SafeGuard™ Sentinel

Delivering Cloud Monitoring for Modbus-Enabled Instruments

The ability to detect and predict upcoming water system failures at an early stage is imperative to help avoid unplanned downtime that can lead to plant disruption, regulatory compliance violations and environmental and public health concerns.

Municipal and industrial facilities can enhance their data quality assurance program by remotely monitoring the health of their water and wastewater quality instruments with the SafeGuard™ Sentinel conditional monitoring system.

SafeGuard™ Sentinel is a universal solution for Modbus-enabled analyzers that provides facilities with accurate and reliable 24/7/365 conditional monitoring data for water and wastewater management industrywide. SafeGuard™ Sentinel features a user-friendly web-based dashboard that provides remote access to current, historical, and time-sensitive alarms, alerts and events.

The real-time and online health monitoring data provided by SafeGuard™ Sentinel help facilities predict unforeseen early failures, better plan maintenance, and keep essential infrastructure running at minimal costs.
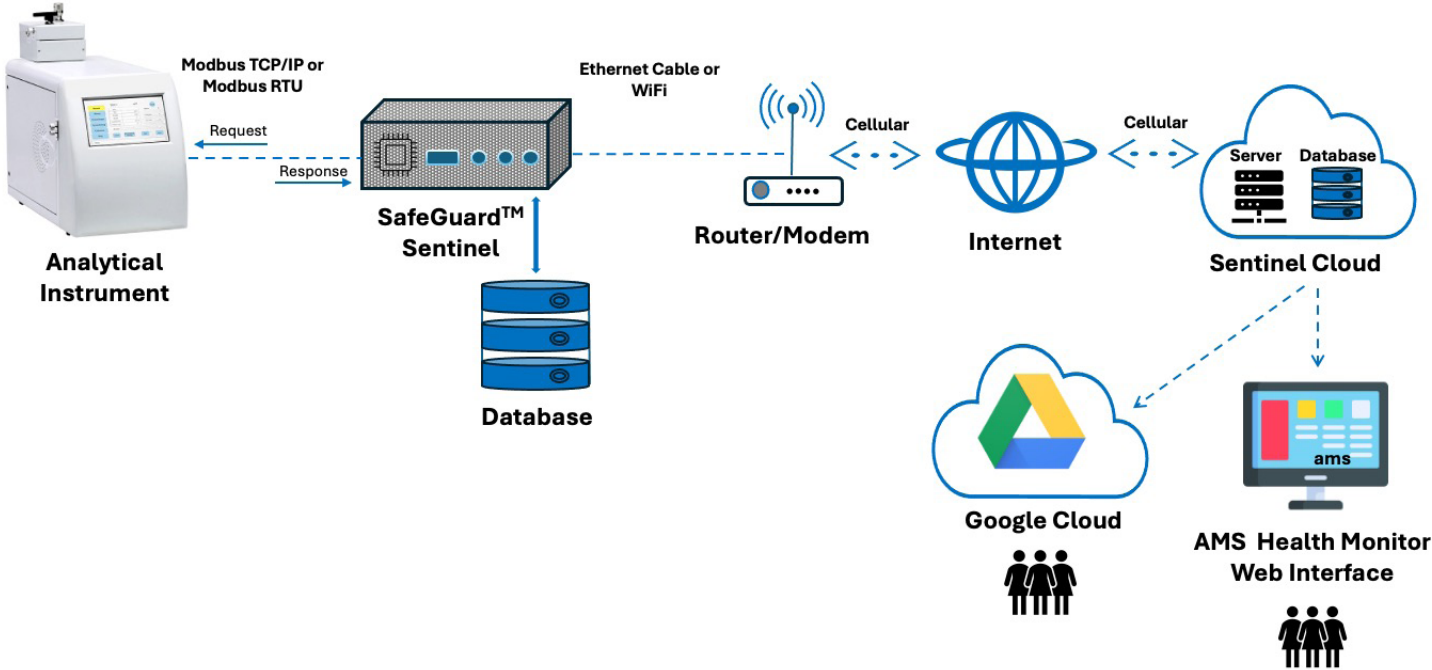
SafeGuard™ Sentinel Features

- When attached to a Modbus-enabled analytical device, SafeGuard™ Sentinel allows for cloud access to current and historical data to support conditional monitoring and analysis.
- Hardware includes a local mini-computer connected to the analytical device and a cellular router to transfer the data securely to cloud services hosted by AMS.
- AMS cloud services include (1) a health monitor (a single portal) with a graphical web interface for charting data for all analytical devices attached to a SafeGuard™ Sentinel system and (2) a Google Drive for data files shared with client users for download.
- Uses a simple touch screen with menus for device and connectivity status and screens for downloading the entire historical Modbus data onto a USB-A memory flash drive.

SafeGuard™ Sentinel Benefits

- Users can easily and remotely discern performance metrics (Ex: mean time to repair/mean time to failure).
- Provides users with a health overview of all water and wastewater quality analyzer assets.
- Provides users with the data needed to employ advanced data analytics.
- Decreases maintenance costs.
- Reduces system and facility downtime.
- Extends asset life.
- Provides cost savings by avoiding the premature change out of existing resources or assets.
- Improves facility reliability and provides compliance protection.
- Increases efficiency since less time is required to ensure continuous facility operations.

SafeGuard™ Sentinel supports a range of vendor instruments, including instran® (ammonia, fluoride, manganese, nitrate, and phosphate), Sievers TOC (M5310C, M500, R3-Horiba Tocadero One), and Lovibond Turbidity (PTV1000). Support for other models/vendors is available on request.
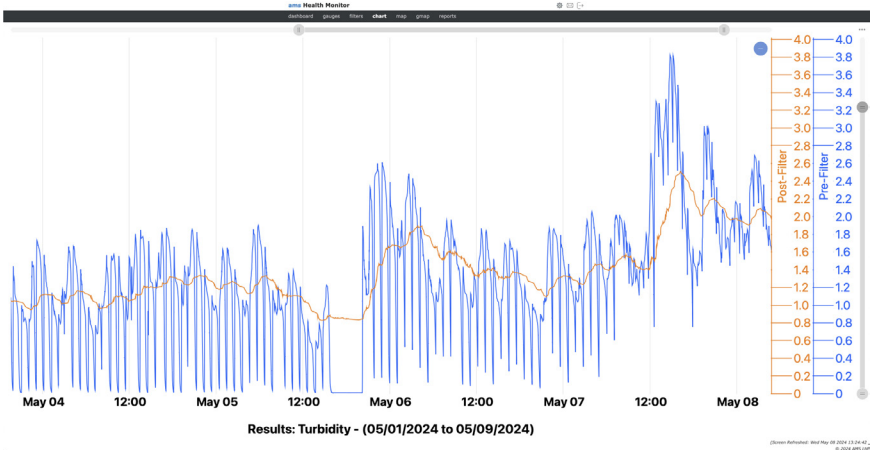
Figure 1. SafeGuard™ Sentinel Process Diagram

Security Notes

SafeGuard™ Sentinel is password protected and secured with remote cloud access 24/7/365 via AMS Health Monitor. The device is not required to be connected to the client's LAN if the internet is accessed via a cellular modem. MODBUS is the only protocol and connection by which the device and the client's analyzers communicate.

Figure 2. The AMS Health Monitor

The AMS Health Monitor web interface allows for easy graphical viewing of data and exporting it to a variety of image and text file formats.

Technical Specifications

SafeGuard™ Sentinel	
Dimensions (LxWxH)	3" x 2" x 1"
Weight	5 oz.
Color	Black
Housing	ABS Plastic
Display	3.5" 480 x 320 Touch TFT LCD
Modbus Connections Ports & Cables (Included)	Ethernet (Modbus TCP-IP) or USB-A to RS485 (Modbus RTU)
Ports (Extra)	3 x USB-A (for Data Download)
Power	A/C Adapter (6' cable included) through USB-C (Input: 100-240 V-0.5 A; output: 5V-3.0 A)
Operating System	Raspberry Pi, Debian 12
Storage	64 GB MicroSD
Modbus Data Retrieved	Per Manufacturer Specifications of Modbus-Enabled Analytical Device
Cradlepoint IBR-200 Modem Router	
Dimensions (HxWxD)	3.2" x 2" x 1" (Excluding Antennas)
Weight	8 oz.
Color	Black
Housing	ABS Plastic
Power	AC Adapter (6' cable included) (Input: 100-240 V-0.4 A Max; Output: 12-1.0 A Max)
SafeGuard™ Sentinel Connection	WiFi or via Ethernet Port When Modbus Protocol is RTU
Cellular Data	Up to 5 GB/month, US or Global Data Plans (Included)