

OTH-7000

OTH Remote Test Unit



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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Patents

The exhaustive list of patents is available at EXFO.com/patent.

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Regulatory Information

USA Electromagnetic Interference Regulatory Statement

Electronic test and measurement equipment is exempt from FCC part 15, subpart B compliance in the United States of America. However, EXFO Inc. makes reasonable efforts to ensure compliance to the applicable standards.

The limits set by these standards are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user documentation, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Canada Electromagnetic Interference Regulatory Statement

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference.

Cet équipement génère, utilise et peut émettre de l'énergie radio-fréquence et, s'il n'est pas installé et utilisé conformément à la documentation de l'utilisateur, il peut occasionner une interférence néfaste aux communications radio. L'utilisation de cet équipement dans une zone résidentielle est susceptible d'occasionner une interférence néfaste.

Regulatory Information

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Attention : Cet appareil n'est pas destiné à être utilisé dans des environnements résidentiels et peut ne pas assurer la protection adéquate à la réception radioélectrique dans ce type d'environnements.

This is a class A, group 1 product.

Ceci est un produit de classe A, groupe 1.

- **Class A equipment:** Equipment that is, by virtue of its characteristics, highly unlikely to be used in a residential environment, including a home business shall be classified as class A and shall comply with the class A limits specified in the applicable ICES standard. Characteristics considered in this assessment include price, marketing and advertising methodology, the degree to which the functional design inhibits applications suitable to residential environments, or any combination of features that would effectively preclude the use of such equipment in a residential environment.

Classe A : Matériel qui, en raison de ses caractéristiques, ne sera fort probablement pas utilisé dans un milieu domiciliaire ni par des entreprises établies à domicile. Parmi les caractéristiques considérées dans cette évaluation, il y a le prix, les méthodes de commercialisation et de publicité, la mesure dans laquelle les fonctions de l'appareil font qu'il ne se prête pas à des applications convenant au milieu domiciliaire ou toute combinaison de ces caractéristiques qui aurait pour conséquence d'en prévenir effectivement l'utilisation à domicile. Utilisé également pour indiquer les limites d'émission correspondantes qui s'appliquent à un tel matériel.

- **Class B equipment:** Equipment that cannot be classified as Class A shall comply with the Class B limits specified in the applicable ICES standard.

Classe B : Matériel qui ne peut pas être inclus dans la classe A. Utilisé également pour indiquer les limites d'émission correspondantes qui s'appliquent à un tel matériel.

- Group 1 equipment: group 1 contains all equipment which is not classified as group 2 equipment, and includes equipment such as laboratory and scientific equipment, industrial process, measurement and control equipment.

Group 2 equipment: group 2 contains all ISM RF equipment in which radio-frequency energy in the frequency range 9 kHz to 400 GHz is intentionally generated and used or only used locally, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material for inspection/analysis purposes, or for transfer of electromagnetic energy.

Appareils du groupe 1 : le groupe 1 réunit tous les appareils compris dans le domaine d'application de la présente Norme, qui ne sont pas classés comme étant des appareils du groupe 2. Le groupe 1 inclut les appareils scientifiques et de laboratoire, les processus industriels, appareils de mesure ou de contrôle.

Appareils du groupe 2 : le groupe 2 réunit tous les appareils ISM à fréquences radioélectriques dans lesquels de l'énergie à fréquences radioélectriques dans la plage de fréquences comprises entre 9 kHz et 400 GHz est produite et utilisée volontairement ou uniquement utilisée localement sous forme de rayonnement électromagnétique, de couplage inductif et/ou capacitif, pour le traitement de la matière, à des fins d'examen ou d'analyse ou pour le transfert d'énergie électromagnétique.

Supplier's Declaration of Conformity (SDoC)

The SDoC for your product is as follows:

CAN ICES-001 (A) / NMB-001 (A)

EU and UK Electromagnetic Compatibility Regulatory Statement

Warning: This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures. Your product is suitable for use in industrial electromagnetic environments.

General Wireless Compliance Related Information

Your unit comes with an internal wireless module (adapter) and antenna for which the information hereafter applies:

This product does not contain any wireless user-serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals.

Canada and USA Wireless Compliance Related Information

Your unit comes with an internal wireless module (adapter) and antenna for which the information hereafter applies:

- This device complies with Part 15 of the FCC Rules.
- This device complies with Innovation, Sciences and Economic Development Canada license-exempt RSS standards.
- Operation is subject to the following two conditions:
 - (1) This device may not cause harmful interference
 - and
 - (2) this device must accept any interference received, including interference that may cause undesired operation.

Use in Specific Environments:

- The use of wireless products in hazardous locations is limited by the constraints posed by the safety directors of such environments.
- The use of wireless products on airplanes is governed by the Federal Aviation Administration (FAA).
- The use of wireless products in hospitals is restricted to the limits set forth by each hospital.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment.

Radiation Exposure Statement:

- The product complies with the US/Canada portable RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this user documentation.
- Further RF exposure reduction can be achieved if the device can be kept as far as possible from the user's body.

RF Function and Frequency Range:

Your unit is designed to operate in the Bluetooth 2.4 GHz band, between the frequencies 2400 MHz – 2483.5 MHz.

The output power is 7.0 dBm typical.

EU and UK Wireless Compliance Related Information

Your unit is designed to operate in the Bluetooth 2.4 GHz band.

The information about the Bluetooth band is 2400 MHz – 2483.5 MHz.

The output power is 7.0 dBm typical.

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states, United Kingdom, and EFTA countries, except in France and Italy where restrictive use applies.

Regulatory Information

In Italy, the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying access to telecommunications and/or network services.

This device may not be used for setting up radio links in France, and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 - 2483.5 MHz. For detailed information, the end-user should contact the national spectrum authority in France.

Simplified EU and UK Declaration of Conformity

Hereby, EXFO declares that the radio equipment type “OTH-7000” is in compliance with European Directive 2014/53/EU and the UK legislation S.I. 2017/1206 Radio Equipment Regulations 2017.

The full text of the declaration of conformity is available at the following Internet address: www.exfo.com/en/resources/legal-documentation.

EU Economic Operator

EXFO Solutions SAS
2, rue Jacqueline Auriol,
Saint-Jacques-de-la-Lande,
35091 Rennes Cedex 9
FRANCE

1 **Introducing the OTH-7000 Optical Test Head**

The OTH-7000 Optical Test Head is a remote test unit with an integrated OTDR and optical switch.

You can use the OTH-7000 as a standalone unit (Test Agent mode) to perform ad-hoc OTDR tests or in conjunction with Nova Fiber Monitoring System (FMS).

When you work with FMS, you can program tests or perform them on demand. FMS is the central management software for all EXFO's fiber monitoring probes such as the OTH-7000, FG-750, and RTU-2.

Main Features

Your unit offers the following:

- One, four or sixteen optical output ports, depending on the purchased configuration
- Four USB host ports
- One LAN/WAN Ethernet port (10/100/1000 Base-T)
- One management Ethernet port (10/100/1000 Base-T) for local access
- One port to connect an SFP transceiver module
- Installation in 19-inch and ETSI racks or cabinets (with the provided brackets)
- Possibility to use with the RTUe-9120 external switches
- 24/7 surveillance of dark (no traffic) or live (with traffic) optical fibers
- Possibility of integration into a third-party monitoring system with the provided API

Introducing the OTH-7000 Optical Test Head

Available Configurations

Available Configurations

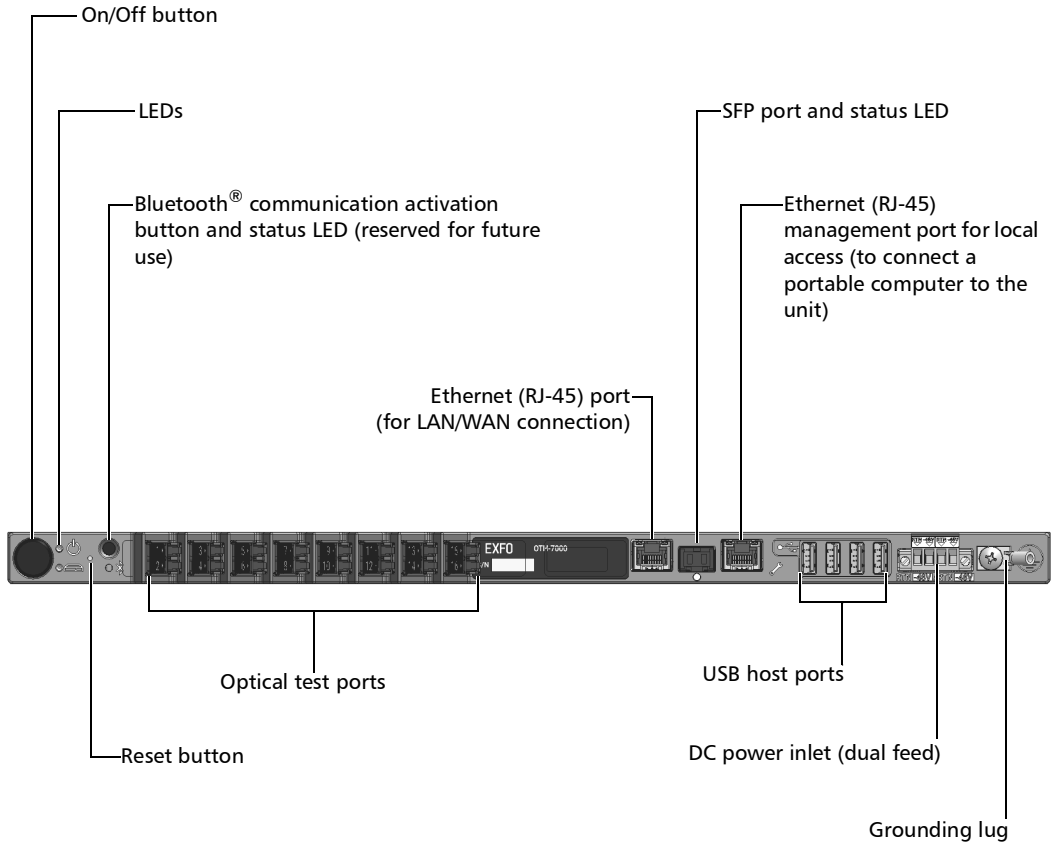
Several configurations are available for the OTH-7000 Optical Test Head.

Configuration	Features
AWAT-1	<ul style="list-style-type: none">▶ Remote test unit (RTU) with integrated OTDR▶ One SC-APC output port
AWAT-4	<ul style="list-style-type: none">▶ RTU with integrated OTDR and optical switch▶ Four SC-APC output ports
AWAT-16	<ul style="list-style-type: none">▶ RTU with integrated OTDR and optical switch▶ Sixteen LC-APC output ports

Introducing the OTH-7000 Optical Test Head

Available Configurations

Front panel (16-port model shown)

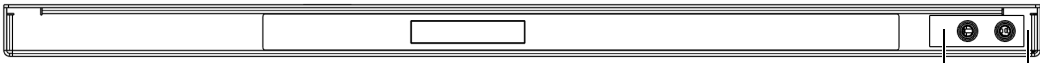


Note: You can also connect the unit to AC power with the AC/DC power adapter sold by EXFO.

Introducing the OTH-7000 Optical Test Head

LED Indicators Description

Back panel





Holes for alternative installation of a grounding lug

LED Indicators Description



There are LED indicators located on the front panel of your unit, providing you with information about the power and system statuses.

The table below presents the possible statuses once the initial startup sequence is complete.

LED	Status	Meaning
 Power	Green	Unit is on.
	Off	Unit is off.
 System ^a	Green	The unit is working properly and is ready.
	Green, slow blinking	The initialization of the unit is underway.
	Green, fast blinking	The unit is being restored to its original state at time of purchase (factory state).
	Yellow	Non-critical hardware error detected. The temperature of the room where the unit is located could be slightly too high or there could be a hardware malfunction. Ensure that the temperature falls within the specified operating temperature range (see <i>Electrical Safety Information</i> on page 13). If the problem persists, contact EXFO.

Introducing the OTH-7000 Optical Test Head

LED Indicators Description

LED	Status	Meaning
 System (continued)	Red	<p>Critical hardware error detected.</p> <p>The temperature of the room where the unit is located is critically too high or there could be a hardware malfunction.</p> <p>Ensure that the temperature falls within the specified operating temperature range (see <i>Electrical Safety Information</i> on page 13).</p> <p>If the problem persists, contact EXFO.</p>
	Off	Unit is off.
SFP port LED	Green	A communication link has been established through the SFP transceiver module.
	Off	No SFP transceiver module is connected to the port or no communication link is currently established with the SFP transceiver module.
 Bluetooth®	Blue	Reserved for future use.
	Blue, blinking	

- a. If more than one error is detected at the same time, the color of the LED will be set according to the most severe error (red as the most severe, followed by yellow).

Product Registration

You can register your new EXFO products online and benefit from every possible opportunity to optimize their performance. By doing so, you will always be notified of the latest software updates, key product enhancements and up-to-date support information related to your products.

To register your product online:

- 1.** From a computer, open a Web browser and go to www.exfo.com.
- 2.** Log in to your EXFO account.
- 3.** Click **Support > Product registration**.
- 4.** Under **My Products**, click **Register**.
- 5.** Follow the on-screen instructions.

Technical Specifications

To obtain this product's technical specifications, visit the EXFO Web site at www.exfo.com.

Conventions

Before using the product described in this guide, you should understand the following conventions:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.



IMPORTANT

Refers to information about this product you should not overlook.

2 **Safety Information**



WARNING

Do not install or terminate fibers while a light source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.



WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.



WARNING

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



WARNING

Use only accessories designed for your unit and approved by EXFO. For a complete list of accessories available for your unit, refer to its technical specifications or contact EXFO.




IMPORTANT

Refer to the documentation provided by the manufacturers of any accessories used with your EXFO product. It may contain environmental and/or operating conditions limiting their use.




IMPORTANT

When you see the following symbol on your unit , make sure that you refer to the instructions provided in your user documentation. Ensure that you understand and meet the required conditions before using your product.



IMPORTANT

When you see the following symbol on your unit , it indicates that the unit is equipped with a laser source, or that it can be used with instruments equipped with a laser source. These instruments include, but are not limited to, modules and external optical units.



IMPORTANT

Other safety instructions relevant for your product are located throughout this documentation, depending on the action to perform. Make sure to read them carefully when they apply to your situation.













WARNING

Use only the pluggable transceivers specified for your product and approved by EXFO. Refer to the technical specifications of your product for the list of approved transceivers and ordering codes.

Other Safety Symbols on Your Unit

One or more of the following symbols may also appear on your unit.

Symbol	Meaning
	Direct current
	Alternating current
	The unit is equipped with an earth (ground) terminal.
	The unit is equipped with a protective conductor terminal.
	The unit is equipped with a frame or chassis terminal.
	On (Power)
	Off (Power)
 OR 	On/off (Power)
	Fuse

Safety Information

Laser Safety Information

Laser Safety Information

Your instrument is in compliance with standard IEC 60825-1: 2014.



WARNING

Viewing the laser output with telescopic optical instruments (for example, telescopes and binoculars) may pose an eye hazard and thus the user should not direct the beam into an area where such instruments are likely to be used.

Laser radiation may be encountered at the optical output port.

The following label indicates that the product contains a Class 1M source:



LASER RADIATION
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
DO NOT EXPOSE USERS OF TELESCOPIC OPTICS
CLASS 1M LASER PRODUCT

RAYONNEMENT LASER INVISIBLE
NE PAS OBSERVER DIRECTEMENT À L'AIDE D'INSTRUMENTS D'OPTIQUE
NE PAS EXPOSER LES UTILISATEURS DE DISPOSITIF OPTIQUE
TÉLESCOPIQUE
APPAREIL À LASER DE CLASSE 1M

Wavelength: / Longueur d'onde : 1600 nm – 1700 nm

Pulse width: / Largeur de l'impulsion : $\tau \leq 20 \mu\text{s}$

Max. peak power: / Puissance crête maximum : $P \leq 150 \text{ mW}$

Electrical Safety Information



WARNING

- ▶ A readily accessible disconnect device must be installed on the mains (AC or DC circuits). The power cord of the AC/DC power adapter can be considered the disconnect device to the main power.
- ▶ If you intend to connect your OTH-7000 to AC power, use only the listed and certified AC/DC power adapter provided by EXFO with your unit. It provides reinforced insulation between primary and secondary, and is suitably rated for the country where the unit is sold.
- ▶ **DO NOT** connect the unit interfaces metallicity to OSP (Outside Plant) wiring. The unit interfaces are designed for use as intra-building surfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallicity to OSP wiring.
- ▶ Use only the certified power cord that is suitably rated for the country where the unit is used.
- ▶ Replacing detachable MAINS supply cords by inadequately RATED cords may result in overheating of the cord and create a risk of fire.



CAUTION

Position the unit so that the air can circulate freely around it.

Safety Information

Electrical Safety Information

Equipment Ratings	
Temperature	
➤ Operation	➤ unit connected to DC power: 0 °C to 45 °C (32 °F to 113 °F) ➤ unit connected to AC power (with AC/DC power adapter): 0 °C to 40 °C (32 °F to 104 °F)
➤ Storage	➤ -40 °C to 70 °C (-40 °F to 158 °F)
Relative humidity ^a	0 % to 95 % non-condensing
Maximum operation altitude	➤ unit connected to DC power: 3000 m (9843 ft) ➤ unit connected to AC power (with AC/DC power adapter): 2000 m (6562 ft)
Pollution degree	2
Oversvoltage category	I
Measurement category	Not rated for measurement categories II, III, or IV
Input power ^b	➤ unit: -48 V ---; 2 A ^c ➤ AC/DC power adapter (units connected to AC power only): 100 - 240 V ~; 50/60 Hz; 1 - 0.5 A

a. Measured in 0 °C to 31 °C (32 °F to 87.8 °F) range, decreasing linearly to 50 % at 40 °C (104 °F).

b. Not exceeding ± 10 % of the nominal voltage.

c. Range: -38.5 - -70 V.



CAUTION

The use of voltages higher than those indicated on the label affixed to your unit may damage the unit.

3 **Getting Started with Your Unit**

Preparing for Installation



WARNING

- Your unit is designed to be installed in a limited access area, for example, Central Offices, Telecommunication Centers, computer rooms, wiring closet, Outside Plant/CELL-Site class 1, and similar type locations and in accordance with local codes.
- Only trained personnel can perform the unit installation and configuration tasks. These people have appropriate technical training and experience to be aware of the hazards to which a person can be exposed when performing these installation tasks.



IMPORTANT

To ensure compliance with GR-1089-CORE, use only shielded cables for Ethernet connections to the unit. The shielded cables must be grounded at both ends.

Before installing your unit, you should take the following into consideration:

- The chosen location provides adequate clearance for maintenance procedures.
- The location is an environmentally-controlled area that meets the minimum operating parameters.
- The location is isolated from strong electromagnetic fields produced by electrical devices.
- The power cable and power supply are compatible with your power service.
- The power source is properly grounded and falls within the internal power supply rating.

Getting Started with Your Unit

Installing Your Unit in a Rack

Installing Your Unit in a Rack

Your unit is designed to be installed in 19-inch racks and in ETSI (21-inch) racks with the corresponding provided mounting brackets. It will not fit into 23-inch racks.

- The height of the unit is half a rack unit (0.5U) high or 22,2 mm (0.87 in.).
- When operating the unit, select a location that provides at least 75 mm (3 in.) of clearance on the front.



CAUTION

Failure to provide adequate clearance from hot surfaces may result in an excessive internal temperature, thus reducing the reliability of your OTH-7000 unit.

Note: *There is no need to leave an empty slot between units when you stack them one on top of the other inside a rack.*



WARNING

- The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more units are extended in front of the rack on slides. You must also consider the weight of any other device installed in the rack. A crush hazard exists if the rack tilts forward, which could cause serious injury.
- Mounting of the unit in a rack or cabinet should be such that a hazardous condition is not achieved due to uneven mechanical loading.

To install your unit in a rack:

1. Ensure that your unit is turned off.
2. Ensure that no USB or electrical cables are connected to the unit.
3. Position the unit so that its bottom panel rests on a flat surface such as a table.



IMPORTANT

The OTH-7000 is only half a unit high. To maximize the utilization of rack space in 19-inch racks, EXFO recommends to alternate the position of the brackets for each unit. The brackets should be placed with their rack screw holes at the bottom for the first unit, at the top for the second, at the bottom for the next unit, and so on (see illustrations hereafter).

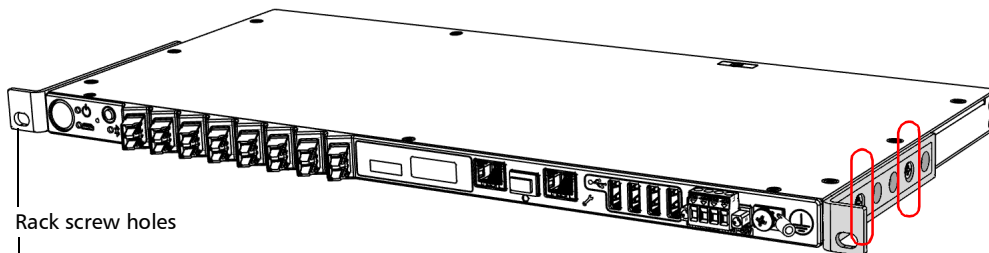
Getting Started with Your Unit

Installing Your Unit in a Rack

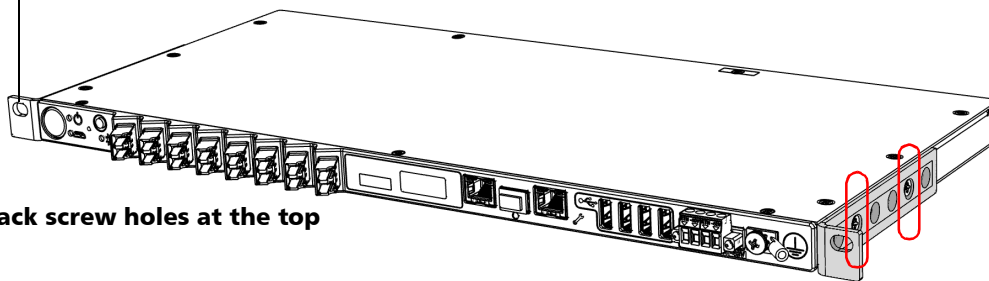
4. Align the holes of the first bracket with the holes of the unit's casing at the position that best suits your installation needs. You can even invert position of the mounting bracket if necessary.

Brackets in standard position - 19-inch racks

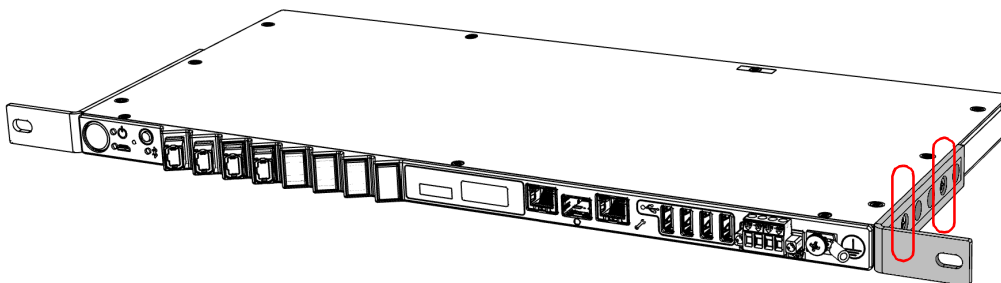
Rack screw holes at the bottom



Rack screw holes at the top



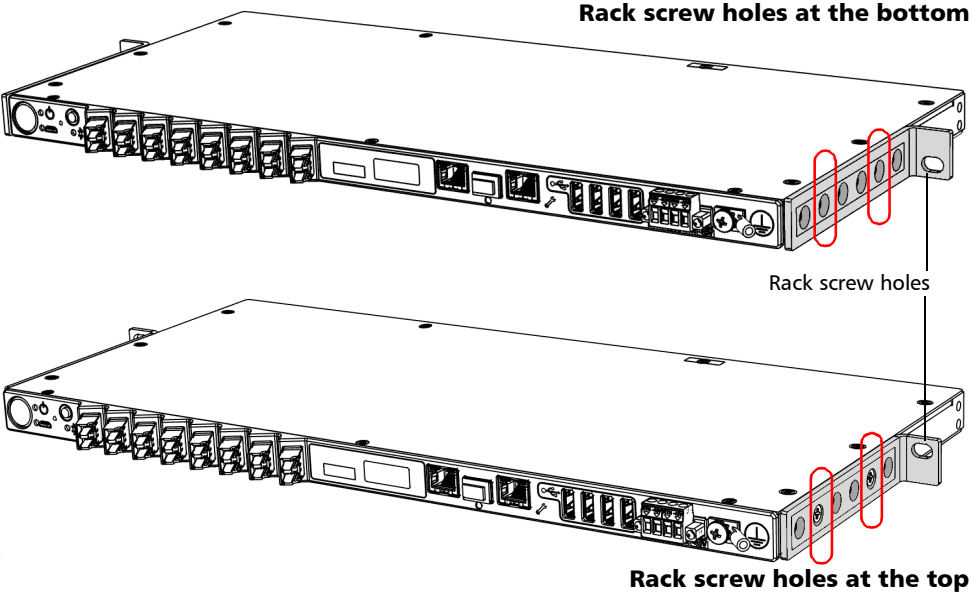
Brackets in standard position - ETSI racks



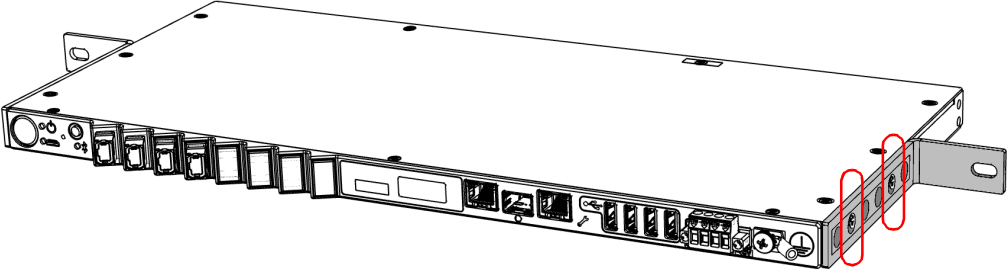
Getting Started with Your Unit

Installing Your Unit in a Rack

Brackets in inverted position - 19-inch racks



Brackets in inverted position - ETSI racks



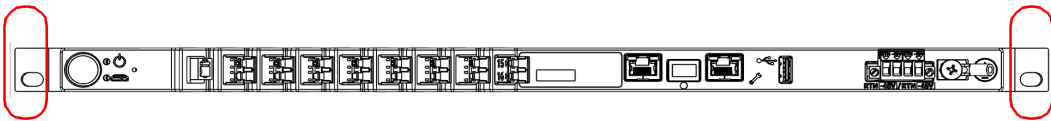
Getting Started with Your Unit

Installing Your Unit in a Rack

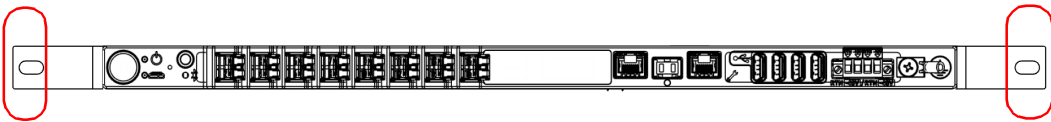
5. Fix the first bracket on the unit with the supplied screws (two screws per bracket).
6. Repeat steps 4 and 5 with the other bracket, ensuring that you place the bracket at the exact same position (orientation of the bracket, set of holes on the bracket and on the unit's casing).
7. Place the unit in the rack at the desired height.
8. Fix the unit in place using the hardware supplied with the rack. Use one screw per side.

To ground your unit properly, you must ensure that there is a metal-to-metal contact between the rack and the mounting hardware. For this reason, EXFO recommends to use thread-forming screws, star (tooth) lock washers, or similar hardware that remove any paint or non-conductive coatings. For more information, see *Grounding Your Unit* on page 21.

19-inch rack



ETSI rack



Grounding Your Unit

To avoid the potential for an electrical shock hazard, you must reliably connect an earth grounding conductor to the unit.

Note: *The DC units are intended for installation with an isolated DC return (DC-I) and are to be installed in a Common Bonding Network (CBN) per GR-1089-CORE.*



WARNING

All wiring and installation must be in accordance with local building and electrical codes acceptable to the authorities in the countries where the equipment is installed and used.

If you are not sure on how to proceed, consult a certified electrician.

To ground your unit:

1. Remove the Phillips screw and the grounding lug from the front panel of your unit.



2. Prepare the ground wire (#14 AWG, green), and attach one of its ends to the unit's grounding lug using a crimping tool.
3. Use the Phillips screw to attach the grounding lug and wire assembly to the front panel of your unit.
4. Ground the other end of the wire as per your local regulation.

Your unit is now grounded properly.

Note: *For particular installation needs, you can attach your own grounding lug and wire to the back panel of the unit (to the corresponding holes) instead.*

Getting Started with Your Unit

Connecting RTUe-9120 External Switches to Your Unit

Connecting RTUe-9120 External Switches to Your Unit

Depending on your testing needs, you may want to connect external switches to your unit to increase the number of optical ports available.

If you want to remove an external switch from the system, ensure that no test is underway, and then simply disconnect the optical fibers and the USB cable.

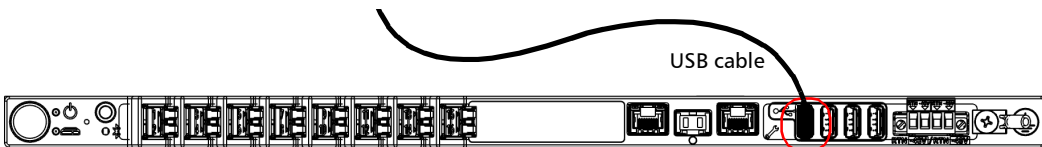
Note: *Once you have connected or disconnected an external switch, you need to update your test setup in FMS. You must first detach and reattach the corresponding OTH-7000 unit, and then select the desired switch and ports when applicable. For more information on how to attach or detach units, refer to the user documentation of FMS.*

To connect a single switch to your unit:

1. Connect the provided USB cable to the USB port (B type) located on the front panel of the RTUe-9120 switch.



2. Connect the other end of the USB cable to one of the USB ports located on the front panel of the unit.



Note: *For more information on how to connect several switches to your unit, refer to the Optical Switch user guide.*

Working With an SFP Transceiver Module

You can connect an SFP transceiver module to your unit using the corresponding port located on the front of your unit.



IMPORTANT

Ensure that your unit is off before inserting the SFP transceiver module. Otherwise, the transceiver module will not be recognized and you will have to restart your unit to force its detection.

Note: *You will be able to configure the related settings such as the network addresses from the Nova Fiber application (see Working With Your Unit for the First Time on page 34).*

To insert an SFP transceiver module into your unit:

1. Ensure that your unit is off.
2. Slide the transceiver module into the corresponding port.



Getting Started with Your Unit

Connecting Your Unit to a Power Source

Connecting Your Unit to a Power Source

Before starting to work with your unit, you must connect it to a power source (AC or DC). There is a specific procedure for each of these types of power sources.



WARNING

- ▶ A certified over-current protecting device that is suitably rated must be installed at the source.
- ▶ All electrical installation and accessories must be done and selected as per local electrical code and regulation.
- ▶ To avoid fire hazards and ensure your safety, when you intend to connect your unit to DC power, always select a wire gauge according to the OTH-7000 unit's ratings, cable length, and local electrical code.



CAUTION

For optimum performance and safety, you must either crimp a terminal (ferrule) onto the stranded conductors, or tin them before installing them in the terminal block.

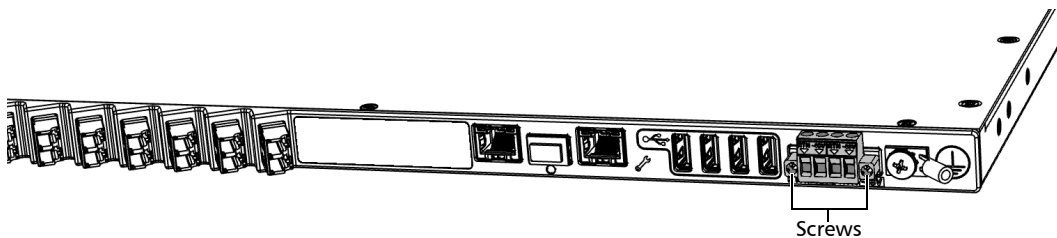
Note: *The AC/DC power adapter is not covered by the NEBS certification.*

To connect your unit to DC power:

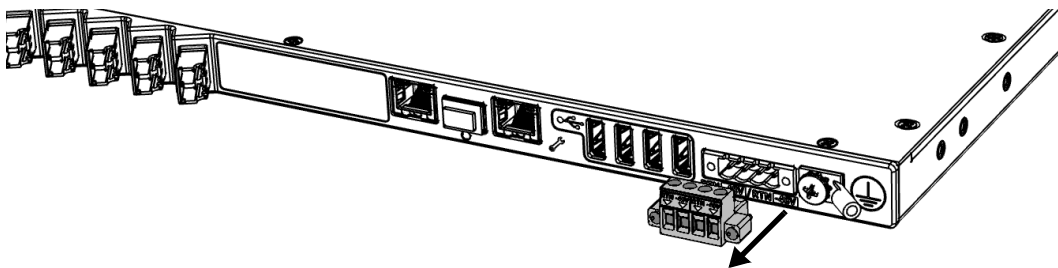
1. Ensure all power is off or disconnected at the source.

Note: *A certified over-current protection, suitable for your particular setup, must be installed at the power secondary distribution. If you are not sure on how to proceed, consult a certified electrician.*

2. Ensure that the unit is grounded properly. For more information, see *Grounding Your Unit* on page 21.
3. Unscrew the two screws holding the terminal block in place.



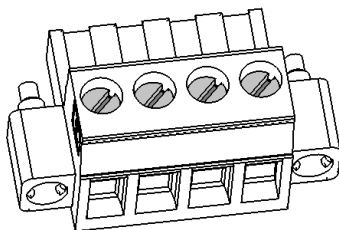
4. When the terminal block is loose, gently pull it toward you to remove it, exposing the electrical connectors.



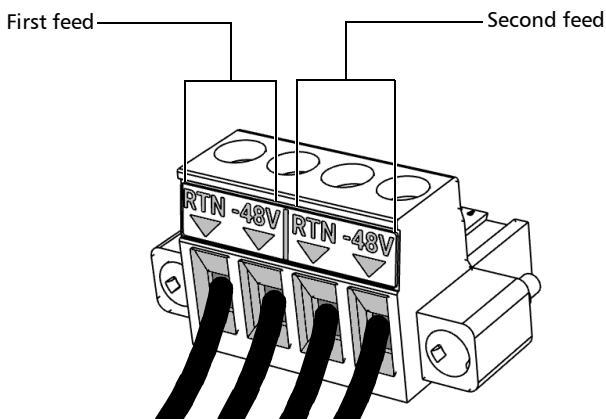
Getting Started with Your Unit

Connecting Your Unit to a Power Source

5. Crimp each power lead (maximum 14 AWG) with a terminal (ferrule) or tin each of them. Unscrew the four screws (shown in gray) located at the top of the terminal block.



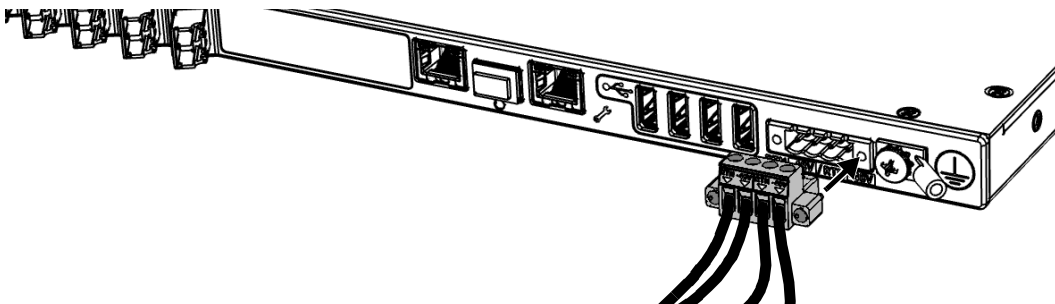
6. Pair the power leads with the appropriate power terminal for each of the feed, respecting the polarity as indicated on the terminal block.



Getting Started with Your Unit

Connecting Your Unit to a Power Source

- 7.** Tighten the four screws located at the top of the terminal block to secure the wires in place.
- 8.** Ensure that the terminal block is aligned properly with the bay containing the electrical connectors.



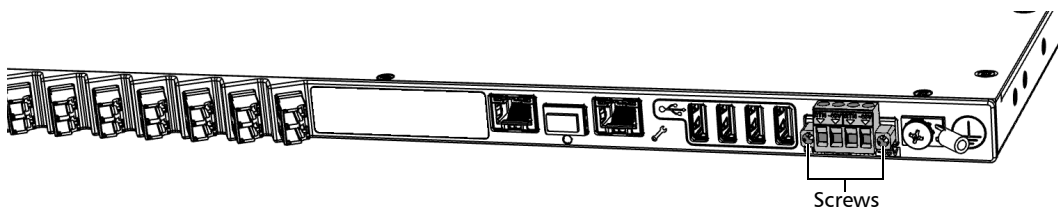
- 9.** Slide the terminal block all the way into the bay until it stops.
- 10.** Screw the two screws to secure the terminal block in place.
- 11.** Turn on the disconnect device that is connected to the unit.
The unit will start automatically.

Getting Started with Your Unit

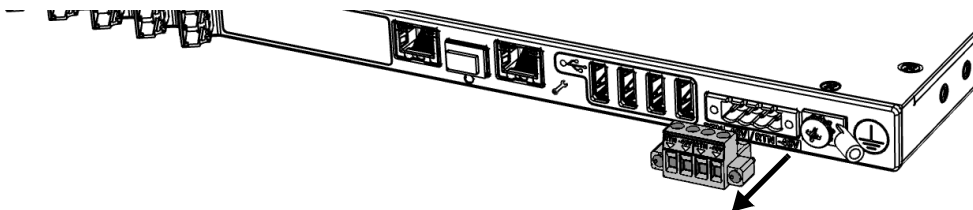
Connecting Your Unit to a Power Source

To connect your unit to AC power:

1. Ensure all power is off or disconnected at the source.
2. Ensure that the unit is grounded properly. For more information, see *Grounding Your Unit* on page 21.
3. If necessary, remove the block terminal (shown in gray below) as follows:
 - 3a. Unscrew the two screws holding the terminal block in place.



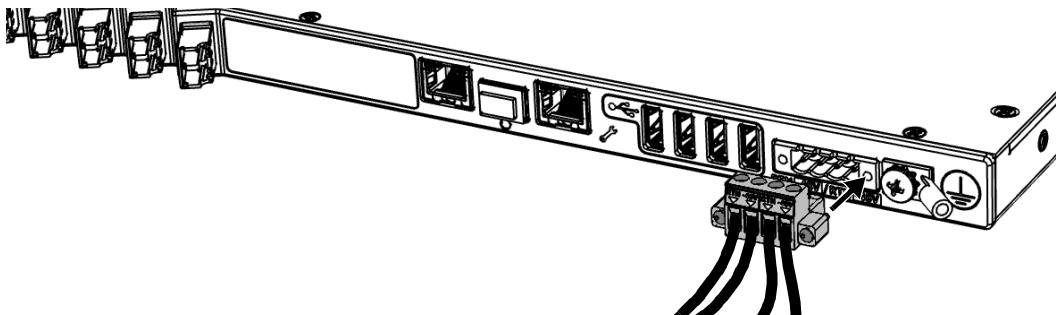
- 3b. When the terminal block is loose, gently pull it toward you to remove it, exposing the electrical connectors.



Getting Started with Your Unit

Connecting Your Unit to a Power Source

4. Ensure that the connector of the AC/DC power adapter is aligned properly with the bay containing the electrical connectors.



5. Slide the connector of the AC/DC power adapter all the way into the bay until it stops.
6. Screw the two screws to secure the connector of the AC/DC power adapter in place.
7. Ensure that the removable power cord is connected to the other end of the AC/DC power adapter, and then connect the adapter to the power outlet.
8. If necessary, turn on the disconnect device.
The unit will start automatically.

Getting Started with Your Unit

Turning on Your Unit


Turning on Your Unit

Before you turn on the unit for the very first time, EXFO recommends that you read the safety and installation instructions, including how to connect the unit to AC or DC power.

To turn on the unit:

Press the on/off button. For more information about working with your unit for the very first time, see the corresponding section in this documentation.



Note: You will know that your unit is ready when its  (System) LED is steady green. The startup process may take a few minutes to complete.

Turning off Your Unit

Your unit will shut down when you press the power button. It will perform a complete restart routine the next time you use it.

Note: *Should the unit ever stop responding, you can force a hardware reset by pressing and holding down the on/off button for at least 10 seconds. To restart your unit, release the on/off button, and then press it again as you would normally do to start your unit.*

In the event of a power outage, your unit is configured to automatically restart when the power comes back.



CAUTION

To avoid damaging your unit when you need to disconnect it from its external power source, first turn the unit off.

To turn off the unit completely from the unit itself:

Press the on/off button.


Getting Started with Your Unit

Turning off Your Unit

To restart the unit or turn it off completely from the Nova Fiber application:

1. If it is not already done, connect one end of a network cable to the management port of your unit and the other end to an Ethernet port on the computer.



2. Ensure that the  (System) LED is steady green.
3. From your computer, open a Web browser and type 169.254.10.10 in the address bar to access the Nova Fiber application.

Note: *It may take a few seconds before you can see the Nova Fiber application if your computer needs to reconfigure its network to a link-local address first.*

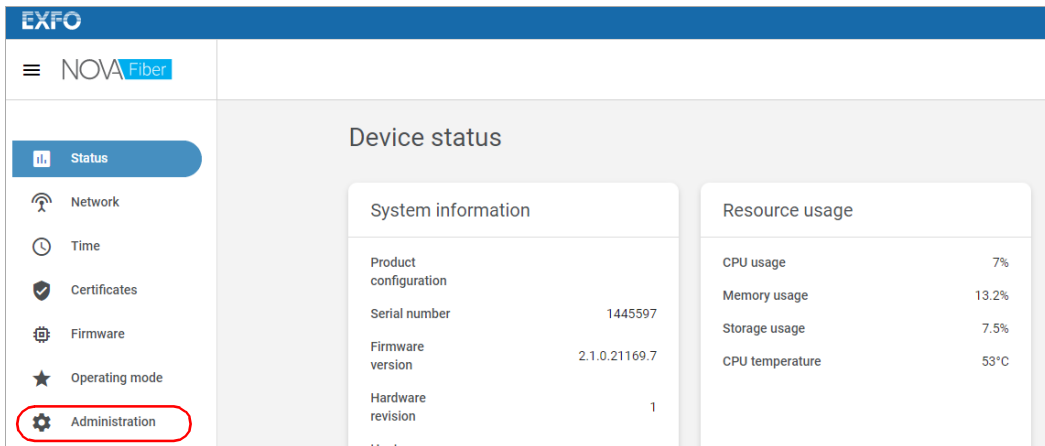
4. When the application prompts you, enter the connection information.
 - The default user name is: localadmin
 - The default password is: admin



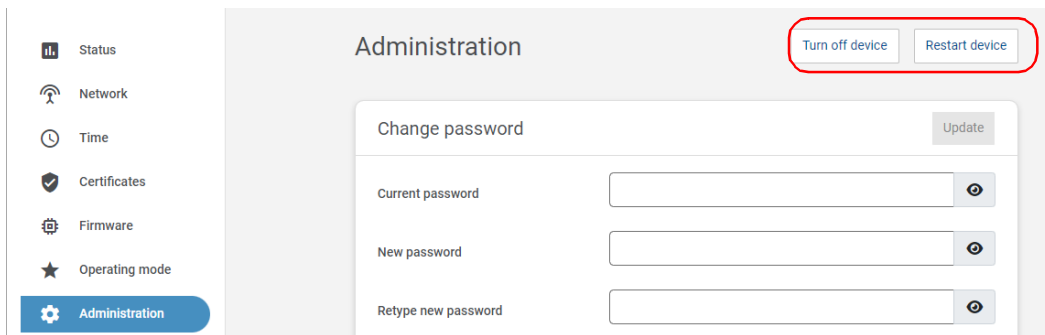
IMPORTANT

The application will lock your account after a certain number of unsuccessful connection attempts. Before entering your connection information again, you will have to wait a few minutes. The waiting time starts increasing after the fifth unsuccessful connection attempt up to a maximum of fifteen minutes.

5. From the list, select **Administration**.



6. Click the **Restart device** or the **Turn off device** button, depending on the operation that you want to perform.



Getting Started with Your Unit

Working With Your Unit for the First Time

Working With Your Unit for the First Time

By starting to use your unit, you implicitly agree to the EXFO and third-party EULAs related to your unit and instruments.

You will need a computer (laptop) and a network cable to connect to your OTH-7000 unit.


By default, the management of your unit is done locally by connecting a laptop to your unit. However, if you prefer to be able to manage your unit remotely (via LAN or WAN) after the first connection, you can enable a feature allowing you to do so. For more information on how to connect remotely to your unit, see *Accessing Your Unit Remotely* on page 52.

The following procedure takes into account that you have already mounted your unit in a rack, grounded it, inserted an SFP transceiver module if applicable, etc. For more information, see the corresponding sections presented earlier in this chapter.

To start working with your unit:

1. Connect your unit to a LAN/WAN network (LAN/WAN Ethernet port or SFP transceiver module, depending on your setup).



2. If it is not already done, turn on the unit (see *Turning on Your Unit* on page 30).
3. Wait for your unit to be ready (its  (System) LED will be steady green).

Note: The startup process may take a few minutes to complete.

4. Connect one end of a network cable to the management port of your unit and the other end to an Ethernet port on the computer.



5. From your computer, open a Web browser and type 169.254.10.10 in the address bar to access the Nova Fiber application.

Note: It may take a few seconds before you can see the Nova Fiber application if your computer needs to reconfigure its network to a link-local address first.

Getting Started with Your Unit

Working With Your Unit for the First Time

6. When the application prompts you, enter the connection information.
 - The default user name is: localadmin
 - The default password is: admin



IMPORTANT

The application will lock your account after a certain number of unsuccessful connection attempts. Before entering your connection information again, you will have to wait a few minutes. The waiting time starts increasing after the fifth unsuccessful connection attempt up to a maximum of fifteen minutes.

7. For security reasons, when the application prompts you, change the password. The password must have a minimum of eight characters and include characters from at least three of the following categories:
 - Lowercase letters ('a' - 'z')
 - Uppercase letters ('A' - 'Z')
 - Numbers (0 - 9)
 - Special characters

8. From the **Status** page, ensure that the external switches (USB connection type) have been detected as expected.

The screenshot shows the 'Status' page with network configuration details and a table of detected test instruments. The 'USB' connection type is highlighted with a red circle.

Gateway	10.28.250.1
Primary DNS	10.28.32.43
Secondary DNS	10.28.32.9

Detected test instruments		
Connection type	Model	Serial number
Internal	RTU-9199-SPLX-4-B-101	1445597
USB	RTUe-9110-DPLX-26-B-101	1061917
Internal	OTH-7000-AWAT-4	1445597

9. Configure the network as follows:
9a. From the list, select **Network**.

The screenshot shows the EXFO NOVA Fiber interface. The 'Network' option in the left sidebar is highlighted with a red circle. The main content area displays 'Device status' with two panels: 'System information' and 'Resource usage'.

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597

Resource usage	
CPU usage	7%
Memory usage	13.2%

Getting Started with Your Unit

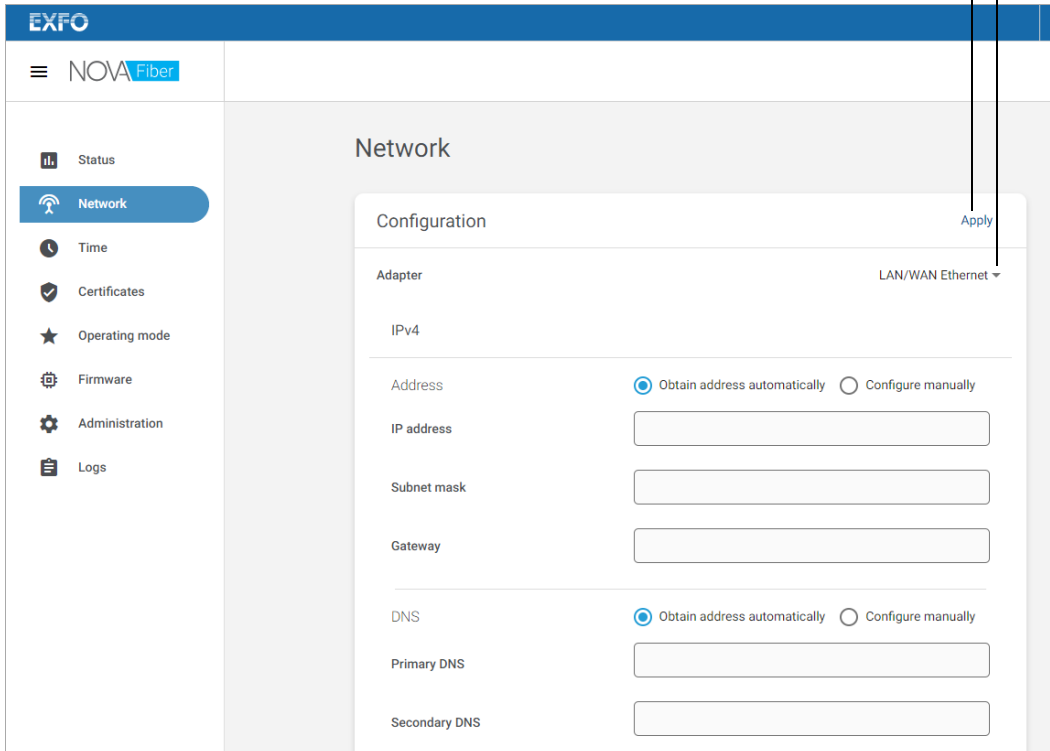
Working With Your Unit for the First Time

- 9b. Set the IP address and various parameters as needed, and then click **Apply** to confirm.

Note: You can access the SFP parameters by clicking the arrow next to the currently displayed adapter.

To access the parameters of other network adapters

To confirm the changes



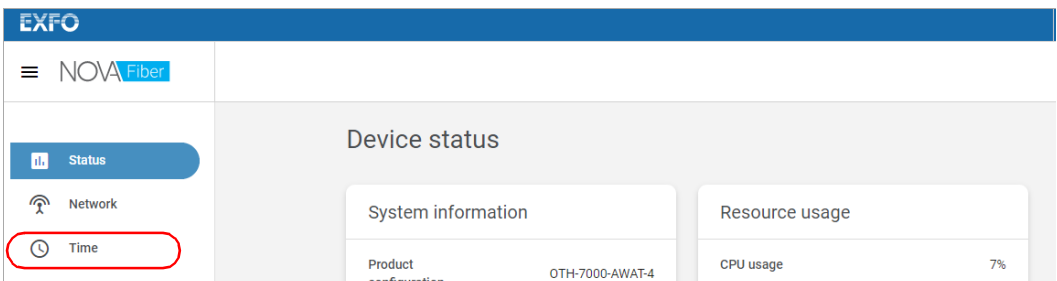


IMPORTANT

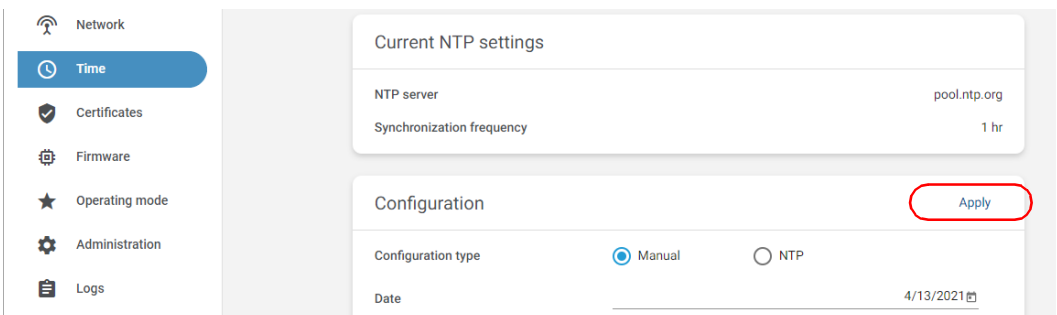
To avoid connection problems between your unit and FMS, ensure that the date and time set on your unit correspond to the current date and time.

10. Configure the date and time as follows:

10a. From the list, select **Time**.



10b. By default, the application sets the date and time values to those of the Web browser you are currently using, but you can change them as needed. You can set the date and time manually or use an NTP server. Click **Apply** to confirm.

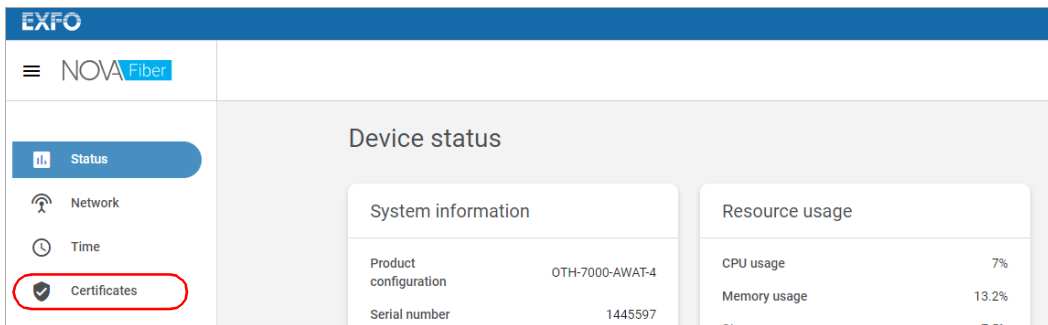


Getting Started with Your Unit

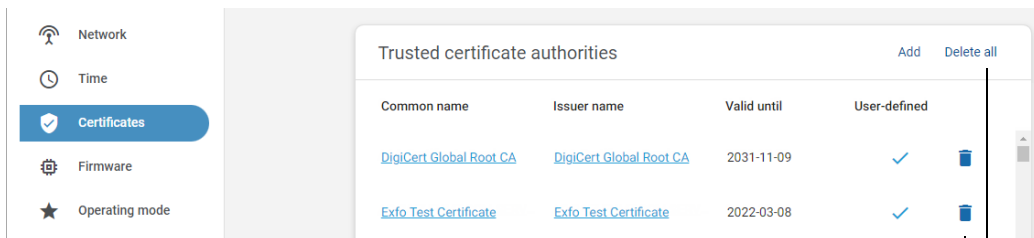
Working With Your Unit for the First Time

11. Configure the list of trusted certificates as follows:

11a. From the list, select **Certificates**.



11b. Click **Add** to add a trusted certificate to the list. The certificate file that you provide must be in PEM format.



To delete a specific trusted certificate from your unit

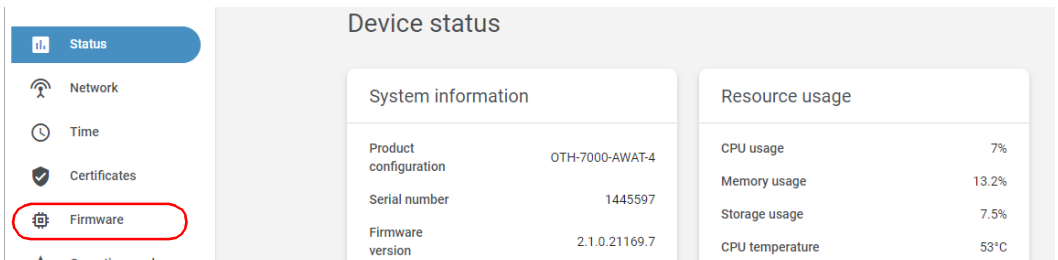
To delete all trusted certificates from your unit

11c. Follow the instructions on screen.

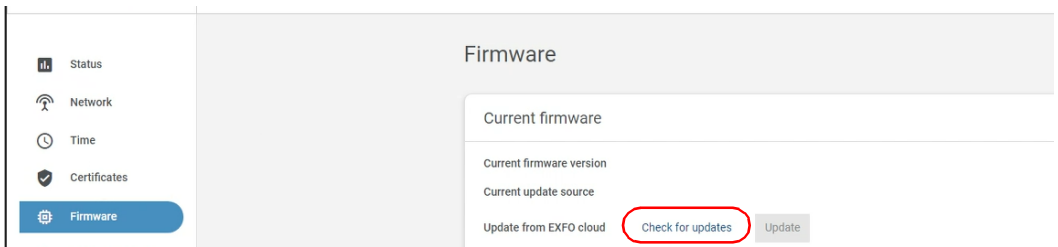
12. If desired, ensure that your unit is up to date as follows:

Note: Refer to the Nova Fiber FMS Readme for the complete compatibility information. Depending on your testing needs, you may want to install a firmware version with which the OTH-7000 can be used either with FMS or as a standalone unit.

12a. From the list, select **Firmware**.



12b. Click **Check for updates**.




Note: Your unit must have access to an Internet connection to be able to download updates and install them.

Getting Started with Your Unit

Working With Your Unit for the First Time

12c. If there are updates available, click the **Update** button to start the process. The unit will restart automatically at the end.

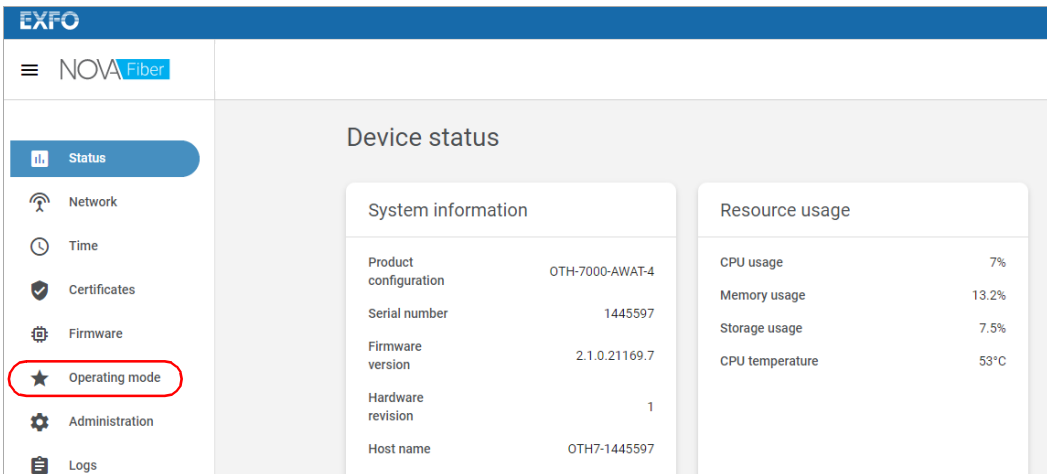
12d. Wait for your unit to be ready (its  (System) LED will be steady green), and then connect again to the Web application.

Note: The update operation may take a few minutes to complete.

Note: After a successful connection between FMS and your unit, FMS will provide the updates if your unit is running a compatible version.

13. Select the operating mode as follows:

13a. From the list, select **Operating mode**.

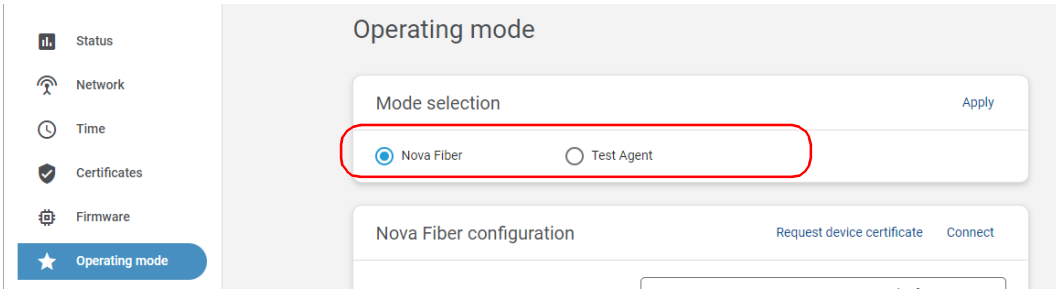


The screenshot shows the EXFO NOVA Fiber web interface. The left sidebar contains a menu with the following items: Status (selected), Network, Time, Certificates, Firmware, Operating mode (highlighted with a red circle), Administration, and Logs. The main content area is titled 'Device status' and contains two panels: 'System information' and 'Resource usage'.

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597
Firmware version	2.1.0.21169.7
Hardware revision	1
Host name	OTH7-1445597

Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C

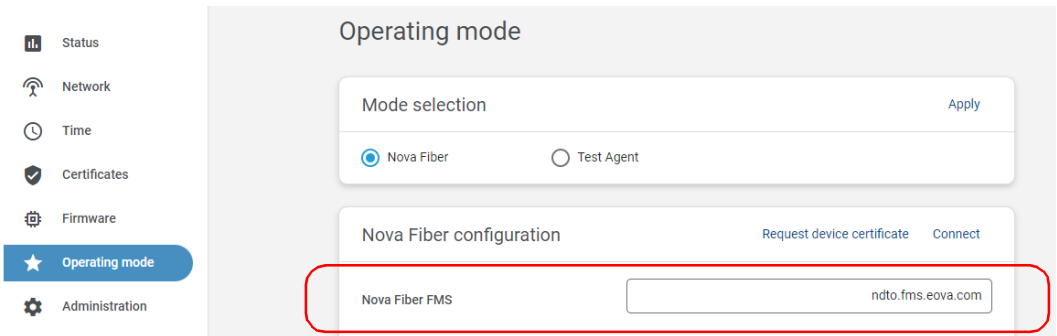
- 13b.** Select **Nova Fiber** if you want to use your OTH-7000 with FMS. Select **Test Agent** to be able to use your unit as a standalone unit that can be remotely controlled with the provided API (see *Test Agent API* on page 79).



- 13c.** Click **Apply** to confirm.

- 14.** If desired, connect your unit to FMS as follows:

- 14a.** In the Nova Fiber FMS box, enter the name of your FMS server (ex.: *abc.fms.your_company.com*).



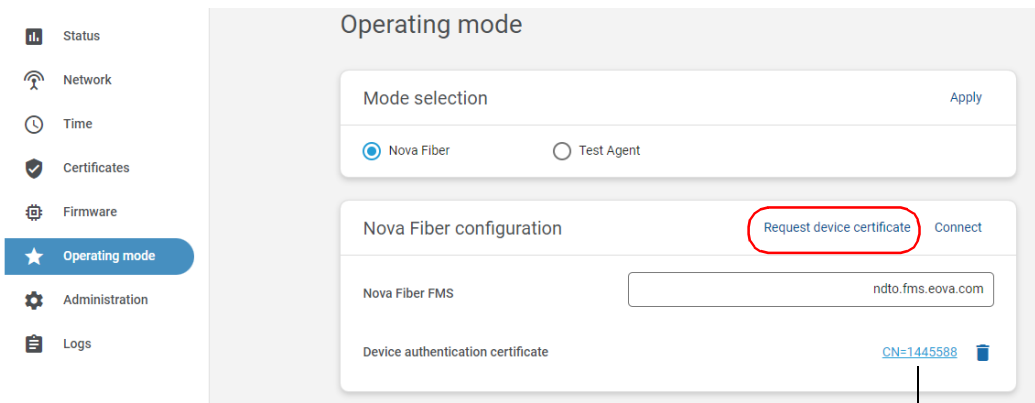
Getting Started with Your Unit

Working With Your Unit for the First Time

14b. If your system is configured so that FMS requires the authentication of all OTH-7000 units, click **Request device certificate**.

OR

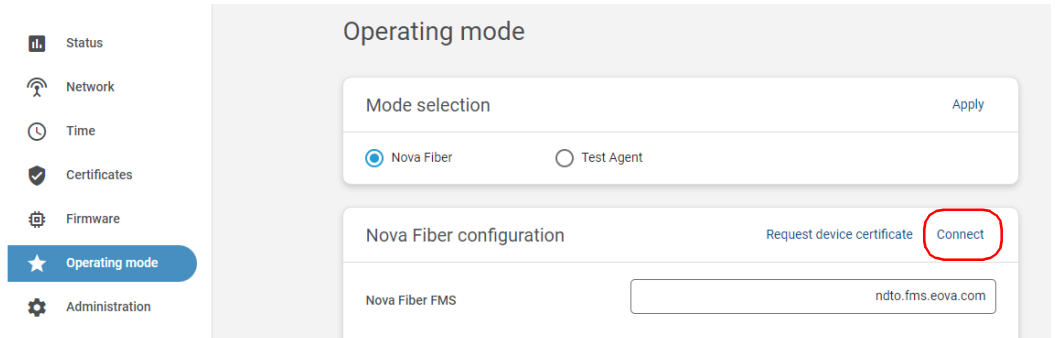
If FMS does not require the authentication of the OTH-7000 units, go directly to step 14d.



Identifies your unit so that it can be seen as "trusted" by FMS

14c. When the application prompts you, enter the user name and password for certificate retrieval that was provided by your system administrator. As soon as the application notifies you that the certificate has been updated, you are ready for the connection.

14d. Click **Connect** to establish the connection with FMS.



Note: The status of the connection is visible from the **Status** page. The status goes from “Not configured” to “Connecting” to “Established”. If any connection problem occurs, the application will display “Connecting” along with the last error, and the OTH-7000 will periodically try to reconnect to the FMS server.

Note: If you need to detach your unit from the link, you can click **Disconnect**. At this point, since there are no monitoring data acquired so far, no data can be lost.

Getting Started with Your Unit

Working With Your Unit for the First Time

15. If you need to define a login banner, you can do so as follows:

15a. From the list, select **Administration**.

The screenshot shows the EXFO Nova Fiber interface for device OTH-7000. The left sidebar has a menu with the following items: Status, Network, Time, Certificates, Firmware, Operating mode, and Administration (highlighted with a red circle). The main content area is titled 'Device status' and contains two panels: 'System information' and 'Resource usage'.

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597
Firmware version	2.1.0.21169.7
Hardware revision	1
Host name	OTH7-1445597

Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C

15b. Select the **Enable banner** check box.

The screenshot shows the EXFO Nova Fiber Administration page. The left sidebar has a menu with the following items: Firmware, Operating mode, Administration (highlighted with a blue bar), and Logs. The main content area shows password fields and a 'Login banner' section with an 'Enable banner' checkbox (highlighted with a red circle) and an 'Apply' button.

New password:

Retype new password:

Login banner Apply

Enable banner

15c. Enter the desired text, and then click **Apply** to confirm.

16. If you want to be able to access your unit remotely for management, proceed as follows:

16a. Select the **Enable remote management on LAN/WAN** check box.

The screenshot shows the web interface of the unit. On the left is a navigation menu with three items: 'Operating mode' (with a star icon), 'Administration' (with a gear icon and highlighted in blue), and 'Logs' (with a document icon). The main content area is divided into three sections. The top section is for password management, with fields for 'new password' and 'Retype new password'. The middle section is titled 'Login banner' and contains an unchecked checkbox labeled 'Enable banner' and a large empty text area. The bottom section is titled 'Remote management' and contains a checked checkbox labeled 'Enable remote management on LAN/WAN', which is circled in red. Each section has an 'Apply' button in the top right corner.

Note: *The remote management will be enabled both on the LAN/WAN Ethernet port and SFP transceiver.*

16b. Click **Apply** to confirm.

Your OTH-7000 Optical Test Head unit is now configured properly.

4 **Maintenance**

To help ensure long, trouble-free operation:

- Always inspect fiber-optic connectors before using them and clean them if necessary.
- Keep the unit free of dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately, disconnect from any external power source and let the unit dry completely.



WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.

Maintenance

Cleaning SC or LC Connectors

Cleaning SC or LC Connectors

You can clean the connectors of your unit using a mechanical cleaner.



WARNING

Never look directly into a live fiber. It could cause serious eye damage. Always use a Fiber Inspection Probe.



WARNING

Before cleaning the connectors, you should suspend the tests to avoid hazardous radiation exposure.

To clean a connector using a mechanical cleaner:

1. Insert the mechanical cleaner into the optical adapter, and push the outer shell into the cleaner.

Note: *The cleaner makes a clicking sound that indicates that the cleaning is done.*

2. Verify connector surface with a fiber inspection probe (for example, EXFO's FIP).


Accessing Your Unit Locally

You will need a computer (laptop) and a network cable to connect to your OTH-7000 unit.

To access your unit locally:

1. If it is not already done, connect one end of a network cable to the management port of your unit and the other end to an Ethernet port on the computer.



2. Ensure that the  (System) LED is steady green.
3. From your computer, open a Web browser and type 169.254.10.10 in the address bar to access the Nova Fiber application.

Note: *It may take a few seconds before you can see the Nova Fiber application if your computer needs to reconfigure its network to a link-local address first.*

4. When the application prompts you, enter the connection information.
 - The default user name is: localadmin
 - The default password is: admin



IMPORTANT

The application will lock your account after a certain number of unsuccessful connection attempts. Before entering your connection information again, you will have to wait a few minutes. The waiting time starts increasing after the fifth unsuccessful connection attempt up to a maximum of fifteen minutes.

Accessing Your Unit Remotely

By default, the management of your unit is done locally by connecting a laptop to your unit. However, if you prefer to be able to manage your unit remotely (via LAN or WAN) after the first connection, you can enable a feature allowing you to do so.

The following procedure takes into account that you have already configured your unit for remote access. If it is not the case, you will need to connect locally to your unit, and then, from the Nova Fiber application ensure you have enabled the remote access (**Administration** page).

To access your unit remotely:

- 1.** Ensure that the unit is reachable with your computer.
- 2.** On your computer, open a Web browser of your choice.
- 3.** Type *https://<IP_address_of_your_unit>*.

Note: *The unit uses a self-signed certificate, which could cause Web browsers to display a message about security issues.*

Changing the Administrator Password

By default, the administrator user account (user name: localadmin), is protected with the *admin* password.

For security reasons, EXFO recommends that you change the default password for a password of your choice after the first connection, and then periodically, according to your own security policy.

To change the administrator password:

1. Connect to your unit, either locally or remotely. For more information, see *Accessing Your Unit Locally* on page 51 or *Accessing Your Unit Remotely* on page 52.
2. When the application prompts you, enter the connection information.
 - The default user name is: localadmin
 - The default password is: admin



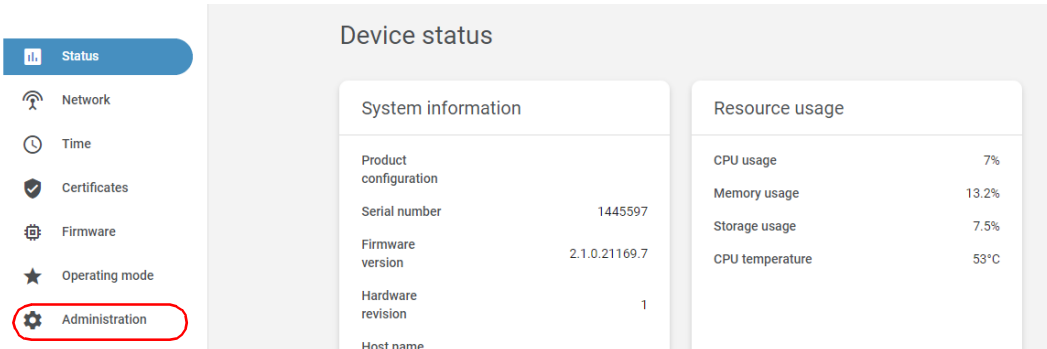
IMPORTANT

The application will lock your account after a certain number of unsuccessful connection attempts. Before entering your connection information again, you will have to wait a few minutes. The waiting time starts increasing after the fifth unsuccessful connection attempt up to a maximum of fifteen minutes.

Maintenance

Changing the Administrator Password

- From the list, select **Administration**.

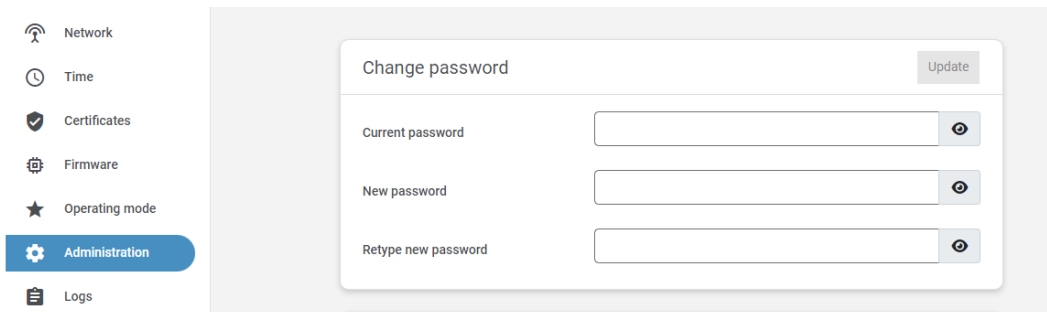


The screenshot shows the 'Device status' page. On the left is a navigation menu with items: Status, Network, Time, Certificates, Firmware, Operating mode, and Administration (highlighted with a red circle). The main content area is titled 'Device status' and contains two panels: 'System information' and 'Resource usage'.

System information	
Product configuration	
Serial number	1445597
Firmware version	2.1.0.21169.7
Hardware revision	1
Host name	

Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C

- Under **Change password**, enter the information.



The screenshot shows the 'Change password' form. The left navigation menu is visible, with 'Administration' highlighted. The form has three input fields: 'Current password', 'New password', and 'Retype new password'. Each field has a toggle icon to the right. An 'Update' button is located in the top right corner of the form.

The new password must have a minimum of eight characters and include characters from at least three of the following categories:

- Lowercase letters ('a' - 'z')
- Uppercase letters ('A' - 'Z')
- Numbers (0 - 9)
- Special characters

- Click **Update** to confirm.

The new password is taken into account immediately.

Upgrading the Firmware

The required firmware has been preinstalled at the factory. However, you may have to upgrade it when new versions become available.


After a successful connection between FMS and your unit, FMS will provide the updates if your unit is running a compatible version. The updates will be performed automatically. Refer to the Nova Fiber FMS Readme for the complete compatibility information and to the FMS user documentation for more information.

If you use your unit as a standalone unit (in Test Agent mode, not connected to FMS), your unit allows you to check for updates, download these updates and install them manually. The information below is useful to upgrade the firmware on standalone units only.

Note: *Your unit must have access to an Internet connection to be able to download updates and install them manually.*



CAUTION

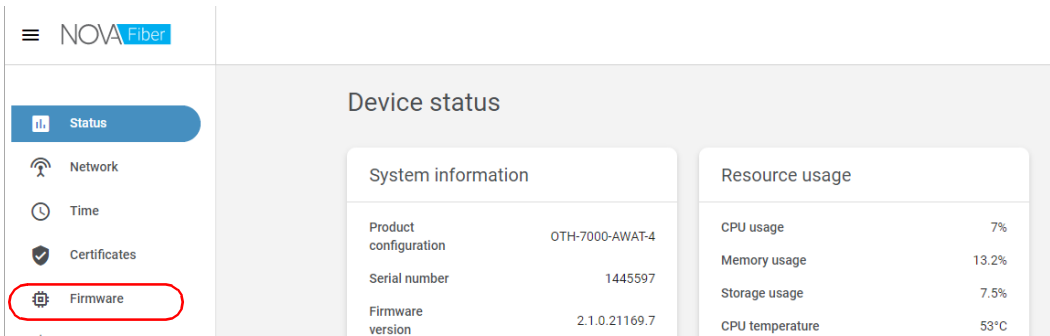
- For a trouble-free upgrade, ensure that your unit remains on during all the process.
- Turning off your unit (or disconnecting it from its power source) could result in unexpected behavior of the test applications, instability of the system, or even severely damage your unit, depending on the operation underway when the unit is turned off.
Damaged units will need to be sent back to EXFO for repair.
- The upgrade could take several minutes to complete. Your unit could restart several times during the operation. You will know that the upgrade is finished when the  (System) LED turns steady green again.

Maintenance

Upgrading the Firmware

To upgrade the firmware manually:

1. Ensure that your unit has access to the Internet.
2. Connect to your unit, either locally or remotely. For more information, see *Accessing Your Unit Locally* on page 51 or *Accessing Your Unit Remotely* on page 52.
3. When the application prompts you, enter your connection information.
4. From the list, select **Firmware**.

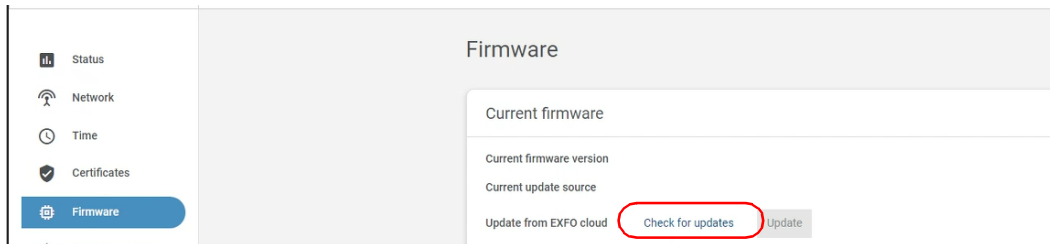


The screenshot shows the NOVA Fiber web interface. The left sidebar contains navigation options: Status, Network, Time, Certificates, and Firmware. The Firmware option is highlighted with a red circle. The main content area is titled "Device status" and contains two panels: "System information" and "Resource usage".

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597
Firmware version	2.1.0.21169.7

Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C


5. Click **Check for updates**.



The screenshot shows the NOVA Fiber web interface with the Firmware page selected. The left sidebar shows the Firmware option highlighted. The main content area is titled "Firmware" and contains a "Current firmware" section with the following information:

- Current firmware version
- Current update source
- Update from EXFO cloud

At the bottom of the update source section, there are two buttons: "Check for updates" (highlighted with a red circle) and "Update".

6. If there are updates available, click the **Update** button to start the process. The unit will restart automatically at the end.
7. Wait for your unit to be ready (its  (System) LED will be steady green), and then connect again to the Web application.

Note: *The update operation may take a few minutes to complete.*

Updating Your Unit With Local Firmware

Keeping both FMS (on your server) and the firmware (on your unit) up to date ensures the optimum performance of your system.

However, should a major incompatibility occur between FMS and your unit's firmware, you could upgrade your unit with local firmware to reestablish compatibility between the two.



CAUTION

- For a trouble-free update, ensure that your unit remains on during all the process.
- Turning off your unit (or disconnecting it from its power source) could result in unexpected behavior of the test applications, instability of the system, or even severely damage your unit, depending on the operation underway when the unit is turned off.
Damaged units will need to be sent back to EXFO for repair.
- The update could take several minutes to complete. Your unit will restart at the end of the operation.



IMPORTANT

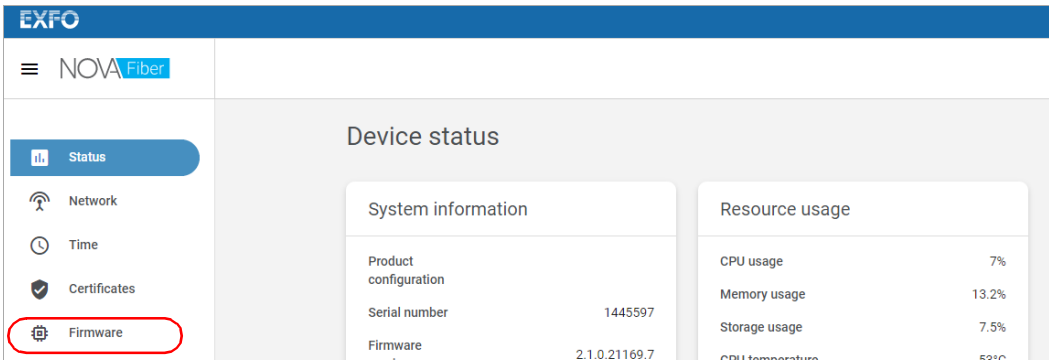
- If the local firmware update results in a downgrade of versions, some data could be lost in the process. You may want to back up your data before the update.
- Performing a local firmware update **DOES NOT** update the image used to revert the unit to its factory state. For this reason, if you revert your unit to its factory state after performing a local firmware update, the compatibility between FMS and the unit's firmware will be lost again. You will need to perform a new update.

Maintenance

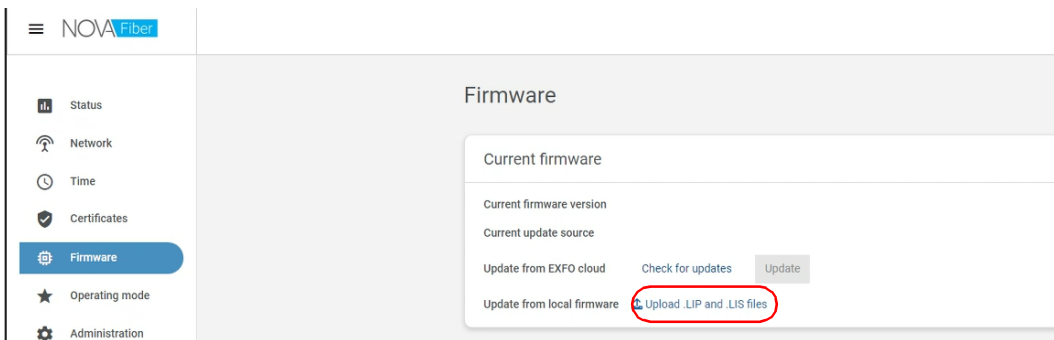
Updating Your Unit With Local Firmware

To update your unit with local firmware:

1. Retrieve both the .LIP and .LIS files provided by EXFO to a folder of your choice on your computer (or to a USB key).
2. Connect to your unit, either locally or remotely. For more information, see *Accessing Your Unit Locally* on page 51 or *Accessing Your Unit Remotely* on page 52.
3. When the application prompts you, enter your connection information.
4. From the list, select **Firmware**.



5. Click **Upload .LIP and .LIS files**.






IMPORTANT

You must select both the .LIP and .LIS files to be able to start the upgrade.

6. Select the .LIP and .LIS files that you want to use. The upgrade starts automatically.

The unit will restart at the end of the operation.

Note: *The update operation may take a few minutes to complete.*

7. Wait for your unit to be ready (its  (System) LED will be steady green), and then connect again to the Web application.

Recalibrating the Unit

EXFO manufacturing and service center calibrations are based on the ISO/IEC 17025 standard (*General Requirements for the Competence of Testing and Calibration Laboratories*). This standard states that calibration documents must not contain a calibration interval and that the user is responsible for determining the re-calibration date according to the actual use of the instrument.

The validity of specifications depends on operating conditions. For example, the calibration validity period can be longer or shorter depending on the intensity of use, environmental conditions and unit maintenance, as well as the specific requirements for your application. All of these elements must be taken into consideration when determining the appropriate calibration interval of this particular EXFO unit.

Under normal use, the recommended interval for your OTH-7000 Optical Test Head is: three years.

For newly delivered units, EXFO has determined that the storage of this product for up to six months between calibration and shipment does not affect its performance.

To help you with calibration follow-up, EXFO provides a special calibration label that complies with the ISO/IEC 17025 standard and indicates the unit calibration date and provides space to indicate the due date. Unless you have already established a specific calibration interval based on your own empirical data and requirements, EXFO would recommend that the next calibration date be established according to the following equation:

Next calibration date = Shipping date + Recommended calibration period (three years)

To ensure that your unit conforms to the published specifications, calibration may be carried out at an EXFO service center or, depending on the product, at one of EXFO's certified service centers. Calibrations at EXFO are performed using standards traceable to national metrology institutes.

Recycling and Disposal



This symbol on the product means that you should recycle or dispose of your product (including electric and electronic accessories) properly, in accordance with local regulations. Do not dispose of it in ordinary garbage receptacles.

For complete recycling/disposal information, visit the EXFO Web site at www.exfo.com/recycle.

5 Troubleshooting


Solving Common Problems

Before calling EXFO's technical support, you may want to consider the following solutions to problems that could occur.

Problem	Possible Cause	Solution
<p>My unit does not start. Its power LED (🔌) remains off when I press the on/off button.</p>	<p>There is a problem related to electrical power.</p>	<ul style="list-style-type: none">➤ If your unit is connected to DC power, ensure that the disconnect device is turned on.If your unit is connected to AC power, ensure that the external power supply is connected at both ends, and that the disconnect device is turned on.➤ If the unit is connected to DC power, ensure that the wires are connected properly, respecting polarity (see <i>Connecting Your Unit to a Power Source</i> on page 24).

Troubleshooting

Solving Common Problems

Problem	Possible Cause	Solution
The RTUe-9120 external switch that I have just connected is not working.	The switch has not been detected.	Disconnect, then reconnect the switch.
		Ensure that the OTH-7000 unit is on and that its System LED () is green and not blinking.
I cannot sign in to my account with my user name and password.	The application locked your account after five or more unsuccessful connection attempts.	Wait a few minutes before attempting a new connection. After eight unsuccessful attempts, you will have to wait 15 minutes before trying again.
	You forgot or lost your password.	Create a new password with FMS. For more information about FMS, refer to its user documentation.

Restoring Your Unit to Normal Operation

If you ever encounter major problems with your unit (for example, the unit does not behave the way it used to), you can revert it to its initial state (as it was at time of purchase).

When you reset your unit to its factory settings:

- All data files will be lost once the operation is complete.
- If you have installed products and updates since you purchased your unit, you will have to reinstall them.



IMPORTANT

Resetting your unit to its factory settings will disable the remote management if it was enabled. This means that, once the operation is complete, you will no longer be able to connect remotely to your unit.



CAUTION

DO NOT TURN OFF your unit while the recovery operation is underway. Doing so may severely damage your unit. Damaged units will need to be sent back to EXFO for repair.

You can perform this operation from the Nova Fiber application or manually, especially if you cannot access the Nova Fiber application.

To restore your unit to factory state with the Nova Fiber application:

1. Connect to your unit, either locally or remotely. For more information, see *Accessing Your Unit Locally* on page 51 or *Accessing Your Unit Remotely* on page 52.
2. When the application prompts you, enter your connection information.

Troubleshooting

Restoring Your Unit to Normal Operation

- From the list, select **Administration**.

The screenshot shows the 'Device status' page. The left sidebar has the following items: Status, Network, Time, Certificates, Firmware, Operating mode, and Administration (highlighted with a red circle). The main content area is titled 'Device status' and contains two panels:

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597
Firmware version	2.1.0.21169.7
Hardware revision	1
Host name	OTH-7000-1445597


Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C


- Click **Restore device to factory state**.

The screenshot shows the 'Administration' page. The left sidebar has the following items: Administration and Logs. The main content area contains several sections:

- Retye new password**: A text input field with a visibility toggle.
- Login banner**: A section with an 'Apply' button and an 'Enable banner' checkbox. Below the checkbox is a large empty text area.
- Remote management**: A section with an 'Apply' button and a checked checkbox for 'Enable remote management on LAN/WAN'.
- Reset**: A section with a 'Restore device to factory state' button highlighted by a red circle.

5. Follow the on-screen instructions.

The restoring process is now underway and the  (System) LED will keep blinking rapidly. Your unit will restart automatically.

Once your unit has restarted, its  (System) LED will blink slowly during the whole initialization. You will know that the operation is complete when the LED becomes steady green.

Note: *The restoring process may take a few minutes to complete.*

6. Configure your unit as you did when you first received it. However, use the following credentials to establish a connection:
 - User name: admin
 - Password: admin

Note: *Depending on when your unit was manufactured, the default user name could be admin or localadmin.*

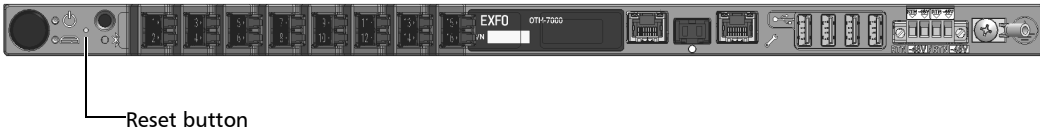
For more information, see *Working With Your Unit for the First Time* on page 34.


Troubleshooting


Restoring Your Unit to Normal Operation


To restore your unit to its factory state without the Nova Fiber application:

1. Turn off your unit.
2. Insert the end of an unbent paper clip into the tiny hole to access the reset button.



3. While you keep pushing on the paper clip, turn on the unit. Do not remove the paper clip yet.
4. As soon as the  (System) LED starts blinking rapidly, remove the paper clip.

The restoring process is now underway and the  (System) LED will keep blinking rapidly. Your unit will restart automatically.

Once your unit has restarted, its  (System) LED will blink slowly during the whole initialization. You will know that the operation is complete when the LED becomes steady green.

Note: *The restoring process may take a few minutes to complete.*

5. Configure your unit as you did when you first received it (see *Working With Your Unit for the First Time* on page 34).

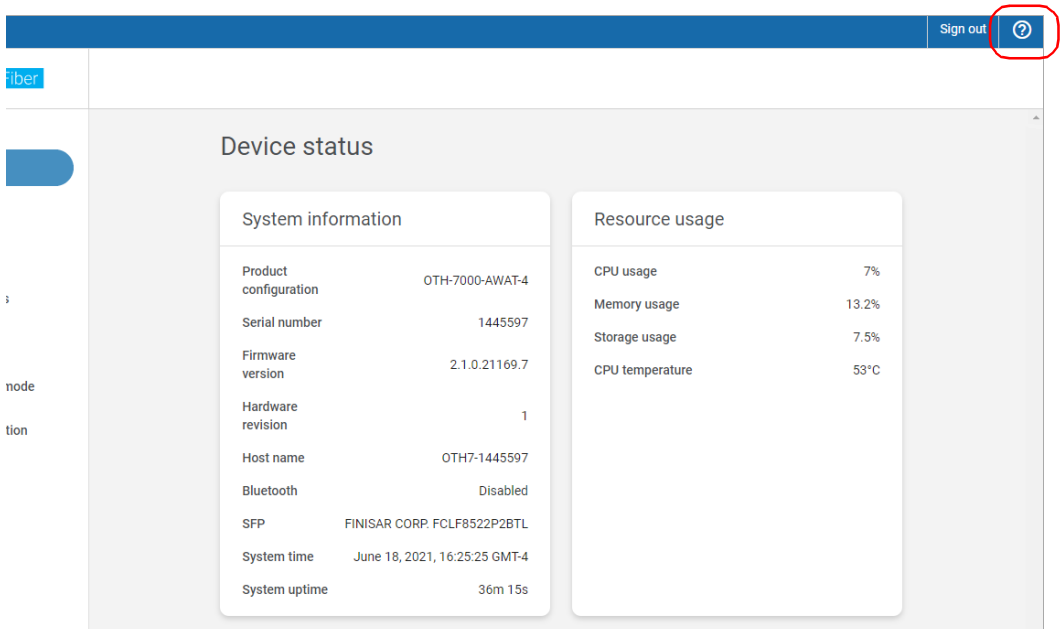
Accessing the User Documentation

You can access the user documentation in PDF format at all times from your unit.

Note: The user guides of all products are also available from the My EXFO section of the EXFO Web site (www.exfo.com) for download in PDF format.

To view the user documentation:

From the title bar of the Nova Fiber application, click .



Retrieving Logs

There are two types of logs that you can retrieve from the Nova Fiber Web application:

- The audit log that lists events and changes that occurred on the OTH-7000 unit.
- The system log that provides special information that you can send to the technical support team at EXFO for further analysis.

To retrieve logs:

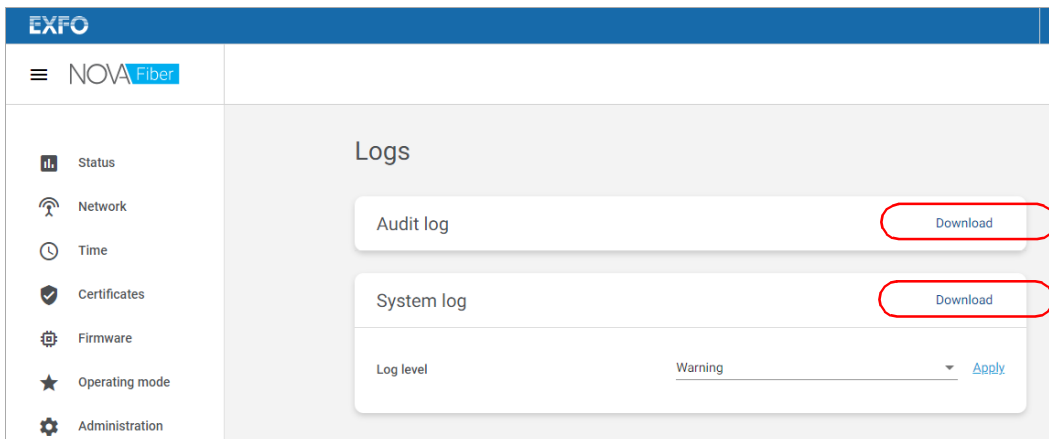
1. Connect to your unit, either locally or remotely. For more information, see *Accessing Your Unit Locally* on page 51 or *Accessing Your Unit Remotely* on page 52.
2. From the Nova Fiber Web application, go to the **Logs** page.

The screenshot shows the EXFO NOVA Fiber web application interface. The top navigation bar is blue with the EXFO logo. Below it, the 'NOVA Fiber' title is displayed. A left sidebar contains a menu with icons and labels: Status (highlighted in blue), Network, Time, Certificates, Firmware, Operating mode, Administration, and Logs (circled in red). The main content area is titled 'Device status' and contains two panels: 'System information' and 'Resource usage'.

System information	
Product configuration	OTH-7000-AWAT-4
Serial number	1445597
Firmware version	2.1.0.21169.7
Hardware revision	1
Host name	OTH7-1445597
Bluetooth	Disabled

Resource usage	
CPU usage	7%
Memory usage	13.2%
Storage usage	7.5%
CPU temperature	53°C

3. Go to the section corresponding to the type of log that you want to retrieve, and then click the corresponding **Download** link.



Note: *By default, the logging level of the system log is set to Warning. If necessary, the technical support team will ask you to change the level to another value for subsequent actions. The Debug level should be used temporarily as it can slow down the system. EXFO recommends to set the level back to Warning once the debug operation is complete.*

Note: *The time necessary to retrieve a log will vary with its size.*

Troubleshooting

Contacting the Technical Support Group

Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

Technical Support Group

400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

For detailed information about technical support, and for a list of other worldwide locations, visit the EXFO Web site at www.exfo.com.

If you have comments or suggestions about this user documentation, you can send them to customer.feedback.manual@exfo.com.

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

6 **Warranty**

General Information

EXFO Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.



IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Warranty

Gray Market and Gray Market Products

Gray Market and Gray Market Products

Gray market is a market where products are traded through distribution channels that are legal but remain unofficial, unauthorized, or unintended by the original manufacturer. Intermediaries using such channels to distribute products are considered to be part of the gray market (hereafter unauthorized intermediary).

EXFO considers that a product originates from the gray market (hereafter gray market product) in the following situations:

- A product is sold by an unauthorized intermediary.
- A product is designed and destined for a particular market and sold on a second market.
- A product is resold, despite being reported lost or stolen.

When products are purchased on the gray market, rather than through an authorized EXFO distribution channel, EXFO is unable to guarantee the source and quality of those products nor the local safety regulations and certifications (CE, UL, etc.).

EXFO will not honor warranty, install, maintain, repair, calibrate, provide technical support nor make any support contracts available for gray market products.

For complete information, refer to EXFO's policy regarding gray market products at

www.exfo.com/en/how-to-buy/sales-terms-conditions/gray-market/

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond the control of EXFO.



IMPORTANT

In the case of products equipped with optical connectors, EXFO will charge a fee for replacing connectors that were damaged due to misuse or bad cleaning.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 77). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 77).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center

400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

EXFO Europe Service Center

Winchester House, School Lane
Chandlers Ford, Hampshire S053 4DG
ENGLAND

Tel.: +44 2380 246800
Fax: +44 2380 246801
support.europe@exfo.com

EXFO Telecom Equipment (Shenzhen) Ltd.

3rd Floor, Building C,
FuNing Hi-Tech Industrial Park, No. 71-3,
Xintian Avenue,
Fuhai, Bao'An District,
Shenzhen, China, 518103

Tel: +86 (755) 2955 3100
Fax: +86 (755) 2955 3101
support.asia@exfo.com

To view EXFO's network of partner-operated Certified Service Centers nearest you, please consult EXFO's corporate website for the complete list of service partners:

<http://www.exfo.com/support/services/instrument-services/exfo-service-centers>.

A **Test Agent API**

In Test Agent mode, you can configure and operate your unit using an API available on the LAN/WAN interface(s).

A complete list of commands allowing you to remotely control your unit is available at all times. It details the commands with examples and appropriate syntax.

For more information on how to set the operating mode, see *Working With Your Unit for the First Time* on page 34.

Accessing the API and Its Documentation

The API and the related documentation are accessible via endpoints, as follows:

- API endpoint: *http://<LAN/WAN IP address>/api*
- Documentation endpoint: *http://<LAN/WAN IP address>/help/api*

Performing Current Tasks With the API

This section presents the most current tasks that you can perform with the API.

Remotely Managing Your Unit

To remotely obtain information about your unit and its state, configure time and certificates, as well as restart your unit, use one of the */system* endpoints.

Managing the Firmware

Checking and installing updates are asynchronous processes that you can launch respectively with the */system/firmware/check* and */system/firmware/install* endpoints.

Performing OTDR Tests



IMPORTANT

- ▶ You can only schedule one OTDR test at a time.
 - ▶ Only the data of the last two OTDR tests is stored. As soon as you request a test, the data of the oldest test is discarded.
 - ▶ Restarting your unit discards all test data.
-
- ▶ You can start an OTDR test by sending an HTTP POST to the `/otdr/tests` endpoint.
 - ▶ Building the optical path might require to query the OTDR and switches characteristics, which can be done with the `/system/devices/otdr` and `/system/devices/opticalswitches` endpoints.
 - ▶ OTDR testing is asynchronous. You can monitor an OTDR test by polling its status. You can also access the final test result, in Bellcore SOR format, with the `otdr/tests/{testId}/result/sor` endpoint.

Troubleshooting

The EXFO support team might ask for more detailed information should the system not behave as expected.

- ▶ You can configure the logging level and retrieve the system logs with the corresponding `/logs` endpoints.
- ▶ You can obtain debug information on a test execution with the `/otdr/tests/{testid}/result/dump` endpoint.

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CHINESE REGULATION ON RESTRICTION OF HAZARDOUS SUBSTANCES (RoHS)

中国关于有害物质限制的规定

NAMES AND CONTENTS OF THE TOXIC OR HAZARDOUS SUBSTANCES OR ELEMENTS
CONTAINED IN THIS EXFO PRODUCT

包含在本 EXFO 产品中的有毒有害物质或元素的名称及含量

Part Name 部件名称	Lead 铅 (Pb)	Mercury 汞 (Hg)	Cadmium 镉 (Cd)	Hexavalent Chromium 六价铬 (Cr(VI))	Polybrominated biphenyls 多溴联苯 (PBB)	Polybrominated diphenyl ethers 多溴二苯醚 (PBDE)
Enclosure 外壳	O	O	O	O	O	O
Electronic and electrical sub-assembly 电子和电气组件	X	O	X	O	X	X
Optical sub-assembly ^a 光学组件 ^a	X	O	O	O	O	O
Mechanical sub-assembly ^a 机械组件 ^a	O	O	O	O	O	O

Note:

注:

This table is prepared in accordance with the provisions of SJ/T 11364.

本表依据 SJ/T 11364 的规定编制。

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。

X: indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572. Due to the limitations in current technologies, parts with the "X" mark cannot eliminate hazardous substances.



X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求。

标记 "X" 的部件, 皆因全球技术发展水平限制而无法实现有害物质的替代。

a. If applicable.

如果适用。

MARKING REQUIREMENTS
标注要求

Product 产品	Environmental protection use period (years) 环境保护使用期限 (年)	Logo 标志
This EXFO product 本 EXFO 产品	10	
Battery ^a 电池	5	

a. If applicable.
如果适用。

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The logo for EXFO, featuring the letters 'EXFO' in a bold, blue, sans-serif font. The letters are composed of horizontal lines, giving it a modern, digital appearance.