



## DESCRIPTION

The 10G DWDM Tunable XFP is a fully duplex serial electric, serial optic device with both transmit and receive functions contained in a single module that provides a high speed serial link at 10 Gbs. The Tunable XFP is controlled by software on the host module and can operate on the full C-band supporting Channels 17 through 60. Installed in the appropriate host module, the Tunable XFP provides a 10 Gigabit interface to the supporting system. Refer the documentation provided with the host module for information on configuring the XFP.

The transmit side of the Tunable XFP converts serial NRZ electrical data at the 10 Gbs line rate to a standard compliant optical signal. The receive side converts the incoming DC balanced serial NRZ optical data at the 10 Gbs line rate into serial electrical data.

### NOTE

To ensure compatibility, refer to the documentation provided with the host module.

The following features are supported on the Tunable XFP:

- 1529.55 ~ 1563.86 nm optical signals for up to 80 km reach
- Low power consumption (<3.5 W max)
- Bit error rate  $10^{-12}$

### CAUTION

Due to compliance certification requirements, use only XFPs supplied by ADTRAN with the host module. ADTRAN cannot certify system integrity with other XFPs.

## OPERATIONAL SPECIFICATIONS

- Transmit Wavelength: Tunable 1529.55 ~ 1563.86 nm (Channels 17 through 60)
- Receive Wavelength: 1528.77 to 1600 nm
- Data Rate: 9.95 Gbs to 11.35 Gbs (see table below)

Data Rate	Without FEC <sup>1</sup>		With FEC <sup>2</sup>	
	BOL	EOL	BOL	EOL
9.95Gbps	>26 dB	>27 dB	NA	NA
Up to 10.7Gbps	NA	NA	>17.5 dB	>18.5 dB
Up to 11.1Gbps	NA	NA	>18.5 dB	>19.5 dB
Up to 11.35Gbps	NA	NA	>18.5 dB	>19.5 dB

1. Forward Error Correction (FEC) at BER 1E-12, input power -7 to -19 dBm
2. Forward Error Correction (FEC) at BER 1E-4, input power -7 to -24 dBm

- Optical transmit levels: -1.0 to +3.0 dBm
- Optical receive level: -24.0 to -7.0 dBm
- Dispersion Tolerance: -400ps/nm to 1600ps/nm
- Dispersion penalty maximum: 2.5dB (-400 to 1600ps/nm)
- Minimum Span Attenuation: 10 dB
- Optical distance: 80 km maximum
- Optical connectors: LC
- Extended Environmental Support:
  - ◆ Operational temperature range: -5°C to +60°C
  - ◆ Storage temperature range: -40°C to +85°C
  - ◆ Relative humidity to 85%, noncondensing

## INSTALLATION

Before installing the equipment, inspect the Tunable XFP. If damage has occurred during shipping, file a claim with the carrier, and then contact ADTRAN Customer Support. For more information, refer to the warranty.

To install the Tunable XFP into an appropriate module, complete the following steps:

### NOTE

Do not remove the protective end cap from the XFP until the fiber optic cable is ready to be connected.

1. Insert the Tunable XFP into the XFP cage on the module. Ensuring that the latch handle on the XFP is facing upward, slide the XFP all the way into the XFP cage until there is an audible "click".

### NOTE

The latch on the XFP is for removal only. When removing the XFP, rotate the latch away from the XFP, the XFP should easily slide out of the cage.

2. Do not remove the protective end cap until the optical fiber connection is made.

## NOTICE

It is recommended that the protective end cap remain on whenever the transceiver optical fiber connector is not inserted.

Continue the installation and turn-up of the host module using the instructions in the Job Aid provided with the module or other system-level documentation available online at [www.adtran.com](http://www.adtran.com).

## SAFETY AND REGULATORY COMPLIANCE

### WARNING

Read all warnings and cautions before installing or servicing this equipment.

### CAUTION

This product uses a Class 1 Laser module that complies with 21 CFR 1040.10 and 1040.11 and IEC 60825-1, IEC 60825-2, EN 60825-1 and EN 60825-2. For continued compliance with the above standards, only approved Class 1 laser modules from an ADTRAN approved vendor list (located on the ADTRAN website) should be installed in this product. ADTRAN cannot certify system integrity with other laser modules.

### CAUTION

- Electrostatic Discharge (ESD) can damage electronic modules. When handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.
- Per GR-1089-CORE the system is designed and intended for installation as part of a Common Bonding Network (CBN). The system is not designed nor intended for installation as part of an Isolated Bonding Network (IBN).
- Per GR-1089-CORE Section 9, this product does not have an internal DC connection between battery return and frame ground. This product can be installed in a DC-I (isolated) or DC-C (common) installation. For installations where other cards or the host system have internal connections between battery return and frame ground, the system would be intended for deployment only in a DC-C installation.
- The chassis frame ground terminal must be connected to an earth ground to ensure that the metal enclosure of the XFP is properly grounded via the backplane connector.

### NOTE

- The Gigabit Ethernet port(s) are optical and therefore are not classified as any type of port as defined in Appendix B of GR-1089-CORE.
- The Tunable XFP is compliant with SFF-8472 "Digital Diagnostics Monitoring Interface for Optical Transceivers," Revision 9.3.
- The Tunable XFP is compliant with the XFP Multi-Source Agreement (MSA).
- The Tunable XFP is designed to be deployed in GR-3108-CORE environmental class 1 as defined in GR-3108-CORE.

This product is NRTL Listed to the applicable UL Standards. The product is designed to meet the applicable requirements of Telcordia GR-63-CORE, and GR-1089-CORE.

This product has also been evaluated to international safety standards EN 60950-1, AS/NZS 60950.1, and IEC 60950-1. This product meets the requirements for CE marking under the EMC Directive and Low Voltage Directive. Standards used to demonstrate Compliance are EN 300 386 and EN 60950. The Tunable XFP is intended for deployment in Central Office (Telecommunication Center) type facilities, EEEs, EECs Access or Trunk Network Locations), and locations where the NEC applies (for example, Customer Premises).

The Tunable XFP is to be installed in ADTRAN products in Restricted Access Locations only, and installed by trained service personnel.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

The product also complies with ETSI EN 300 386 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; Electromagnetic Compatibility (EMC) requirements."

Changes or modifications not expressly approved by ADTRAN could void the user's authority to operate this equipment.

The Tunable XFP is designed to meet the following environmental classes:

- ETSI EN 300 019-1-1 "Classification of environmental conditions; Storage," Class 1.2
- ETSI EN 300 019-1-2 "Classification of environmental conditions; Transportation," Class 2.3
- ETSI EN 300 019-1-3 "Classification of environmental conditions; Stationary use at weather-protected locations," Class 3.2

The equipment is designed to function without degradation during exposure to all test severities per Class 3.2.

The 10G DWDM Tunable XFP meets EU RoHS Directive 2002/95/EC and/or applicable exemptions. Refer to [www.adtran.com](http://www.adtran.com) for further information on RoHS/WEEE.

## FRANÇAIS

### AVERTISSEMENT

Lisez tous les avertissements et mises en garde avant l'installation de cet équipement ou la réalisation de toute opération de maintenance.

### ATTENTION

Ce produit utilise un module laser de classe 1 qui conforme aux normes 21 CFR 1040.10, 1040.11 et IEC 60825-1 et -2. Pour assurer la conformité aux normes mentionnées plus haut, seuls des modules laser de classe 1 approuvés provenant d'une liste de fournisseurs certifiés par ADTRAN (disponible sur le site d'ADTRAN) doivent être installés sur ce produit. ADTRAN ne peut certifier l'intégrité d'un système doté d'autres modules laser.

### ATTENTION

- L'ESD (décharge électrostatique) peut endommager les modules électroniques. Lors de la manipulation des modules, portez un bracelet de décharge antistatique pour éviter d'endommager les composants électroniques. Placez les modules dans un emballage antistatique lors du transport ou du stockage. Lorsque vous travaillez sur les modules, placez-les toujours sur un tapis antistatique certifié muni d'un branchement de mise à la terre.
- Selon le document GR-1089-CORE, ce système est conçu et prévu pour une installation intégrée à un réseau de masse maillé. Ce système n'est pas conçu ni prévu pour une installation intégrée à un réseau de masse isolé (IBN).
- Selon le document GR-1089-CORE section 9, ce produit n'est pas équipé d'une connexion DC interne entre le retour de la batterie et la masse du châssis. Ce produit peut être installé dans une configuration DC-I (isolé) ou DC-C (commun). Pour les installations où les autres cartes ou le système hôte possèdent des connexions internes entre le retour de l'accumulateur et la mise à la terre de l'armature, le système est prévu pour le déploiement de configuration DC-M unique.
- La borne de mise à la terre du châssis doit être branchée à une prise de terre afin d'assurer que le boîtier métallique de la XFP est correctement mis à la terre grâce au connecteur de face arrière.

Ce produit est conçu pour répondre aux classes environnementales suivantes :

- ETSI EN 300 019-1-1 "Classification des conditions d'environnement; Entreposage," classe 1.2
- ETSI EN 300 019-1-2 "Classification des conditions d'environnements; Transport," classe 2.3
- ETSI EN 300 019-1-3 "Classification des conditions d'environnements; l'utilisation à poste fixe dans des endroits protégés contre les intempéries," classe 3.3

L'équipement est conçu pour fonctionner sans dégradation lors des tests à tous les niveaux de sévérité, suivant les spécifications de la classe 3.3 de l'ETSI EN 300 019-1-3.

Ce produit est conforme à la directive européenne RoHS 2002/95/CE et/ou aux exonérations applicables. Reportez-vous à [www.adtran.com](http://www.adtran.com) pour de plus amples renseignements sur RoHS/WEEE.

## DEUTSCH

### WARNUNG

Lesen Sie sich alle Warn- und Sicherheitshinweise durch, bevor Sie dieses Gerät installieren oder warten.

### CAUTION

Dieses Produkt nutzt ein mit den Richtlinien 21 CFR 1040.10 und 1040.11 und IEC 60825-1 und -2 konformes Class 1 Lasermodul. Damit die obigen Richtlinien auch in Zukunft eingehalten werden können, dürfen ausschließlich Class 1 Lasermodule von einem von ADTRAN zugelassenen Anbieter in dem Produkt installiert werden (erhältlich auf der Website von ADTRAN). ADTRAN garantiert nicht für die Systemintegrität bei anderen Lasermodulen.

### VORSICHT

- Elektrostatische Entladungen können elektronische Module beschädigen. Tragen Sie beim Umgang mit Modulen ein Erdungsarmband, um Schäden an den elektronischen Komponenten zu vermeiden. Transportieren oder lagern Sie Module in antistatischem Verpackungsmaterial. Bei der Arbeit an den Modulen, achten Sie darauf, diese stets auf antistatische, elektrisch geerdete Matten zu legen.
- Laut GR-1089-CORE dient dieses System zur Installation in einer gemeinsamen Potentialausgleichsanlage. Dieses System dient nicht zur Installation in einer isolierten Potentialausgleichsanlage.
- Laut GR-1089-CORE Abschnitt 9 verfügt dieses Produkt nicht über eine interne DC-Verbindung zwischen den Batterien und der Gehäusemasse. Dieses Produkt kann entweder in einer DC-I (isolierten) oder DC-C (gemeinsamen) Anlage installiert werden. Installationen, in denen für andere Karten oder das Host-System interne Verbindungen zwischen den Batterien und der Gehäusemasse bestehen, dienen ausschließlich für den Einsatz in DC-C-Anlagen.
- Die Erdungsschiene des Rahmens muss an eine Bodenstation angeschlossen werden, um sicherzustellen, dass das Metallgehäuse des XFP vorschriftsmäßig über den Rückwandanschluss geerdet ist.

Dieses Produkt wurde entsprechend der folgenden Umweltklassen entwickelt:

- ETSI EN 300 019-1-1 "Klassifikation von Umweltbedingungen, Lagerung," Klasse 1.2
- ETSI EN 300 019-1-2 "Klassifikation von Umweltbedingungen, Transport," Klasse 2.3
- ETSI EN 300 019-1-3 "Klassifikation von Umweltbedingungen, Stationärer Einsatz ohne Witterungseinflüsse," Klasse 3.3

Dieses Gerät funktioniert ohne Leistungsabfall während aller für Klasse 3.3 von ETSI EN 300 019-1-3 vorgeschriebenen Belastungstests.

Dieses Produkt erfüllt die EU RoHS Richtlinie 2002/95/EC und/oder gültige Ausnahmen. Bitte besuchen Sie [www.adtran.com](http://www.adtran.com) für ausführlichere Informationen zu RoHS/WEEE.



**Warranty:** ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found online at [www.adtran.com/warranty](http://www.adtran.com/warranty).

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