

BlueBox™:

The Intelligent Event Detection System (EDS)

Whitewater Security's BlueBox™ system integrates, controls and presents online water monitoring from all sensors. In parallel it intelligently detects unusual water quality events, offering an innovative approach to time series analysis of multi-variable data. Its unique software helps overcome the difficulties involved in assessing and interpreting water quality information - ensuring your water system is fully protected.



Can Your System Determine the Difference Between Real Events and False Alarms?

The normal variability in distribution system water quality, coupled with the large amount of data, makes it difficult for standard water quality measurement sensors to successfully detect transient contamination incidents. Most standard control systems suffer from two fundamental weaknesses: they cannot detect hidden problems until problem indications have violated predefined rules, and they can only give alerts based on human knowledge pre-entered into the system. This makes them vulnerable to the unexpected.

BlueBox™: Maximum Reliability, Minimum False Alarms

BlueBox™ intelligently assesses information, regarding any event, past or present using algorithms of various degrees of sophistication to detect anomalous conditions. By meticulously determining water quality irregularities and serving as an auxiliary to the decision making process, BlueBox™ minimizes false alarms and increases reliability, allowing for a fast and accurate response to a contamination event.

How BlueBox™ Works:

- **Collects** information (pH, turbidity, Chlorine, pressure, flow and others) from a wide range of different sensors, then synchronizes and validates it in order to identify irregularities.
- **Presents** online data in real time from all sensors.
- **Creates** a fingerprint of the water and a dynamic

baseline database, factoring in equipment age, periodicity effect, time of year and historical trends. BlueBox™ is sophisticated enough to work efficiently even when some parameters are missing.

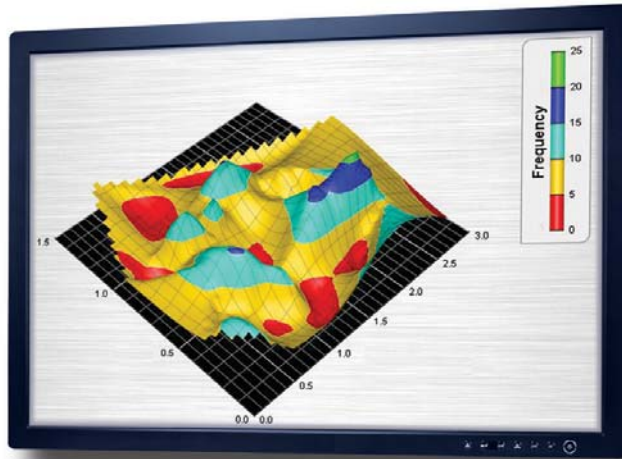
- **Filters** abnormal data based on past knowledge stored in the system database as well as against classification made by an authorized engineer.
- **Aggregates** the data into a series of fully analyzed statistical displays, providing the operator with an easy-to-use view of on line data, irregularities and events.

BlueBox™: A Suite of Unique Detection Technologies

- **“Rare Combination” Alerting:** Unlike standard systems, BlueBox™ has a special algorithm that processes historical event data, event frequency and relevancy, enabling it to detect when a new or rare combination of variables occurs and to distinguish between false and real alarms.
- **Trend-based Alerting:** By analyzing long-term trends, BlueBox™ can detect the deterioration of equipment or a process and recommend recalibration.
- **Prediction-based Alerting:** For selected variables, BlueBox™ calculates an on-line prediction for future values. BlueBox™ compares predicted values to actual values and generates an alert if the gap is too wide, simultaneously updating the internal prediction model.
- **Noise-based Alerting:** Detects changes in the variables distribution shape, sending an alert when fluctuations in the noise patterns are recognised.
- **Rule Engine Alerting:** Enables an authorized expert to add rules to the BlueBox™ database.

BlueBox™: Multiple Benefits for Managers and Operators

- Accuracy in the decision-making process thanks to real-time diagnosis and manual and automatic filtering of irregular data.
- Multi variability analysis.
- Clarity whether irregularities in the water system constitute a real event or a false alarm.
reduced maintenance costs from condition-based predictive maintenance.
- Seamless integration with all existing sensors, creating a single unified online water monitoring system.
- Economical scalability as the water system grows in size and complexity.



BlueBox™: Learning Capabilities

BlueBox™ updates its models using a self learning mechanism based on incoming data. This decreases false alarms and increases prediction accuracy. BlueBox™ enables engineers to classify an alarm as "true", "false" or alarm with other specification. Over time, this growing library of alarms and their information is used in order to improve alarm validation and provide better insight on water quality and facility operation.

BlueBox™ Specifications:

- BlueBox™ terminal 11.8" X 11.8" (30cm X 30cm) - 6.6lbs/3 kg
- Configuration as a central or distributed system. BlueBox™ units can communicate with each other to exchange information.
- Communication capability with most field devices using ModBus, OPC or any standard communication protocol.
- Data collection from field device may include thousands of sensors with time resolution of less than 1 second.
- Easy connectivity with TCP/IP Networks.

About Whitewater Security

Whitewater Security helps governments, municipalities, water utilities and high risk facilities around the world manage their water security, protecting against the threat of accidental and intentional contamination. Whitewater Security's comprehensive solutions include the unique WaterWallô water security management tool, designed to give customers full control of every aspect of their water security.

BlueBox™ is a proprietary system developed by WWS. This revolutionary product was initially launched as a "plug and play" module of Whitewater Security's WaterWall™ water situation management system.