# 4 Wire Analog to Packet



## • Voice Frequency Analog to Encrypted Digital Packet Converter

## Encrypted 4 Wire Analog Voice Frequency over Packet Networks

The Black•Tube VF has balanced 4-Wire 600 ohm Voice Frequency interfaces that utilize a PCM CODEC to convert Analog Voice Band into Digital that is AES encrypted for secure transport over Ethernet based services. This conversion facilitates the interconnection of Voice Band communications over cost effective and ubiquitous Ethernet based LAN/WAN/MAN wired and wireless network services such as MPLS, xDSL, Cable Modem & 4G/LTE.

4-Wire leased line analog networks interconnect VoiceBand Communications for Utilities Municipalities and Public Safety Agencies. Cost and availability issues with these copper telephone lines make finding transport alternatives a priority, and converting VoiceBand interfaces to packet data is a cost effective and easy to implement alternative.



## Public Safety Radio Tower Wireline Secure Audio over Packet Networks

A primary application for the Black•Tube VF is the encrypted conversion of Voice Grade circuit interfaces, that connect Public Safety Radio Base Stations to concentrator hubs, into packets. The Black•Tube VF employs high resolution Analog to Digital circuitry that maintains the quality of the original audio signal.

The packetized Voice Band communication can be securely transported over Ethernet Packet services such as:

### • xDSL • Cable • Cellular 2/3/4G LTE • MPLS • WiFi

### 2-Way Radio Wireline Audio Transport over Packet Networks

## Black•Tube VF Standard Features

### Dual LAN Interfaces

All Black•Tube VF models ship with dual 10/100 BaseT 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

- Protector Option for Redundant Packet Path connections with Constant or Switch Over Criteria

### Assured Delivery Protocol

In order to assure high quality communications over networks with intermittent or noisy performance, such as Wireless, the Black•Tube VF 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

## Black•Tube VF Optional Features

### Protector OPTION -PRO

The protector option utilizes the second LAN interface as a redundant path for the interconnection of the IP encapsulated VF data. This fault tolerant operation transports the packetized VF traffic over the primary or secondary link, which is configured in always on or switch over modes.

## Technical Specifications

**LAN Network Interface:**
• Two 10/100 BaseT Ethernet interfaces

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

**VF Voice Grade Interface:**
• One to Four: 4-Wire Full Duplex independent Transmit and Receive
• 600 Ohm Balanced
• Frequency 200 to 3400 Hertz

**VF Over IP Protocol:**
• TDM Over IP • Circuit Extension Services Over IP

**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

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

**Encryption Algorithm:**
• AES 256-bit • Fully Automatic key management

**Management:**
• Secure Socket Shell - SSH V2
• 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:**
• -10° to 50°C operating temperature
• Up to 90% operating humidity (non-condensing)

**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 — Black•Tube VF

| Part No. | Description | Notes |
|---|---|---|
| 007-VFAD-0x | Black•Tube VF | Specify # of Voice Frequency Ports (1-4) |
| CH-007-VFAD-0x | Chassis Slot Card: Black•Tube VF | Specify # of Voice Frequency Ports (2 or 4) |
| Base Option | Specify as suffix | |
| -PRO | Protector Option | Fault Tolerant Network Interconnect |
| Power Options | Specify as suffix | Hot Standby Configuration 2nd Power Suffix |
| -HSPDC | Connector for Dual 12-26 VDC Supply | Wire to Screw Terminal Removable Connector |
| -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 |