



TRACER 6000 Series

Modular T1/E1/Ethernet Radio

Product Features

- Two flexible, modular network interface ports
- Supports 1–8 or 4 T1/E1s and 4-port Ethernet interfaces
- Triple DES encryption
- Multiple software selectable channel plans
- Dynamic receive sensitivity
- SNMP management spanning multiple hops
- Telnet and VT100 craft port management interfaces
- TFTP and XMODEM firmware upgrades
- License-free deployment
- Link distances up to 30 miles (50 km)
- Available in both all-indoor and indoor/outdoor split-system configurations
- Real time control of both local and remote units from a single menu
- Industry-leading five-year North American warranty

The TRACER® 6000 Series of microwave radios provides license-free, scalable connectivity for service providers and corporate networks. These radios feature two modular network interface ports that can accommodate various combinations of T1, E1, and Ethernet option cards up to 8xT1/E1 (16.384 Mbps). This flexibility provides customized TDM and packet solutions for voice and data applications in a single platform. The TRACER 6000 Series also maximizes flexibility and reduces installation costs by providing outdoor-mounted radio options. In installations with long distances between the antenna and user interface, equipment costs can be drastically reduced by mounting the outdoor unit (ODU) up to 600 feet (180 meters) away from the indoor unit (IDU) using a single 1/2-inch coaxial cable. TRACER radios provide carrier class point-to-point connectivity up to thirty miles in either the 2.4 GHz or 5.8 GHz license-free ISM bands.

Complete network management is supported via SNMP, telnet access, and a VT100 craft port. SNMP and Telnet management can both span multiple hops simply by connecting co-located management ports together. SNMP traps are implemented for all RF link and T1/E1/Ethernet alarm conditions, enabling remote installations to report outages without requiring a truck roll to diagnose problems. Version 2 standard MIBs are supported for all interface cards, while an enterprise-specific MIB is provided for radio functionality.

Triple-DES security provides additional protection from unauthorized access without requiring any additional external security appliances. Future upgrades and enhancements can be added through FLASH firmware download via TFTP on the Ethernet interface or XMODEM on the craft port.

The TRACER 6000 Series represents the fifth generation of ADTRAN® wireless products, and incorporates the latest technology to provide the highest performance and richest feature set on the market today. Receive sensitivity is optimized through the use of extensive forward error correction and high-performance receiver design techniques. Dynamic receive sensitivity allows the user to increase receiver performance by decreasing the delivered bandwidth. This feature maximizes link performance by customizing the delivered bandwidth to the specific needs of the installation.

Three software selectable channel plans are supported to simplify frequency coordination at co-located sites. Channel plans are easily changed via any of the software management interfaces without the added expense of hardware upgrades or spare filter assemblies.

TRACER wireless solutions maximize installation efficiency through the combination of compact size (only 1U rack space required), low power consumption, and high thermal transfer. TRACER systems can be deployed at twice the density of other comparable products.

ADTRAN provides a wide variety of enterprise and carrier-class products that can be integrated into a total system solution. The ADTRAN manufacturing process is ISO 9001 certified to provide the highest level of reliability and durability. All TRACER products come standard with an industry-leading five-year North American warranty.



Outdoor Unit (ODU) for split-system configuration



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ADTRAN is an ISO 9001, ISO 14001,
and a TL 9000 certified supplier.

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TRACER® 6000 Series

Product Specifications



General Specifications

- **Capacity:** 16.384 Mbps, dynamically configurable in 2 Mbps channels
- **Available module slots:** 2
- **Encryption support:** Symmetric 3DES
- **Front panel test points:** RSSI (receive signal strength indication), GND
- **Craft port interface:** VT100 emulation via RS-232 (DB9 physical interface)
- **AUX RS-232:** Provides embedded 9600 bps RS-232 link between both ends for transport of alarm information or other craft port interfaces
- **Management interface:** 10Base-T/100Base-TX supports SNMP and Telnet access across multiple hops
- **Software upgrades:** Via TFTP over Ethernet interface or XMODEM over craft port interface
- **Alarms:** Major alarm (RF link down and fan failure), normally open and normally closed relay contacts

Transmitter

- **Output power:**
 - **2.4 GHz models:** +27dBm maximum
 - **5.8 GHz models:** +24dBm maximum
- **Frequency band:**
 - **2.4 GHz models:** 2.4 to 2.4835 GHz
 - **5.8 GHz models:** 5.725 to 5.850 GHz
- **Channel bandwidth:** 17 MHz
- **Intermediate frequency:** 280 MHz

Receiver

- **Receive level threshold (@10⁻⁶ BER):**
- 2.4 GHz models**
 - 86 dBm @ 8xT1 -84 dBm @ 8xE1 or 16 Mbps Ethernet
 - 90 dBm @ 4xT1 -88 dBm @ 4xE1 or 8 Mbps Ethernet
 - 93 dBm @ 2xT1 -91 dBm @ 2xE1 or 4 Mbps Ethernet
- 5.8 GHz models**
 - 85 dBm @ 8xT1 -83 dBm @ 8xE1 or 16 Mbps Ethernet
 - 89 dBm @ 4xT1 -87 dBm @ 4xE1 or 8 Mbps Ethernet
 - 92 dBm @ 2xT1 -90 dBm @ 2xE1 or 4 Mbps Ethernet
- **Maximum error-free receive level:** -30 dBm
- **Nominal receive level:** -55 dBm
- **Frequency band:**
 - **2.4 GHz models:** 2.4 to 2.4835 GHz
 - **5.8 GHz models:** 5.725 to 5.850 GHz
- **Channel bandwidth:** 17 MHz
- **Intermediate frequency:** 140 MHz

Frequency Pairs

- 2.4 GHz models**
 - **Channel 1:** 2.419 GHz/2.459 GHz
 - **Channel 2:** 2.422 GHz/2.462 GHz
 - **Channel 3:** 2.425 GHz/2.465 GHz
- 5.8 GHz models**
 - **Channel 1:** 5.744 GHz/5.824 GHz
 - **Channel 2:** 5.747 GHz/5.827 GHz
 - **Channel 3:** 5.751 GHz/5.831 GHz

RF/IF Interface

- **Antenna connector:** female type-N
- **Impedance:** 50 ohms
- **Maximum coax length for split configuration:** 600 feet (180 meters) of 1/2-inch coax or 350 feet (100 meters) of RG-8

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Interface Card Options

Quad T1 Card

- **Capacity:** 4xT1 (ANSI T1.403)
- **Interface type:** DSX-1
- **Connectors:** RJ-48C
- **Line code:** B8ZS (default), AMI
- **Framing:** ESF (default), D4
- **Alarms:** AIS, Red, Yellow, BPVs, LOS
- **Loopbacks:** Local and remote line, local and remote link

Quad E1 Card

- **Capacity:** 4xE1 (CCITT G.703)
- **Interface type:** G.703, G.704, and G.823 compliant
- **Connectors:** 120 Ω RJ-48C, 75 Ω BNCs supported with optional breakout panel
- **Line code:** HDB3 (default), AMI
- **Alarms:** LOS, LCV, AIS, RMT, OOF, CRC
- **Loopbacks:** Local and remote line, local and remote link

Quad Ethernet Switch Card

- 802.3u compliant
- Four auto-sensing 10Base-T/100Base-TX ports
- Auto MDI/MDIX support on all interfaces
- Full and half-duplex operation
- Layer 2 switching and MAC bridging
- Maximum frame size 1536 bytes (passes 802.1Q packets)
- Back-pressure flow control for half-duplex interfaces
- Pause-frame flow control for full-duplex interfaces

Environment

- **Indoor operating temp.:** -25° to 65° C (-13° to 149° F)
- **Outdoor operating temp.:** -40° to 65° C (-40° to 149° F)
- **Relative Humidity:** Up to 95%, non-condensing

Physical

- **Dimensions:**
TRACER 6410 Integrated 2.4 GHz radio and TRACER 6420 Integrated 5.8 GHz radio:
 1.7" (4.3 cm) (1U) H, 17.2" (43.7 cm) W, 11.9" (30.2 cm) D
TRACER 6200 IDU: 1.7" (4.3 cm) (1U) H, 17.2" (43.7 cm) W, 11.4" (29 cm) D
TRACER 6320 5.8 GHz ODU: 16" (40.6 cm) H, 9" (22.9 cm) W, 3.9" (9.9 cm) D
 ■ **Weight:** 5 lbs. (2.3 kg) (IDU), 7 lbs. (3.2 kg) (ODU), 7 lbs. (3.2 kg) (integrated)
 ■ **Power:** 21–60 VDC, either polarity referenced to ground
 ■ **Power Dissipation:** 32 Watts maximum

Ordering Information

Split-Systems (Indoor Unit/Outdoor Unit)	Part #
TRACER 6200 Indoor Unit	12806200L1
TRACER 6320 5.8 GHz Outdoor Unit, Plan A	12806320L1A
TRACER 6320 5.8 GHz Outdoor Unit, Plan B	12806320L1B

Integrated Systems (All-Indoor)	Part #
TRACER 6410 2.4 GHz Unit, Plan A	12806410L2A
TRACER 6410 2.4 GHz Unit, Plan B	12806410L2B
TRACER 6420 5.8 GHz Unit, Freq A	12806420L2A
TRACER 6420 5.8 GHz Unit, Freq B	12806420L2B

Available Options	Part #
TRACER Quad T1 Interface Module	1280040L1
TRACER 120 Ω Quad E1 Interface Module	1280044L1
TRACER 75 Ω Quad E1 Interface Module	1280044L2
TRACER 75 Ω Octal E1 BNC Breakout Panel	1280060L1
TRACER Quad Ethernet Switch Module	1280050L1
TRACER 48 VDC Power Supply	1280650L1