



Flexible Serial Data Extensions over IP Packet or MPLS Networks

The **Black•Tube CEP DDS** converts DDS serial data connections into **AES** encrypted IP packets, extending the serial data over very cost effective Ethernet or MPLS based LAN/WAN/MAN wired and wireless networks. Synchronous, Asynchronous, Isochronous or HDLC serial data is encrypted then encapsulated into IP packets. This facilitates the interconnection of Serial Data over IP between Serial Bulk Encryptors (KIV7/OMNI), Data Terminals, Data Acquisition Systems, WAN Routers and Bridges and SCADA RTUs.

Layer 1 with Isochronous Support

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 64 kilobits per second. Isochronous serial protocols, such as Conitel, are transported synchronously to maintain message alignment. A configured number of incoming packets are buffered in order to compensate for the packet delivery jitter introduced by the network. The size of the Tube bit buffer is configurable to accommodate the peak amount of jitter.

Asynchronous Over IP

Asynchronous characters from the DDS interface with 5 to 8 data bits, baud rates from 1.2 to 38.4 kilobits, 1 or 2 stop bits that are with or without parity are efficiently encapsulated into IP packets. The encapsulation supports block mode transfers to minimize the bandwidth required. Additionally the latency is controlled by setting the Tube Bytes per packet.

SCADA Protocol Transparency

The **Black•Tube CEP** transports Bit or Byte orientated SCADA protocols transparently because of its unique TDM circuit emulation capability. RTU transmit data is encapsulated into IP packets at configurable samples per second and de-encapsulated at the far end at the same rate, ensuring properly timed RTU SCADA data delivery.

SDLC Over IP

In Layer 2 operating mode SDLC Data frames, such as those used by IBM 317x Controllers, Wide Area Networking protocols PPP and Frame Relay or proprietary Data Links, are transported within IP packets as SDLC over IP. The Serial to Packet conversion only occurs when SDLC frames are active.



Assured Delivery Protocol

In order to assure high quality communications over links with intermittent or noisy performance, such as Wireless.

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

Protector OPTION -PRO

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

Technical Specifications

LAN Network Interface:

- LAN1/LAN2: Two Data Plane 10/100 Base T
- MLAN: Control Plane 10/100 Base T

LAN Network Protocols Supported:

- IP, TCP, UDP, ICMP, Telnet, DHCP, DDNS, SSH
- Network Time Protocol - NTP

DDS Interfaces:

- 1 DDS DSU RJ-45
- Signal encoding: Bipolar, return to zero
- Terminating Impedance: 135 ohms
- Distance using 26 gauge 3.2 miles at 64,000

DDS Interface Clocking:

- Synchronous: 2400, 4800, 9600, 19200, 56,000 to 64 bits per seconds
- Asynchronous: 1.2/2.4/4.8/9.6/19.2/38.4 Kilobits per second

DDS Over IP Protocol:

- Serial Over IP • Circuit Extension Services Over IP
- IBM 3172 SDLC and HDLC Over IP
- Multi-Drop: 2 to 8

Protocols Supported:

- HDLC, SDLC, IBM 317x, PPP, Frame Relay
- Conitel, Modbus, DNP, Proprietary, Bit or Byte, AutoBaud

SCADA Encryption Algorithm:

- AES 256-bit • Fully Automatic key management

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

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
- FCC Part 68

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 (-40°C to 70°C)

Power:

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

How to Order — Black•Tube CEP DDS

Part No.	Description	Notes
CEP-007-DDS-01	Black•Tube CEP DDS	One DDS to IP/Ethernet Port
CH-CEP-007-DDS-01	Chassis Slot Card: Black•Tube CEP DDS	
Base Option		Specify as suffix
-EXT	Extended Temperature	-40C to 70C
-PRO	Protector Option	Fault Tolerant Network Interconnect
-Y	Serial Redundancy	Serial Interface hardware redundancy
Power Options	Specify as suffix	Hot Standby Configuration 2nd Power Suffix
-HSPDC	Connector for Dual DC Supply	
-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
Wall Mount Option		
-WALLMNT	Right Angle Wall Mount Brackets	Enclosure Nut Serts Installed