



V.35 Over IP



- **V.35 Circuit Extension Over Ethernet, HDLC Over IP**

Flexible Serial Data Extensions over Packet Switch Networks

The **IP•Tube V.35** converts V.35 data connections, which employ leased circuits, into IP packets that extend the circuit over very cost effective Ethernet based LAN/WAN/MAN wired and wireless networks. The **IP•Tube V.35** encapsulates Synchronous or HDLC serial data into IP packets. The **IP•Tube V.35** is available with one V.35 interface ordered as a DCE or DTE. The **IP•Tube V.35** facilitates the interconnection of Serial Data Over IP between Data Terminals, Data Acquisition Systems, WAN Routers and Bridges....

Layer 1

In Layer 1 operating mode every bit is encapsulated into an IP packet. The size and frequency of the IP packets can be set with data bit rates from 2.4 to 250 Kilobits per second. Latency minimization is accomplished with multidimensional adaptive clock configurations. A configured number of incoming packets are buffered in order to compensate for the packet delivery jitter introduced by the network. The size of this buffer needs to accommodate the peak amount of jitter.

HDLC Over IP

In Layer 2 operating mode HDLC Data frames clocked at 2.4 to 2.048 Megabits, such as those used by Wide Area Networking protocols PPP and Frame Relay or proprietary Data Links, are transported within IP packets as HDLC over IP. The latency introduced is dependent upon the clocking rate and the HDLC frame size. Minimum latency is obtained by maximizing the clock rate and minimizing the MTU. HDLC Over IP frames are directly sent out the Serial interface since Clock synchronization is not required. WAN security provisioning, such as firewalling, is maintained.

IP Tubes with HDLC over IP connect to the V.35 leased line interface of an Enterprise's WAN Router and encapsulate the HDLC frames into an IP Packet that is sent to the remote site IP Tube where it is presented to the remote WAN router as the original HDLC frame. Enterprises are able to connect to broadband IP services through their existing proven WAN infrastructure. Internal Ethernet networks remain isolated and security services such as Firewalling are maintained.

IP•Tube V.35 Standard Features

Dual LAN Interfaces

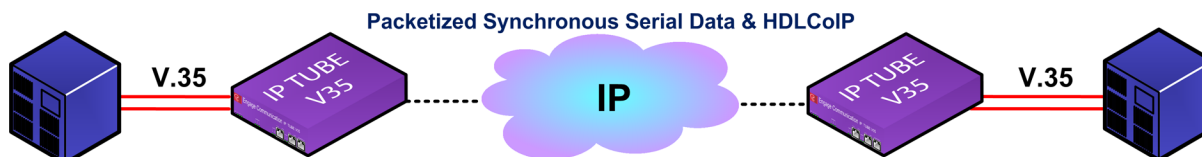
All **IP•Tube V.35** models ship with dual 10/100BaseT Ethernet LAN ports. The dual Ethernet interfaces provide for:

- Management interface on LAN port 2 when LAN port 1 is connected to a VPN tunnel
- The LAN ports can be configured to support connections over 2 Asymmetrical bandwidth links
- Alternator Option for load balanced SDSL interconnects
- Protector Option for Redundant Packet Path connections with Constant or Switch Over Criteria

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 V.35** employs Engage's robust Assured Delivery Protocol with the following benefits:

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



IP•Tube V.35 Optional Features

Protector OPTION -PRO

The protector option utilizes the second LAN interface as a redundant path for the interconnection of the IP encapsulated V.35 data. The extension of the V.35 has a fault tolerant link that is configured to always on, or with switch over criteria.

Alternator Load Balancing OPTION -ALT

The Alternator option alternatively sends the IP packetized V.35 data on LAN 1 and LAN 2. The Alternator option enables the packetized V.35 data to be split over two IP WAN connections such as SDSL.

Technical Specifications

LAN Network Interface:

- Two 10/100BaseT Full/Half Ethernet

LAN Network Protocols Supported:

- IP, TCP, UDP, ICMP, Telnet, DHCP, DDNS, SSH

V.35 Interfaces:

- 1 DCE or DTE V.35 • DTR Controllable Transmission
- CD Reception Indicator

V.35 Interface Clocking:

- Synchronous : 2.4 Kilobits to 2.048 Megabits per seconds

V.35 Over IP Protocol:

- TDM Over IP • Circuit Extension Services Over IP • HDLC Over IP

WAN Network Protocols Supported:

- HDLC, SDLC, PPP, Frame Relay

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

Management:

- Secure Socket Shell - SSH
- Telnet support with Edit and Paste Template Files
- Console Port for Out of Band Management
- SNMP Public and Private MIB support with configured traps

TFTP Online Upgrade Capable (FLASH ROMs)

- IPTube is fully operational during upgrade

Dimensions:

- Dimensions: 9" (L) x 7.3" (W) x 1.50" (H)

Environmental:

- 0° to 132° F (-10° to 50°C) operating temperature
- Up to 90% operating humidity (non-condensing)
- Optional Extended Temperature Range available

Power:

- 12-30 VDC, 1.0A. • Screw Locking Connector
- Universal Adapter 100/240 VAC 50/60 Hz
- Optional -48V 0.25 Amp • Hot Standby

How to Order — IP•Tube V.35

Part No.	Description	Notes
040-0V35-C1	IP•Tube V.35 DCE	Base Model with 1 V.35 DCE Interface
040-0H35-C1	IP•Tube V.35 DCE HDLC	DCE HDLC Protocol Only
040-0V35-T1	IP•Tube V.35 DTE	Base Model with 1 V.35 DCE Interface
040-0H35-T1	IP•Tube V.35 DTE HDLC	DTE HDLC Protocol Only
Base Options		Specify as suffix
-PRO	Protector Option	Fault Tolerant Network Interconnect
-ALT	Alternator Load Balancing Option	Load Balancing Inverse Mux
Power Options	Specify as suffix	Hot Standby Configuration 2nd Power Suffix
-DCMOD	Power Supply Module 12/26 VDC ADP CON	Ships with Universal Adapter 90/240 50/60
-WIREDC	Power Supply Module 12/26 VDC Screw Term	
-N48VDC	Power Supply Module Negative 48 Volt DC	Isolated Negative 48 Volt Power
Rack Mount Option		Specify as suffix
-RACKMNT	19" Wide Rack Mount Brackets	Enclosure Nut Serts Installed