

DSD 72B-SP(I)

SONET OC-12
SDH STM-4
Optical Data Encryptor

**High-Level
Data Encryption**

**Protecting Enterprise &
Governmental Data
Communications**

TCC Proprietary Information

**Frame Sensitive Data Encryption with
Fiber Optic Cable Data Interfaces**



DSD 72B-SP(I)

The *DSD 72B-SP(I)* SONET/SDH optical data encryptor is TCC's latest offering in a long line of data security devices, designed to reliably operate in 'industrial' operational environments. Like all of the TCC encryption products in the 'DSD' line, the *DSD 72B-SP(I)* provides **strategic level data protection** with trusted, user-friendly, key and device management. The product's protocol-sensitive, path encryption approach provides **end-to-end virtual container (VC-n) encryption and handling** allowing unrestricted network routing of virtual containers with no plaintext network exposure of the path-encrypted payload.

Data bandwidth demands continue to increase for commercial and governmental communications. Mission critical information, including voice, streaming video, data telemetry, and general purpose data like email and file transfers, must be protected from interception and exploitation. Wide area networks (WANs) now transport high-speed data at rates exceeding 622Mbps. Conventional broadband radio solutions cannot easily handle these data bandwidths, driving the demand for fiber optic networks (FONs). These higher bandwidth networks rely on data routing within the WAN. Many commercial fiber optic data encryptors take the 'concatenated' data approach. However, the *DSD 72B-SP(I)* autonomously encrypts individual Virtual Container payloads leaving each containers' Path Overhead (POH) unencrypted. Add / Drop Multiplexers (ADMs) and Digital Cross Connects (DXCs) within the FON can then dynamically route individual virtual containers without ever needing to decrypt the concatenated payload to obtain the POH information.

Security Threat

Even non-networked FON lines are vulnerable to eavesdropping. Many users lease commercial FON circuits as part of their network infrastructure, potentially exposing data at repeaters, ADMs, and switches. Even where these network elements are under the control of the user, FON lines themselves can be tapped anywhere along the path. The risk is magnified by the high volume of the data on these links, making the FON infrastructure an attractive point of the network for an adversary to attack. It is critical that these data links be protected in an end-to-end manner.

The Solution

The *DSD 72B-SP(I)* SONET/SDH data security device is designed to fully counter the threat to fiber optic data communications. The exploitation vulnerability is effectively eliminated by the combined use of its AES-256 encryption algorithm implementation and its SHA-256 based authentication. All data encryption is accomplished end-to-end. User payload data is never exposed within the WAN.

In addition to operating at either 622.08Mbps, or 155.52Mbps when so configured, the *DSD 72B-SP(I)* is a "layer 2" encryption device, fully supporting the SONET/SDH standards and preserving all framing structures. Each virtual container (VC) is separately encrypted. The encrypted VCs are totally unaffected by network topology.

The *DSD 72B-SP(I)* is a rack-mountable device, and is designed to operate in indoor environmental conditions. The *DSD 72B-SP(I)* is designed with durability, reliability, and ease-of-use in mind, making it perfectly suited for government and commercial security applications. It is 100% interoperable with the 'ruggedized' *DSD 72B-SP(RI)* supporting networks with a mix of harsh and benign operational environments.

*** Features ***

Network Compatibility

Supports both SDH STM-4 & STM-1 and SONET OC-12 & OC-3 protocols
Compatible with transmission over both fiber optic cable and microwave RF
Handles SONET/SDH Regenerator; Multiplexer, & Path Overhead Data
Adaptable network configuration (STM-4)
▶ One VC-4-4c payload
▶ Up to four 'VC-4' payloads
▶ Up to twelve 'VC-3' payloads
▶ Or a mix of 'VC-3' & 'VC-4' payloads
Accommodates Add/Drop Multiplexer and Digital Cross-Connect elements within the fiber optic network

No need for Data Decryption to route within the Fiber Optic Network

Security

AES-256 algorithm, or (optionally) a National co-developed crypto algorithm
Secret Key Management infrastructure
Encrypted device management messages
SHA-256 integrity and authentication
Controlled menu access
Comprehensive audit logs

High Reliability

Dual Redundant Power Supplies
Hot-Swappable:
Universal AC power supply and / or
-48VDC power supply
Redundant Cooling Fans
Extensive Built-In-Test (BIT)
Remotely executed BIT capability
Modular design for rapid repairs
Tamper-resistant enclosure

DSD 72B-SP(I)

SONET / SDH

622.08Mbps (or 155.52Mbps)

Fiber Optic Data Encryption

Designed to meet ITU-T SDH Standards

Designed to meet ANSI SONET Standards

Interfaces

- Optical Transceivers for each Line I/O Interface
 - STM-4 (OC-12) @ 622.08Mbps Optical
 - STM-1 (OC-3) @ 155.52Mbps Optical
- Radio Transceiver (Electrical) Interface
 - ITU-T G.703 STM-1/ES1 (§15) @ 155.52Mbps Electrical



specifications

Network

Supports both SONET and SDH protocols
 Transparent handling of SONET/SDH section & path headers
 Adaptable payload configurations

- 1 x VC-4-4c (concatenated payload)
- 1 x VC-4 and 9 VC-3s
- 2 x VC-4s and 6 x VC-3s
- 3 x VC-4s and 3 x VC3s
- 4 x VC-4s

Accommodates Add/Drop Multiplexer elements occurring anywhere in the network path ... without any exposure of unencrypted data payloads

Device Management

At the Local Device, or Remotely Controlled (via *Keynet 3™*)
 Encrypted and Authenticated Device Management Messages
 Key Changes handled without Traffic Interruption

End-To-End Encryption Options

- 1) AES-256 - standard
- 2) National Algorithm(s) via co-development - optional

Key Management Options

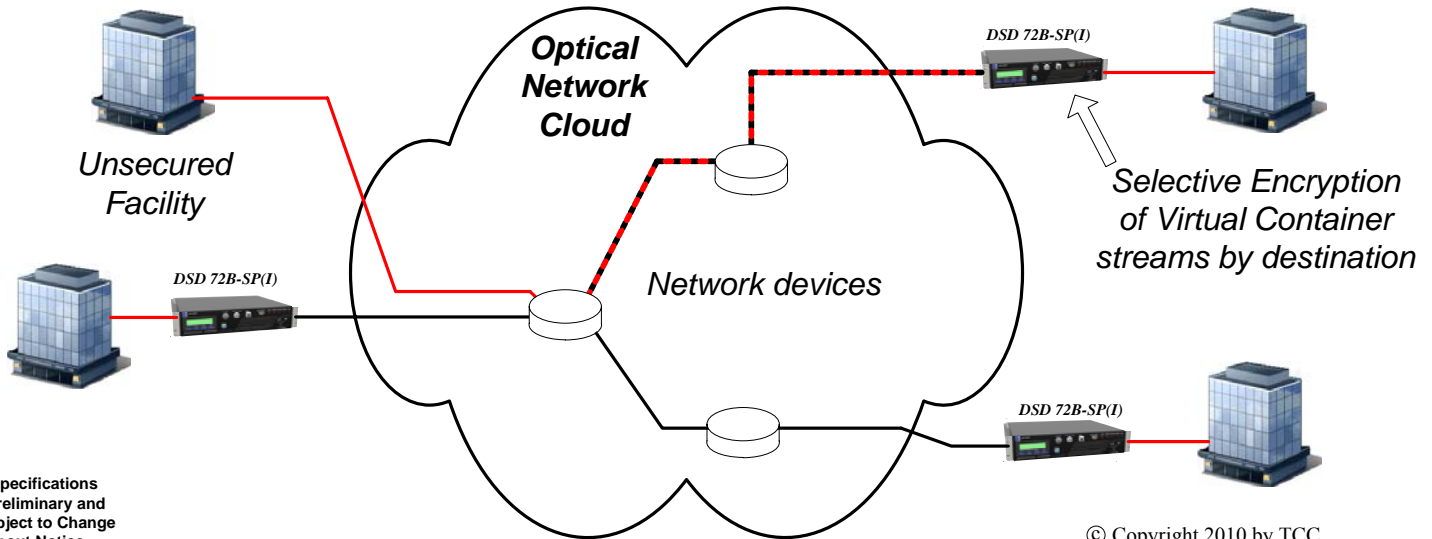
- 1) Symmetric Key with Secure Key Management Infrastructure
- 2) Symmetric Key using Manually Distributed Key Approach

* All options offer SHA-256 Integrity and Authentication *

Functional Design

Commercial grade enclosure with 'high-rel' grade components
 0°C to +50°C (Operational Temperature)
 Hot-Swappable, Dual Redundant Power Supplies
 Dual Redundant Cooling Fans
 Power Options:
 100V to 240VAC / 50Hz & 60Hz
 -48VDC (-18VDC to -60VDC)
 Standard 19" Rack Mountable
 Extensive Built-In-Test capability
 Access Control and Anti-Tamper design

OC-12 / STM-4 Intelligent Frame-Sensitive Encryption



All Specifications are Preliminary and are Subject to Change without Notice.

Commitment to Quality

As an ISO 9001 certified company, TCC designs, manufactures and supports high-grade secure communications systems that protect highly sensitive information transmitted over a wide range of data, voice and fax networks. Over 2,000 government/military agencies, financial institutions, telecom carriers and other multinational corporations worldwide rely on TCC to protect their communications networks.



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