



LongHaul™ TDM Series

EASY-TO-USE BACKHAUL RADIOS GO THE DISTANCE

The LongHaul™ TDM Series of Ethernet and T1/E1 bridges provides unparalleled range, signal strength, reliability and capacity while still remaining affordable and easy to use. Carlson's revolutionary SWiFT™ synchronous platform allows LongHaul™ TDM Series radios to operate as point-to-point IP bridges that eliminate packet collisions, optimizing wireless voice and data communications.

An optional T1/E1 interface makes it possible to backhaul multiple carrier-class T1s with wayside Ethernet.

APPLICATIONS:

- Public Safety Networks
- WISP Networks
- VoIP PBX Links
- Cellular Backhaul
- Remote Equipment Monitoring
- Remote Video Surveillance
- Disaster Restoration Communications
- Rural Broadband
- Streaming Media
- UDP Intensive Applications
- SCADA polling
- SmartGrid
- Substation Isolation & Control
- Distributed Generation
- WiMax Backhaul

The SWiFT™ radio platform performs with ultra-low fixed latency to meet the speed and precision requirements of today's critical telecommunications, public safety and utilities networks. LongHaul™ TDM Series radios support TDM to IP migration, making this series both legacy-compatible and future-proof. High performance features and unparalleled range capabilities, combined with ease of installation and an extremely easy to use GUI, make the LongHaul™ TDM Series the most flexible, affordable and truly interoperable microwave backhaul solution available.

FEATURES:

Powerful and Flexible Throughput

- Up to 108 Mb/s CSMA or 32 Mb/s TDM throughput per link
- Range of 60+ miles (96 km)
- Low fixed latency (bounded delay)
- Synchronous transmission structure

Fast Deployment and Easy Network Control

- Self configures MAC addresses, encryption and SSIDs
- Simple Alignment System (SAS)

Equipment, Network and Environmental Monitoring

- Monitor status and control radios from anywhere
- User configurable alarms via GUI or e-mail
- Integrated power and temperature monitoring capabilities (rack mount models only)

Low Power Use for Remote Applications

- Power consumption 6 to 8 watts
- Easily solar powered using 12 to 24 volt power supply

Built Rugged for Extreme Weather and Industrial Applications

- IP67 rated ODU with highest level lightning protection
- Optional extended temperature range from -40°C to +60°C
- Hazardous location and explosion proof enclosures are also available
- Solid aluminum indoor rackmount (IDU) available

Security and Encryption

- Secure 64, 128 and 152 bits WPA and AES encryption

US/International Frequency Plans

- Carlson Wireless radios are available in a wide range of US licensed and unlicensed frequencies, including 4.9 GHz and 5x GHz.
- International frequencies are also available.





LongHaul™ TDM Series

USER DATA THROUGHPUT

| | |
|----------------------------|--|
| Data Throughput (IP Mode) | 60+ Mb/s asymmetric throughput in CSMA (802.11a/n) |
| Data Throughput (TDM Mode) | 16/32 Mb/s symmetric throughput in TDM |
| Over the Air Data Rate | Up to 108 Mb/s per radio |

RF PERFORMANCE

| | |
|---------------------------|--|
| Frequency Bands Supported | 2.4, 3.65, 4.9, 5.1-5.2, 5.7-5.8, and 5.9 GHz |
| RF Channel Width | 5/10/20/40 MHz |
| Modulation | OFDMA - BPSK, QPSK, 16QAM, 64QAM |
| Tx Power 6-2 | 4 Mb/s +23 dBm, 54 Mb/s +18 dBm |
| Receiver Sensitivity | 54 Mb/s -72 dBm, 48 Mb/s -77 dBm, 36 Mb/s -82 dBm, 24 Mb/s -85 dBm, 18 Mb/s -89 dBm, 6 - 12 Mb/s -90 dBm |
| Duplexing | TDD (Time Division Duplexing) |
| End-to-End Latency | CSMA (IEEE 802.3+ propagation) or TDM @ 5 or 2.5 ms |
| Range | 60+ miles without repeaters (96 km) |

ENVIRONMENTAL

| | |
|--------------------------|---|
| Ingress Protection | IP67 (dust tight, 1 m water immersion) |
| Outdoor Unit Temperature | -40°C to 60°C |
| Outdoor Unit Humidity | Up to 100% humidity (non-condensing) |
| Indoor Unit Temperature | -20°C to 45°C |
| Indoor Unit Humidity | Up to 90% humidity (non-condensing) |
| Safety | UL 60950, CAN-CSA C22.2 60950, EN 60950, IEC 60950 |
| EMC | FCC 47CFR class B part 15, subpart B, CAN/CSA-CEI/IEC CISPR 22-02, EN300 386, EN301 489, EN55022, EN61000, EN55024, AS/NZS CISPR 22 |
| Environmental | IEC 60721 class 4M5 IP67 |

ETHERNET INTERFACE

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|--------------------------|---|
| Type | 10/100 BaseT with Auto-negotiation |
| Number of Ethernet Ports | 1 data port and 1 management port |
| Framing/Coding | IEEE 802.3/U |
| Bridging | Self-learning up to 2047 MAC addresses |
| Connector | RJ-45 |
| QoS Services | WME - Prioritizes traffic according to voice, video, best effort and background |

NETWORK MANAGEMENT INTERFACE

| | |
|----------------------------|--|
| User Interface | Browser based access via Ethernet port w/Flash GUI |
| Setup and Alignment | Audio tone varies with signal strength |
| Protocol | HTTPS |
| Upgrade Capabilities | Local and remote software upgrades |
| Telemetry Alerts Mechanism | Email and GUI |
| Diagnostics | Local and remote loopback testing |
| Management Port | DHCP based |
| Configuration Management | Sys. Built-in w/full history |
| Voltage Input/Monitoring | Range 9-56 V at ± 3% |
| Temperature Monitor Range | -40 to 124°C at ± 2° |
| Programmable Alert System | Email and GUI |

SECURITY

| | |
|--------------------|---|
| Security Mechanism | WPA2 PSK |
| Encryption | AES (NIST/FIPS 140-2 compliant), WEP, WEP2, WPA, AES-128, 64, 128, 152 -bit WEP data encryption |

POWER SUPPLY

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|-------------------|--|
| Voltage | 100-240 VAC, -24 VDC or -48 VDC optional |
| Power Consumption | 6 - 8 watts typical, ODU with IDU-E |

PHYSICAL/MECHANICAL

| | |
|-----|--|
| ODU | POE injector connects via outdoor CAT-5e cable (300 ft max length) to the Outdoor Unit containing the LongHaul radio with either N connector or an integrated panel antenna. |
| IDU | Standard 1u rack enclosure with N connector |

ODU INTEGRATED ANTENNA

| | |
|--------------|------------------------|
| Gain | 23 dBi |
| Beamwidth | 8° |
| Polarization | Vertical or Horizontal |

DIMENSIONS AND WEIGHTS

| | |
|------------------------|-----------------------------|
| ODU Dimensions (HxWxD) | 15.5" x 15" x 4" |
| ODU Weight | 4 lb 8.5 oz |
| IDU Dimensions | 1.75" (1 EIA unit) x 19"x6" |
| IDU Weight | 1 lb 1.6 oz |

