ABB’s communication networks portfolio connects the operator to the field – enabling the digitalization of the oil and gas field.

Mission-critical Communications. Let’s connect.

- Connecting telecommunications safely, economically and without risk
- Digitalization can’t happen without communications
- Are you ready for the challenges of tomorrow?
As we look towards the future we see a continued convergence of technologies and applications - where the network is everything. Voice, data and video may need be carried over the same network, with higher speed and bandwidth. To assure reliability and serviceability, standard, off-the-shelf products and systems will be increasingly utilized to build customized total solutions.

Telecommunications play an increasingly important role in the industry’s efforts to reduce CAPEX and OPEX. As more remote and less accessible reservoirs are developed, high-speed, reliable telecommunications - both fiber and radio - will allow for increased off-site monitoring and control. Land-based operations of offshore facilities are one example of how advanced telecommunication creates opportunities for more efficient and cost-effective operations.

Technology has taken great strides forward in developing mobile telecommunication solutions in the last few years, and mobility will continue to evolve in the future.

Stationary operator stations will give way to more flexible mobile solutions, providing operators access to their facilities regardless of location. Streamlining technology through integration Modern telecommunications are all about streamlining technology through integration, and this trend will certainly continue into the future. Duplication of hardware, software and cabling can have a strong impact on the bottom line due to higher costs, more spare parts, increased training and less efficiency. To rationalize operations and control costs, tomorrow’s Oil & Gas industry will take advantage of common user interfaces for all applications and systems, common network infrastructures, common technologies (Legacy SDH/PDH, Ethernet, IP, MPLS-TP, etc.) and common maintenance systems.

As a global leader in telecommunications for the Oil & Gas industry, ABB will continue to ensure that communication technology keeps pace with the changing needs of the industry, and implement innovative solutions for increased efficiency in the future.

Connecting telecommunications safely, economically and without risk.

ABB is at the forefront of telecommunication technology for the oil & gas industry. We keep updated on industry trends and long-term strategies and stay abreast of the latest advancements in telecom technology to ensure future-proof solutions that are engineered for the full lifecycle of the facility.
Many factors to consider for mission-critical communications.

Challenging exploration environments
- Extreme temperatures, magnetic and electrical fields
- Robust, reliable and proven capabilities needed for providing accurate functionality under extreme conditions
- Dusty and remote environments, where regular maintenance cannot be guaranteed

Critical applications
- Very fast signal transmission required in case of failures in the electrical grid
- Highly delay, jitter, asymmetry sensitive applications
- Highest availability for critical services including signal control applications, track switching, video surveillance and security

Future proof while supporting legacy networks
- Legacy Investment with backward compatibility
- Legacy & advanced packet voice services
- Reliable mission critical multi-service packet
- True hybrid TDM and Packet technologies within the same multiplexer
- Optimal scalability and lowest TCO

Backbone for critical infrastructure
- Running system - not easy to migrate, long active life time of system (10 to 15 years or more)
- Long active life time requires specific solution - high MTBF in order to compromise on availability
- Long supplier support required (10 to 15 years or more) - opposite to the fast changing telecom environment where life cycles get shorter and shorter
Digitalization can’t happen without communications. Proving robust, secure and reliable communications in a rapidly changing world takes ability.

Gas distribution company in Switzerland

Optical backbone network with 3 operation centers, 22 distribution points, very high availability. Connectivity services include pipeline automation - Point to multi-point RS-232 with multi-master, remote sites connections with x.21 and Fast Ethernet LAN connections as well as Video Surveillance.

One of the top 5 oil producers worldwide located in the Middle East

Countrywide communication system for pipeline control. ABB supplied XMCs and EDS500 connecting SCADA-devices for pipeline control over SDH, partially interworking with an existing SDH-system.

Special features used:
- Serial data and voice services, partly Point-Multipoint
- SDH and PDH-Multiplexing
- UNEM onsite support for integration into customers environment, including security support

One of the longest gas pipelines in Latin America

Communication network for the Leak Detection System based on SDH and Ethernet technology.
ABB has been at the forefront of mission-critical oil and gas communications for more than 140 years. Take a look at some of the oil and gas projects ABB has already delivered.

One of the top 5 gas producers worldwide, located in Russia

Redundancy communication system consisting of hybrid Ethernet and SDH connections, with as well voice and fast Ethernet connections.

Leading natural gas processing company in United Arab Emirates

Communication system for pipeline control. ABB supplied XMCs connecting Ethernet-based SCADA-devices for pipeline control and CCTV over STM16 (EoS).

Leading oil exploration and development company in Oman

Communication system for group of projects connecting SCADA, hot-line and other critical applications.
Ready for the challenges of tomorrow
ABB is the only major automation player to design mission-critical communications systems that keep people, assets and data securely monitored at the same time as optimizing automation and power requirements.
Mission-critical communications.
ABB Ability™ enabling communication networks for oil & gas.

ABB’s communication networks portfolio connects the operator to the field, enabling the digitalization of the oil and gas field. As a leading supplier of customized, reliable and cost efficient telecommunications and security systems for turnkey or standalone offshore, onshore or pipeline projects, we are able to offer oil and gas customers a single source telecommunications provision that helps to reduce costs while keeping projects on schedule.

ABB provides a full-range of digital solutions that help Oil & Gas companies manage complexity.

From electrical condition monitoring in the Barents Sea to developing the world’s largest industrial computer network for plant integration in Saudi Arabia, ABB offers tried and tested solutions for each stage of your operational lifecycle. Our leading digital products and solutions have been designed to meet the real world needs of the industry. This is based on over fifty years of experience in Oil & Gas, a team of 5,000 experts and the implementation of over 1,000 projects worldwide.

Mission Critical Applications:
1. **SCADA**
   Production and injection well monitoring, measurement, logging and control; source and disposal water well monitoring; storage tank monitoring and control; emergency equipment shutdown and recovery.

2. **Real-time video feeds and surveillance**
   Provides operations with remote situational awareness and information that can facilitate decisions, improve safety, and deliver early visibility into critical situations unfolding.
As a proven leader in the oil & gas industries and with continued investment and expansion of new services and solutions, we are uniquely positioned to support your digital needs.

3. Security and surveillance systems
Enhance facility security with electronic access control at entry points or secure locations in the facility; video security at gates or around the site perimeter.

4. Drill rig communications and diagnostics
Monitor drill bit depth and tilt, mud weight, temperatures and pressures; remotely run diagnostics and analyze results.

5. Asset tracking
Track and update the location of fixed and mobile assets in the field improves operations and contributes to safety and security.

6. Field workforce connectivity
Keep work crews in the field connected with access to SCADA data, instant messaging and email at remote sites even if they lack cell service.

7. Voice
IP phones for mobile workers even in remote areas improves operational efficiency and worker safety.
XMC20, mission-critical communications for oil & gas.
Ready for the challenges of tomorrow.

ABB's mission-critical communication solutions for oil & gas offer a broad range of world leading products for local and wide area communication networks.

XMC20
Nothing is more important in mission critical networks than guaranteeing the highest availability of each connection and the highest security for transferred data against attacks from outside. With mission-critical data, downtime and manipulation can mean risk to life and limb. The systems developed and produced by ABB stand apart due to their extreme reliability. From the outset, ABB developers in Germany and Switzerland have placed the highest priority on achieving this goal.

Key attributes were confirmed during the developmental phase of the manufactured systems. These included top availability, maximum service life, simplicity of operation, easy maintenance, a good eco footprint, as well as being thoroughly future-proof in nature.

ABB products, based on decades of experience, bring solutions that meet the stringent access & transport networks requirements for mission critical networks in the areas of clock synchronization, scalability, protection, reliability, ultra-long lifecycles and backward compatibility. In addition, they are highly flexible providing multi-service access for a wide range of applications and the simultaneous availability of circuit-based and packet-based technologies e.g. PDH/SDH and MPLS-TP. The full hybrid concept allows for the co-existence of native TDM and packet-based access services within the same node, providing a perfect future-proof solution for MCS applications.

Highlights
• Full hybrid concept for coexistence and interworking of native TDM and packet services within the same node as well as gateways between TDM and packet worlds
• Protection, redundancy and encryption functions for secure data transmission and highest availability
• Wide range of applications and access interfaces supported
• Support for various transmission interfaces and protocols, including 10 Gbps, SDH STM-16, MPLS-TP and many others
• Guaranteed long lifecycles due to state-of-the-art FPGA technologies and careful lifecycle management
• Wide array of services which include 3rd party equipment integration and maintenance
• All ABB equipment and selected 3rd party equipment are managed under one Network Management System
UNEM
UNEM is the highly-available, scalable and proven solution to manage XMC20 networks in a cost efficient and user-friendly manner, both in the TDM and packet worlds. Beyond the standard fault, configuration, accounting, performance and security management expected from any NMS, it also provides value added features such as:

• Language localization
• End-to-end service provisioning in TDM and MPLS-TP
• Southbound interface for selected 3rd party devices
• Northbound interface for hypervisor-type integration

Quantum safe cyber security solutions
for mission-critical communication

The rising threat of cyber-attacks to mission-critical infrastructures and new threat vectors, like a quantum computer, means that these networks urgently need improved protection.

This is leading to a re-thinking of security. ABB offers the industry’s first quantum-safe solution for highly secure MPLS-TP end-to-end encryption and, taking into account the specific needs of mission-critical applications in terms of communication performance (e.g. jitter, wander, latency), but also considering the availability and long-time protection of the communication infrastructure. Quantum technologies improve the overall safety of critical infrastructure by improving cryptographic key generation with Quantum Random Number Generators (QRNG).
Wireless networks.
The fabric connecting the digital oilfield.

Oil and gas field communications require reliable and resilient, high capacity wireless networks that operate over large areas under extreme environmental conditions.

Well pad communications

Oil and gas fields can span thousands of square miles in remote areas. The TropOS 6420-XA broadband mesh router from ABB Wireless is an ideal well pad communications hub, meeting requirements throughout the pad’s life cycle. ABB Wireless networks are reliable, high-capacity networks that can cover large areas, increasing efficiency and safety.

Using a TropOS 6420-XA in all well pad life cycle phases provides benefits not offered by the common practice of deploying a different network at each stage. Not considering the beginning-to-end requirements for well pad communications is costly. Each time a network is installed, cost and downtime increase.

Using an ABB Wireless network during all phases of a well pad’s life cycle eliminates unnecessary downtime and cost.

The life cycle of an unconventional oil or gas well pad can be divided into four phases: drilling, fracking, completion and production. During each stage, communications are required to support multiple applications. TropOS 6420-XA wireless mesh routers deployed as well pad communications hubs meet the requirements of all applications across all well pad life cycle phases.

The four basic phases in the life cycle of oil or gas well pads includes: drilling, fracking, completion and production. Historically, VSAT was a common choice used in the first two phases with narrow band radio used in the final two. Deployment of an ABB Wireless network during the initial phase is less costly than VSAT and can be leveraged throughout the entire well pad life cycle providing not only significant cost savings but higher performance and reliability.

- **Drilling Phase**
  Applications include geospatial reserve data access, MWD/LWD, remotely steerable downhole tools and field worker applications.

- **Fracking Phase**
  Typical applications include well casing pressure measurements, measurement of injection materials, seismic monitoring, video monitoring and field worker applications.

- **Completion Phase**
  During this phase the well is awaiting entry into production; applications include well hole pressure measurement and SCADA.

- **Production Phase**
  This phase places the most strenuous demands upon the communications network, and includes applications such as high resolution data, video, SCADA, pump off control, flow computers, emissions monitoring, asset monitoring and field worker access.

Using an ABB Wireless network as a well pad communications hub is cost effective solution that meets the wireless communication needs throughout the life of a well pad and is also a cost effectively approach for upgrading communications of mature well pads in the production phase.
Wireless networks.
Modern wireless network architecture for upstream.

Mesh core, broadband PTP/PMP backhaul, narrowband PRP/PMP on the edge.

Oil and Gas Network Building Blocks
ABB Wireless routers located at oil and gas well sites can connect drilling rig and wellhead sensors and controls, video surveillance and security systems, and field workers’ laptops, tablets, handhelds and IP phones. TropOS mesh routers at well sites located near one another can form a single mesh network, enhancing reliability and allowing long-range backhaul links to be shared by several wells. Backhaul from the well sites to the company’s enterprise network and data center can be implemented using ArcheOS (licensed) or TeleOS (unlicensed) PTP/PTMP radios. ABB Wireless offers a comprehensive field proven solution for oil and gas field exploration and production from a market leaders. ABB Wireless also provides comprehensive professional services to simplify and accelerate deployment.

Offshore mesh networks
Customized wireless telecommunication solutions for reliable and flexible communications throughout and around the platform, between platforms and platform-to-shore help to navigate the many challenges faced with offshore operations. Providing a cost-effective way to monitor and control operations, both on the rig and remotely, wireless networks enable applications including internal communication on the rig, wireless connectivity of mobile applications, voice, video, process control and safety system traffic necessary to allow uninterrupted safe operations of the facility.

Network Management Systems.
Unlock the value of network data.

ABB’s Network Management Suite answers the strong need for integrated software solutions capable of managing complex Mission-critical communication networks.

SuprOS is a comprehensive wired and wireless network management system that provides the functionality and tools required to manage ABB communication networks as a single system – including TropOS broadband wireless mesh routers, MicrOS broadband wireless client nodes, TeleOS unlicensed narrowband PTP/PTMP access points and ends points, and ArcheOS licensed narrowband PTP/PTMP with access points and end-points plus selected broadband PTP/PTMP access points and end-points from Cambium and Redline. SuprOS also includes management tools for AFS Ethernet switches and AFR Ethernet routers from ABB. SuprOS streamlines and minimizes costs of deployment, optimization, operation, troubleshooting of network problems and maintenance of ABB communication networks.
**Seamless connectivity.**

**EDS500**

Simple management, configuration and predictive failure notifications to help lower total cost of ownership.

EDS500 is a product family of ruggedized Ethernet/SHDSL switches and FSK modems especially designed to support critical infrastructure companies by enhanced robust communication technology offering minimal downtime, predictive failure notification and encrypted management.
The future is agile and collaborative. We assess your needs, implement solutions and sustain your operations.

ABB are your strategic partner for a changing world, through our six dedicated packages we provide ongoing technical and functional support for your oil & gas projects.
Rapid Response
We guarantee fast and flexible response to maximize your equipment uptime.

Preventive Maintenance
We employ powerful tools and knowledge to optimize and extend your equipment life.

Software & Firmware Lifecycle
We optimize connectivity, reliability and efficiency of your assets to increase speed and yield.

Cyber security
We enable smarter system protection to make your operations more efficient, more productive, and more economic.

Spare Parts
Guaranteed fast and flexible service response to maximize your equipment availability.

Training
We offer training courses to develop your in-house capabilities. Achieve greater levels of self-reliance and maintenance with a package that improves your own team’s ability.

We are with you around the world
ABB Service has more than 150 customer care centers strategically located around the globe. These one-stop shops are staffed by 6,000 professionals with extensive industry and service experience on a wide array of mission-critical communication systems. Our team help you address today’s toughest challenges and prepare you to meet the challenges of future.
Mission-critical communications systems from ABB are ready for the challenges of tomorrow. Providing robust, secure and reliable communications in a rapidly changing world that are with you for the lifetime of your network.

Let’s connect.