

Global Solutions

Fixed Wireless Solutions



# WIREFLESS

## The TRACER Series

[www.adtran.com/tracer](http://www.adtran.com/tracer)

**ADTRAN**

# Cost-effective wireless connectivity for carrier and enterprise networks.

## The TRACER Series from ADTRAN.

### The TRACER Series At-A-Glance

- Point-to-Point fixed wireless systems
- Modular and fixed-port models available
- Point-to-point LAN bridging/switching up to 40 kilometers
- Point-to-point WAN connectivity up to 48 kilometers
- Ethernet, DS3, E1, and T1 interface options
- 75 and 120 ohm E1 interface options
- 5.8 GHz ISM band
- Compact, space-saving chassis
- Easy configuration through terminal connection
- Carrier-class design for 99.999% reliability
- Reliable pre- and post-sales support

### Why TRACER?

The TRACER Series is a family of digital microwave radio systems for use in the network of any organization implementing fixed wireless technology, including enterprises, public institutions and agencies, utilities, cellular and PCS service providers, and local and long distance telephone companies. This comprehensive product line supports both TDM (up to DS3) and packet-based (up to 45 Mbps full-duplex) technologies. The TRACER 6000 Series is the industry's first modular wireless solution offering user-configurable TDM and Ethernet functionality in a single 1U chassis.

There are many compelling reasons to implement TRACER wireless solutions as part of your network plan.

**1. As a wireless carrier, you need viable options for improving backhaul efficiency and eliminating the under-utilization of E1s in your cellular network.** TRACER, combined with complementary ADTRAN products, streamlines network efficiency,

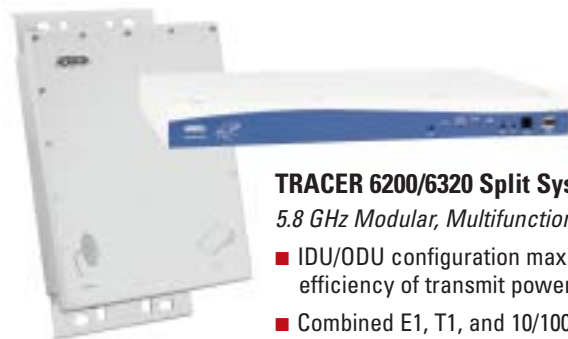
conserves space at hub and cell sites, and prepares your network for next-generation technologies.

**2. You must find a cost-effective way to transport both E1 and Ethernet services while accommodating growth in your network.** Previously, this required redundant equipment to support each technology and add-on chassis to support new users. The TRACER 6000 Series of modular radios allows you to combine a variety of E1, T1, and 10/100Base-T interfaces (up to 16 Mbps total) in a single chassis.

**3. You need a wireless bridge to transport high-bandwidth data between Local Area Networks (LANs).** The TRACER 5045 Wireless Bridge with integral Ethernet switch offers cost-effective transport of high-speed data at distances up to 40 kilometers; while the TRACER 6000 Series offers the ability to combine LAN extension with up to 4 E1s.

## Solutions to empower your wireless network.

The TRACER Series from ADTRAN delivers the exact functionality you need for high-speed, digital transport over a fixed wireless connection. Service options range from E1, multi-E1, and DS3 wide area transport to 45 Mbps full-duplex Ethernet bridging at frequencies of 5.8 GHz.



### TRACER 6200/6320 Split System

*5.8 GHz Modular, Multifunction Radios*

- IDU/ODU configuration maximizes efficiency of transmit power
- Combined E1, T1, and 10/100Base-T connectivity up to 16 Mbps
- Dual-slot, 1U chassis supports Quad E1, Quad T1, and Quad Ethernet Bridge Modules
- Dual slot, IDU chassis
- Fully SNMP manageable
- Distances up to 48 kilometers
- Multiple, software-selectable channel plans



### TRACER 6420

*5.8 GHz Modular, Multifunction Radios*

- Combined E1, T1, and 10/100Base-T connectivity up to 16 Mbps
- Dual-slot, 1U chassis supports Quad E1, Quad T1, and Quad Ethernet Bridge Modules
- Fully SNMP manageable
- Distances up to 48 kilometers
- Multiple, software-selectable channel plans



**4. You need a quick, affordable method of establishing a point-to-point wide area communications link between remote sites**, either across campus or across town. A TRACER wireless solution, combined with complementary ADTRAN voice and data equipment, provides a complete high-speed communications solution at distances up to 48 kilometers—with no monthly circuit costs.

*In any case, what is the most flexible, cost-effective system for fixed wireless connectivity in both carrier and enterprise networks?*

*The TRACER Series from ADTRAN.*

**Is broadband an urgent need in your network?**

The TRACER Series includes equipment for broadband applications, including LAN-to-LAN bridging and switching (45 Mbps full-duplex/90 Mbps aggregate), combined TDM and Ethernet transport (up to 16 Mbps aggregate), point-to-point DS3, and octal/quad/dual

E1/T1 transport, all at an extremely competitive price. These broadband wireless solutions ensure rapid deployment and increase network capacity, while lowering operating costs and reducing capital expenditures.

**Is the wireless link just one part of the problem being addressed?**

If your application involves LAN-to-LAN data transport, the TRACER 5045 Wireless Bridge provides complete connectivity in a single, cost-effective package. For links supporting voice and data, TRACER radios can be coupled with other ADTRAN equipment to implement a complete, end-to-end communications link. Other ADTRAN equipment available includes M13 and OC-3/OC-12 multiplexers, integrated access devices (IADs), switches, routers, firewall/security devices, and more. A single-source solution typically simplifies installation, eliminates compatibility issues, and provides a single point of contact.

## TRACER 6000 Series

### Interchangeable Application Modules

The TRACER 6000 Series is a modular platform that can be configured to meet a variety of TDM and packet network requirements, while establishing a simple and inexpensive upgrade path. Interchangeable interface modules satisfy service requirements ranging from one to eight E1s or from one to four 10/100Base-T Ethernet ports—up to 16 Mbps total.



TRACER 6420 Rear Panel



#### TRACER 5045

*5.8 GHz Wireless Bridge with Integral Ethernet Switch*

- Broadband LAN/WAN connectivity at 45 Mbps full-duplex (90 Mbps aggregate)
- Layer 2 Ethernet switching and MAC bridging
- Four integral auto-sensing 10/100Base-T Ethernet ports
- Compact, energy-efficient 1U chassis
- Distances up to 40 kilometers



#### TRACER 4205

*5.8 GHz DS3 Radio*

- Broadband WAN connectivity at 45 Mbps
- Space-saving 1U chassis
- Distances up to 40 kilometers

# TRACER: Built to address today's most challenging wireless issues.

**Advanced functionality and abundant features help reduce network costs and improve flexibility.**



## **TRACER In Your Network**

- Establish LAN extension with wayside E1s
- Bridge local area networks
- Integrate wireless WAN/LAN connections
- Extend Wireless Access Point (WAP) reach
- Internetwork office complex or campus
- Create disaster recovery/redundant links
- Establish emergency service restoral
- Establish special event communications
- Improve cellular backhaul efficiency
- Connect cell towers to Mobile Switching Centers (MSCs)
- Overcome geographic barriers
- Establish short-haul ISP links

## **Building your wireless network using the TRACER Series**

Designed using the latest silicon technologies under ISO 9001 and TL 9000 quality processes, the TRACER Series provides the highest possible level of reliability and durability in a fixed wireless solution. All radios operate point-to-point at distances of up to 48 kilometers (depending on the model selected). TRACER systems are engineered to minimize interference and achieve carrier-class quality and reliability in a form factor that conserves valuable rack space.

## **Highly effective solutions for improving carrier backhaul operations**

ADTRAN carrier-class products are widely deployed in the fiber, copper, and wireless networks of many country's successful service providers. This same expertise is available to you in TRACER Series radios. TRACER, along with other ADTRAN network access products, offers advanced models of efficiency in both the signaling transport and access portions of the network. These products have application in locations reaching from the Mobile Switching Center (MSC) to the cell site. Using them, you can reduce capital expenditures, maximize backhaul efficiency, and expand service capacity, while successfully positioning for 3G and advanced data service offerings.

## **Industry's first user-configurable TDM/Ethernet combination**

ADTRAN's TRACER 6000 Series is the industry's first modular radio offering the flexibility to choose the type and number of TDM and Ethernet interfaces to be deployed out of any given chassis. These grow-as-you-go radios feature a streamlined 1U chassis with interchangeable Quad E1, Quad T1, and Quad Ethernet

Bridge modules. Modules can be used in combination to support simultaneous Layer 2 Ethernet switching and wayside multi-E1/T1 (for mixed voice and data), or to support up to eight E1/T1s in traditional TDM applications. The TRACER 6000 Series is fully manageable using any standards-based SNMP management system, and is available in integrated and split system configurations.

## **An innovative, single-box WAN/LAN solution**

TRACER 5045 is a license-free wireless bridge with integral Ethernet switching functionality. This unique device combines the benefits of a 45 Mbps full-duplex bridge (90 Mbps aggregate) with an integrated four-port Ethernet switch in a compact, energy-efficient form factor. It provides switching functionality between LAN ports, and bridges protocols over wireless links at distances up to 40 kilometers. With TRACER 5045, you can implement complete WAN/LAN wireless networks using a single piece of equipment at host and remote locations.

## **Broadband Ethernet without bandwidth degradation**

TRACER offers DS3, multi-E1, and Ethernet broadband solutions to supply the capacity necessary to meet today's voice and data transport requirements, quickly and affordably. These systems alleviate bandwidth congestion between business locations, and can be coupled with other ADTRAN equipment to enhance connectivity or network performance. TRACER's dynamic receive sensitivity ensures that the performance of your link is optimized for the amount of bandwidth being used in a particular application. These solutions are ideal for time-critical installations where you must rapidly deploy a network link.

### Reliability comparable to wireline

TRACER fixed wireless radios are engineered to deliver superior performance and link integrity. With proper link engineering design, TRACER radios deliver 99.999% carrier-class reliability with full-duplex data transmission over a 40 or 48 kilometer link (DS3 and E1, respectively)—the same reliability you expect from wireline.

### Designed to minimize interference

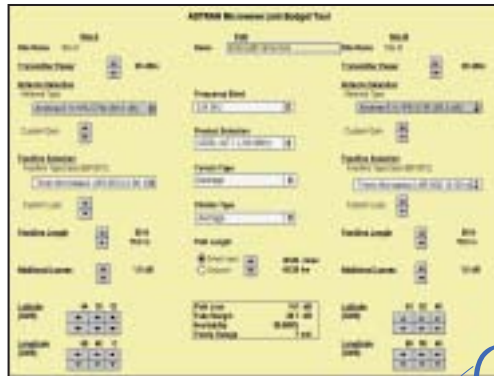
The digital modulation technique used in TRACER radios helps to minimize interference from other systems operating in the same vicinity. In addition, multiple frequencies and software-selectable channel plans provide maximum flexibility in configuring TRACER systems for the best possible reception at a particular site. When combined with proper system design, these features promote the greatest possible interference protection.

### Multiple configurations fit varied applications

TRACER is one of the industry's most flexible license-free microwave product lines. Advanced transmission technologies, combined with various physical configuration options, make TRACER an extremely functional and versatile solution. You can choose from integrated or split systems on many models. Multiple user interface options, such as Ethernet, DS3, G.703, and E1, along with user-selectable line code formats, allow TRACER radios to fit into many types of installations.

### Suitable for high-density installation

TRACER radios allow you to increase density in your racks without increasing power supply. All integrated TRACER radio systems are housed in a space-saving 1U chassis that is one-half the size of competing rackmount solutions, automatically doubling rack capacity. In addition, TRACER radios consume less power—approximately half that required for competing radios. In the typical installation, no modification of power is required to support twice the number of radios.



### TRACER Link Analyzer

**Determine the most cost-effective solution for your wireless application!** Perform repetitive "what-if" analyses by adjusting design parameters, then view the impact on performance measures. The result: a properly engineered wireless link that delivers optimum performance.

[www.adtran.com/link\\_analyzer](http://www.adtran.com/link_analyzer)

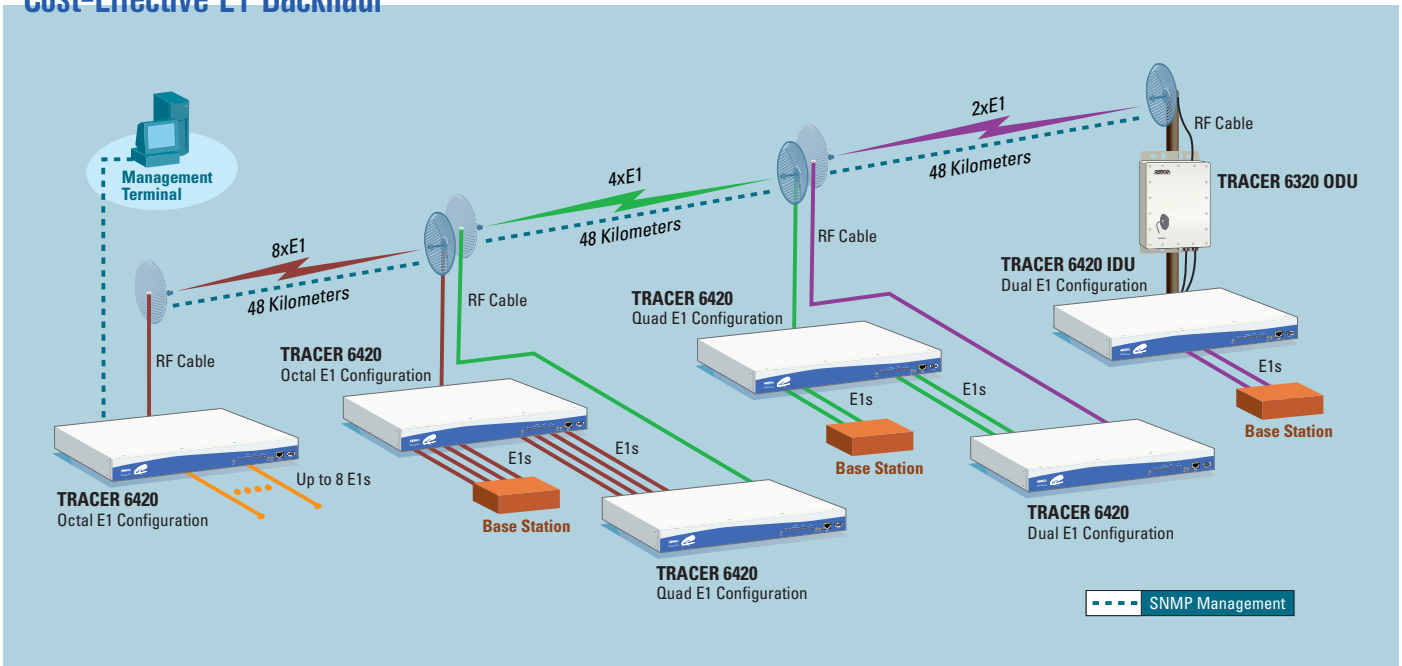
### Simplified configuration and operation

TRACER's user interface is intuitive, concise, and easy-to-use. Upon powering the unit, you receive instant notification of device, link, and circuit status. Configuration and provisioning of both ends of a link may be performed from either end of that link. The interface provides the ability to initiate local and remote loopbacks and tests, and to verify device configuration. Management capabilities include control, status, and alarm functions. TRACER 6000 Series radios offer full SNMP management across multiple links, and are firmware upgradable via TFTP or XMODEM.

### An exceptional value in wireless

Available at extremely competitive price points, TRACER radio systems reduce initial investment, resulting in lower capital expenditures and accelerated return on investment. Depending on E1 and DS3 wireline tariffs, the return on investment on these products can be less than a year in many areas. Combined with ADTRAN's industry-leading warranty and best-in-class service and support, TRACER is one of the most risk-free decisions you can make for fixed wireless connectivity.

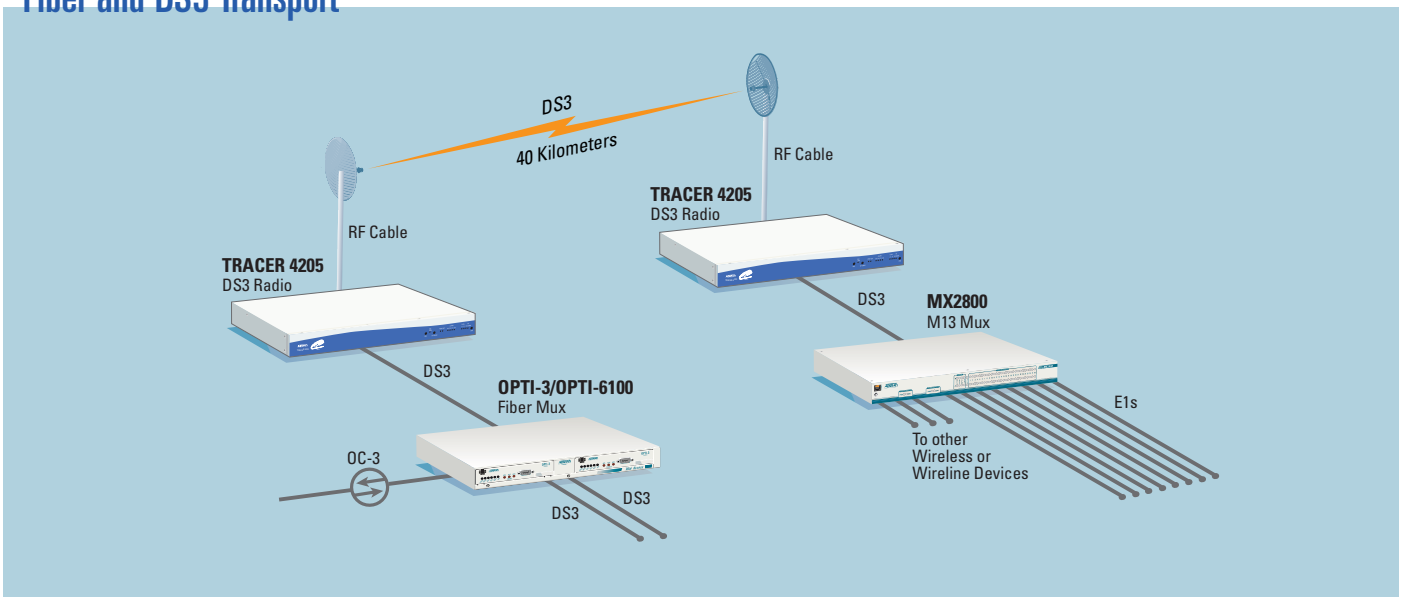
## Cost-Effective E1 Backhaul



In cellular backhaul operations, TRACER 6000 Series radios offer a flexible, grow-as-you-go solution to varying bandwidth requirements throughout a network. These modular, 1U radios accept two Quad E1, Quad T1, or Quad 10/100Base-T Ethernet cards up to 16 Mbps of total bandwidth. With TRACER 6000 Series radios, you need only one model

of radio to support from one to eight E1/T1 or four 10/100Base-T Ethernet ports, or a combination of these services. This simplifies network topography, minimizes sparing, and creates a single point of contact for technical support issues. TRACER 6000 Series radios are manageable using any standards-based SNMP management platform.

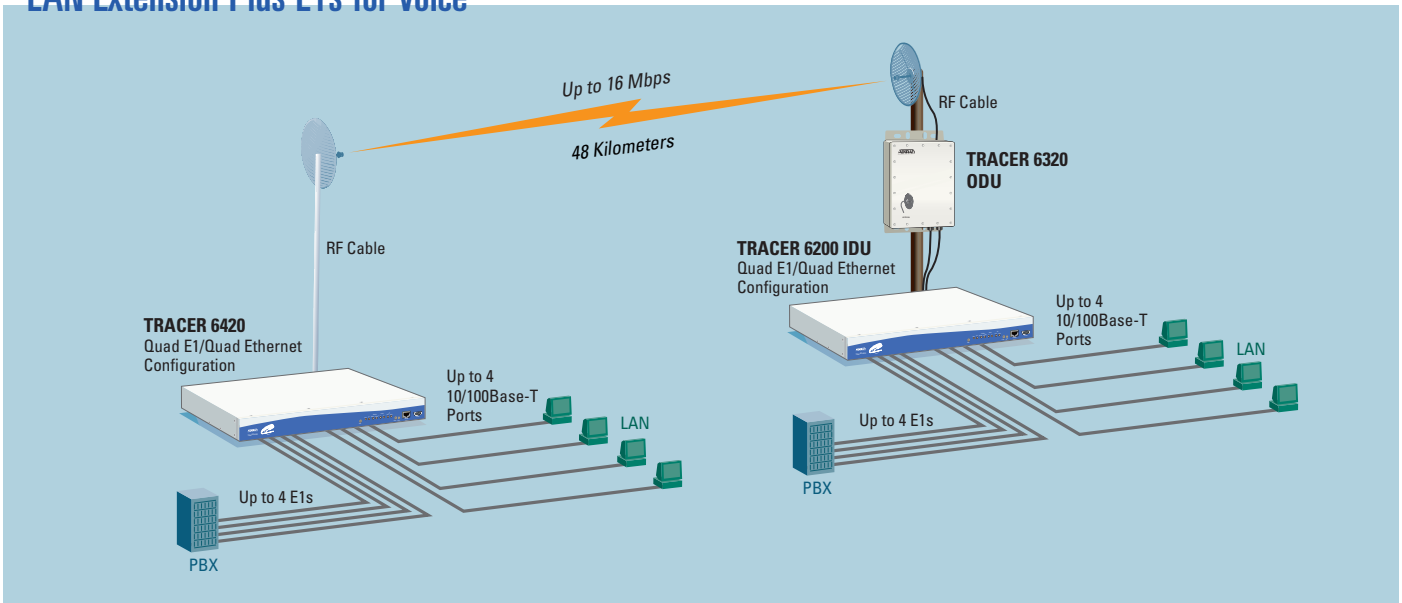
## Fiber and DS3 Transport



For applications involving DS3 and fiber, ADTRAN offers the TRACER 4205 DS3 radio. Used at the hub site with ADTRAN's MX2800 M13 multiplexer, this solution consolidates and groups up to 21 E1 or 28 T1 circuits for efficient backhaul to the Mobile Switching Center

(MSC). ADTRAN's OPTI-3 OC-3 multiplexer consolidates up to three DS3s onto fiber at the MSC. For higher capacity fiber applications, ADTRAN offers the OPTI-6100 OC-3/OC-12 multiplexer.

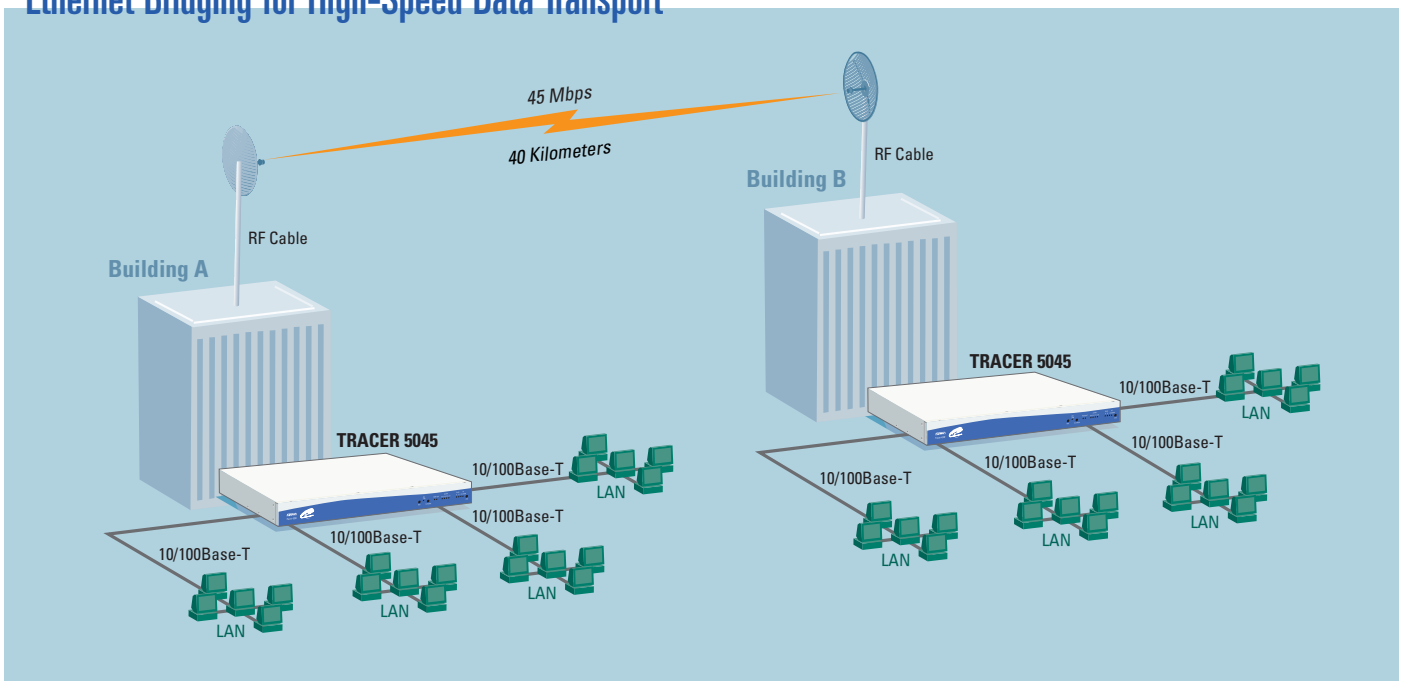
## LAN Extension Plus E1s for Voice



**TRACER 6000 Series modular radios offer flexible bandwidth options for converged voice and data applications over a point-to-point wireless link.** In this example, the TRACER 6000 Series radio is equipped with one Quad E1 module and one Quad Ethernet Bridge module. User-selectable bandwidth allows the user to designate the number of interfaces being activated in order to maximize the transmit

functionality of the radio. The TRACER 6000 Series radio can be configured with any combination of Quad E1, Quad T1, and Quad Ethernet Bridge modules to support applications that combine TDM technology (including wayside E1s for voice) and 10/100Base-T bridging (LAN extension) with Layer 2 switching.

## Ethernet Bridging for High-Speed Data Transport

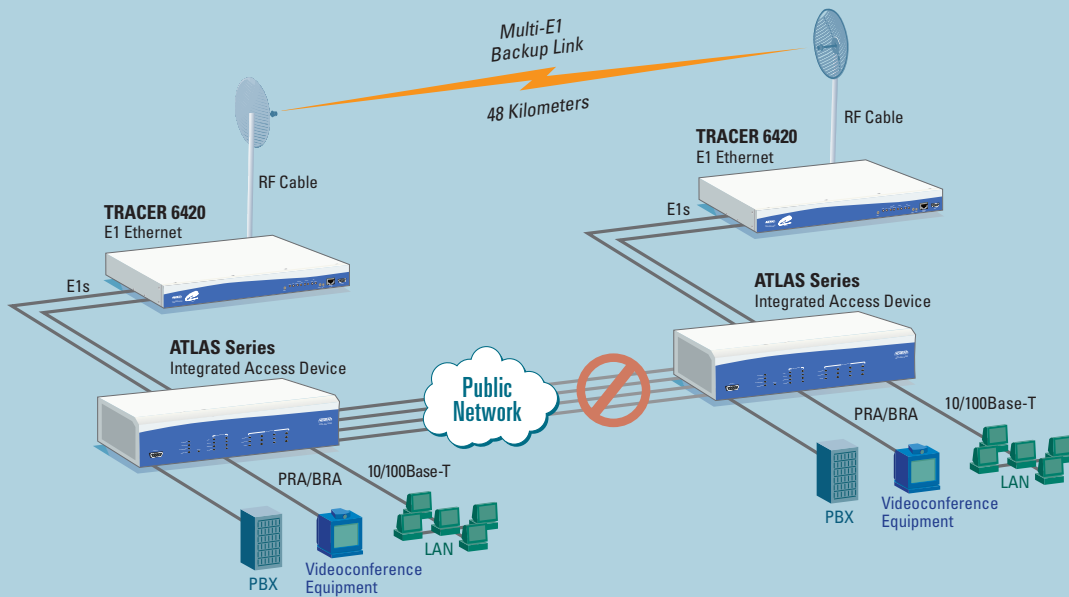


**Users seeking to connect high-speed LANs between buildings or across campuses** can use the TRACER 5045 Wireless Bridge with Integral Ethernet Switch. TRACER 5045 provides a 45 Mbps full-duplex wireless link for line-of-sight connections. Using one or more of the

10/100Base-T Ethernet ports, network managers can easily establish a connection to existing LAN networks, then extend connectivity to another location.



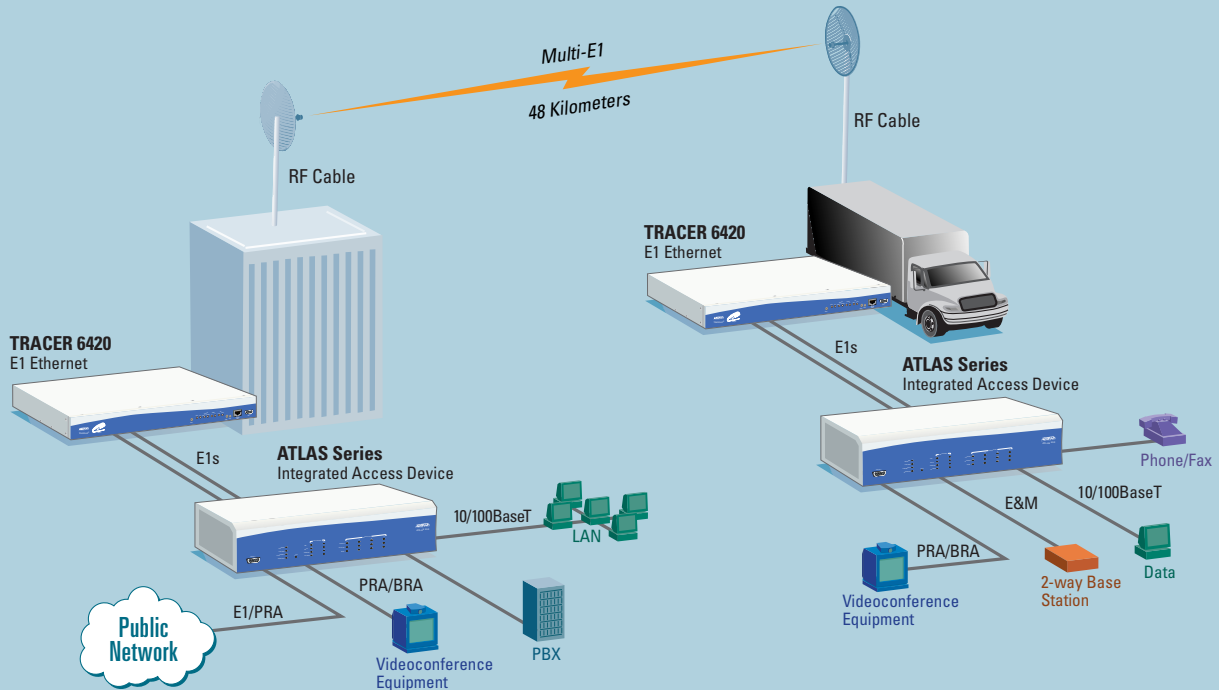
## Disaster Recovery/Emergency Service Restoral



**TRACER radios can protect your network from costly downtime, instantly restoring voice and data communications** in the event of a natural or man-made disaster. If your primary leased line or switched circuit fails, TRACER 6000 Series radios quickly resume communications over wireless E1s and can provide backup or redundant links for

point-to-point distances of up to 48 kilometers. The TRACER 5045 Wireless Bridge can be used for redundant LAN networks or for recovery of mission-critical data networks at distances up to 40 kilometers. For DS3 applications, an ATLAS 830 IAD and TRACER DS3 radio could be used.

## Rapid Mobile Response



**This application illustrates how to quickly and affordably deploy temporary communications using a portable communications system** built using TRACER and other ADTRAN network access products. This "communication on wheels" application is ideal for

temporary cell towers and special events. Here, an ATLAS 550 IAD complements the TRACER wireless connection to support voice, data, and video communications. For DS3 applications, an ATLAS 830 IAD and TRACER DS3 radio could be used.

# ADTRAN: One of the world's most successful network access equipment suppliers.

**ADTRAN is a company you can depend on for high-value, customer-centric solutions.**



**LAN to WAN** **Think ADTRAN.**



**NetVanta 1000 Series**  
Integrated Switch-Router Platforms  
Managed Fast Ethernet/PoE/Gigabit Switches



**NetVanta 2000 Series**  
VPN/Internet Security Appliances



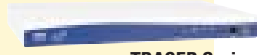
**NetVanta 3000/4000/5000 Series**  
IP Access Routers



**NetVanta 300 Series**  
ADSL/ADSL2/ADSL2+ Routers



**ATLAS Series**  
Integrated Access Devices



**TRACER Series**  
License-Free Wireless Devices

## **Value-oriented solutions for the cost-conscious IT manager**

ADTRAN addresses today's value-oriented networking market with a full line of enterprise solutions for LAN-to-WAN connectivity over IP, TDM, switched, and wireless architectures. Our mission with these solutions is to lower acquisition costs, lower recurring monthly costs, or both, lowering TCO and offering you the best possible value in network access.

## **The reliability of a market leader**

Our LAN-to-WAN solutions complement our highly successful and long-standing lines of wide area connectivity and carrier-class network access products. Our newest products reflect the same attention to detail that won us market leadership positions in key technologies such as integrated access devices (IADs), T1/HDSL2/4 transport, T1 and subrate NTU, Frame Relay/DDS extension, and ISDN extension.

## **Relentless product refinement and cost reduction**

A strategy of relentless product refinement and cost reduction remains one of the primary drivers behind our market successes. Cost reduction at ADTRAN is about smart engineering, not cutting corners. We reward engineers who reduce costs in the same way we reward engineers who innovate. We also lower costs by using ADTRAN-developed intellectual property where feasible.

## **Quality and reliability in every unit**

Your ADTRAN purchase is backed by an indisputable reputation of quality and reliability—the result of ADTRAN's long-term, corporate-wide commitment to quality assurance in all phases of business and manufacturing operations. From initial product design and development to post-production testing of every unit shipped, ADTRAN means quality. A TL 9000 3.0 and ISO 9001:2000 certified supplier supporting next-generation quality standards, the company maintains extensive in-house labs for reliability, component, and compliance testing—all in the name of customer satisfaction.

## **High-touch customer support**

Every ADTRAN solution is backed by a 100% satisfaction guarantee, including an industry-leading warranty and best-in-class service and support.

- **Unlimited telephone technical support**—A single call puts you in touch with a knowledgeable expert in our technical support organization.
- **Comprehensive training and certification services**—Access to a comprehensive training and

**ACSP**  
ADTRAN Certified Solutions Professional

**ACSE**  
ADTRAN Certified Solutions Expert

certification program that includes both free and fee-based options. Sessions are available on-site, off-site, on CD, and on the Internet.

**Technical Questions** [www.adtran.com/support](http://www.adtran.com/support)

**Where To Buy** [www.adtran.com/where2buy](http://www.adtran.com/where2buy)

# TRACER Series Feature Matrix



	TRACER 6420	TRACER 6200/6320	TRACER 5045	TRACER 4205
<b>Services Supported</b>				
10/100Base-T Ethernet	Up to 16 Mbps	Up to 16 Mbps	45 Mbps	
DS3				•
E1	Up to 8*	Up to 8*		
<b>Components</b>				
Split System		•		
Integrated System	•		•	•
<b>Form Factor</b>				
Modular	•	•		
Fixed-port			•	•
Rackmount	•	IDU (6200)	•	•
Mastmount		ODU (6320)		
<b>Frequency Band</b>				
5.8 GHz ISM	•	•	•	•

\* with two Quad E1 modules

IDU: Indoor Unit

ODU: Outdoor Unit



75 ohm Breakout Panel



## Ordering Information

Equipment	Part #
<b>TRACER 4205</b>	
TRACER 4205 5.8 GHZ (Plan A)	12804205L1A
TRACER 4205 5.8 GHZ (Plan B)	12804205L1B
<b>TRACER 5045</b>	
TRACER 5045 5.8 GHZ (Plan A)	12805045L1A
TRACER 5045 5.8 GHZ (Plan B)	12805045L1B
<b>TRACER 6000 Series Systems</b>	
TRACER 6200 International IDU	12806200L2
TRACER 6320 5.8 GHZ ODU (Plan A)	12806320L1A
TRACER 6320 5.8 GHZ ODU (Plan B)	12806320L1B
TRACER 6420 5.8 GHZ (Plan A)	12806420L1A
TRACER 6420 5.8 GHZ (Plan B)	12806420L1B
<b>TRACER 6420 (Plan A)</b>	
with Quad 75 ohm E1	42806420L1A#4E
with Quad 120 ohm E1	42806420L1A#4E12
with Ethernet Bridge	42806420L1A#4B
with 2 x Quad 75 ohm E1	42806420L1A#8E
with 2 x Quad 120 ohm E1	42806420L1A#8E12
with 75 ohm E1 and Ethernet Bridge	42806420L1A#EB
with 120 ohm E1 and Ethernet Bridge	42806420L1A#EB12
<b>TRACER 6420 (Plan B)</b>	
with Quad 75 ohm E1	42806420L1B#4E
with Quad 120 ohm E1	42806420L1B#4E12
with Ethernet Bridge	42806420L1B#4B
with 2 x Quad 75 ohm E1	42806420L1B#8E
with 2 x Quad 120 ohm E1	42806420L1B#8E12
with 75 ohm E1 and Ethernet Bridge	42806420L1B#EB
with 120 ohm E1 and Ethernet Bridge	42806420L1B#EB12

Equipment	Part #
<b>TRACER 6200/6320 Split Configuration (Plan A)</b>	
with Quad 75 ohm E1	42806320L1B#4E
with Quad 120 ohm E1	42806320L1A#4E12
with Ethernet Bridge	42806320L1A#4B
with 2 x Quad 75 ohm E1	42806320L1A#8E
with 2 x Quad 120 ohm E1	42806320L1B#8E12
with 75 ohm E1 and Ethernet Bridge	42806320L1B#EB
with 120 ohm E1 and Ethernet Bridge	42806320L1B#EB12
<b>TRACER 6200/6320 Split Configuration (Plan B)</b>	
with Quad 75 ohm E1	42806320L1B#4E
with Quad 120 ohm E1	42806320L1B#4E12
with Ethernet Bridge	42806320L1B#4B
with 2 x Quad 75 ohm E1	42806320L1B#8E
with 2 x Quad 120 ohm E1	42806320L1B#8E12
with 75 ohm E1 and Ethernet Bridge	42806320L1B#EB
with 120 ohm E1 and Ethernet Bridge	42806320L1B#EB12
<b>Modules</b>	
Quad 120 ohm E1 Module	1280044L1
Quad 75 ohm E1 Module	1280044L2
Octal 75 ohm E1 Breakout Panel	1280060L1
Four Port Ethernet Bridge/Switch Module	1280050L1

To place an order for an ADTRAN solution, please contact your technology supplier.

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\* Managed out of Huntsville, Alabama, USA Headquarters

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

Five-year warranty applies only to products sold in North America and Europe.

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The Network Access Company

**ADTRAN**