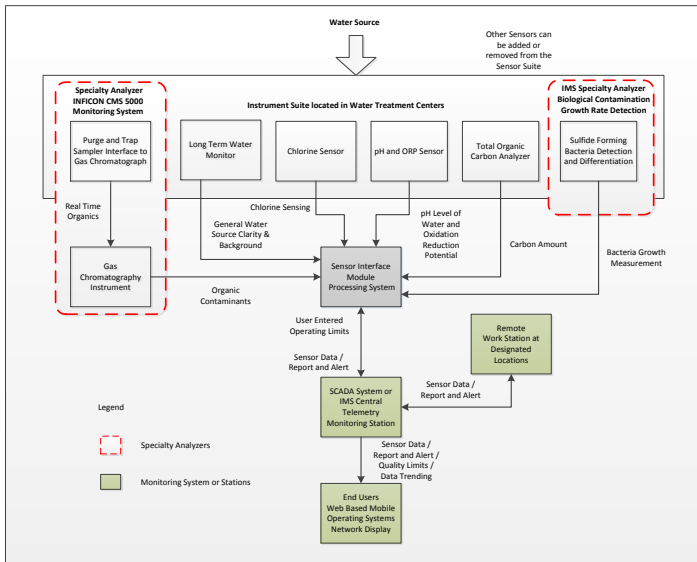
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Benefits:

- Process time reduction from traditional sampling methods
- Modular plug and play integration of multiple sensors from various industry components
- Implementation of specialty analyzer interfaces to capture majority volatile organic contaminants on EPA contamination list
- Data reduction convenience using analytical chemistry algorithms and software development
- Instrument Panel laboratory interface near water location readily available with cellular wireless data link
- Secure User Interface
- Agility to implement additional sensors to system
- Maintenance of several instruments at the same time



Integration Notional Physical Block Diagrams:



IMS Heritage and Experience

- Real time monitoring and control system development and operation utilizing SCADA (Supervisory Control and Data Acquisition) Systems and Web Based API User Interfaces
- Contamination and remote surface analysis measurements for several missions in the Materials Engineering Branch with the NASA Mars Sample Analysis project
- Chemical analysis using space robotic instruments for sampling of surface elements on Mars using mass spectrometry in-line with an automated remote sensing system
- Performance of flow injection analysis for analyzing a large number of water samples.
- Cyber Security and Vulnerability Analysis

- Systems Engineering of arrays of sensor subsystems into complete remote and secure real-time telemetry systems
- Design, Integration and Test of Instrument Sensor Suites
- Systems Engineering on National Security Access Programs
- Implemented numerous projects using Embedded Software Systems
- Mission operations and ground support in satellite communications (Real time telemetry, limits monitoring, and data trending of spacecraft for various NASA missions)
- Familiarity with the requirements for carrying out analysis of software from validated and verifiable levels required by the EPA and other Federal regulatory levels
- Hardware/Software systems integration and test and verification for various ground, cyber networks, test beds, and flight programs



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