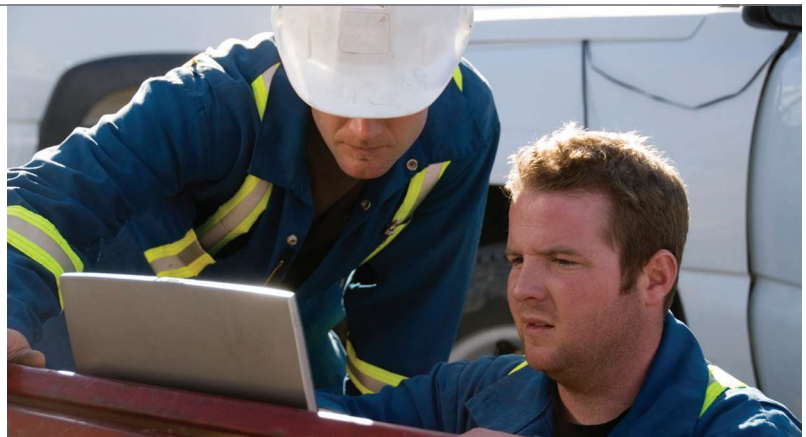


In Oil and Gas, Safety is Non-Negotiable

The oil and gas industry demands the highest level of engineering, productivity and safety. Every aspect of exploration, extraction and refinement must be carefully orchestrated to operate continuously and maximize profits. Achieving this high level of operational excellence is not



possible without advanced data, voice and video communications as well as SCADA (Supervisory Control and Data Acquisition) process control and monitoring.

Wireless Internet Protocol (IP) is fast becoming the preferred communication delivery system due to its excellent reliability, adaptability and affordability. However, additional requirements of security and ruggedization have emerged with similar levels of importance. In some oil/gas production and exploration applications, radios must also meet requirements to be deployed in hazardous or explosive environments. Cambium Networks has solutions that meets these diverse requirements to ensure successful use in the broadest set of deployments.

ATEX AND HAZLOC CERTIFIED WIRELESS

Cambium Networks has multiple products in the portfolio that meet ATEX/HAZLOC requirements.

For broadband applications the Cambium Point-to Point (PTP) 450i and Point-to-Multipoint (PMP) 450i Series Wireless Ethernet Solutions are excellent access and backhaul systems to support petrochemical industry communications requirements. Operating in frequency bands from 4.940 to 5.85 GHz, these radio links are engineered to provide carrier-grade, high-speed, secure connectivity in virtually any environment. You can establish communications in non-line-of-sight (NLOS), long-distance line-of-sight (LOS) and high-interference environments, as well as over water and desert terrain. The ruggedized radios can withstand temperatures between -40° F and 140° F (-40° C and 60° C) and wind speeds up to 200 miles (322 kilometers) per hour.

Cambium's cnReach™ product line provides narrow-band process control and critical infrastructure monitoring for oil/gas, electric utility, water treatment and rail transportation industries. cnReach is deployable in point-to-point, point-to-multipoint and repeater topologies and is available in 450 MHz,

700 MHz and 900 MHz licensed and unlicensed spectrum. cnReach is 100% factory tested for extreme temperatures and harsh environments. This unrivaled performance is possible due to our unique combination of technologies. These technologies work together to overcome obstacles, mitigate interference and enable long-distance communications with high spectral efficiency and up to five-nines of reliability. The systems routinely operate in some of the most hostile environments on earth, including icy mountaintops, hot and dusty deserts, turbulent seas and congested cities.

ATEX AND HAZLOC CERTIFICATIONS

Both the 450i and the cnReach platforms have been tested and certified to meet ATEX and HAZLOC directives for equipment operations in hazardous locations. Compliance classifications granted are:

PTP 450I

ATEX

Equipment Group II – electrical equipment intended for use in places with an explosive gas atmosphere other than mines susceptible to firedamp (methane); equipment category 3 G which is equipment that is suitable for Zone 2

Category 3 / Zone 2 – electrical equipment intended for use in a location where an explosive atmosphere is not likely to occur in normal operations, but if it does, only occurs for short periods of time; protection by intrinsic safety assessment for Zone 2

Gas Group IIC – acetylene and hydrogen for example

Temperature Class T4 – 135° C maximum surface temperature

HAZLOC

Class 1 Location – flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures

Division 2 – ignitable concentration of flammable gases, liquids or vapors are not likely under normal conditions

Gas Groups A, B, C, D – acetylene, hydrogen, ethylene and propane for example

cnREACH

HAZLOC

Class 1 Location – flammable gases, flammable liquid-produced vapors, or combustible liquid-produced vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures

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Gas Groups A, B, C, D – acetylene, hydrogen, ethylene and propane for example

UPSTREAM APPLICATIONS

In both offshore and onshore exploration and production, Cambium products support a variety of communications to enhance productivity and support ongoing operations safely. Typical upstream applications include:

- **Video Surveillance Backhaul:** PMP/PTP 450i systems are ideal solutions to backhaul traffic from surveillance cameras to a control center. With user speeds up to 240 Mbps, the radios can stream video from multiple cameras in multiple locations. With adjustable uplink/downlink ratios, the systems can be tuned to the high uplink needs of video application.
- **NLOS and Long-Distance Connectivity:** When you need to communicate between drilling rigs and a host platform, a 450i solution can overcome path challenges from high interference and obstacles which obstruct the line-of-sight.

If you need to communicate over a long distance, our systems reliably communicate over distances up to 124 miles (200 km).

- **Network Resiliency:** Often exploration and drilling occur in very remote locations which may have mountainous or desert terrain, bodies of water and fluctuating weather conditions. Such environmental challenges make it very difficult to restore communications in the event of an outage. Deploying PTP systems as back-up links enables a continuous flow of information and helps to maintain your overall productivity. Plus, our sophisticated deployment assistance features help you quickly and easily install these links.
- **SCADA applications:** with any combination of TCP/IP, Serial or general-purpose digital/analog I/O, cnReach connects remote sources of data back to the operations center. Whether reading sensors or setting actuators, cnReach reliably and securely delivers the messages.
- **Remote access:** 450i-based solutions can be used to deliver remote access connectivity to Wi-Fi access points such as the Cambium Networks cnPilot™ E400 indoor and E500 outdoor solutions.

DOWNSTREAM APPLICATIONS

Refineries and petrochemical complexes are required to operate continuously at high productivity over long periods of time. To support optimal productivity and continuity, PTP systems can establish communications quickly, supply increased capacity and provide redundancy for critical operations. Typical downstream applications include:

- **Rapid Deployment for Turnarounds:** When you need to shutdown operations for a turnaround, PTP/PMP 450i radios can supply needed wireless connectivity for employees and contractors at the work site. Because radios can be installed in a day, you can provide temporary communications fast. Once installed, the systems are easy to use and can be managed remotely. Combined with Cambium's Quick Deploy Positioner, field technicians can more easily align the 450i remote module making set-up faster and more accurate.
- **Process Control and Monitoring:** For critical infrastructure nodes being used for SCADA, cnReach provides reliable and secure communications.
- **Video, VoIP and PCS Backhaul:** PMP/PTP 450i radios are excellent options to backhaul traffic from your surveillance cameras, voice-over-IP (VoIP) and process control systems to a command center. You can also extend the reach of these systems into remote areas where fiber is not available or is prone to accidental cable cuts due to construction projects.
- **Added Capacity:** As with all industries, the oil and gas industry has experienced an increase in the demand for bandwidth-intensive voice and video communications. 450i systems provide additional capacity to support the ever-growing amount of multimedia content.

PMP/PTP 450I ADVANTAGES

450i systems offer several significant advantages over comparable systems, including:

- **Deployment Flexibility:** available in point-to-point and point-to-multipoint topologies, wide frequency ranges (4.9 to 5.9 GHz) and multiple channel bandwidths (5/10/20/40 MHz)
- **Reliable:** designed for wide temperature operation and harsh environments
- **Scalable:** multiple access points can be synchronized to reduce self-interference and increase spectral efficiency
- **Secure:** 128/256-bit AES encryption, multi-level roles-based access
- **LINKPlanner™:** easy-to-use planning tool for reliability and availability predictions. Also prepares bill of materials, proposal reports and installation report.
- **Management:** integration with Cambium's cnMaestro™ for single pane-of-glass view of the entire network.

cnREACH ADVANTAGES

- **Single and dual radio modules** are available to operate in license or unlicensed spectrum
- **Deployment Flexibility:** cnReach can be deployed in point-to-point, point-to-multipoint and relay topologies.
- **Reliable:** cnReach is designed for wide temperature operation and harsh environments
- **Low Power:** for remote areas where power is provided by solar or in case of battery backup scenarios, cnReach requires very little power
- **Scalable:** multiple access points can be synchronized to reduce self-interference and increase spectral efficiency
- **Secure:** 128/256-bit AES encryption, multi-level roles-based access
- **LINKPlanner:** easy-to-use planning tool for reliability and availability predictions. Also prepares bill of materials, proposal reports and installation report.
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SUMMARY

Oil and gas exploration, extraction and production entail sophisticated and complex processes to achieve productivity and profitability goals. State-of-the-art communication systems are crucial to the success of those efforts, and the safety afforded by those systems is paramount. Cambium Networks is helping critical infrastructure operators operate safely in oil and gas environments with ATEX and HAZLOC certifications.

ABOUT CAMBIUM NETWORKS

Cambium Networks is a leading global provider of wireless broadband solutions that connect the unconnected. Through its extensive portfolio of reliable, scalable and secure narrowband SCADA, WiFi and wireless broadband point-to-point (PTP) and point-to-multipoint (PMP) platforms managed by cloud-based software, Cambium Networks makes it possible for all service providers; enterprises; government and military agencies; oil, gas and utility companies; Internet service providers; and public safety networks to build powerful communications networks, reach users from 250 kilometers across mountain tops down to the last meter to their devices and intelligently manage their infrastructure through end-to-end network visibility and actionable analytics. Headquartered outside Chicago and with R&D centers in the U.S., Ashburton, U.K., and Bangalore, India, Cambium Networks sells through a range of trusted global distributors.

For more information, visit: www.cambiumnetworks.com and www.connectingtheunconnected.org



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