



- T1 Over IP Interconnect for Voice and Data -

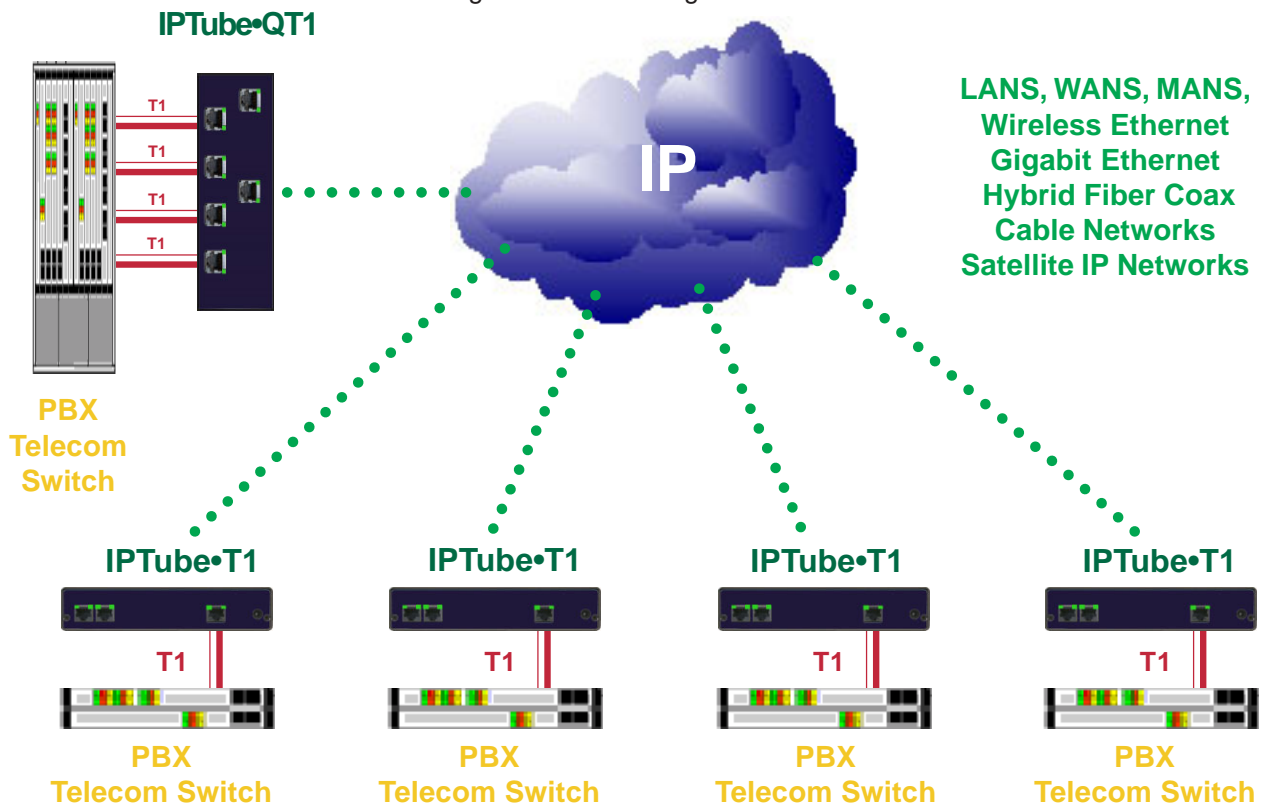
The **IPTube•QT1** encapsulates full and fractional T1 and TDM circuits, along with their framing and signaling bits, into IP packets. The **IPTube•QT1's** T1 Over IP, T1 Over Ethernet connection provides for the transparent interconnection of PBXs, Telecom Switches and T1 based communication systems via LANs, WANs, MANs, Satellite and Wireless Ethernet.

The **IPTube•QT1's** transparent operation maintains the proprietary signaling required to support PBX features such as call conferencing, call forwarding, caller ID and SS7. Legacy phone equipment investment is preserved. Transparent support for Modem, Fax, or Data circuits. Voice quality is not compromised.

The **IPTube•QT1** is available with one to four T1 interfaces and a 10/100 BaseT Full/ Half Duplex Ethernet Interface. The T1 interfaces have configurations that for provide independent protocol, compression, packet sizing, buffering, clocking, framing, coding and channel settings. The protocols supported are IPTube, CESoIP, and HDLCoIP.

T1 Circuit Extension Over IP

- Return on investment measured in weeks
- Exploits Efficiency and Flexibility of IP/Ethernet
- Supports legacy telephony switches or PBXs
- Straight Forward Configuration



IPTube•QT1

T1 Private Line Services over IP Ethernet

Businesses, Education Districts, Universities, National, State and Local Government, incur significant recurring monthly costs for rigid-bandwidth leased lines used only for the interconnection of PBXs and Telecom switches.

The **IPTube•QT1** provides enterprises with the ability to interconnect their existing phone systems over flexible bandwidth lines that are used to carry data, voice, and video. The Voice Only Leased Line Toll charges assessed by long distance and local carriers are eliminated or dramatically reduced by transporting voice traffic across:

LANs

The most compelling option for the interconnection of T1 based systems is when it can be accomplished over a Local Area Network. The deployment of Fiber based LANS such as FDDI and Gigabit Ethernet, provides organizations with high performance and high quality bandwidth that is especially well suited for the interconnection of PBXs and Telecom Switches.

WANs

Wide Area Networks that have sufficient bandwidth and Quality of Service provisioning result very significant cost savings especially for Multinational Corporations. The **IPTube•QT1•C**, a model with lossless data compression, detects idle and redundant data within each voice circuit resulting in a 56 to 1 bandwidth savings. WAN bandwidth is not consumed by silence or redundant samples.

Wireless Ethernet

Connecting phone systems across a wireless Ethernet connection has a return on investment that is measured in weeks. Eliminating the wired connection for the T1 based communication equipment is made possible with the IPTube's T1 Over Ethernet capability.

Competitive IP Ethernet Service Providers

Companies, that are able to provide IP Ethernet access networks generate new revenue by offering traditional T1 leased line and private line services, such as:

Cable Operators

Cable operators connect traditional T1 leased line and private line services over their hybrid fiber coax (HFC) cable networks.

Metropolitan Area Networks

Metropolitan carriers with IP or Ethernet access networks deliver traditional leased line and private line services.

Utilities

Utilities generate new revenue by offering traditional T1 leased line and private line services over their fiber or power line networks.

IPTube•QT1

CLEC PBX Back Haul

The **IPTube•QT1** provides CLECs with a way to back haul T1 DS0s from a customer's phone systems over their Internet connection. The back hauled DS0s are connected to the CLECs phone switch for connection to the Public Switched Telephone Networks. Competitive Local Exchange Carriers are able to provide customers with a very economical alternative to the local Phone Company since the Local Loop charges for each phone line are consolidated.

International Toll Bypass

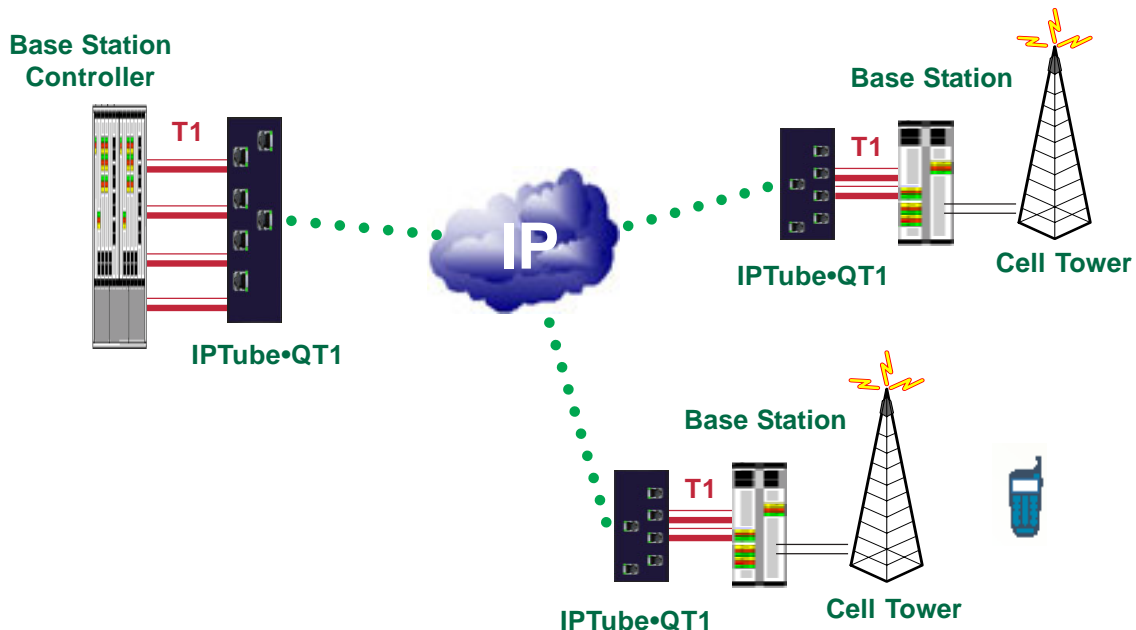
The **IPTube•QT1's** most dramatic cost savings is when it is used for the international interconnections of TDM based telecommunication equipment. The IPTube-E1 is interoperable with the European TDM standard E1.

Incumbent Carriers

Telcos reduce costs by delivering profitable leased and private line services over their flexible Ethernet infrastructures.

IP Cellular Back Haul

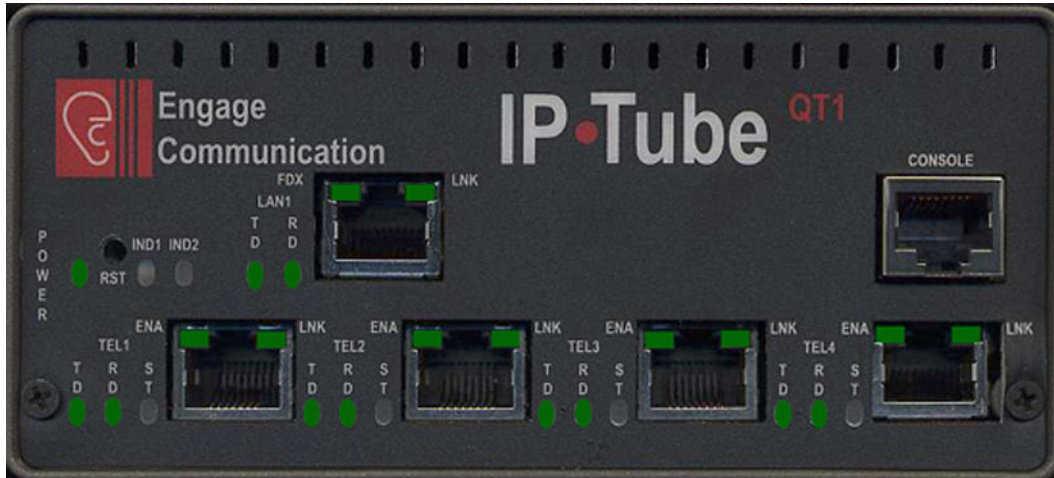
IPTube•QT1s are used to provide transparent interconnection of the base stations (BTSs), base station controllers (BSCs) and mobile switching centers (MSCs) over IP Ethernet packet-switched networks. Supported access media include fiber, coax and fixed wireless. Cellular phone service providers are able to save substantially by converting to a packet switch network from circuit TDM lease lines. The **IPTube•QT1** has the Duplicate packets transmission and reception feature that provides for resilient performance through a lossy interconnect.



IPTube•QT1

Lossless Data Compression

The IPTube•QT1•C continuously detects idle/redundant data within each T1 Voice circuit resulting in as much as a 56 to 1 bandwidth savings. The compression works from the lowest latency setting of 8 T1 frames to the highest setting of 56 T1 frames per packet. TDMoIP WAN bandwidth is not consumed by silent or redundant circuits. Note: Compression only supported with IPTube•QT1•C model.



Technical Specifications

LAN Network Interface:

- 10/100 BaseT Full/Half Ethernet
- Autonegotiation or Configurable Speed and Duplex

LAN Network Protocols Supported:

- IP, TCP, UDP, ICMP

Duplicate Packet Transmission:

- 1 to 4 Duplicates
- Provides for resilient performance through a lossy interconnect.

T1/Fractional T1 Specifications:

- One to Four Port Models
- Connects directly to T1 Line or to a DS1 interface with a Crossover Cable
- Framing - ESF or D4
- Coding - B8ZS or AMI
- Supports DS0 assignments from 1 to 24
- Not Contiguous Configuration x-y,z Supported

T1 Over IP Protocol:

- TDM Over IP - TDMOIP
- Circuit Extension Services Over IP - CESOIP
- HDLC Over IP - HDLCOIP
- Frames Per Packet Configurable from 8 to 56
 - Low Latency Mode: 1 millisecond - 8 T1 frames
 - Max Payload Mode: 7 millisecond - 56 T1 frames

Regulatory:

- Safety -IEC60950
- EMC - CFR 47 Part 15 Sub Part B:2002
 - EN55022:1994+A1&A2
 - EN55024, ICES-003 1997
 - CISPR 22 Level A
- Telecom - Part68
- CE

Lossless Data Compression Option:

- Detects idle and redundant data within each DS0
- Interconnect bandwidth is not consumed by silent or redundant data within the voice circuits
- Low Latency 8 to 1 Compression
- Compression setting from 8 to 1 to 56 to 1

Quality of Service Support:

- IP Type of Service (TOS) CLI configurable
- IANA Registered UDP Port 3175

TFTP Online Upgrade Capable (FLASH ROMs)

- IPTube is fully operational during upgrade

Management:

- Telnet support with Edit and Paste Template Files
- Console Port for Out of Band Management
- SNMP support (MIB I, MIB II)
- Remote configuration & monitoring

Power:

- 12-24 VAC/VDC 1.0A International Adapters Available
- Optional -48V 0.25 Amp
- Hot Standby with 2nd Power Module

Dimensions:

- 14" (L) x 5.5" (W) x 2.50" (H)