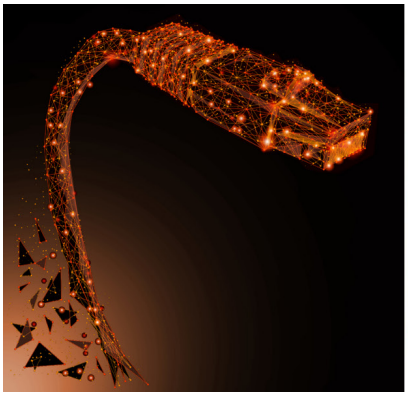
IP-Tube DRV CEP



TDM or Serial Circuits Over IP

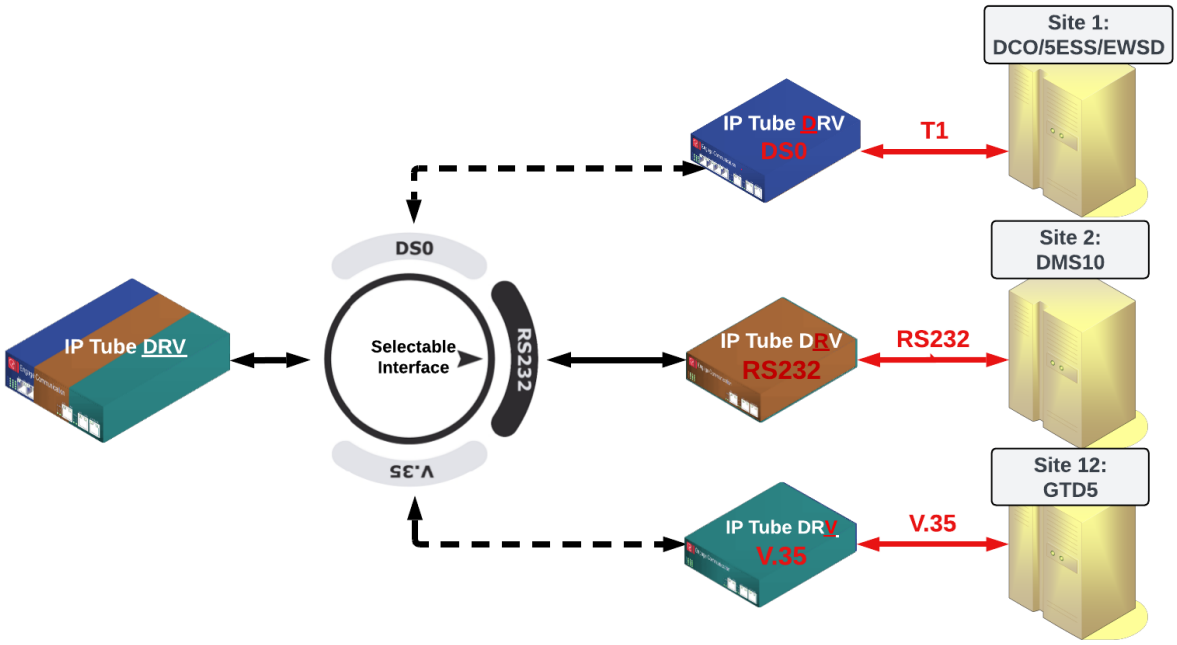
- **Selectable DS0, RS232 or V.35 Over IP Solution**

Overview

The **IP•Tube CEP DRV** converts TDM or Serial data connections into IP packets, extending the serial data over very cost effective Ethernet or MPLS based LAN/WAN/MAN wired and wireless networks. Synchronous serial protocols such as: SS7, SDLC or HDLC are encapsulated into IP packets. This facilitates the interconnection of Serial Data over IP between Telecom Switches, Data Terminals, Data Acquisition Systems, WAN Routers and Bridges, SCADA RTUs....

DRV: (DS0, RS232, or V.35)

The **IP•Tube CEP DRV** enables users to select what interface they wish to extend over an IP network. Only 1 interface can be selected at a time, this allows for the same part number to be ordered for all 3 different data types instead of having to order 3 different part numbers.



4 LAN Interfaces

All **IP•Tube CEP DRV** models ship with dual 10/100/1000 BaseT Ethernet LAN ports and another pair of Dual SFP LAN ports. The choice of 4 different Ethernet interfaces provide for:

- Management interface on LAN port 2 when LAN port 1 is connected to a VPN tunnel
- Protector Option for Redundant Packet Path connections with Constant or Switch Over Criteria

CEP Management

IP•Tube CEPs isolate management and data plane functionality with the use of two separate processor modules. Management processor access is limited to **SSH** or **SNMPv3** encrypted sessions that employ **AES256** bit keys and sophisticated **NIST** passwords. These sessions may be established after authentication via **TACACS+** or **Radius**.
The independent Linux based management plane of the **IP•Tube CEP** ensures Critical Infrastructure Data is isolated from management network access. The Management Module uses internal serial ports to connect to the Data Plane processor.

Administration and **User Logs** are available with **Syslog**.

CEP management security features include:
• Administrative policies for **adding, removing, disabling** and **renaming** authorized **users**; limiting user access to assigned commands; and enabling only desired port numbers.
• User authentication directly or in conjunction with **TACACS**+ or **RADIUS** servers including RSA SecureID support for two factor trusted compliance.
• An **SSH** command interface encrypting management traffic with powerful **256** bit symmetric keys and **NIST** based passwords.
• Support of the **SNMPv3** protocol for secure connectivity to **SNMP** element managers.
• In addition, administrative accounting data can be reported to syslog servers with accurate timestamps provided by an **NTP** source.

IP•Tube DRV Standard Features

Assured Delivery Protocol

In order to assure high quality communications over links with intermittent or noisy performance, such as Wireless or Broadband over Power Line, the IP•Tube DRV employs Engage's robust Assured Delivery Protocol with the following benefits:

- Packet out of sequence detection and re-sequencing
- Duplicate skipping,
- Lost packet retransmission with configured delay.

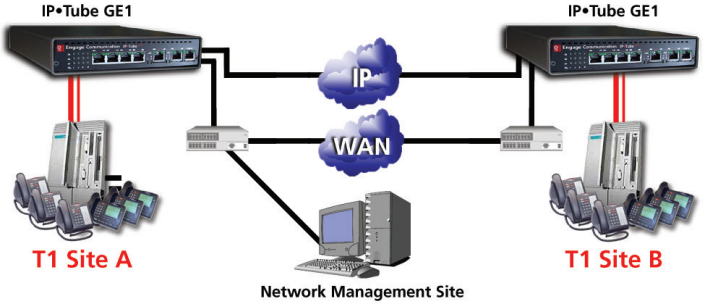
Service Quality Packet Prioritizing

The IP•Tube DRV uses the Type of Service byte in the IP packets or 802.1p/q mac levels for prioritization of the encapsulated data.

Virtual Private Network Support

Interconnecting the IP•Tube DRV through a Virtual Private Network with sufficient real time committed information rate ensures that the required quality of service is provisioned.

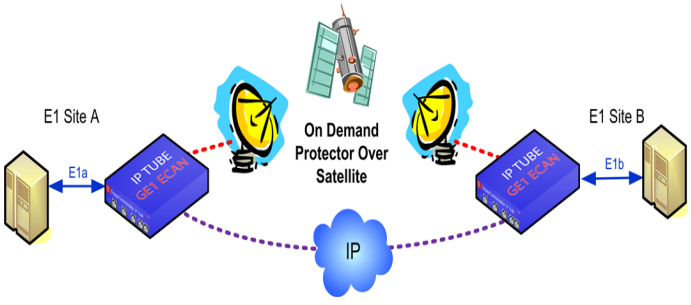
The second Ethernet interface provides a management port. Each LAN interface features independent IP network configurations.



IP•Tube DRV Optional Features

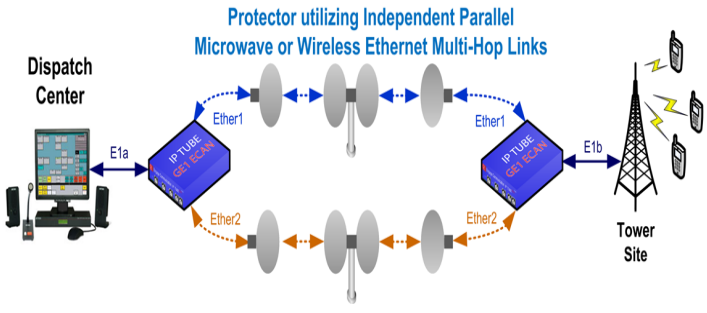
Lossless Data Compression OPTION -C

The IP•Tube DRV continuously detects idle/redundant data within each E1 Voice circuit resulting in as much as a 40 to 1 bandwidth savings. The compression works from the lowest latency setting of 8 E1 frames to the highest setting of 40 E1 frames per packet.



Protector OPTION -PRO

The protector option utilizes the second LAN interface as a redundant path for the interconnection of the IP encapsulated E1 data. The extension of the E1 circuit has a fault tolerant link that is configured to always on, or with switch over criteria.



IP•Tube DRV Application with the IP-Tube DLT1 DS0 Multiplexor

In this application, the IP Tube DRV acts as a **remote interface adapter**, converting legacy electrical interfaces into secure, deterministic IP streams that can be transported over Ethernet, fiber, microwave, or satellite networks.

Key Capabilities Shown in the Diagram

- **DS0 / T1 transport**
- **RS-232 serial transport**
- **V.35 data transport**
- **Point-to-point or hub-and-spoke architectures**
- **Optional DS0 timeslot multiplexing (MUX)**
- **Central Site (Hub or Core Network)**

At the central location:

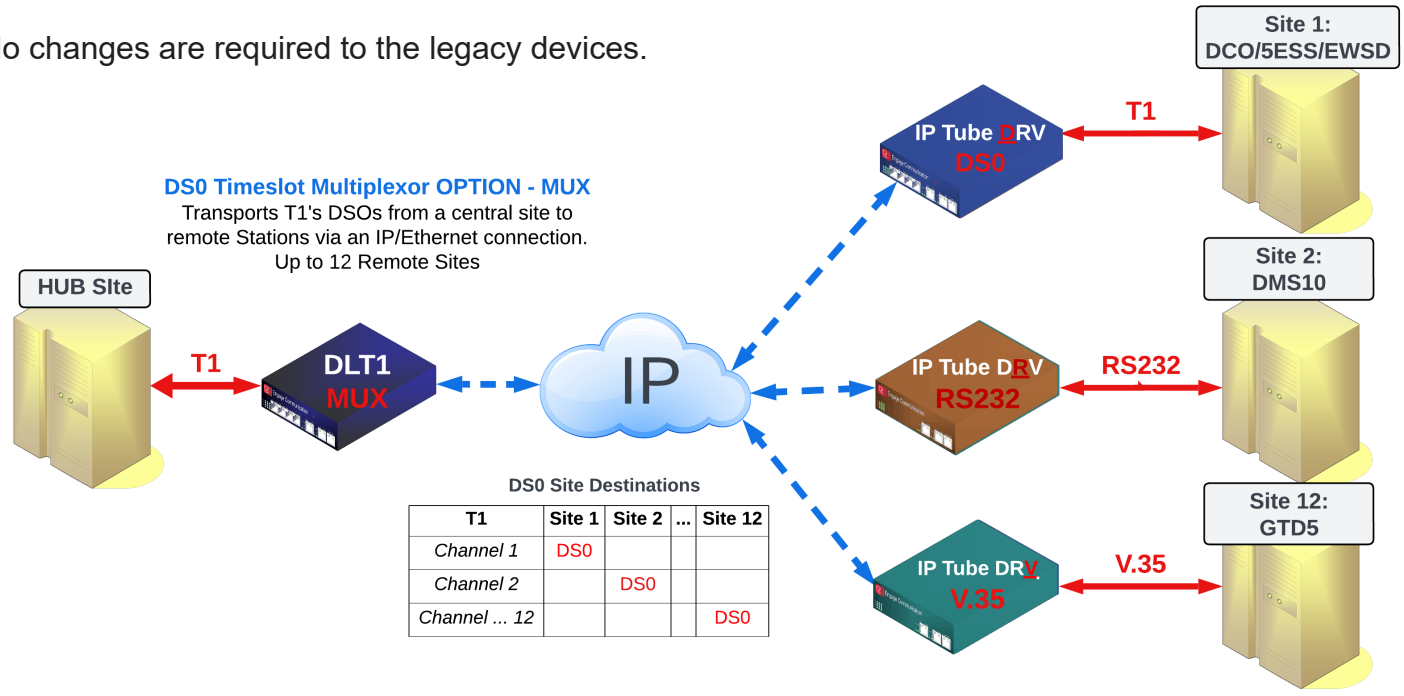
- A **T1 interface** connects to a legacy switch, controller, or host system (e.g., DCO/5ESS/EWSD).
- An **IP Tube DLT1 with DS0/MUX capability** extracts individual DS0 timeslots from the T1.
- Each DS0 can be mapped to a **specific remote site** and transported over a shared IP network.
- Up to **12 remote sites** can be supported from a single T1 using DS0 multiplexing.

This design eliminates the need for multiple leased circuits while maintaining deterministic circuit behavior.

At each remote site:

- An **IP Tube DRV** terminates the IP connection.
- The DRV presents the native interface required by the legacy equipment:
  - **DS0/T1** for voice switches or channel banks
  - **RS-232** for SCADA, telemetry, or control systems
  - **V.35** for legacy data or router interfaces
- The connected equipment operates **as if it were directly connected** via a traditional circuit.

No changes are required to the legacy devices.



IP-Tube DRV CEP

Technical Specifications

LAN Network Interface:
• Two 10/100/1000 BaseT Ethernet LAN ports
• Two SFP LAN ports (1 Gbps)

LAN Network Protocols Supported:
• IP, TCP, UDP, ICMP, Telnet, DHCP, DDNS, SSH

DS0 Interfaces
• 1 DS0 interfacewith RJ45 Connectors
• Signal encoding: Bipolar, return to zero
• Terminating Impedance: 135 ohms

DS0 Interface Clocking
• Synchronous: 56 kilobits per seconds

RS232 Interface
• 1 Sync / HDLC / Async, DCE / DTE RS232: 1 DB25F
• DTR Controllable Transmission
• CD Reception Indicator

RS232 Interface Clocking
• Synchronous : 75 to 256 Kilobits per seconds

RS232 Interface Control Signal Extension
• Full On Emulation of DCE to DTE control signals: DTR; DSR; RST; CTS

RS232 Over IP Protocol
• Serial Over IP
• Circuit Extension Services Over IP
• HDLC Over IP

Lossless Data Compression Option:
• Detects idle and redundant data within each Voice Circuit (DS0)
• Interconnect bandwidth is not consumed by silent or redundant data
• Low Latency 8 to 1 Compression, settings from 8 to 1 to 40 to 1

SFTP Online Upgrade Capable (FLASH ROMs)
• IPTube is fully operational during upgrade

Quality of Service Support:
• IP Type of Service (TOS) CLI configured • IANA Registered UDP Port 3175
• 802.1p/q mac level prioritization

Regulatory:
• CE • Safety -IEC60950 • EMC - CFR 47 Part 15 Sub Part B:2002, EN55022:1994+A1&A2, EN55024, ICES-003 1997, CISPR 22 Level A
• Telecom TBR12, TBR13

Management:
• Secure Socket Shell - SSH V2 - Session Encryption
• Centralized Authentication, Authorization and Accounting - TACACS+, RADIUS, Two Factor Authentication
• Syslog with NTP Time Stamping
• Console Port for Out of Band Management
• SNMP V3 Public and Private MIB support with configured traps

Power:
• 10-30 VDC, 1.0A. • Screw Locking Connector • Power Consumption 6W
• Universal Adapter 100/240 VAC 50/60 Hz
• Dual -48VDC 0.25 Amp Power Redundancy

Environmental:
• Dimensions: 9" (L) x 7.3" (W) x 1.50" (H)
• Operating Temperature: 0° to 132° F (-10° to 50°C)
• Humidity: Up to 95% non-condensing

How to Order — IP•Tube DRV CEP

Part No.	Description	Notes
CEP-040-DRV-03	IP-Tube DRV CEP 1 DS0 56K or 64K Port 1 Sync or Async RS232 DCE/DTE Interfaces 1 V.35 DCE Interface 2 Mbps max CEP Advanced Management	
CH-CEP-040-DRV-03	IP-Tube DRV CEP 1 DS0 56K or 64K Port 1 Sync or Async RS232 DCE/DTE Interfaces 1 V.35 DCE Interface 2 Mbps max CEP Advanced Management Slot Card Version (CHUBE-Card)	Chube-Chassis Slot card model
Base Options		Specify as Suffix
-PRO	Protector Option (LAN Redundancy)	Fault Tolerant Network Interconnect
Rack Mount Option		
095-1000	19" Wide Rack Mount Brackets	Enclosure Nut Serts Installed
095-2000	2 unit 19" x 1RU Rack Mount Kit for 7" products	

Engage Communication • 9565 Soquel Drive, Aptos, CA 95003 • Tel: (831) 688-1021 • Fax: (831) 688-1421 • www.engageinc.com