



CARLSON

BROADBAND AND VOICE PRODUCTS



LongHaul™ 5x TDM

POWERFUL, FLEXIBLE, EASY TO USE BACKHAUL RADIO

Much more than just wireless data transport, the LongHaul™ 5x TDM unlicensed band digital microwave Ethernet bridge provides unparalleled range, signal strength, flexibility and capacity combined with incredible ease of use. Carlson's revolutionary SWiFT™ solution allows LongHaul™ 5x TDM radios to operate as point-to-point IP bridges that don't degrade at long distances. The SWiFT™ platform supports TDM and IP migration and is both legacy compatible and future proof, making the LongHaul™ the most affordable and truly interoperable radio available.

APPLICATIONS:

- WISP Networks
- VoIP PBX Links
- Cellular Backhaul
- Remote Equipment Monitoring
- Remote Video Surveillance
- Temporary and Disaster
- Restoration Communications
- Rural Broadband
- Smart Grid
- Streaming Media
- UDP Intensive Applications
- SCADA polling
- WiMax Backhaul

The LongHaul™ 5x TDM provides the best quality, performance, features and price in its class. LongHaul™ can switch from a standard IP (108 Mb/s OTA rate) to the SWiFT™ platform, providing a constant user data throughput of 16/32 Mb/s at distances of 60+ miles (96 km). SWiFT™ eliminates packet collisions that typically limit wireless VoIP system and media streaming performance making the LongHaul™ the most robust backhaul solution in its class, at any distance.

FEATURES:

Powerful and Flexible Throughput

- Up to 108 Mb/s over-the-air rate and up to 60 Mb/s TCP/IP throughput
- 16/32 Mb/s throughput in SWiFT™ TDM mode that does not degrade with distance!
- RF bandwidth adjustable (5/10/20/40 MHz)
- 1 MHz tuning with up to 54 non overlapping channels
- Range of 60+ miles (96 km)

Superior for VoIP Networks and Streaming Media

- Low fixed latency (bounded delay)
- No data packet collisions

SuperVision GUI for Fast Deployment and Easy Network Control

- Self configures MAC addresses, encryption and SSIDs
- Real-time access to performance and event logging history
- Simple Alignment System (SAS)

Equipment, Network and Environmental Monitoring

- Monitor status and control radios from anywhere
- Integrated power and temperature monitoring capabilities
- User configurable alarms via the interface, GUI or e-mail
- SNMP (v1 or v2 basic)

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-128 encryption

US/International Frequency Plans

- This model's standard frequencies are 5.1-5.2 GHz and 5.7-5.8 GHz.
- LongHaul™ radios are available in a wide range of US licensed and unlicensed frequencies, including 4.9 GHz.





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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	108 Mb/s per radio

RF PERFORMANCE

Frequency Bands Supported	5.1-5.2 GHz, 5.7-5.8 GHz
RF Channel Width	5/10/20/40 MHz
Modulation	OFDMA - BPSK, QPSK, 16QAM, 64QAM
Tx Power	6-24 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) per IEEE 802.3 + propagation, (TDM) 5 ms
Range	60+ miles (96 km) without repeaters

PHYSICAL/MECHANICAL

IDU-E with ODU	POE injector connects via outdoor CAT-5e cable (300 ft max length) to the Outdoor Unit containing the LongHaul radio with either integrated antenna or N connector.
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POWER SUPPLY

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

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

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
Compatibility	IPv6

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 System	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

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" x 6"
IDU Weight	1 lb 1.6 oz

ODU INTEGRATED ANTENNA

Gain	23 dBi
Beamwidth	8°
Polarization	Vertical or Horizontal

SECURITY

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

