



• Encrypted 4 Wire Analog Voice Frequency over IP

Encrypted 4 Wire Analog Voice Frequency over Packet Networks

The **Black•Tube VF CEP** 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.

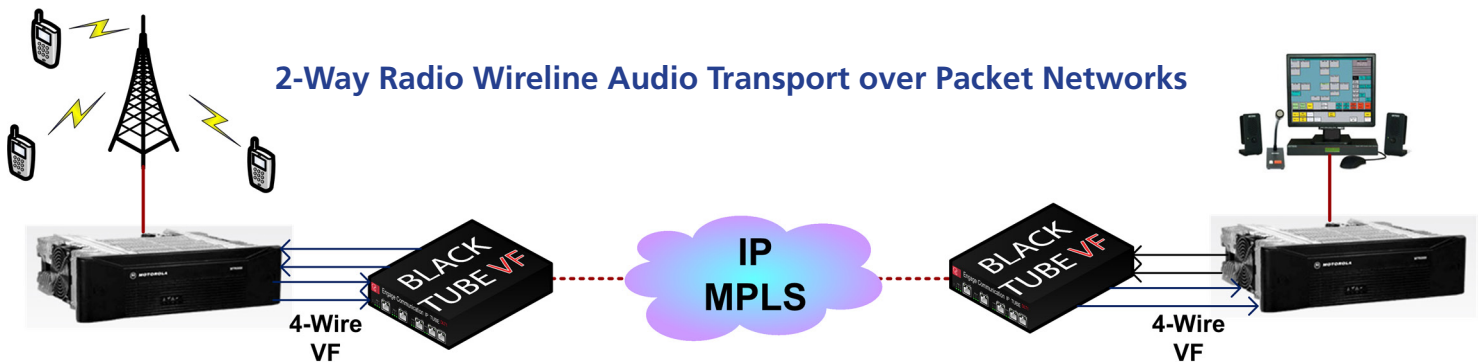


Public Safety Radio Tower Wireline Secure Audio over Packet Networks

A primary application for the **Black•Tube VF CEP** 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 CEP** 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



Black•Tube VF CEP Standard Features

CEP Management Module

Black•Tube CEP isolates management and data plane functionality with the use of two separate processor modules. Management processor access is limited to encrypted sessions via SSH, or SNMPv3, that employ AES 256 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 Black•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.

Assured Delivery Protocol

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

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 CEP

Part No.	Description	Notes
CEP-007-VFAD-0x	Black•Tube VF CEP	Specify # of Voice Frequency Ports (1-3)
CH-CEP-007-VFAD-0x	Chassis Slot Card: Black•Tube VF CEP	Specify # of Voice Frequency Ports (2 or 3)
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
-WIRED	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