SIEMENS

Ingenuity for life

Setting standards in robust communications

Proven communication networks for the oil and gas industry

siemens.com/communications-for-oil-gas

Reliable communications for harsh environments

The oil and gas industry faces challenging conditions daily, these include harsh environments with extreme temperatures, hazardous areas, high electromagnetic interference, high vibration and shock levels. We at Siemens have a clear awareness of the requirements that these conditions demand. Continuous investment, innovation and development of a comprehensive industrial communications portfolio are key factors for the success of our customers. We offer rugged components designed specifically for one of the most demanding industries worldwide which deliver reliable and secured communications.

Our task: Digitalization along the oil and gas value chain

Innovation has always been in our DNA. We set new standards with our industrial communications portfolio – preparing you for the digital future. Our comprehensive offering for plant-wide industrial communications relies on international, cross-vendor standards that are mutually compatible. More specifically, our SCALANCE and RUGGEDCOM products and systems are purpose-built to withstand harsh conditions to address the unique and evolving challenges of the oil and gas industry.

Highest efficiency based on proven standards

At Siemens, we ensure maximum consistency among our communication components, regardless of whether specific topology is wired, wireless or remote. Based on international, cross-vendor standards, this plug-and-play approach significantly simplifies and accelerates engineering, commissioning, operation and maintenance. What's more, it maximizes planning flexibility, the implementation of optimal network infrastructures and the minimizing of costs. Integrated network communication is standard with all of our automation components. As such, they create the basis for the efficient interoperability of all components and facilitate seamless management of the entire network infrastructure.

Siemens is a partner you can rely on

Siemens understands the unique requirements of the oil and gas industry and offers the proven technology you need to meet them, all from a single source. Our experience and network expertise help to increase efficiency and can facilitate the reduction of capital and operational expenditures (CAPEX and OPEX), while also fulfilling HSSE (Health, Safety, Security, and Environment) requirements. Additionally, our offering safeguards the smooth flow of your data. We are one of very few manufacturers that offer a comprehensive portfolio that can be applied independently whether it is an upstream, midstream or downstream application. This means, Siemens can help you to optimize the entire value-added chain, from production to distribution and the refining of hydrocarbons – today as well as tomorrow.

Industrial communication for:

- Rugged wired and wireless networks for harsh environments
- Real-time, reliable and secure data transmission, even in remote locations – directly from the field up to management level
- Highest level of mobility and flexibility
- Totally integrated and indispensable for all types of automation (DCS, PLC, RTU, SCADA, and ICSS systems)
- A wide range of other applications such as CCTV, drilling automation, fire & gas systems and utilities, e.g. in water treatment, power generation, E-Houses / substation automation

The right communication network for your specific application

As a trusted partner in the oil and gas industry, we have proven our unique ability to master its three main challenges: HSSE, CAPEX and OPEX reduction and increased productivity. This is made possible by our comprehensive RUGGEDCOM and SCALANCE portfolios of best-in-class industrial network components, which support the deployment of reliable and secure communication networks for a nearly limitless range of oil and gas applications – whether upstream, midstream, or downstream.

Upstream

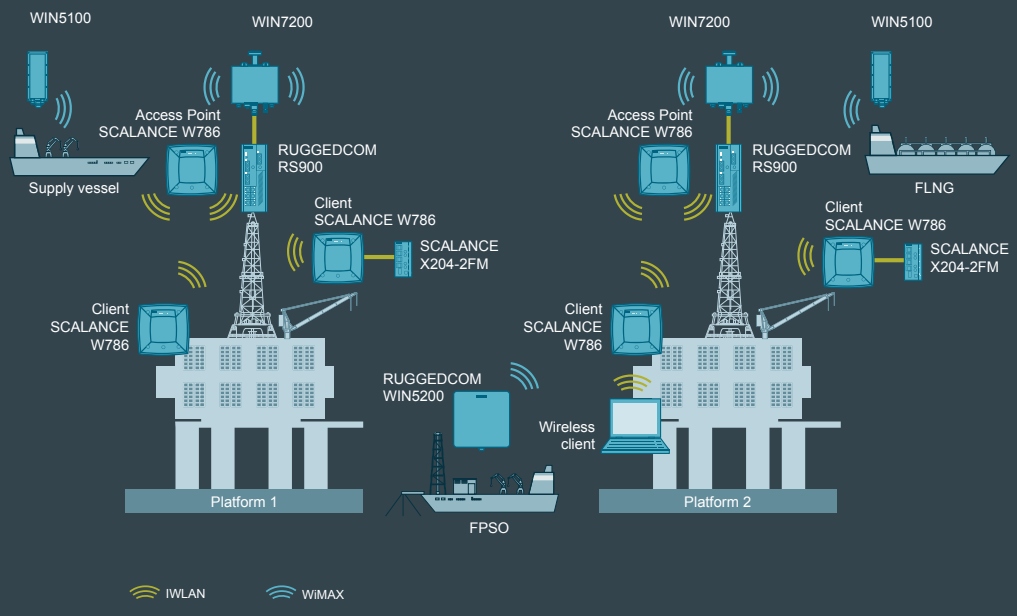
Application example

Wireless data transmission for offshore facilities

Using industrial wireless communications via IWLAN (SCALANCE W) and WiMAX (RUGGEDCOM WIN) in offshore facilities such as oil platforms, FPSOs, exploring and service vessels enables reliable and secure short and long haul wireless data transmission. This allows for cable independence and eliminates the disadvantages of installation, maintenance and troubleshooting.
It is especially useful in places where cabling is not an option due to challenging environmental and hazardous conditions.

Benefits

- CAPEX and OPEX reduction
- Reduction of HSSE incidents without compromising production targets
- Minimized footprint and weight
- Reduced time to first production
- Wireless fail-safe data transmission (SCALANCE W)
- 5 years warranty



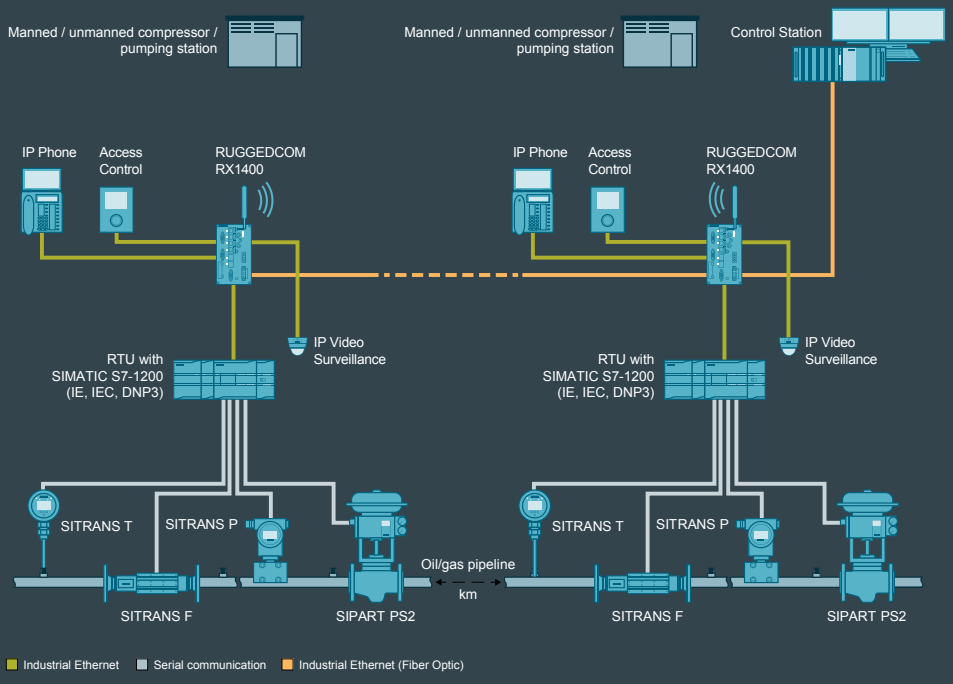
Visit our website and see further upstream, midstream and downstream application examples:
siemens.com/communications-for-oil-gas

Midstream

Application example

Redundant wired and wireless data transmission along gas or oil pipelines

Transport of oil and gas through pipelines is monitored by process instrumentation (e.g. SITRANS), CCTV and voice systems for safety and security reasons. All this infrastructure together with pumping/compression stations runs across hundreds of kilometers, through a wide range of inhospitable and uninhabitated landscapes, including mountains, deserts and rainforests with extreme climates ranging from sweltering tropics to the frozen Arctic. Under these extreme conditions, reliable and secure communication for end-to-end data availability along the pipeline is required. By means of long range connectivity via fiber optic up to 100 km or cellular communication based on LTE with provider redundancy, Siemens offers a wide portfolio to fulfill such requirements.



Benefits

- OPEX savings, increased availability and efficiency: by means of remote control and monitoring from a central location
- CAPEX savings: complete solution from one provider saves commissioning time, permitting easier integration
- Reduction of HSSE incidents without compromising production targets: cyber security via IPsec, HTTPS, SSH/SSL, 802.1Q VLAN, SNMPv3

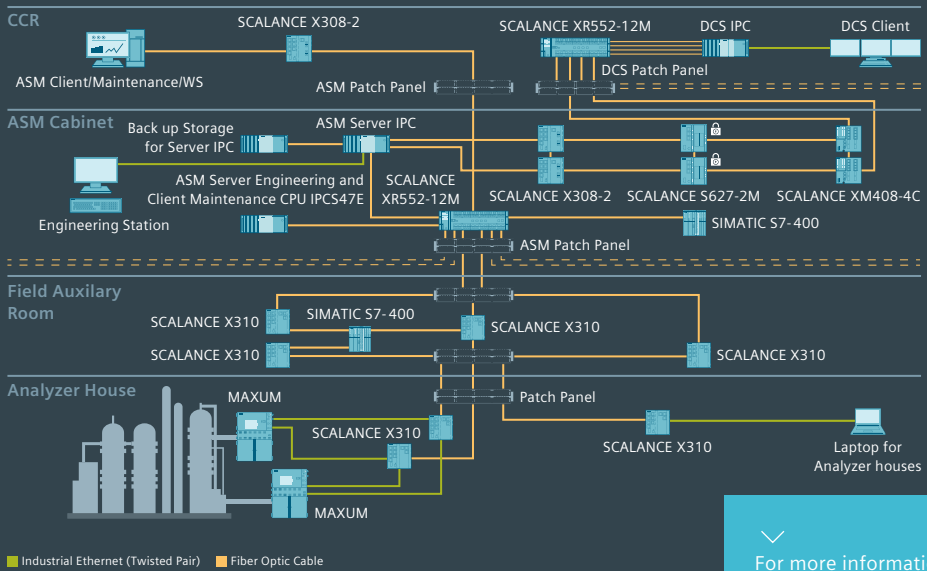
For more information see:
siemens.com/sensors/oil-gas

Downstream

Application example

Monitoring and asset management of gas chromatographs

Our communication portfolio provides transparent connectivity from the gas chromatographs, e.g. MAXUM, up to the Analyzer System Manager (ASM) for the monitoring of measurement quality and device status. The MAXUM gas chromatograph provides chemical composition analysis of gases and liquids present in all branches of fine chemicals, refining and hydrocarbon process industries being built for installation in harsh environments. SCALANCE X Industrial Ethernet switches enable reliable communication in harsh environments from the field up to the control room to ensure smooth monitoring and asset management of gas chromatographs. This provides relevant process value curves and operating status via KPIs laying the foundation of predictive maintenance.



Benefits

- Increased efficiency: comprehensive visualization and calibration of all gas chromatographs from a central station such as smooth integration and compatibility with 3rd party DCSs
- Increased productivity: reliable industrial communication lays the foundation of predictive maintenance
- CAPEX and OPEX savings: complete solution from one provider saves commissioning time permitting easier integration

For more information see:
siemens.com/analytics-solutions

A comprehensive and proven portfolio for industrial communications

Siemens industrial-grade communication components enable secure, reliable and high-availability network connectivity in challenging environments. This ensures greater operational efficiency.

Switching and Routing

Our Industrial Ethernet switches ensure the reliable distribution of data to network devices in a targeted manner. Siemens offers a graded portfolio of SCALANCE and RUGGEDCOM switches that is customized for specific networking tasks. The SCALANCE X Industrial Ethernet switches featuring the FastConnect for RJ45, M12 and fiber optic cables. These switches offer different interfaces for electrical or optical connections supporting numerous IT standards.

Industrial Wireless Communication

Our comprehensive range of products spans everything from industrial wireless communication to remote networks based on Industrial Wireless LAN, WiMAX, GSM, GPRS, UMTS and LTE. Whether your applications include cranes, mobile workforce, metering, teleservice/ telecontrol or video surveillance, our components for wireless communication are distinguished by their reliability, robustness and safety.

Industrial Security

With increasing digitalization, security for automation is becoming even more important. Our Siemens offering supports the defense-in-depth concept according to ISA99/IEC 62443 that minimizes risks associated with the use of integrated Ethernet structures and Internet technology, specifically for the plant and production areas of your company.

Industrial Wireless Communication

RUGGEDCOM WIN
is the proven broadband wireless product portfolio designed for private networks, delivering the benefits of carrier-grade 4G technology.

SCALANCE W
devices offer reliable industrial wireless communication at various automation levels acc. to the IEEE 802.11n standard supporting even wireless fail-safe data transmission.

SCALANCE M
family includes modems and routers for wired or wireless private and public IP-based networks.

Industrial Switching and Routing

RUGGEDCOM
switches and routers are ideally suited for mission-critical control applications requiring high degrees of reliability and availability in extreme harsh environments.

SCALANCE X
With SCALANCE X, Siemens offers a comprehensive portfolio of switches and routers for industrial networks in harsh environments.

Industrial Security

SCALANCE S
security modules are specifically used in automation, yet connect seamlessly with security structures of the office and IT world.

Further products

Cabling
FastConnect is a cabling system specially designed for industrial networks. Its optimally matched components ensure quick configuration and assembly of network structures within the shortest possible time and without specialist knowledge.

Network Management
Consequences of network failures can be prevented with SINEMA Server and RUGGEDCOM NMS, specifically developed for ensuring that problems are detected and remedied at an early stage.

Additional products
Our portfolio for industrial applications also includes further products such as multi-service platforms, RTUs, media converters, serial device servers and software solutions.

Discover more about these and all other products and solutions at
siemens.com/communications-for-oil-gas

Benefit from our broad expertise in industrial communication networks

Our experience both in the oil and gas industry and in industrial communication networks offers you added value even in the most challenging market environments. Additionally, with our 24/7 service and support in more than 160 countries around the globe, we are your reliable partner at your side to assist you with your industrial communications needs.

Meeting your requirements

Siemens complies with a broad spectrum of approvals to ensure health, safety, security and environmental considerations (HSSE) as required in the global oil and gas industry. Examples of these standards include the ATEX, FM, IECEx and UL HazLoc approvals for use in hazardous areas. Many of our SCALANCE portfolio elements already fulfill these requirements and, additionally, CSA for some RUGGEDCOM components. Further examples are the various marine approvals which include ABS, BV, DNV-GL, LR, NK, PRS and RINA for several SCALANCE and RUGGEDCOM (ABS and DNV-GL) products.

Additionally, our RUGGEDCOM WIN portfolio has successfully passed the MIL-STD-810F salt atmosphere test.

- Extended temperature range with passive cooling and fanless operation (–40 °C up to +85 °C)
- IP20, IP30, IP65, IP66 and up to IP67 degree of protection acc. to IEC 60529
- Conformal coating as an option for extra environmental protection
- Resistance to high EMI, vibration and shock, dust and salt fog environments (acc. to IEC/EN 60068-2-52 or IEEE 1613)
- PROFIBUS, PROFINET and EtherNet/IP compliant
- DNP3 and IEC 60870-5 compliant
- IEC 61850 compliant
- IEEE 802.3 compliant
- IEEE 802.11n compliant
- IEEE 802.16 compliant
- Compliant with several redundancy protocols:
  IEC 62439-2 (MRP), IEC 62439-3 (PRP&HSR), IEEE 802.1d-2004 (RSTP), IEEE 802.1Q (MSTP)
- 5 years warranty (SCALANCE and RUGGEDCOM)

SINOPEC

The challenge

To ensure reliable and secure data transmission from the field level up to the central monitoring station for a gas field, including pipelines to fulfill HSSE requirements.

The solution

- Siemens implemented a redundant solution using Industrial Ethernet networks by SCALANCE X switches.
- In addition to the switches, Siemens also supplied customized redundant power supplies for the network switches to ensure communications availability in the case of a power failure.

Benefits

- Reduced OPEX due to remote access to technical experts without the need to dispatch them on site immediately.
- Remote monitoring enables reduction of HSSE incidents.
- Increased productivity and efficiency:
  - Through continuous data availability
  - Using industrial network components capable to withstand hazardous areas and harsh environments

China National Offshore Oil Corporation

The challenge

To enable transparent integration of new platform power plants into Liaodong' Distribution Management System (DMS) without laying costly undersea optical cable communication.

The solution

- Implementation of a reliable and secure long-haul wireless solution using RUGGEDCOM based on IEEE802.16e, capable to mitigate diffuse reflection of the surface of the sea without interrupting the wireless communication.

Benefits

- Remote monitoring enables connectivity to experts from abroad
- Enhanced efficiency by continuous data availability
- Reduced CAPEX and OPEX compared with a wired solution
- Fully compliance with standards for marine applications and electromagnetic compatibility

Petroleum Development Oman

The challenge

To enable reliable resilient communication for monitoring, control and surveillance of oil and gas fields under harsh environmental conditions such as extreme temperatures and humidity, moisture and blowing sand.

The solution

- Reliable and secure communications network based on Siemens RUGGEDCOM switches.
- Siemens met PDOs requirement for three basic applications:
  - Wellhead monitoring to support safe, efficient operations
  - Improved SCADA connectivity that allows the integration of legacy and new sensors
  - Enhanced surveillance capabilities to enable intrusion detection, realtime alarms and timely responses

Benefits

- Reduced OPEX due to remote access to technical experts without the need to dispatch them on site immediatly.
- Remote monitoring and implementation of security appliances enables reduction of HSSE incidents
- Increased productivity and efficiency:
  - Through continuous data availability
  - Using industrial network components capable to withstand hazardous areas and harsh environments

Read the full reference stories at
siemens.com/communications-for-oil-gas

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Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit
http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
http://www.siemens.com/industrialsecurity.