NEOX NETWORKS

NEOX**PacketRaven Hybrid 1G Multimode Fiber TAPs**

FULL NETWORK VISIBILTY | FPGA CHIPSET | CRITIS-APPROVED
DATA DIODE FUNCTION | INDIVIDUALLY CONFIGURABLE

PACKET**RAVEN**
WATCH YOUR NETWORK!

SecurITy made in Germany
Trust Seal
www.teletrust.de/itsmig

CRITIS APPROVED

IEC 62443 APPROVED

Hybrid Fiber TAPs with media conversion and signal regeneration are decoupling elements for passive, secure and reliable tapping of network data in optical networks. These TAPs are looped into the fiber-optic line to be monitored and route out the entire data traffic while maintaining data integrity, without interruption and without packet loss.

Using conventional SPAN ports, also known as mirror ports, on the other hand, can distort the result, as this copying process works in store-and-forward mode and, for example, discards FCS/CRC faulty packets on OSI layer 2 instead of providing these Ethernet frames to the security or monitoring tool.

Our Network TAPs do not have a MAC or IP address, but work entirely on OSI Layer 1 and cannot be traced in the network without special and expensive measuring equipment. Hackers and attackers therefore have no chance. As the integrity of the outgoing data remains unaltered due to this tapping method, our Network TAPs are increasingly used in the areas of network forensics, security and monitoring.

Furthermore, our Hybrid 1000Base-SX TAPs behave passively on the network side, which means that there is no interruption of network traffic in the event of a TAP power supply failure. In order to ensure the highest possible reliability on the monitoring side, our Hybrid Fiber TAPs have redundant power supplies, but can also be additionally operated or protected with 12-48V DC voltage.

Additionally, our TAPs work like a Data Diode and the monitoring ports are physically isolated from the network ports, which prevents access to the network via the monitoring ports on the hardware side for security reasons. Therefore, our Hybrid Fiber TAPs guarantee a reliable network analysis or security investigation without compromise.

Our models in the portable PacketRaven Network TAPs product family were designed as portable TAPs, but can also be installed in a 19" mounting frame in data centers using a mounting kit or on a DIN rail using a DIN rail clip.

These active hybrid Fiber TAPs support a network speed of 1000Mbps (1000Base-SX).

Our portable TAPs with RJ45/copper monitoring port are also available in a specially hardened version (Hardened TAPs) for high-security areas according to IEC 62443. They also have secure and encrypted firmware, security seals to prevent unnoticed opening, security screws to prevent unwanted opening and are optionally preconfigured.

With PacketRaven Fiber TAPs you get permanent network access without risk and provide e.g. your monitoring tools with 100% reliable network data - without introducing a single point of failure.

- Full Network Transparency
- No impairment of Data Traffic
- 100% Network Data
- Invisible for Attackers
- No Network Access via Monitoring Port
- Flexible to Use
- Plug-n-Play
- Failure Protection on Power Loss
- Redundant Power Supply
- Various Split Ratios
- Fast and Precise
- Support Jumbo Frames
- Made in Germany

HIGHLIGHTS

Secure, rock-solid FPGA-based design
1000Base-SX - supported network speed 1G
Alternative to SPAN ports - mirrors 100% of traffic including FCS/CRC errored packets that may be dropped by SPANs
Invisible on the network, no IP address, no MAC address, cannot be hacked
Guaranteed no package loss
100% reaction-free due to galvanic isolation (Data Diode Function)
Available in different split ratios e.g. 50:50, 60:40, 70:30, 80:20, 90:10
100% passive without affecting the active network connection, no additional latency
Support breakout, aggregation and regeneration mode
Power supply via 2 redundant 5V AC/DC power supplies and/or 12-48V DC voltage
Support up to 16k Jumbo Frames
Plug-n-Play - Operating mode change via DIP switch
Specially hardened IEC62443 models available for CRITIS applications
Various mounting options available
Designed, assembled, certified and tested in Germany

INTERFACES

1	LC Network Ports A & B	5	2x AC/DC (5V) Power LED
2	RJ45/SFP Monitoring Ports A & B and Status LEDs	6	DIP switch for setting the TAP operating mode
3	Aggregation mode LED	7	Redundant connections for 2x 5V AC/DC power supplies
4	12-48V DC Power LED	8	Connection for 12-48V DC voltage

Front View

PRP-OM5-SLC

PRP-OM5-SLS
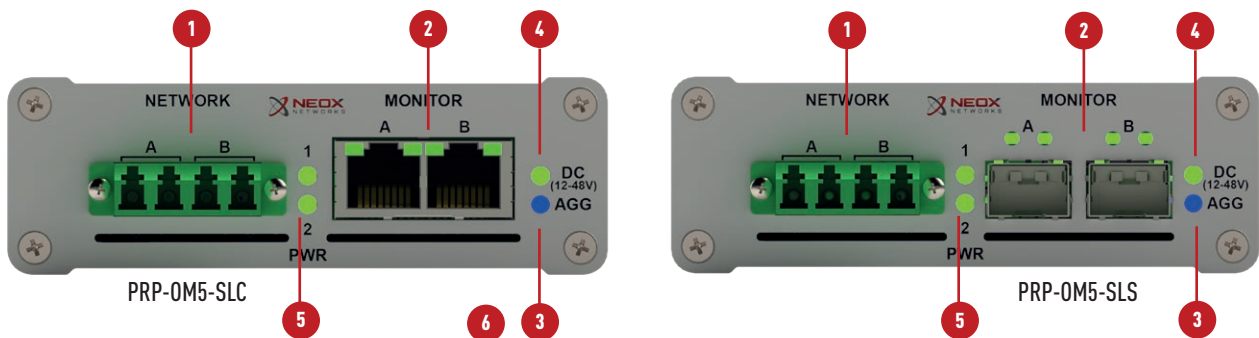
Back View
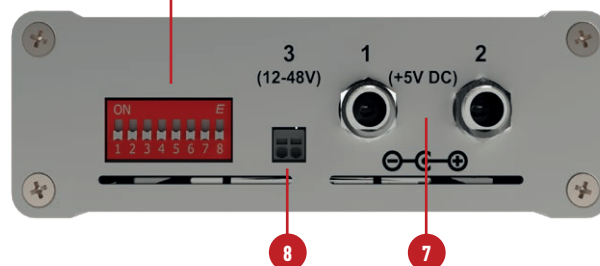
INDIVIDUALLY CONFIGURED AVAILABLE

Due to the FPGA chipset on which our active TAPs are based, it is possible to programme these models according to customer-specific requirements.

For example, TAPs with fixed operating mode and/or fixed speed, time stamping of outgoing packets, and much more.
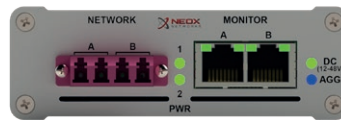
MOUNTING OPTIONS

⚠ TAPs with rack mount frame bracket or DIN rail clip can of course also be used in mobile applications!

1. Mobile Use

Portable models - these models have no special mounting options and are primarily designed for mobile use.

PacketRaven Network TAP for mobile use

Handy & portable
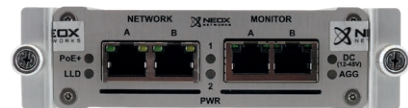
2. Server Rack Mounting

To install our portable TAPs in a server rack, you need our server rack mounting frame with item number **PRP-1U3-V2**, as well as a rackmount frame mounting kit (item number **PRP-1U3-CLIP**) for the TAP.

The server rack mounting frame PRP-1U3-V2 provides space for up to 3 portable PacketRaven Network TAPs.

Both components are available as accessories.

**Server rack mounting frame PRP-1U3-V2
for up to 3 PacketRaven portable Network TAPs**

**TAP with rack mounting kit for
server rack mounting frame PRP-1U3-V2**

3. DIN Rail Mounting

As a further alternative, we also offer a top-hat rail clip for our TAPs for mounting on a TS35/7.5 DIN top-hat rail. This clip can be rotated by 180° so that the connections of the TAP can be aligned according to the respective requirements. This DIN rail clip, available as an accessory, has the item number **PRP-DIN-CLIP**.

TS35/7.5 DIN rail

**Network TAP
with DIN rail clip**

CONNECTION RELIABILITY IN CASE OF POWER LOSS

With all our active Network TAPs (except the SFP TAP) it is guaranteed that a loss of the TAP power supply will not lead to a failure of the active network line.

Only the devices connected to the monitoring port may no longer be supplied with data.

DATA DIODE FUNCTION

Network TAP

Network Packet Broker / Monitoring Device / IDS / IPS
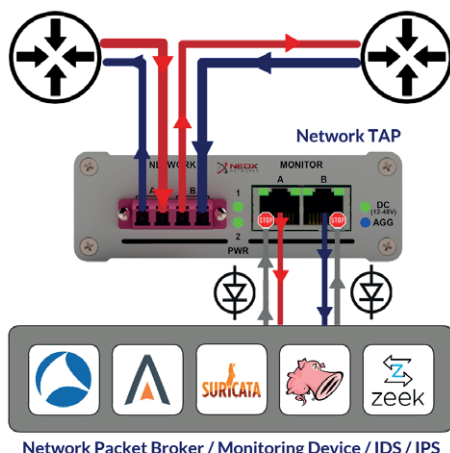
Data Diodes ensure unidirectional communication and ensure that traffic can only flow in one direction.

Unidirectional network devices are typically used to ensure information security or the protection of critical digital systems, such as industrial control systems or production networks from cyber attacks.

Our Hybrid TAPs work like a diode and do not allow access to the network via the monitoring ports for security reasons.

By adding this further layer of security, it is therefore not possible to compromise the network connection and the productive network.

AVAILABLE TAP MODES

- **Aggregation**: In this mode, the data streams are bundled and output aggregated on both of the monitoring ports. This allows you to evaluate the network data of a full duplex line simultaneously with a single network interface on your analyzer. Due to the aggregation in hardware (FPGA), faulty packet sequences during recording are a thing of the past in this mode.
  For example, you can analyse the entire data traffic aggregated in 100Base-Tx lines without loss.

- **Breakout**: Each Ethernet packet transmitted via the network line is mirrored separately in this mode while maintaining data integrity in the TAP. The send and receive directions are output separately on the two monitoring ports so that the network traffic can be analysed per data direction in this case.
  Another great advantage of the Breakout mode is the visibility of the network traffic even with a fully loaded network connection. In this mode, the set network speed is transferred to the monitoring ports.

- **Regeneration**: Regeneration is used to capture 100% full duplex traffic that can be sent to multiple monitoring devices (up to 3 in this case) for analysis of your network.
  In this mode, the network speed settings are synchronised as in Breakout mode and the setting on the DIP switch is applied to all ports.

Breakout mode — Aggregation mode — Regeneration mode
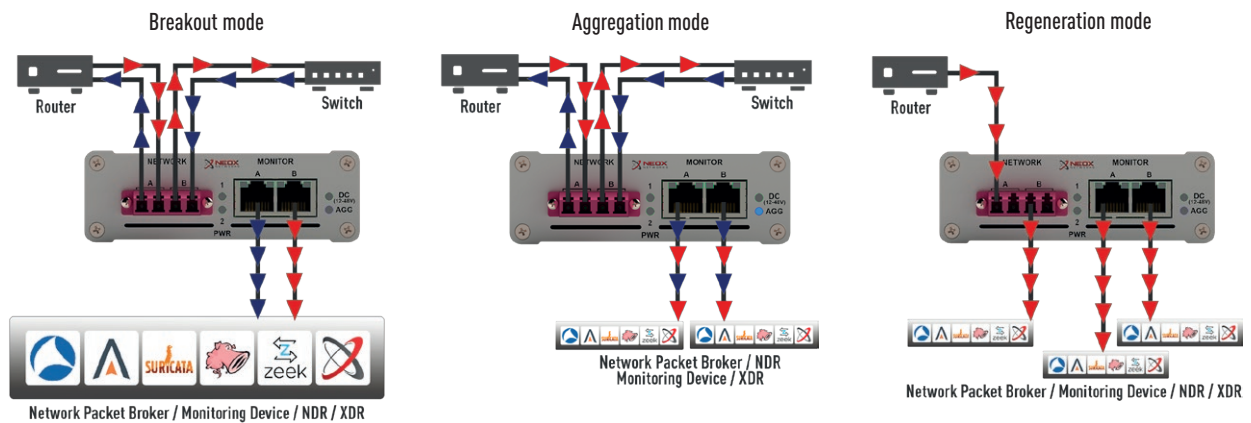
- **Passive/Power Off Mode:** If the TAP power supply fails, the active network connection is not interrupted. Only the devices connected to the monitoring port are no longer supplied with data.
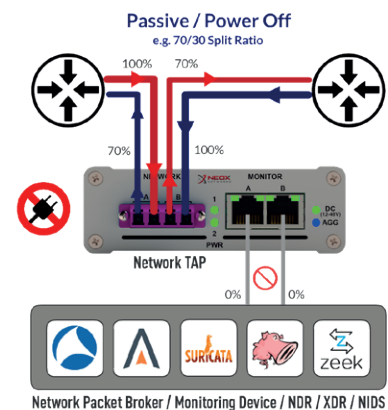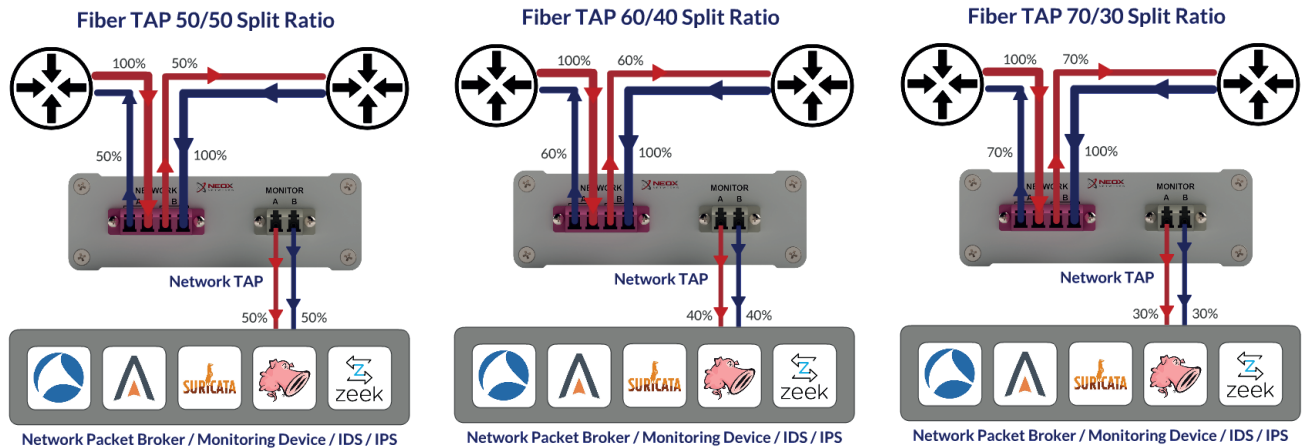

SPLIT RATIOS / LIGHT EXTRACTION*

In order to tap data from an optical network connection, it is necessary to decouple or split off a part of the available light signal.
The split ratio is the ratio of the amount of light that is still available for the Fiber network connection in relation to the amount of light that is diverted or split off to the monitoring ports of the Fiber Network TAPs.

A split ratio of e.g. 70/30 means that 70% of the light is still available for the network connection and 30% is split off for the monitoring ports.

However, since our Hybrid TAPs have a copper or SFP-based monitoring output, 100% signal strength is available by means of so-called OEO conversion - i.e. conversion of the optical signal into an electrical signal - in contrast to fiber-based monitoring ports.

* part of the light signal is needed in the TAP for the regeneration of the monitoring signal

Fiber TAP 50/50 Split Ratio

Network TAP

Network Packet Broker / Monitoring Device / IDS / IPS

Fiber TAP 60/40 Split Ratio

Network TAP

Network Packet Broker / Monitoring Device / IDS / IPS

Fiber TAP 70/30 Split Ratio

Network TAP

Network Packet Broker / Monitoring Device / IDS / IPS

ADVANCED FUNCTIONS OF THE HARDENED TAPS

Preconfigured

Secure Boot

Security Seal

Safety Screws

Our Network TAPs with RJ45 monitoring output work like a data diode and thus physically isolate the monitoring ports from the network ports. This ensures that, for security reasons, access to the network via the monitoring ports is prevented on the hardware side.

PacketRaven Network TAPs are therefore already in the standard version among the network components through which an attack vector is excluded.

For high-security areas according to IEC 62443 and critical infrastructures (CRITIS), however, even this is sometimes not sufficient, which is why NEOX Networks now also offers a specially hardened version of its TAPs.

If desired, these TAPs can be delivered pre-configured and then do not allow any subsequent configuration changes.
In addition, they are secured against unwanted or unnoticed opening by special screws and security seals.

And to round it all off, these TAPs also have a specially secured and encrypted firmware. Secureboot checks each time the TAP is started whether the firmware to be executed has a valid signature and an authorised public key. If this is not the case, the TAP cannot be put into operation.

CRITIS APPROVED

IEC62443 APPROVED

TECHNICAL SPECIFICATIONS

NETWORK TAPS

|			
Dimensions:	10.60 cm x 3.50 cm x 16.40 cm	Operating temperature:	0° to 55°C
Weight:	460 g	Storage temperature:	-40° to 70°C
Consumption:	max. 3 Watt at 5V/0,6A	Relative humidity in operation:	20% to 80%, non-condensing
Certifications:	CE, FCC, RoHS, WEEE, EN 55032 KL. A/B, EN 55035, EN 61000-3-2, EN 61000-3-3, EN 61000-6-2, EN 50121-4:2016*, EN 50129*		

* Hardened TAPs

ATTENUATION VALUES

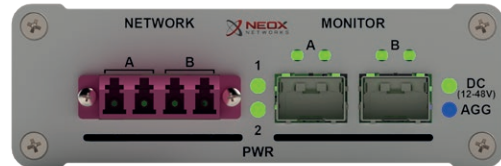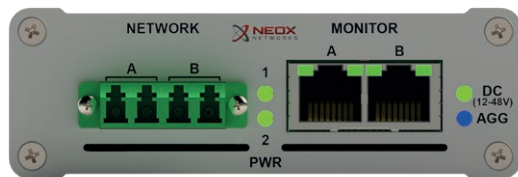| SPLIT RATIO (OTHERS ON REQUEST)	50:50	60:40	70:30
Multimode OM3, OM4, OM5	3.8 dB / 3.8 dB	2.8 dB / 4.8 dB	2.2 dB / 6.1 dB

TAP MODELS

⚠️ If you need a TAP with DIN rail mounting clip, please additionally order the mounting clip **PRP-DIN-CLIP**!
If you need a TAP with rackmount frame front panel, please order the **PRP-1U3-CLIP** front panel additionally!
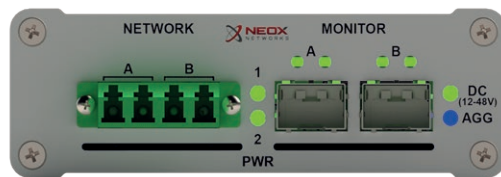*(see „Mounting Options")!*
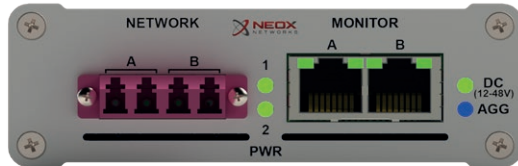
PRP-OM4-SLC-x

PRP-OM4-SLS-x

PRP-OM5-SLC-x

PRP-OM5-SLS-x

STANDARD MODELS

All TAPs for fiber type OM4 are also OM3 compatible! All TAPs for fiber type OM5 are also OM4 and OM3 compatible!

ITEM NO.	STANDARD	NET-WORK	FIBER TYPE	WAVELENGTH	INTERFACE NETWORK / MONITORING		OPERATING MODES
PRP-OM4-SLC-*	1000Base-SX	1G	OM4	850 nm	LC Multimode	RJ45	Aggregation, Breakout, Regeneration
PRP-OM4-SLS-*	1000Base-SX	1G	OM4	850 nm	LC Multimode	SFP	Aggregation, Breakout, Regeneration
PRP-OM5-SLC-*	1000Base-SX	1G	OM5	850 nm – 950 nm	LC Multimode	RJ45	Aggregation, Breakout, Regeneration
PRP-OM5-SLS-*	1000Base-SX	1G	OM5	850 nm – 950 nm	LC Multimode	SFP	Aggregation, Breakout, Regeneration

** respective split ratio - e.g. „**70**" for a split ratio of 70:30, „**60**" for 60:40, and „**50**" for 50:50*

HARDENED MODELS

All TAPs for fiber type OM4 are also OM3 compatible! All TAPs for fiber type OM5 are also OM4 and OM3 compatible!

ITEM NO.	STANDARD	NET-WORK	FIBER TYPE	WAVE-LENGTH	INTERFACE NETWORK / MONITOR.		OPERATING MODES
PRP-OM4-SLC-*-**1GA**-S	1000Base-SX	1G	OM4	850 nm	LC Multimode	RJ45	Aggregation, Breakout, Regeneration
PRP-OM4-SLC-*-**1GAO**-S	1000Base-SX	1G	OM4	850 nm	LC Multimode	RJ45	Aggregation
PRP-OM4-SLC-*-**1GBO**-S	1000Base-SX	1G	OM4	850 nm	LC Multimode	RJ45	Breakout
PRP-OM5-SLC-*-**1GA**-S	1000Base-SX	1G	OM5	850 nm – 950 nm	LC Multimode	RJ45	Aggregation, Breakout, Regeneration
PRP-OM5-SLC-*-**1GAO**-S	1000Base-SX	1G	OM5	850 nm – 950 nm	LC Multimode	RJ45	Aggregation
PRP-OM5-SLC-*-**1GBO**-S	1000Base-SX	1G	OM5	850 nm – 950 nm	LC Multimode	RJ45	Breakout

** respective split ratio - e.g. „**70**" for a split ratio of 70:30, „**60**" for 60:40, and „**50**" for 50:50*

ACCESSORIES

INSTALLATION & MOUNTING

ITEM NO.	DESCRIPTION
PRP-1U3-V2	Server rack mounting frame for 3 portable TAPs
PRP-1U3-BP-V2	Blank plate for mounting frame PRP-1U3-V2
PRP-1U3-CLIP	TAP rackmount frame bracket for server rack monuting frame PRP-1U3-V2
PRP-DIN-CLIP	TAP DIN rail mounting clip

PRP-DIN-CLIP
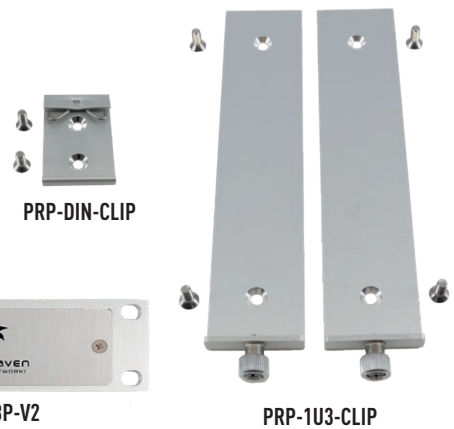
PRP-1U3-V2

PRP-1U3-BP-V2

PRP-1U3-CLIP

POWER SUPPLIES & ACCESSORIES

ITEM NO.	DESCRIPTION
PRP-PS-INT	PSU with EU, UK, and US plug head
PRP-PS-*-A	Plug head *EU, *UK or *US
PRP-PS-EU	Power supply unit with EU plug (head)
PRP-PS-UK	Power supply unit with UK plug (head)
PRP-PS-US	Power supply unit with US plug (head)
PRP-PS-C14-25W	Power supply unit with C14 socket - connected to PSU via C13-C14 cable

PRP-PS-INT

PRP-PS-C14-25W

ITEM NO.	SFP TRANSCEIVER
NX-SFP-TX-1G	10/100/1000Base-T SFP transceiver, supports connection lengths of up to 100 m
NX-SFP-FX-100M	100Base-FX SFP transceiver, Multimode, 1310nm, supports connection lengths of up to 2 km
NX-SFP-SX-1G	1000Base-SX SFP transceiver, Multimode, 850nm, supports connection lengths of up to 550 m
NX-SFP-LX10-1G	1000Base-LX SFP transceiver, Singlemode, 1310nm, supports connection lengths of up to 10 km
NX-SFP-LX20-1G	1000Base-LX SFP transceiver, Singlemode, 1310nm, supports connection lengths of up to 20 km
NX-SFP-LX40-1G	1000Base-LX SFP transceiver, Singlemode, 1310nm, supports connection lengths of up to 40 km
NX-SFP-ZX80-1G	1000Base-ZX SFP transceiver, Singlemode, 1550nm, supports connection lengths of up to 80 km
NX-SFP-ZX120-1G	1000Base-ZX SFP transceiver, Singlemode, 1550nm, supports connection lengths of up to 120 km
NX-SFP-ZX160-1G	1000Base-ZX SFP transceiver, Singlemode, 1550nm, supports connection lengths of up to 160 km

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SecurITy
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