

FSP 3000: secure optical transport

BSI-approved for transport of classified data up to VS-V level

Today's optical transport demands are constantly changing. High-bandwidth services and cloud-based applications are booming and software-defined networking is evolving to the domain of transport networks. Network operators and enterprises need a secure, flexible and scalable solution that increases agility and automation, while keeping cost and footprint at a minimum.

Our FSP 3000 is a scalable optical transport solution designed to efficiently deal with this new environment, lowering its complexity and minimizing cost-per-bit and operational efforts. With an open and modular design, our FSP 3000 supports a wide range of services and applications, from data center interconnect (DCI) to carrier-optimized infrastructure solutions. Incorporating the latest innovation in photonic networking and our innovative ConnectGuard™ low-latency encryption technology, our FSP 3000 enables secure optical network solutions that can scale and accommodate tomorrow's needs. As the first commercial post-quantum cryptography (PQC) optical transport solution, our FSP 3000 now also protects data against cyberattacks from quantum computers. Moreover, with a high-density and energy-efficient design for smallest footprint and power consumption, our FSP 3000 meets the most stringent sustainability requirements.



Your benefits

✓ Scalability

Ultra-high-speed channels with up to 800Gbit/s per line port; 38.4Tbit/s duplex capacity per fiber pair with best-in-class metrics; up to 3.6Tbit/s duplex capacity per 1RU chassis

✓ Flexibility

From complete turnkey systems, including all equipment necessary for end-to-end transport applications, to disaggregated solutions

✓ Pay-as-you-grow design

Modular and scalable architecture that ensures both low initial cost and flexibility into the future

✓ Fully open and programmable

Open line system (OLS) architecture and YANG-based APIs (OpenConfig) for network disaggregation and easy integration into SDN-based environments

✓ Dynamic and scalable optical layer

Multiple ROADM options from a metro-optimized 2-degree ROADM to multi-degree ROADMs for flexgrid optical layer

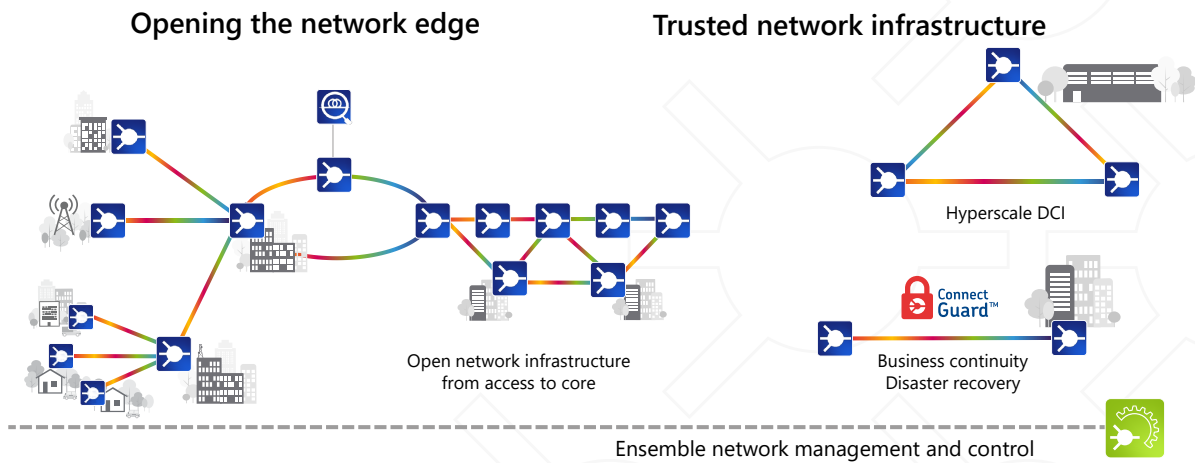
✓ Quantum-safe ConnectGuard™ encryption

Layer 1 encryption with ultra-low latency and 100% throughput, FIPS and CC certified; BSI approval; PQC cryptography with hybrid key exchange system

High-level specifications

<h3>General information</h3> <ul style="list-style-type: none"> • Up to 38.4Tbit/s duplex capacity per fiber pair • Point-to-point, ring and mesh topologies with optional protection mechanisms • Open line system • Flexgrid support • Ensemble Controller and open APIs for mgmt. and control 	<h3>Client services</h3> <ul style="list-style-type: none"> • From 100Mbit/s to 425Gbit/s • Ethernet up to 400GbE, RoCE, CE LR • OTU-1/2/3/4, OTUCn • SONET/SDH up to 10Gbit/s • Fibre Channel up to 64GFC • ESCON, FICON, Coupling Link, Infiniband • CPRI up to eCPRI 	<h3>Terminals</h3> <ul style="list-style-type: none"> • Fixed line (<=100Gbit/s) and SW-defined (>=100Gbit/s) transponders/muxponders • Up to 400Gbit/s per 1-slot card • Up to 800Gbit/s per channel • Up to 3.6Tbit/s per 1RU chassis • 400 / 1200Gbit/s OTN switches • 10Gbit/s QSFP-based service multiplexer (MicroMux™)
<h3>Photonic layer architectures</h3> <ul style="list-style-type: none"> • DWDM: up to 128 channels • CWDM up to 16 channels • Hybrid CWDM + DWDM • Wide variety of filters and ROADMs options up to 32 degree • Coherent and direct detection (PAM4) based solutions • Optimized OLS for 400ZR DCI • Optical timing channel (OTC) and fiber monitoring (OTDR) 	<h3>ConnectGuard™ encryption</h3> <ul style="list-style-type: none"> • Layer 1 AES-256 encryption • Dynamic key exchange <=4096 bit keys every minute • FIPS 140-3 and CC EAL-2 certified. BSI approval for German (“VS-V”) and NATO-restricted (“NATO confidential”) data • Encryption options via QKD and post-quantum cryptography 	<h3>Power and environmental</h3> <ul style="list-style-type: none"> • Highest energy efficiency, TEER-proven ecodesign • Redundant power supplies for -48VDC or 100-240VAC PSUs • Variety of active and passive chassis from 1RU to 12RU; 19in/ ETSI/NEBS rack mounting • Extended temperature options

Applications in your network



End-to-end network infrastructure

- Scalable system architecture for cost-effective access, metro and backbone optical network infrastructure
- Open optical networking solution for turnkey as well as disaggregated use cases

DCI for cloud and business continuity applications

- Terascale data center connectivity
- Open hardware architecture and YANG-based software (OpenConfig) modelling for easy integration into SDN-based environments



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Wavelength technologies

- CWDM: 16 wavelengths/20 nm according to ITU-T G.694.2
- DWDM schemes
 - 4, 8, 16, 40 channel, C-band, 100 GHz spaced
 - 80-channel, C-band, 50 GHz spaced
 - 96-channel, C-band, 50 GHz spaced
 - 128-channel, C-band, 37.5 GHz spaced
 - Flexgrid with down to 6.25 GHz channel width granularity
- Hybrid CWDM/DWDM

Topologies

- Point-to-point
- Point-to-multipoint
- Linear add/drop
- Multiplexed add/drop (drop and continue)
- Ring (+ feeder + dual homing)
- Hubbed-ring
- Meshed

Services

- Ethernet: FE, GbE, 10GbE (LAN and WAN), 25GbE, 40GbE, 100GbE and 400GbE, 10G and 25G RoCE, CE LR
- ESCON and Fibre Channel/FICON 1Gbit/s, 2Gbit/s, 4Gbit/s, 8Gbit/s, 10Gbit/s, 16Gbit/s 32Gbit/s, 64
- InfiniBand 5G and 10G
- STM-1, -4, -16, -64 / OC-3, -12, -48, -192
- OTU-1, -2, -3 and -4, OTUCn
- CPRI up to rate 10 (eCPRI)

Service protection

- Versatile protection
- Channel protection
- Path protection
- Channel card protection
- Client layer protection

Channel modules with fixed line format

- Transponders (line capacity up to 100Gbit/s)
- Muxponders (aggregating services in the range from 100M to 40G)
- Add/drop multiplexers (dynamic routing of sub-aggregate traffic 100M to 10G services)

Channel modules with SW-defined line optics

- Trans-/Muxponders (aggregating services in the range from 10G to 400G, line capacity up to 800Gbit/s)
- OTN switch and add/drop multiplexer (for sub-aggregated services from 10G to 100G)

Optical layer

- Fixed filter from 1 to 128 channels WDM
- Reconfigurable optical add/drop modules (ROADM) from 1 to 32 degrees with multiple fixed, colorless, directionless and contentionless add/drop structures
- Multiple amplification solutions using Erbium fiber and/or Raman amplifiers

- Automated optical layer with channel equalization and span loss equalization
- Optical supervisory functions like optical channel monitoring with full support of third-party wavelengths
- Tailored solutions for access, metro and regional/long-haul infrastructure (e.g., filterless OLS for coherent access, metro data center interconnect, etc.)
- Dedicated amplifier suite for coherent and direct detect signals (like SmartAmp™ designed for PAM4 solutions)
- Dedicated OLS optimized for 400ZR DCI links at over 25Tbit/s per fiber pair

Common equipment

- 1RU, 2RU, 3RU, 4RU, 7RU, 9RU and 12RU shelf variants
- 1RU extended temperature shelf
- Power supply modules from 50 to 1200W (AC, DC, full redundant)
- Various controller modules (from compact to redundant and high performance)
- Multiple management interfaces (USB, RJ45, digital IO-housekeeping)

Equipment management

- Embedded CRAFT/CLI
- Embedded web-based graphical user interface with “point and click” provisioning via HTTPS
- Full support of SNMP, TL1, REST, NETCONF (OpenConfig)
- Streaming telemetry (gRPC)
- Full support of FTP, SFTP, SCP, SSH, TELNET
- Remote authentication via RADIUS or TACACS+
- Equipment management using DCN or in-band management tunnels
- Enhanced user management with multiple security options
- Zero-touch provisioning methods using automated set-up, scripting environment like Ansible and network-wide profile management
- Use of augmented reality and equipment identification for guided installation and fault identification

Laser safety

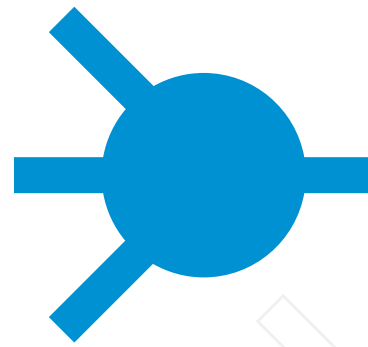
- Class1M laser product with hazard Level 1M

Environmental

- Standard temperature (operating): +5°C to +40°C
- Extended temperature active (operating): -40°C to +65°C
- Extended temperature passive: -40°C to 85°C
- Relative humidity (non-condensing): 5% to 85% (operating) / 5% to 90% (short-term)
- Outdoor enclosures for passive components

Regulatory compliance

- ETSI EN 300 019-1-1 V2.2.1 Storage class 1.2
- ETSI EN 300 019-1-2 V2.2.1 Transportation class 2.2
- ETSI EN 300 019-1-3 V2.4.1 Stationary use at weather protected locations class 3.1
- ETSI EN 300 019-2-3 V2.4.1 Non- temperature controlled, weather protected locations Class 3.3E (-40°C to max +65C) for extended temperature shelf configurations
- NEBS level 3
- Laser safety: IEC 60825-1, IEC 60825-2, ITU-T G.664-2012
- EMC: CISPR 22, CISPR 24 / CISPR 32, CISPR 35
- Product safety: IEC 60950-1, IEC 62368-1:2014
- Directive 2011/65/EU (RoHS II) and 2015/863/EU (RoHS III)
- WEEE: directive 2012 / 19 / EU, EN 50419:2006
- IP20. Use in a pollution degree 2 environment and indoor controlled office environments only
- CE declaration of conformity
- FCC supplier's declaration of conformity
- WCAG 2.0 certification for embedded web GUI



4TCC-PCN-32GU+AES100G-G

BSI-approved Layer 1 encrypted transport of 32GFC client services

The 4TCC-PCN-32GU+AES100G-G is a muxponder that provides encrypted transport of up to three 32GFC client services on a single wavelength. With our robust and reliable ConnectGuard™ Layer 1 encryption technology, the 4TCC-PCN-32GU+AES100G-G satisfies the most stringent security demands, including being qualified by the German Federal Office for Information Security (BSI) for the transport of classified data up to VS-NfD level (“BSI-VSA-10333”).

The 4TCC-PCN-32GU+AES100G-G is a 100Gbit/s TDM channel module (muxponder) supporting three 32GFC client interfaces using the independent lanes of a single quad small form-factor pluggable (QSFP28) interface cage, and one OTU4/OTU4V network interface using a single CFP interface cage. If necessary, a breakout cable terminating in multiple optical connectors, each supporting a single optical lane (such as an MPO-to-LC breakout cable), might be used to connect to any client equipment that does not offer 32GFC interfaces on QSFP ports. The network data stream is encrypted/decrypted using the Advanced Encryption Standard (AES). Data encryption and the use of an endpoint authentication mechanism protect the network link between two communicating 4TCC-PCN-32GU+AES100G-G modules against man-in-the-middle attacks. Our ConnectGuard™ Layer 1 encryption technology satisfies the strictest security standards such as FIPS 140-2. What’s more it has achieved BSI approval for transport of classified data up to VS-V level. This makes it ideal for the transmission of sensitive information that must be protected from unauthorized access.



Your benefits

- ✓ **Built-in cryptographic functions**
No need for additional equipment or software
- ✓ **BSI approval; CC-certified**
BSI-VSA-10333 approval for the transport of classified data up to “VS-NfD” level; Common Criteria (CC) certification (operating system level)
- ✓ **Tamper-evident case**
Hardware designed to avoid any unauthorized access or manipulation of security-sensitive components
- ✓ **High-density design**
Two-slot compact design enabling up to eight modules per 9RU shelf
- ✓ **FEC for network and client interfaces**
32GFC clients implement the mandatory FEC required in the Fibre Channel specifications for 32GFC
- ✓ **Comprehensive monitoring capabilities**
Multiple client and network port fault monitoring (FM) and performance monitoring (PM) capabilities

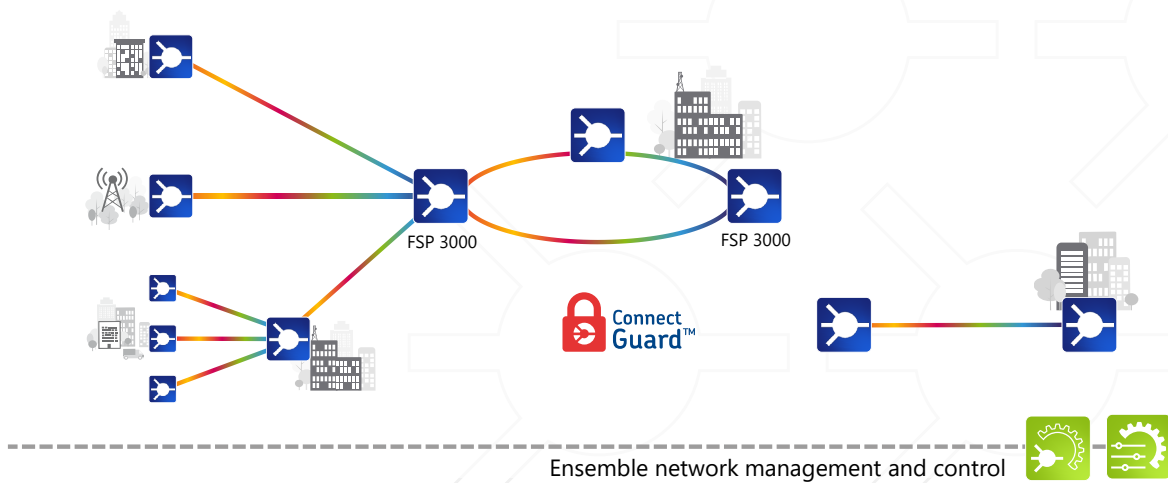
High-level specifications

<p>General information</p> <ul style="list-style-type: none"> • Terminal multiplexer supporting three 32GFC independent client services • Two-slot module • Embedded communication channel (ECC) • Typical power consumption with transceivers: 75W 	<p>Client and network ports</p> <ul style="list-style-type: none"> • Client interface: <ul style="list-style-type: none"> – 1x standard-compliant QSFP28 supporting three standard 32GFC interfaces • Network interface: <ul style="list-style-type: none"> – 1x standard-compliant CFP transceiver (grey or colored) – Support of breakout cables 	<p>Environmental</p> <ul style="list-style-type: none"> • Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 (9RU) or 3.1e (1RU) • Operating temperature: +5°C to +40°C / -33°C to +40°C with 1RU E-Temp shelf • 5% to 85% relative humidity (non-condensing)
<p>FM and PM monitoring</p> <ul style="list-style-type: none"> • Client interface: <ul style="list-style-type: none"> – Physical layer (PHYS), physical coding sublayer (PCS) • Network interface: <ul style="list-style-type: none"> – Physical layer (PHYS), OTU section layer, encryption layer, ODU path layer, TCM layer, FEC PMs 	<p>ConnectGuard™ encryption</p> <ul style="list-style-type: none"> • Encryption of payload in accordance to AES-GCM with 256bit key • Diffie-Helman 4096 key exchange every minute • Protection against modification • Far-end authentication 	<p>Security certifications</p> <ul style="list-style-type: none"> • BSI approval for transport of classified data up to VS-NfD level (BSI-VSA-10333) • Common Criteria (operating system level)

Applications in your network

Secure SAN DCI enterprise connectivity

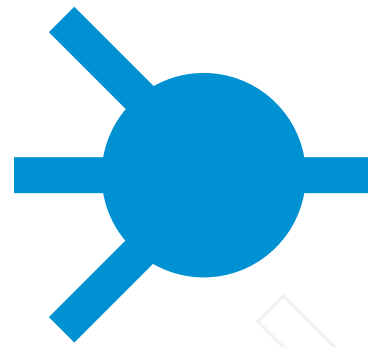
- High-capacity transport of sensitive data over WDM metro network infrastructure
- Built-in Layer 1 encryption technology for robust protection of data in motion with 100% throughput and ultra-low latency
- Protocol-agnostic Layer 1 encryption protecting data at all layers in the network stack
- Most robust and reliable Layer 1 encryption on the market:
 - BSI approval for the transport of classified data up to VS-NfD level (BSI-VSA-10333)
 - Common Criteria certification (operating system level)
 - ADVA is the only DWDM vendor that has achieved the BSI approval



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9TCE-PCN-10GU+AES10G-G

Muxponder/quad-transponder with BSI-approved Layer 1 encryption

The 9TCE-PCN-16GU+AES100G-G is a channel card that can work as a 10Gbit/s multiplexer or quad-transponder with four independent transponders in just one card. With our robust and reliable ConnectGuard™ Layer 1 encryption technology, this module satisfies the most stringent security demands, including being qualified by the German Federal Office for Information Security (BSI) for the transport of classified data up to VS-NfD (“BSI-VSA-10292”).

Our 9TCE-PCN-16GU+AES100G-G is an enterprise-type TDM channel module with 10 interface cages that can serve as either client or network ports depending on the application (muxponder or transponder). Moreover, it implements cryptographic functions such as encryption, decryption and random number generation. The network interface data stream is encrypted/decrypted using the Advanced Encryption Standard (AES). Data encryption and the use of an endpoint authentication mechanism protect the network link between two communicating 9TCE-PCN-16GU+AES100G-G modules against man-in-the-middle attacks. Our ConnectGuard™ Layer 1 encryption technology satisfies the strictest security standards such as FIPS 140-2. What’s more, it has achieved BSI approval for transport of classified data up to VS-NfD level. This makes this terminal ideal for the transmission of sensitive information that must be protected from unauthorized access.



Your benefits

- ✓ **Built-in cryptographic functions**
No need for additional equipment or software
- ✓ **BSI-approved and CC-certified**
“BSI-VSA-10292” approval for the transport of classified data up to “VS-NfD” level; Common Criteria (CC) certification (operating system level)
- ✓ **Tamper-evident case**
Hardware designed to avoid any unauthorized access or manipulation of security-sensitive components
- ✓ **High-density design**
10Gbit/s muxponder or quad-transponder with four independent transponders in just a 1-slot module
- ✓ **Multi-protocol ports**
10 multi-protocol ports that can work as client or network ports in accordance with the operation mode
- ✓ **Comprehensive monitoring capabilities**
Multiple fault and performance monitoring capabilities on the client and the network ports

High-level specifications

General information

- Two operation modes:
 - 10G terminal multiplexer
 - 10G quad-transponder
- 1-slot module
- 10x SFP/SFP+ cages for client port or network port use
- Typical power consumption fully equipped: 25W/35W (muxponder/transponder)

Muxponder mode

- Nine client ports (SFP/SFP+) and one network port (SFP+)
- Up to nine client services multiplexed/demultiplexed onto/from one 10Gbit/s ITU-T wavelength (OTU2)
- Client protocols supported: STM-4/OC12, GbE, STM-16/OC48 and electrical Ethernet E10-1000T

Transponder mode

- Up to four independent transponders per card, each one with one client port (SFP/SFP+) and one network port (SFP+)
- Client protocols supported: 8GFC, STM-64/OC192, 10GbE LAN, CE-LR, RoCE, OTU-2

Environmental conditions

- Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 (9RU)/3.1e (7RU, 1RU)
- Operating temperature: +5°C to +40°C / -33°C to +40°C with 1RU E-Temp shelf
- 5% to 85% relative humidity (non-condensing)

ConnectGuard™ encryption

- Encryption of payload acc. to AES-GCM with 256bit key
- Diffie-Helman 4096 key exchange every minute
- Protection against modification
- Far-end authentication

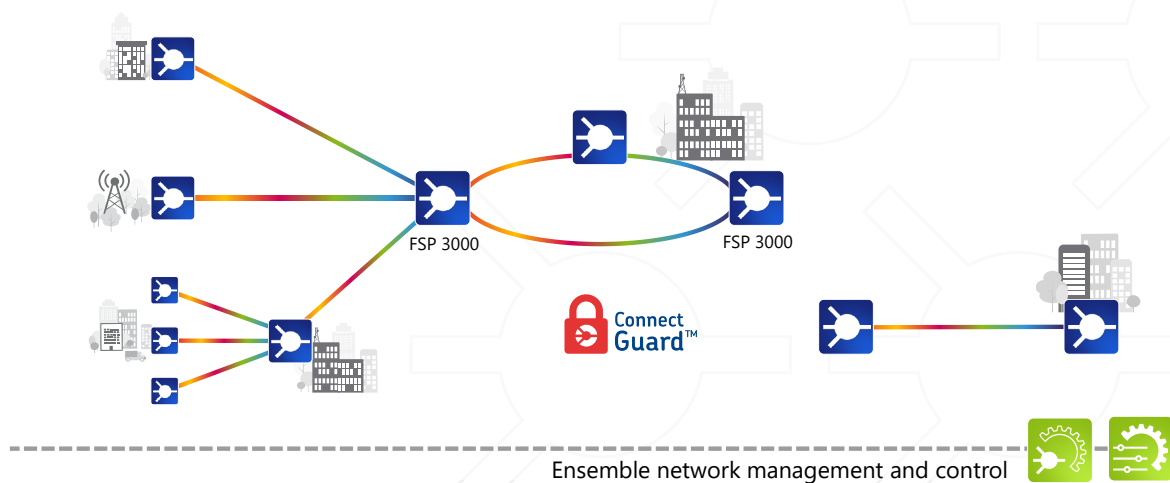
Security certifications

- BSI approval for transport of classified data up to VS-V level ("BSI-VSA-10292")
- Common Criteria (operating system level)

Applications in your network

Secure enterprise connectivity

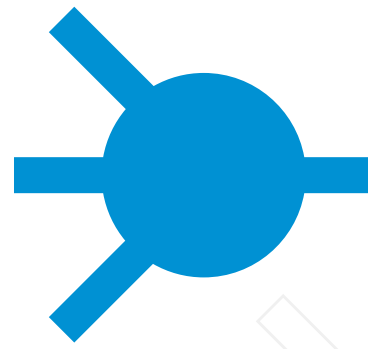
- High-capacity transport of sensitive data over WDM metro network infrastructure
- Built-in Layer 1 encryption technology for robust protection of data in motion with 100% throughput and ultra-low latency
- Protocol-agnostic Layer 1 encryption protecting data at all layers in the network stack
- Most robust and reliable Layer 1 encryption on the market:
 - BSI approval for the transport of classified data up to VS-NfD level ("BSI-VSA-10292")
 - Common Criteria certification (operating system level)
 - ADVA is the only DWDM vendor that has achieved BSI approval



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ADVA™



10TCE-PCN-16GU+AES100G-BSI

100Gbit/s muxponder with BSI-approved Layer 1 encryption

The 10TCE-PCN-16GU+AES100G-BSI is a channel card that can multiplex/demultiplex up to 10 client interface signals of up to 16 Gbit/s services onto/from an ITU-T-compliant wavelength for transport over an optical network. With our robust and reliable ConnectGuard™ Layer 1 encryption technology, this module satisfies the most stringent security demands, including being qualified by the German federal office for information security (BSI) for the transport of classified data up to VS-V level (“BSI-VSA-10034” for VS-NfD and “BSI-VSA-10332” for VS-V).

Our 10TCE-PCN-16GU+AES100G is an enterprise-type TDM channel module with ten SFP+ interface cages on the client side and a single CFP interface cage on the network side. The 10TCE-PCN-16GU+AES100G implements cryptographic functions such as encryption, decryption and random number generation. The aggregate 100Gbit/s data stream is encrypted/decrypted using the Advanced Encryption Standard (AES). Data encryption and the use of an endpoint authentication mechanism protect the network link between two communicating 10TCE-PCN-16GU+AES100G modules against man-in-the-middle attacks. Our ConnectGuard™ Layer 1 encryption technology satisfies the strictest security standards such as FIPS 140-2 level 2. What’s more, it has achieved BSI approval for transport of classified data up to VS-V level. This makes this module ideal for the transport of sensitive information that must be protected from unauthorized access.



Your benefits

- ✓ **Built-in cryptographic functions**
No need for additional equipment or software
- ✓ **BSI-approved and CC-certified**
BSI-VSA-10332/BSI-VSA-10034 approvals for the transport of classified data up to “VS-V” level and Common Criteria (CC) certification (operating system level)
- ✓ **Tamper-evident case**
Hardware designed to avoid any unauthorized access or manipulation of security-sensitive components
- ✓ **High-density design**
Two-slot compact design enabling up to eight modules per 9RU shelf
- ✓ **Multi-service support**
Support of any combination of client services, only limited by the maximum aggregated bandwidth (100Gbit/s)
- ✓ **Comprehensive monitoring capabilities**
Multiple fault and performance monitoring capabilities on the client and the network ports

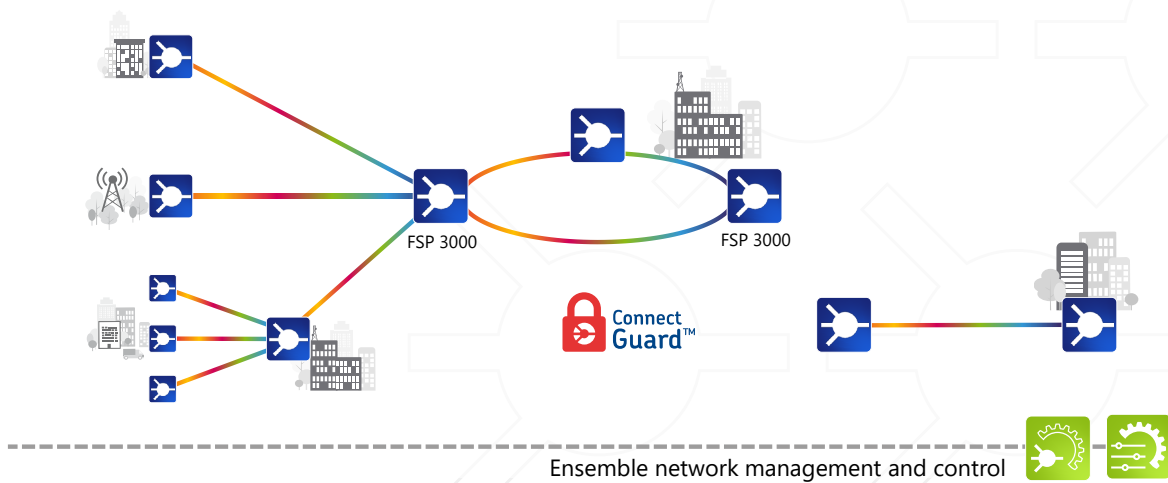
High-level specifications

<p>General information</p> <ul style="list-style-type: none"> • Terminal multiplexer • 2-slot module • Pluggable transceivers: <ul style="list-style-type: none"> – Up to 10x SFP+ client interfaces – 1x CFP network interfaces • Typical power consumption with SFP+ and CFP: 96W 	<p>Client data rates supported</p> <ul style="list-style-type: none"> • 4GFC, 5G IB, 8GFC, 10GFC, 16GFC, STM-64/OC-192, 10 GbE WAN PHY, 10GbE LAN PHY, CE-LR, RoCE 40GbE* and 100GbE** • Any combination of client services allowed (up to the max aggregated bandwidth) 	<p>Environmental conditions</p> <ul style="list-style-type: none"> • SH9RU shelf: Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 (9RU) or 3.1e (1RU) • Operating temperature: <ul style="list-style-type: none"> • +5°C to +40°C / -33°C to +40°C with 1RU E-Temp shelf • 5% to 85% relative humidity (non-condensing)
<p>Protection switching</p> <ul style="list-style-type: none"> • 1+1 unidirectional revertive and non-revertive switching • 1+1 bidirectional revertive and non-revertive switching • Switching times <50ms • Automatic protection switching (APS) channel per sub-aggregate service for client channel card protection 	<p>ConnectGuard™ encryption</p> <ul style="list-style-type: none"> • Encryption of payload according to AES-GCM with 256bit key • Diffie-Helman 4096 key exchange every minute • Protection against modification • Far-end authentication 	<p>Security certifications</p> <ul style="list-style-type: none"> • BSI approval for transport of classified data up to VS-V level (BSI-VSA-10332 / BSI-VSA-10034) • Common Criteria (CC) certification (operating system level)

Applications in your network

Secure enterprise connectivity

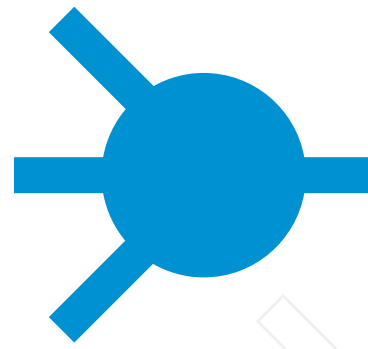
- High-capacity transport of sensitive data over WDM metro network infrastructure
- Built-in Layer 1 encryption technology for robust protection of data in motion with 100% throughput and ultra-low latency
- Protocol-agnostic Layer 1 encryption protecting data at all layers in the network stack
- Most robust and reliable Layer 1 encryption on the market:
 - BSI approval for the transport of classified data up to VS-V level (BSI-VSA-10332/BSI-VSA-10034)
 - Common Criteria certification (operating system level)
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WCC-PCN-AES100GB-G

100Gbit/s transponder with BSI-approved Layer 1 encryption

The WCC-PCN-AES100GB is a WDM transponder for the transport of encrypted 100GbE and OTU4 client services over optical networks. With our robust and reliable ConnectGuard™ Layer 1 encryption technology, this module satisfies the most stringent security demands. It has achieved the approval of the German Federal Office for Information Security (BSI) for the transport of classified data up to VS-NfD level (“BSI-VSA-10333”).

Our WCC-PCN-AES100GB-G is a two-slot cryptographic WDM channel module with one 100Gbit/s client interface supporting QSFP28 pluggable transceivers and one 100Gbit/s network interface supporting CFP pluggable transceivers. The 10TCE-PCN-16GU+AES100G implements cryptographic functions such as encryption, decryption, and random number generation. The aggregate 100Gbit/s data stream is encrypted/decrypted using the advanced encryption standard (AES). Data encryption and the use of an endpoint authentication mechanism protect the network link between two communicating WCC-PCN-AES100GB-G modules against man-in-the-middle attacks. Our ConnectGuard™ Layer 1 encryption technology satisfies the strictest security standards such as FIPS 140-2. What’s more, it has achieved BSI approval for transport of classified data up to VS-NfD level. This makes this module ideal for the transport of sensitive information that must be protected from unauthorized access.



Your benefits

- ✓ **Built-in Layer 1 encryption functionality**
No need for additional equipment or software
- ✓ **BSI-approved; CC-certified**
“BSI-VSA-10333” approval for the transport of classified data up to “VS-NfD” level; Common Criteria (CC) certification (operating system level)
- ✓ **Tamper-evident case**
Hardware designed to avoid any unauthorized access or manipulation of security-sensitive components
- ✓ **Compact footprint**
Two-slot compact design enabling up to eight modules per 9RU shelf
- ✓ **Multi-protocol support**
The module supports 100GbE 100BASE-R as well as OTN OTU-4 client services
- ✓ **Comprehensive monitoring capabilities**
Fault and performance monitoring capabilities for both client as well as network interfaces

High-level specifications

General information <ul style="list-style-type: none">• 100Gbit/s transponder• 2-slot module• Pluggable transceivers• Embedded control channels• Typical power consumption including pluggable transceivers: 75W	Client and network ports <ul style="list-style-type: none">• Client port:<ul style="list-style-type: none">– 1x QSFP28– Protocols supported: 100GbE 100GBaseR and OTU4• Network port:<ul style="list-style-type: none">– 1x CFP network port– Tuneable DWDM interface	Environmental information <ul style="list-style-type: none">• SH9HU shelf: Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 (9RU) or 3.1e (1RU)• Operating temperature: +5°C to +40°C / -33°C to +40°C with 1RU E-Temp shelf• 5% to 85% relative humidity (non-condensing)
Protection switching <ul style="list-style-type: none">• 1+1 unidirectional revertive and non-revertive switching• Switching times <50ms• Automatic protection switching (APS) channel per sub-aggregate service for client channel card protection	Encryption <ul style="list-style-type: none">• Encryption of payload according to AES-GCM with 256bit key• Diffie-Helman 4096 key exchange every minute• Protection against modification• Far-end authentication	Security certifications <ul style="list-style-type: none">• BSI approval for transport of classified data up to VS-NfD level (“BSI-VSA-10333”)• Common Criteria (operating system level)

Applications in your network

Secure high-speed connectivity over WDM network infrastructure

- Built-in Layer 1 encryption technology for robust protection of data in motion with 100% throughput and ultra-low latency
- Protocol-agnostic Layer 1 encryption protecting data at all layers in the network stack
- Most robust and reliable Layer 1 encryption on the market:
 - Approved by BSI for the transport of classified data up to VS-NfD level (BSI-VSA-10333)
 - Common Criteria certification (operating system level)
 - ADVA is the only DWDM vendor that has achieved BSI approval

