

## Point-to-Point nxT1/E1/EtherNet Digital Microwave Radio Systems

### KEY PRODUCT FEATURES

- Three different base models, allowing users to select wireless transmission rates of 45, 22.5 or 11.25Mb/s, up to 40 miles
- Mix and match up to four T1/E1 circuits, with residual bandwidth available for Ethernet traffic
- Two license-free options: 5.8GHz ISM or 5.3GHz UNII
- Full Duplex, Frequency Division Duplexing (FDD) operation for low-latency, symmetric traffic
- Three, six or twelve distinct software selectable channel pairs, depending on the model, for industry leading frequency coordination
- 16 QAM modulation allows up to 48 co-located radios without interference
- Single cable to radio for Ethernet and power
- Advanced security settings allow three levels of user access
- Extended temperature range:  
Outdoor Unit: -33°C to +60°C  
Indoor Unit: -10°C to +50°C
- Outdoor unit available with integral antenna or optional connection for external flat or parabolic directional antennas
- SNMP, FTP, Telnet, and Web Interface allow flexible radio management, configuration, installation and operation
- Low part count contributing to a High Mean Time Between Failure Rate (MTBF) > 7 years
- 99.999% uptime Carrier Class reliability meets or exceeds wireline standards
- Industry-best five year product warranty and advance replacement service option
- Specifications are guaranteed over the full temperature range and for the life of the product

### WHAT IS THE TDM4LINK FAMILY OF RADIO SYSTEMS?

The TDM4Link family is an advanced line of broadband radio communication systems, designed for delivery of packetized Ethernet data. Customers can choose from versions offering three different data rates: T4-4500 (45Mb/s), T4-2500 (22.5Mb/s) or T4-1200 (11.25Mb/s). The lower rate products are field upgradeable to deliver the higher rates. All radios offer full-duplex, Telco grade performance.

Each system consists of an outdoor point-to-point microwave radio (ODU) connected to an indoor, rack-mountable access panel (IDU). The IDU provides connections for up to four mix and match T1/E1 circuits. Excess bandwidth is available via an RJ-45 port. The IDU powers the ODU using Power over CAT5. This two-part flexible architecture allows optimal radio placement for maximum performance.

TDM4Link systems operate in the license-free band, and operators can choose versions transmitting in the 5.3 GHz UNII band or in the 5.8 GHz ISM band. The outdoor radios can be ordered with either an integral antenna, or an external antenna connector.

TDM4Link indoor units mount easily onto standard telco racks, and with a narrow form factor, operators can place two units side by side using only one rack unit (1.75").

### WHY AERAS WIRELESS BROADBAND?

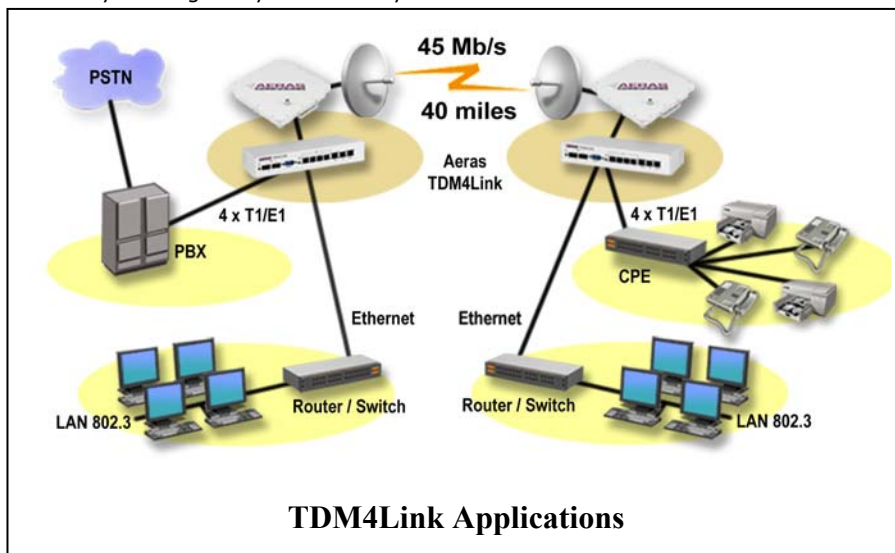
Aeras Networks' TDM4Link systems deliver up to 45 Mb/s full duplex backhaul bandwidth with powerful Forward Error Correction (FEC). The UNII versions reach up to 7 miles, while the ISM versions carry up to 40 miles. By combining superior ease of installation, next-generation license-free wireless technology with sophisticated remote management capabilities, Aeras delivers a powerful alternative to expensive traditional leased lines, and is a dramatic improvement over older wireless broadband systems.

Aeras Networks offers wireless customers:

- Faster return on investment
- Next day deployment (no limitations or delays)
- Carrier Class reliability "Five Nines"
- Easy installation and maintenance with high MTBF rate
- Internal Loopback Test
- Industry-leading five year warranty



**TDM4Link System showing indoor access panel, and outdoor units with external and integral antenna options**



**TDM4Link Applications**

**TDM4LINK MODELS**

MODEL	DATA RATE	AVAILABLE CHANNEL PAIRS	# CO-LOCATED RADIOS*
T4-4500	45, 22.5, 11.25Mb/s	3	12
T4-2500	22.5, 11.25Mb/s	6	24
T4-1200	11.25Mb/s	12	48

\*TWO FREQUENCY PLANS (5.3 AND 5.8GHZ) AND TWO POLARIZATION OPTIONS (VERTICAL AND HORIZONTAL)

**GENERAL PRODUCT INFO**

FREQUENCY BAND	Full duplex operation in either the UNII or ISM Bands, depending on the model
SPECTRUM OPTIONS	5.250-5.350GHz or 5.725-5.825GHz
CAPACITY OPTIONS	Up to four T1/E1 ports and two 10/100BaseT Ethernet switched ports
CHANNEL BANDWIDTH	16 MHz

**DIGITAL INTERFACES**

1) <u>4xT1/E1</u>	<u>T1</u>	<u>E1</u>
LINE RATE	1.544Mb/s	2.048Mb/s
LINE CODE	AMI, B8ZS	HDB3
INTERFACE	DSX-1, CSU	CEPT-1
CONNECTORS	RJ-45	RJ-45
2) <u>10/100BASET</u>		
TYPE	2x10/100BaseT per IEEE802.3	
ETHERNET MODE THROUGHPUT	MAXIMUM 11.25, 22.5 OR 45.0 Mb/s	
MAX DISTANCE (IDU TO ODU)	300 feet	

**TRANSMITTER (OUTDOOR RADIO)**

FREQUENCY RANGE (Frequency Agile)	5.250-5.350 GHz OR 5.725-5.825 GHz
OUTPUT POWER AT FREQUENCY (Adjustable)	5.3GHZ 5.8GHZ +10dBm max +16 dBm max
TRANSMIT ATTENUATION	1-30dB adjustable below max power
FREQUENCY STABILITY MODULATION	±5 ppm
MODULATION	16 QAM with built in Equalization

**RECEIVER (OUTDOOR RADIO)**

TYPE	Double Heterodyne
SENSITIVITY BER 10 <sup>-6</sup> INCLUDING FORWARD ERROR CORRECTION (FEC)	T4-1200 T4-2500 T4-4500 -84dBm -81dBm -78dBm
MAX RF INPUT LEVEL	-35dBm
FREQUENCY STABILITY	±5 ppm
ADJACENT CHANNEL REJECTION	≥40 dB (RF bandwidth of ≤16 MHz)

**MANAGEMENT**CRAFT PORT/CLI

CONNECTOR	DB9
INTERFACE	RS232 RX & TX Only
ALARMS	Supports two alarm inputs and one alarm output

ETHERNET PORT

CONNECTOR	RJ-45
INTERFACE	10/100BaseT
SNMP	MIB II
	HTML Configuration and troubleshooting via management port

**STATUS INDICATORS/DIAGNOSTICS**1) OUTDOOR RADIO (ODU)

<u>EXTERNAL LEDS</u>	Power, Local Alarm, RF Link, 1xEthernet link
ALARMS STATUS	AIS, Radio TX/RX, BER, NMS IP addresses, BER, TX/RX Power, Signal Level, Loopback Test, Ethernet Input
CONFIGURATION COMMANDS	NMS IP addresses, TX Power, TX Mute, Frequency, RSL, BER Alarm, Loopback Tests, BER Tests
DIAGNOSTIC TEST FEATURES	BER, Local/Remote/RF Loopbacks
PERFORMANCE MONITORING	Receive Signal Strength Indicator (RSSI), Ethernet Statistics

2) Indoor Unit (IDU)

ETHERNET STATUS	Link, Data flow
T1/E1 CONNECTORS	Configured & Receiving
CONNECTION STATUS TO RADIO	Power and Link Status
<b>POWER</b>	
INPUT POWER RANGE (IDU)	±22 to 56 VDC Nominal 48V
POWER CONSUMPTION (IDU)	7 Watts
MAX. CAT5 WAN CABLE LENGTH	100 METERS AT 48V
IMPEDANCE (IDU)	T1 (100 OHMS); E1 (75 OR 120 OHMS)
POWER CONSUMPTION (RADIO)	35 Watts
POWER CONNECTOR (IDU)	3 Pin Molex
AC ADAPTER (IDU)	100-250 VAC 50-60Hz input 48VDC out

**MECHANICAL**

	<u>ODU (Radio)</u>	<u>IDU (Access Panel)</u>
DIMENSIONS (HxWxD)"	4"x12"x12"	1.7"x8.7"x6.25"
WEIGHT	11 lbs (5 kg)	3 lbs (1.4 Kg)

**ENVIRONMENTAL**

TEMP. RANGE:	Outdoor Unit: -33°C to +60°C Indoor Unit: -10°C to +50°C
ALTITUDE	15,000 feet
HUMIDITY	Outdoor Unit: Weatherproof Indoor Unit: 96% non-condensing

**ANTENNAS**

	FORWARD GAIN	FRONT/BACK RATIO
INTEGRAL	21dBi	40dB
EXTERNAL PARABOLIC:		
-2 feet (.61m)	28.1dBi	38dB
-4 feet (1.22m)	34dBi	46dB

**FCC INFO (US ONLY)**

FCC APPROVAL PENDING

**LINK CONFIGURATION OPTIONS (SELECT WHEN ORDERING)**

**TRANSMISSION RATE:** 45MB/S (BASE MODEL #T4-4500), 22.5MB/S (T4-2500) OR 11.25MB/S (T4-1200)

**FREQUENCY:** 5.3GHZ (UNII) OR 5.8GHZ (ISM)

**OUTDOOR UNIT (ODU) ANTENNA:** INTEGRAL OR EXTERNAL

**TRANSMISSION BAND:** HIGH OR LOW (ONE OF EACH REQUIRED FOR LINK)

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