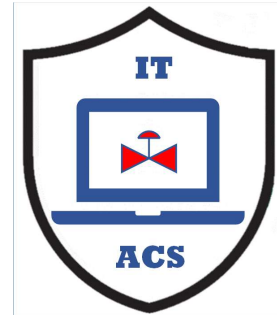


Secure Analyzer Gateways And Remote Operations Centers



MLM-085-B

Industry	– All
Principal Role	– All
Professional Role	– Analyzer Specialists + Control Engineers
Enterprise Phase	– All



Turn on your audio and
click start to begin video

START

This MLM provides an introduction to the use of Secure Analyzer Gateways and Remote Operations Centers

It is intended for Online Analyzer Specialists, design and plant Control Engineers.

Click the START button when you are ready to advance to the next slide.

What is a Secure Analyzer Gateway ?



A standardized device that interfaces with sophisticated analyzers, enabling:

- Secure remote support by analyzer integrator or supplier
- AI-based device monitoring and reporting
- Secure communication interface for site optimizers
- Secure communication interface for Quality Laboratory
- Local interface for operators and maintenance staff.



2

A Secure Analyzer Gateway is a standardized device that interfaces with sophisticated analyzers and enables:

- Secure remote support by the analyzer integrator or supplier
- AI-based device monitoring and reporting
- Secure communication interface for site optimizers
- Secure communication interface for the Quality Laboratory
- Local interface for operators and maintenance staff.

Why are Secure Analyzer Gateways Needed ?



Secure Analyzer Gateways are needed to provide more effective maintenance and optimization support. This is because:

- Gas Chromatographs have slower response times (often several minutes) and are difficult to maintain.
- New, faster, lower-cost analyzers, including UV and Infrared Spectrometers, Raman, and Mass spectrometers, require even more sophisticated design and support staff.
- More sophisticated analyzer models and optimization algorithms are required to effectively use the results of existing and improved analyzers.
- Increased cybersecurity requirements make remote maintenance and optimization support difficult or impossible.

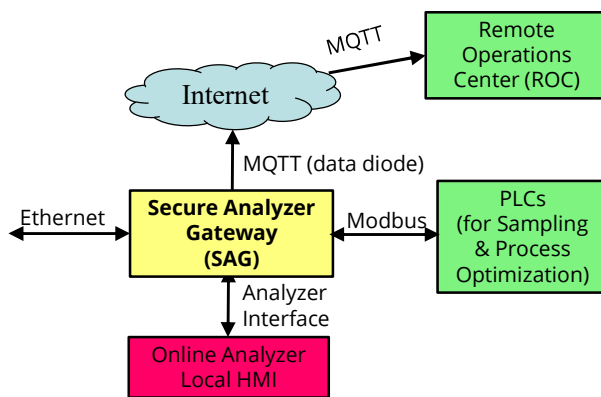


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Secure Analyzer Gateway (SAG)



Standard SAG Features:

- Modular commodity “edge devices”
- Supports many Analyzer Interfaces
- OPC UA, MQTT, Modbus, and Ethernet TCP/IP communication protocols
- Supports common PLCs for process optimization
- Communicates to Central Analyzer Remote Operations Center (ROC)
- Certified Cybersecurity

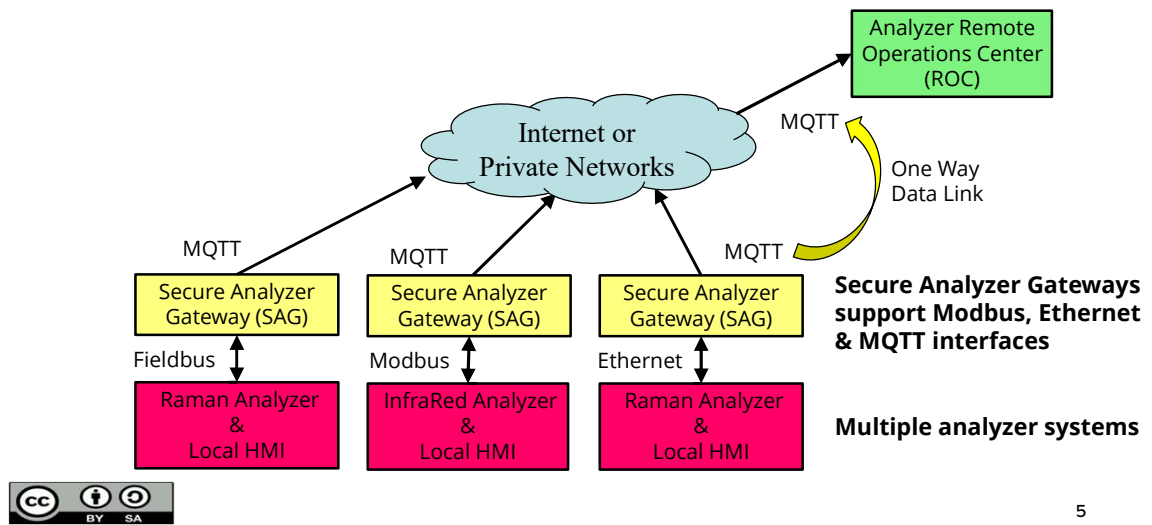


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Typical Multi-site Company Configuration



Local SAG systems support Modbus, Ethernet and other Fieldbus Interfaces to Analyzers and HMI.

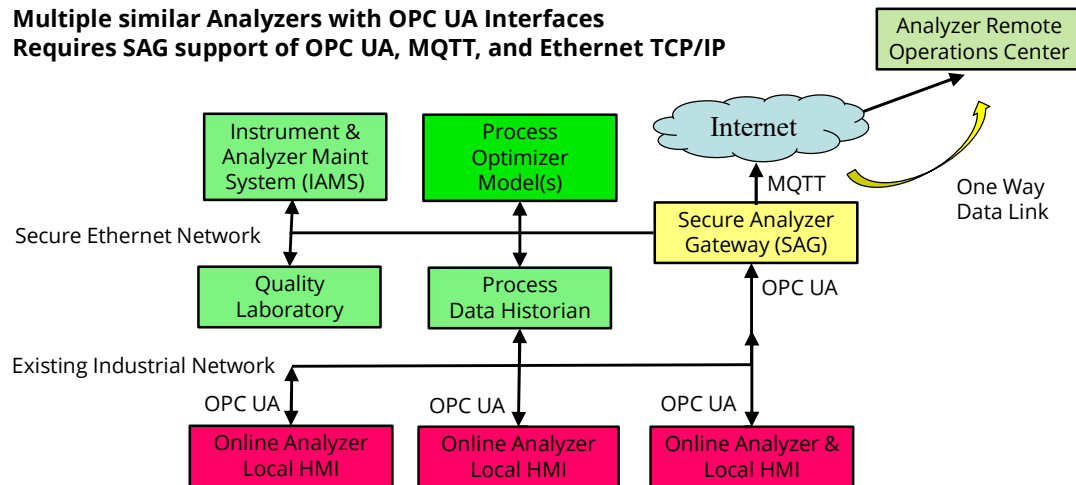
Remote connections to ROC support MQTT interfaces

Maintenance support and troubleshooting, operating information and optimization is shared across multiple company facilities.

Example Large Process Plant Site Configuration



- Multiple similar Analyzers with OPC UA Interfaces
- Requires SAG support of OPC UA, MQTT, and Ethernet TCP/IP



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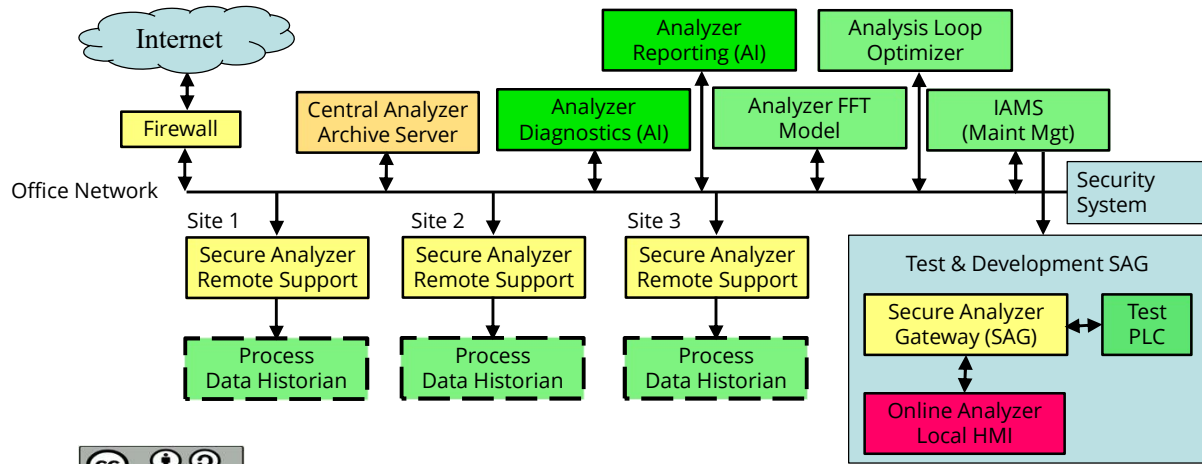
Large company sites may require:

- SAG support of OPC UA, MQTT, and Ethernet TCP/IP interfaces
- Support for existing Sitewide Industrial Networks
- Interfaces with Process Data Historians and/or Quality Laboratory
- Interfaces to Engineering and Process Optimizer Models
- Interfaces to Instrument and Analyzer Maintenance Systems

Remote Operations Center (ROC)



Supports multiple analyzer systems, including Analyzer Diagnostics, Reporting, Analyzer FFT and Loop Optimizers, Data Historian, and a test/development system.



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Remote Operations Center (ROC)

An ROC can improve production, maintenance, and support across multiple Process Units and Plant Sites.

This involves interfaces to the following:

- Multiple Process Analyzer Types,
- Multiple analyzer controllers (perhaps with Local HMIs),
- Multiple human-machine interface systems (eg., a DCS or SCADA host).
- Process Plant Optimization Mathematical Models, and
- A central analyzer maintenance system to monitor analyzer performance and reliability.

It may also be desirable to support the Analyzer Systems, Process Plant Optimizers, and Analyzer maintenance using local plant and/or remote expert staff.

Note that remote support capability will require special cybersecurity precautions for personnel, including Zero Trust access.

Key “Take-away” Messages



- More sophisticated analyzers can bring dramatic improvements in process quality and throughput
- AI tools can provide process optimization strategies such as model-based control and multi-unit integration
- New analyzers often require advanced mathematical models that can be difficult to maintain and support at plant sites.
- Any changes in raw materials, process facilities, or operations may require modification of analyzer control or process optimization models.
- Certified SAG H/W, S/W, and MQTT Protocol support many architectures
- Cybersecure remote support is practical and profitable, but requires carefully planned design and operation strategies



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Key messages include:

- More sophisticated analyzers can bring improvements in process quality and throughput but need remote support
- AI tools can provide process optimization strategies such as model-based control and multi-unit integration
- New analyzers often require advanced mathematical models that can be difficult to maintain and support at each plant site.
- Any changes in raw materials, process facilities, or operations may require modification of analyzer control or process optimization models.
- Certified SAG H/W, S/W, and MQTT Protocols support existing and future architectures
- Cybersecure remote support is practical and profitable, but requires planned design and operation strategies

Author



Gary has more than 40 years of experience with enterprise integration and optimization projects, including PERA master planning and project management.

As one of the initial authors of the PERA Handbook of Master Planning, he has used PERA Enterprise Architecture and Master Planning methodologies throughout his career including control and information systems for oil production, pipelines, refining and marine loading, petrochemicals, coal, gas, and oil-fired power plants, polyethylene, ammonia, explosives, paint, pulp and paper, food and beverage, and pharmaceuticals. LNG facilities included world-scale arctic, European, and US Gulf coast complexes.

Secure infrastructure facilities included SOC and Emergency Response systems for major industry and municipal facilities, as well as emissions reporting and trading systems for more than 100 US Power Plants.

