

BROADBAND COMMUNICATIONS BUILDING TO BATTLEFIELD

CAMBIUM POINT-TO-POINT (PTP) AND
RAPID DEPLOYMENT BROADBAND (RDB) SOLUTIONS



FAILSAFE, HIGH-BANDWIDTH COMMUNICATIONS

To deliver essential services, our nation relies on real time, secure communication networks to share vital information and effectively coordinate operations. Today's strategic communications must combine data, voice, and video into a unified stream of intelligence that is available anytime and anywhere. This requires high-bandwidth networks to enable the timely transport of everything from video imagery, voice commands, and surveillance data to telemetry and budgetary data. Our point-to-point (PTP) and point-to-multipoint (PMP) wireless solutions can help your agency share information efficiently, securely, and economically. So, you can focus on the mission at hand.

RESULTS-DRIVEN SOLUTIONS

Within our portfolio of broadband solutions, we offer several models specifically designed for the stringent requirements of civilian and military communications. These systems can be deployed independently or configured together to form a cohesive communications network. In addition, our systems are Commercially available Off-the-Shelf (COTS) systems which have been optimized for civilian and military use.

Feature	PTP 600	RDB 350	PTP 800
Operating Frequencies	4.5, 4.8 GHz	4.4 – 5.0 GHz	6 – 38 GHz
Maximum Throughput	300 Mbps	45 Mbps	368 Mbps (full duplex)
Maximum Range	124 mi (200 Km)	34 mi (54 km)	Depends on antenna and configuration
Security	128/256-bit AES, Proprietary Air Interface	128-bit AES, Standard Air Interface	128/256-bit AES, Proprietary Air Interface

PTP 600: PREMIER PROBLEM SOLVER

Cambium PTP 600 systems are our premier systems to deliver data, voice, and video over challenging paths and ultra-long distances. Built to overcome interference, path obstructions, and weather extremes, these systems routinely perform in environments where comparable systems cannot make a connection. PTP 600 radios have attained Federal Information Processing Standards (FIPS) 140 validation and Unified Capabilities, Approved Products List (UC-APL) certification for interoperability and information assurance. So, you can be confident that your PTP 600 solution will deliver secure, rock-solid connectivity and backhaul.

RDB 350: RAPIDLY DEPLOYABLE BROADBAND

The Cambium RDB 350 is a point-to-multipoint system designed to provide mobility and rapidly deployable broadband communications in line-of-sight (LOS) and near-line-of-sight (nLOS) environments. These 4G-based,

IEEE 802.16e systems are ideal for applications such as convoy mobility, surveillance and sensor networks, tactical communications, and disaster recovery. The systems can be vehicle or mast mounted. And, they comply with MIL-STD 810G and IP-68 regulations.

Designed to operate nimbly in harsh radio-frequency environments, RDB 350 units are tunable over the entire 600 MHz spectrum. So, the communications officer can select a variety of channel bandwidths, including 10, 7, 5 and 3.5 MHz. The platform includes Electronic Counter Counter-Measure (ECCM) features such as advanced error correction (FEC, HARQ, CTC), adaptive modulation, automatic transmit power control, and Multiple Input, Multiple Output (MIMO) capability transmitting on multiple polarities.

PTP 800: AFFORDABLE NTIA-COMPLIANT MICROWAVE

Cambium PTP 800 solutions are our cost-effective, Ethernet-based, traditional microwave systems. These systems are ideal where you want dedicated spectrum, added backbone capacity, extremely low latency, and/or redundancy. Their exceptional scalability can help you reduce your initial capital expenditure by allowing you to purchase only the throughput capacity needed today and upgrade capacity as requirements increase. NTIA-compliant 7 and 8 GHz models are available for U.S. Federal and Department of Defense (DoD) applications. In addition, PTP 800 systems comply with FIPS 140-2 guidelines for cryptographic algorithms, key security, and tamper evidence. Validation status can be confirmed at:

<http://csrc.nist.gov/groups/STM/cmvp/inprocess.html>.

PREFERRED AND PROVEN BROADBAND

Within government agencies, there are thousands of strategic and tactical applications, spanning a vast number of locations and environmental conditions worldwide. As a result, we offer a family of broadband solutions which are specifically engineered to help you implement increasingly



TM: Certification Mark of NIST (National Institute of Standards and Technology), which does not imply product endorsement by NIST, the U.S. or Canadian Governments.

PTP 600

- NATO Band IV
- UC-APL
- FIPS 140-2
- IP-66 & MEF9
- Two T1/E1 Ports

RDB 350

- 4.4 – 5.0 GHz
- IEEE 802.16e
- MIL-STD 810G
- IP-68

PTP 800

- 6-38 GHz
- 368 Mbps (Full Duplex)
- Ultra-low Latency
- 1+1 Hot Standby and 2+0 Redundancy
- FIPS 140-2



PTP 600
INTEGRATED &
CONNECTORIZED
RDB 350
PTP 800 ODU & CMU

capable fixed and mobile communication networks. At the same time, we have made and continue to make significant investments to validate that our wireless solutions give you the functionality, interoperability, and security you require.

With more than 2.2 billion field hours logged and 441 years MTBF (PTP 600), our systems have proven their reliability, performance, durability, and cost-effectiveness in some of the most hostile environments on earth. The following information gives you a sampling of the many varied applications that these systems can support.

BASE MODERNIZATION

UC-APL-listed PTP 600 solutions offer an impressive array of rich features to help you upgrade and extend your broadband ecosystem under the Installation Information Modernization Program (I3MP). In addition, our RDB 350 solutions can add point-to-multipoint functionality and mobility where needed. Where traditional microwave and/or ETSI bands are preferred, our PTP 800 systems can offer added backbone capacity, edge communications, and hot-standby redundancy. Typical applications served by these systems include:

- Leased line replacement to reduce or eliminate monthly fees
- Building-to-building communications as an economical alternative to trenching fiber
- Long-distance connectivity and backhaul for remote communications
- Satellite LAN extensions to reduce operating costs
- Sensor and security backhaul from the base perimeter to the technical operations center (TOC)
- Impromptu communications for short-term activities
- LTE and WiMAX backhaul

TEST RANGE COMMUNICATIONS

Whether testing weaponry, vehicles, or electronic equipment, a test-range communication system has to continually transmit information from video cameras and sensors to the command center and communicate between personnel. Vehicle-mounted and fixed-mounted RDB 350 devices can interconnect your surveillance cameras and sensors to deliver information in real time.

Today, our PTP 600 solutions are backhauling high-definition video at several test ranges located on bases with many obstructions and terrain challenges. The PTP 600's NLOS and long-distance capabilities often make the difference between a successful test mission and an unsuccessful one. Plus, the radios have a small footprint and are easy to set up and take down.

CONVOY MOBILITY

Our military is constantly on the move. So, communication mobility is a critical requirement. Our RDB 350 solution is designed and engineered for convoy mobility with vehicle-mounted devices. On the move or at the halt, you can maintain continuous communications with the vehicles and personnel. In addition, PTP 600 systems can support this mobility with reliable backhaul in challenging conditions.

BORDER PATROL

Today, a country's border is dotted with thousands of surveillance cameras and sensors. Information from those cameras and sensors has to be sent to various command centers in real time. Our RDB 350 and PTP 600 solutions can help you backhaul surveillance information, mobilize patrol communications, connect remote offices and personnel, and provide redundancy for critical communications.

TEST RANGES USING PTP

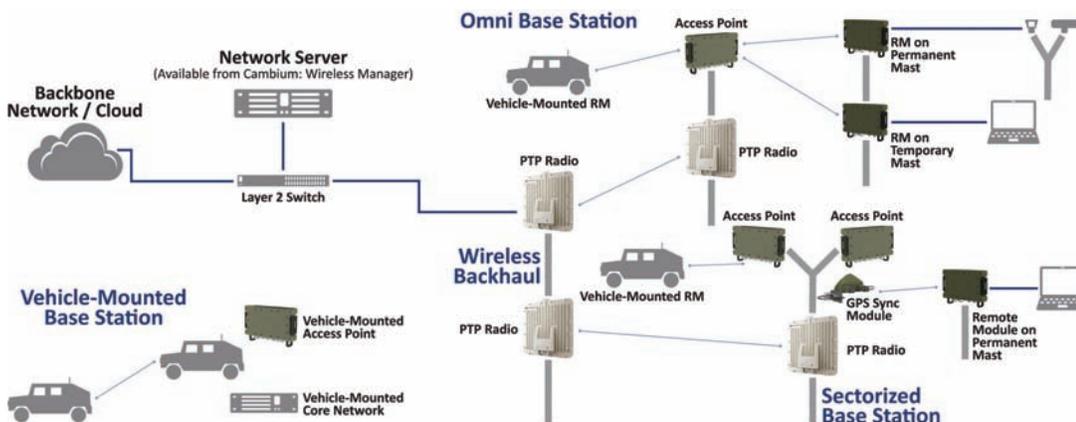
- Aberdeen Proving Grounds
- Eglin Field
- Fort Huachuca
- White Sands Missile Range
- Yuma Proving Grounds

IN THE U.S., CBP PROTECTS

- 327 Ports of Entry (POEs)
- Approx. 7,000 Miles of Land Border
- Approx. 95,000 Miles of Shoreline (in Partnership with the U.S. Coast Guard)

FIELD-PROVEN DURABILITY

- More Than 2.2 Billion Field Hours
- 441 Years MTBF (PTP 600)



Rapid Deployment Broadband and Backhaul

CAMBIUM: SOLUTIONS, PARTNERS, EXPERTISE

Both systems are extremely durable and can operate reliably in tough environments and severe weather conditions. At or near major posts, the PTP 800 can provide the added benefit of having high capacity at an extremely affordable price point.

LAW ENFORCEMENT

Event security, remote access, and video surveillance connectivity and backhaul are key applications to support the operations of Federal Marshals. Our PTP 600, RDB 350, and PTP 800 systems can function independently and together to enhance situational awareness and officer safety. Both the PTP 600 and RDB 350 can be deployed rapidly for special missions and national emergencies to provide fixed and mobile communications as needed.

TACTICAL COMMUNICATIONS

Due to the critical nature of the communications and the global scope of operations, military and NATO agencies need high-capacity, super-reliable communication systems that perform flawlessly in virtually all situations and geographies. Our PTP 600 radio is the “radio of record” for U.S. DoD situational awareness programs. PTP 600 and RDB 350 systems consistently deliver the high performance, reliability, and security needed to:

- Enable battlefield communications
- Increase persistent awareness
- Support training and simulation networks
- Backhaul traffic from telemetry and Land Mobile Radios (LMRs)
- Establish building-to-building and campus connectivity from brigade to battalion and battalion to company
- Provide drop-in wireless communication networks

SHIP-TO-SHORE, SHIP-TO-SHIP

When wireless signals travel over water or hard surfaces such as a desert, these highly reflective surfaces can create performance and reliability challenges. Varying water heights from tidal changes create added over-sea challenges. With spatially diverse antennas, PTP 600 systems can mitigate the ducting and fading that is typical over water and desert.

In one of our more well-known deployments, the National Oceanic and Atmospheric Administration (NOAA) feeds data, voice, and video via cable from the ocean floor to the

top of a 30-foot buoy on the ocean surface. The PTP 600 radio installed on top of the buoy transmits voice, video, telemetry, and life support data to a land-side station. The system performs reliably through turbulent seas and averages 100 Mbps full duplex.

Another PTP 600 deployment provides consistent communications between a land-based dock and a ship anchored off shore, while a PTP 600 link in the desert communicates at up to 100 Mbps across a 60-mile path. These are just a few examples of how you can enable high-throughput, reliable communications across water and desert terrain.

SUMMARY

At Cambium Networks, we recognize that civilian and military connectivity and backhaul must meet strict and exacting requirements. We have made and continue to make significant investments to ensure that our systems meet your application requirements and comply with the appropriate regulatory agencies. Working with our global network of experienced partners, we have successfully deployed wireless solutions in a wide variety of civilian and military agencies. As a result, we have the solutions, partners, and expertise to configure the right broadband solution for your unique requirements.

So, let us demonstrate how we can help you communicate from building to battlefield reliably, securely, and affordably.



NOAA Buoy with PTP Radio

U.S. MARSHALS

- 94 Districts
- More Than 3,950 Deputy Marshals and Criminal Investigators

TYPICAL CIVILIAN AND MILITARY CUSTOMERS

North America	U.S. Marshals	U.S. Army, Air Force, Marines and Navy
	NASA	U.S. Coast Guard
Latin America	Colombia Polices Forces	Colombia Military Forces
	Mexico Polices Forces	Mexico Navy Forces
	Argentina Polices Forces	Ecuador Polices Forces
	Brazil Polices Forces	Chile Military Forces
Europe, Middle East and Africa	Border Control Agencies	Military Tactical and Base Camp
	Public Safety Organisations	Special Forces
Asia, Pacific	Australian Federal Police	New Zealand Defence Forces
	Australian Customs and Boarder Protection Service	

For more information, visit cambiumnetworks.com.



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