



T100S-HP

High Power Tunable Laser



Getting Started

Contact Information

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers.

Technical Support Group

400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

Tel. USA and Canada: 1 866 683-0155
Fax: 1 418 683-9224
E-mail: 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/support

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.

Table of Contents

Contact Information	2
Table of Contents	3
Important Safety Information for Your Product	4
1. Product Presentation	7
1.1 Product Features.....	7
1.2 Technical Specifications	8
1.3 Product Overview	11
1.3.1 Description of the Front Panel	11
1.3.2 Description of the Rear Panel.....	14
2. Installing and Connecting the Product	16
2.1 Unpacking and Installing the Product.....	16
2.2 Connecting the T100S-HP to a Power Source	17
2.3 Connecting External Optical Devices to the product	17
3. Turning on/off and Initializing the Product	19
3.1 Initializing the Laser.....	19
3.2 Enabling/Disabling the Laser Output.....	20
3.3 Shutting Down the Product	20

For full details on how to use the T100S-HP, see *T100S-HP User Manual* available on the USB key provided with the instrument.

Important Safety Information for Your Product

Before you start working with your device, you need to first read the important safety information provided in this section. This section provides information that may supplement or add safety information to the user guides of your product. Keep this information close at hand.

You can obtain a copy of the complete user guide for your product at the following link: www.EXFO.com



Important

- If you see the  symbol on your unit, make sure that you refer to the instructions provided in this safety notice. Ensure that you understand and meet the required conditions before using your product.
- 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.

Product Safety

Safety Symbols on Your Product

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

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

Electrical Safety Information

This unit uses an international safety standard three-wire power cable. This cable serves as a ground when connected to an appropriate AC power outlet.



Warning

- The use of voltages higher than those indicated on the label affixed to your unit may damage the unit.
- 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.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Use only accessories designed for your unit and approved by EXFO. For a complete list of accessories available for your unit, see its technical specifications or contact EXFO.
- 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 fire risk.
- Unless otherwise specified, all interfaces are intended for connection to Safety Extra Low Voltage (SELV) circuits only.
- To avoid electrical shock, do not operate the unit if any part of the outer surface (covers, panels, etc.) is damaged.
- Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.
- Only authorized personnel should carry out adjustments, maintenance or repair of opened units under voltage. A person qualified in first aid must also be present. Do not replace any components while the power cable are connected.
- Use only fuses with the required rated current and specified type. Do not use repaired fuses or short-circuited fuse holders. For more information, see the section about replacing the fuses in this user documentation.



Caution

- Where applicable, the operation and storage temperatures, as well as the altitude and relative humidity values of some modules may differ from those specified for your platform. In this case, always ensure that you comply with the most restrictive conditions (either module or platform).
- Position the unit so that the air can circulate freely around it.

Optical Safety

Safety Symbols on Your Product

Symbol	Meaning
	This symbol on your product indicates that the unit is equipped with a laser source, or that it can be used with instrument equipped with a laser source. These instruments include but are not limited to, modules and external optical units.

Optical Safety Instructions

Your instrument is in compliance with standards IEC 60825-1: 2007 and 2014.



Warning

- (IEC 60825-1: 2007) Viewing the laser output with certain optical instruments designed for use at a distance (for example, telescopes and binoculars) may pose an eye hazard.
- (IEC 60825-1: 2014) 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.
- 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.

Laser radiation may be encountered at the optical output port.

The following labels indicate that the product contains a Class 1M source:



INVISIBLE 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

Pout max: / Psortie max. : ≤ 42 mW (on 1240-1400 nm); 100 mW (on 1400-1680 nm)
Complies with standards 21 CFR 1040.10, except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

1. Product Presentation

1.1 Product Features

The T100S-HP is a high-performance, self-aligned external cavity laser. It is a general-purpose instrument designed for fiber-optic system testing and precise WDM component testing, as well as for research and development in the field of optical communications.

The following table lists the T100S-HP main features.

Feature	Description
Wide, fast, and 100%-continuous tunability	Extremely smooth scans over 100 nm obtained in 1 second, with a high resolution of 1 picometer. A digitally-controlled analog fine-tuning extending the resolution beyond the 1-picometer step to the sub-MHz level.
Active cavity control	The proprietary active cavity control provides the means for full optical communications systems and components characterizations. It ensures true mode-hop-free operations over the entire tuning range along with remarkable wavelength accuracy.
Internal wavelength referencing	The T100S-HP features its own internal referencing system to ensure highly accurate and repeatable measurements.
Active wavelength monitoring	This feature turns the T100S-HP into a high-precision tunable laser for DWDM component characterization.
Full-featured wavelength sweeper mode	True swept-wavelength function with adjustable sweep speed setting over the user-defined wavelength range (within the system's specified wavelength range).
Mode-hop free	A wide range guaranteed to be free of any mode hopping to ensure a smooth and accurate wavelength sweep for reliable testing of narrow-band components.
SSE-free operation	A unique optical design to yield intra-cavity filtering of SSE coming out of the diode. More than 90 dB of dynamic range for a pure, high-power single-mode laser line.
High output power	+10 dBm delivered by the <i>Essential</i> models. +8 dBm delivered by the <i>Extended Range</i> models. See section <i>Technical Specifications</i> , p. 8.
Outstanding long-term stability	Self-aligned optical layout, single-moving-part design and construction with low CTE materials to ensure a high level of long-term stability.
Intuitive and user-friendly controls	Optimized keyboard and display for intuitive and easy-to-implement laboratory operations. Dual parameter input (keyboard or multi-speed rotary control).

Feature	Description
Multiple modulation capability	Easy direct analog and digital modulation of the laser: <ul style="list-style-type: none"> • Low frequency modulation • High frequency modulation. • Coherence control.
Easy system integration	A fully integrated system featuring computer interfaces, on-board software, and analog inputs/outputs to allow all operations to be performed in remote mode and to make integration into a test set-up easy.

Table 1: T100S-HP – Main Features

1.2 Technical Specifications

The following table lists the technical specifications of all T100S-HP models.



Important

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO web site at www.exfo.com.

		Essential Models		Extended Range Models			
		O	CL	O+	ES	SCL	CLU
Wavelength range (nm)		1260–1360	1500–1630	1240–1380	1350–1510	1440–1640	1500–1680
Output power	Over full wavelength range	≥ +10 dBm		≥ +8 dBm			
	Peak	≥ +13 dBm					
Signal to source spontaneous emission ratio *1		≥ 90 dB (100 dB typical)					
Side mode suppression ratio *2		≥ 45 dB					
Stability *3	Wavelength	±5 pm/h (±3 pm/h ; ±5 pm/24h typical)					
	Output Power	±0.01 dB/h (±0.025 dB/24h typical)					
Relative intensity noise *4		< -140 dB/Hz					
Spectral width (FWHM)		> 100 MHz (coherence control on) 400 kHz typical (coherence control off)					
Absolute wavelength accuracy *5		±20 pm					
Wavelength setting repeatability		5 pm typical					
Wavelength setting resolution		1 pm (0.1 pm in fine tuning mode)					
Fine tuning mode range		±25 pm (±2 GHz)					
Tuning speed in step mode		Approximately 1 s for 100 nm step					
Mode hop free range *6		Full wavelength range					
Continuous sweep speed		Adjustable from 1 to 100 nm/s					
Power flatness during sweep		±0.25 dB typical					

		Essential Models		Extended Range Models			
		O	CL	O+	ES	SCL	CLU
Power repeatability sweep to sweep ^{*7}		±0.05 dB typical					
Low frequency modulation		DC to 8 MHz (sinusoidal), DC to 1 MHz (TTL)					
High frequency modulation		30 kHz to 200 MHz					
Output fiber type		SMF or PMF (option)					
Output connector		FC/APC					
Communication interfaces ^{*8}		RS-232C and GPIB (IEEE-488.1)					
Temperature / Humidity range		+15 °C to +30 °C (+60 °F to +85 °F) / <80% (non-condensing)					
Electrical Specifications	Power supply	100-240 V \sim ; 50/60 Hz					
	Maximum input current	5 A rms					
	Maximum power consumption	300 W					
	Fuse type	2x T4AL250V, 5 x 20 mm (0.2 x 0.79 in) Equipment has double fuse in both Line and Neutral conductors.					
Laser safety classification		Class 1M					
Laser type		External cavity laser diode					
Laser output		Single mode optical fiber					
Laser Output divergence (full angle at 1/e²)		0.18 rad					
Dimensions (W x H x D)		448 x 370 x 133 mm (17.64 x 14.6 x 5.2 in)					
Weight		12.5 kg (27.5 lb)					

All specifications are given after 60 minutes warm-up and apply for wavelengths not equal to any absorption line.

*1: Measured over a 0.1 nm bandwidth ± 1 nm from the signal.

*2: For output power ≥ 0 dBm.

*3: Over one hour at constant temperature.

*4: RIN within the range 100 MHz–3 GHz measured at +8 dBm output power with RBW = 30 kHz.

*5: O and CL at 10 dBm / Others at 8 dBm, ± 40 pm all at 0 dBm.

*6: Validated at 0 and +10 dBm for essential and 0 and +8 dBm for extended range models.

*7: Over 100 wavelength scans at constant temperature.

*8: GPIB tested & validated with National Instruments GPIB Board.

Table 2: Technical Specifications

Environmental Specifications

Equipment Type	Test and measurement
Overtoltage category	II
Pollution degree	2
Temperature	Operation: +10 °C to +35 °C (+50 °F to +95 °F) Storage: -10 °C to +50 °C (+14 °F to +122 °F)
Maximum relative humidity	< 80 % (non-condensing)
Altitude (maximum operating)	2000 m (6562 ft)

Table 3: Environmental Specifications

Valid Ranges for Parameter Settings

		Essential Models		Extended Range models			
		O	CL	O+	ES	SCL	CLU
Laser diode current level (I)		See the <i>Acceptance Test Report</i> delivered with the product					
Beam output power (P)		0.2-42 mW					
Wavelength scan steps (nm)	Step-mode	0.001-150					
	Swept-mode	continuous					
Time at each scan step (Pause timer)		0.1-25 s					

Table 4: Valid Range for Parameter Settings

Available Accessories and Replaceable Parts

For information about accessories and replaceable parts, contact your EXFO sales representative.

Name	Description
Fuse	see <i>Technical Specifications, p. 8</i>
PM optical fiber cable	Single-mode polarization maintaining cable
Optical fiber cable	Single-mode cable
Power key	Front panel key-lock
Rack-mount handles	2 rack-mount handles
Carrying case (3U)	Field carrying case (3U)

Table 5: Available Accessories and Replaceable Parts

1.3 Product Overview

The T100S-HP Tunable External Cavity Laser is delivered with the following standard accessories:

- A power supply cord
- An FC/APC-FC/APC patchcord
- A safety-lock key
- A USB-RS232 converter cable
- A USB key containing the user documentation and available software

For more information on replaceable parts, see section *Available Accessories and Replaceable Parts*, p. 10.

This section provides an overview of the operating interfaces of all T100S-HP functions.

1.3.1 Description of the Front Panel



Figure 1: Front Panel

DATA Area

Description

The DATA area displays the three main operating parameters:

- Emission wavelength (λ) or optical frequency (f)
- Output power (P)
- Laser diode current (I)

This area is also used to display system status messages.

Function Keys

Function Key	Purpose
nm/GHz	Displays either the wavelength in nanometer (nm) or the corresponding optical frequency in gigahertz (GHz).
mW/dBm	Displays the optical output power either in dBm or mW.
Enable	Enables the optical output. <ul style="list-style-type: none"> • If the optical output is disabled, the message <code>Disabled...</code> is displayed. • If the optical output is enabled the current of the diode is displayed in milliamperes (mA).

Table 6: DATA Area – Function Keys

MODE Area**Description**

The MODE area allows you to access and change the parameters that you want to configure.

It consists of 8 keys that light up when the corresponding function is active.

Function Keys

Key	Description
$\lambda.f$	Edits the current value of the emission wavelength λ or the optical frequency f ., and enables the entry of a new value (see <i>T100S-HP User Guide</i> , section <i>Changing the Emission Wavelength or Frequency</i> , p. 27).
P	<ul style="list-style-type: none"> Edits the current value of the output power P, and allows the entry of a new value (see <i>T100S-HP User Guide</i>, section <i>Changing the Optical Output Power and Diode Current</i>, p. 33). Switches to the constant-power mode (see <i>T100S-HP User Guide</i>, section <i>Switching Between Constant-Power and Constant-Current Modes</i>, p. 34).
I	<ul style="list-style-type: none"> Edits the current value of the diode current I, and allows the entry of a new value. Switches to the constant-current mode (see <i>T100S-HP User Guide</i>, section <i>Switching Between Constant-Power and Constant-Current Modes</i>, p. 34).
STEP	Changes the wavelength increment (STEP) value (see <i>T100S-HP User Guide</i> , section <i>Setting a Predefined Increment/Decrement Step</i> , p. 28). It is also possible to increase or decrease the wavelength STEP-by-STEP, at any time, by pressing the ← or → keys on the keypad.
APC	Automatic Power Control. Switches between constant-current (APC light off) and constant-power (APC light on) modes. See <i>T100S-HP User Guide</i> , section <i>Switching Between Constant-Power and Constant-Current Modes</i> , p. 34.
FSC	Enables/Disables the Fine SCanning mode. (see <i>T100S-HP User Guide</i> , section <i>Using the Fine Scanning Mode (Fine Tuning)</i> , p. 28).
2nd	Enables you to access advanced functions.
$\lambda.f$	To set the motor-speed for swept-mode wavelength scanning (see <i>T100S-HP User Guide</i> , section <i>Setting the Sweep Speed</i> , p. 32).
P	To perform power calibration (see <i>T100S-HP User Guide</i> , section <i>Performing Power Calibration</i> , p. 37).
I	To perform system auto-calibration (see <i>T100S-HP User Guide</i> , section <i>Performing Internal Wavelength Referencing</i> , p. 38).
APC	To disable/enable active cavity control (see <i>T100S-HP User Guide</i> , section <i>Disabling/Enabling Active Cavity Control</i> , p. 35).
dBm/mW	To turn on active wavelength monitoring (see <i>T100S-HP User Guide</i> , section <i>Enabling Active Wavelength Monitoring</i> , p. 39).

Key	Description	
2nd	STEP	To activate wavelength step-mode (see <i>T100S-HP User Guide</i> , section <i>Implementing Step-by-Step Wavelength Scanning</i> , p. 29) or sweep-mode scanning (see <i>T100S-HP User Guide</i> , section <i>Implementing Continuous Wavelength Sweep (hop-free)</i> , p. 31).
	1	To disable/enable backlash suppression of the micrometer screw (see <i>T100S-HP User Guide</i> , section <i>Turning On/Off Backlash Suppression of the Micrometer Screw</i> , p. 32).
	2	To display the software version.
	Remote	To change the GPIB address and to activate/deactivate the RS-232 remote mode: see <i>T100S-HP Programming Guide</i> .
	FSC	To enable the coherence control function (see <i>T100S-HP User Guide</i> , section <i>Turning On/Off Coherence Control</i> , p. 32).
Remote	Switches between remote mode and manual mode (see <i>T100S-HP Programming Guide</i>).	

Table 7: MODE Area – Function Keys

SETUP Area**Description**

The SETUP area is used to enter or change the values of the system operating parameters.

Keys

Key	Purpose
Numeric keypad	Enters a numeric value
← →	Corrects a typing error.
ENTER	Validates the selection.
.	Enters a decimal point.
-	Enters a negative value.
Rotary knob	Adjusts parameter values.
↑ ↓	Changes the basic increment/decrement applied by the rotary knob.

Table 8: SETUP Area – Keys

OUTPUT Area

- **STBY/ON:** key-lock switch. The product can only be started if the key-lock switch is in the ON position.
- **FC/APC:** connector type, protected by a cover bearing the laser warning symbol.

Laser Warning Labels:

The warning symbol indicates the location of the laser source. For more details, see section *Optical Safety Instructions*, p. 6.

1.3.2 Description of the Rear Panel

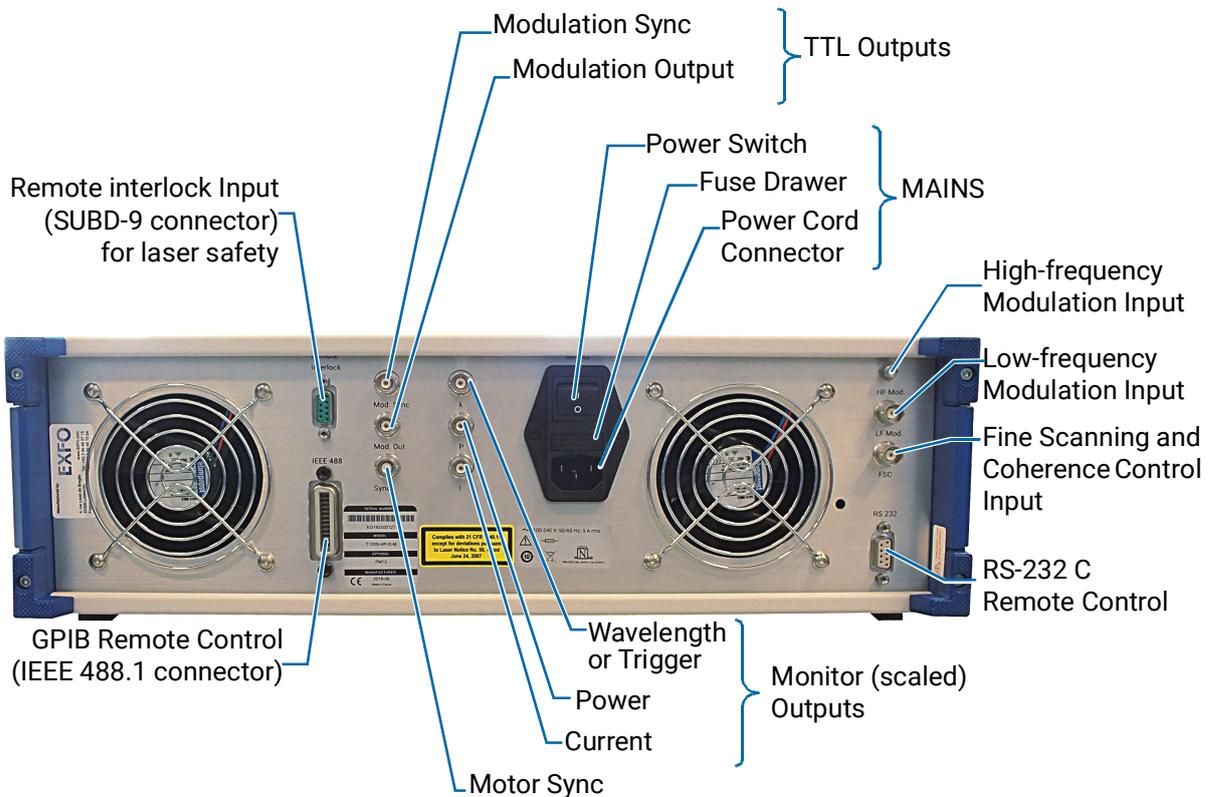


Figure 2: Rear Panel

MAINS

The MAINS module includes:

- The mains power switch
- The power cord connection
- The fuse drawer

Monitor (Scaled) Outputs

- **Sync:** BNC connector for motor Sync.
- **λ :** BNC connector for wavelength monitoring.
You can also use this output connector as a trigger, as explained in *T100S-HP User Guide*, section *Activating/Deactivating the λ Output as a Trigger*, p. 49.
- **P:** BNC connector for power monitoring.
- **I:** BNC connector for current monitoring.

TTL Outputs

- **Mod. Sync:** BNC connector for modulation sync (TTL output).
- **Mod. Out:** BNC connector for modulation output (TTL output).

For a detailed description on particular connectors, see *T100S-HP User Guide*, section *Using the Auxiliary Inputs and Outputs*, p. 43.

Inputs

- **HF Mod:** SMA connector for high-frequency modulation input.
- **LF Mod:** BNC connector for low-frequency modulation input.
- **FSC:** BNC connector for fine scanning and coherence control.
- **Remote Interlock:** SUBD-9 connector for laser safety (safety interlock is mandatory for Class 3B and 4 laser products. Note that T100S-HP lasers are Class 1M).

For a detailed description on particular connectors, see *T100S-HP User Guide, section Using the Auxiliary Inputs and Outputs, p. 43*.

Remote Interfaces

- RS-232 C remote control (SUBD-9 connector).
- GPIB remote control (IEEE-488.1 connector).

Remote commands are available in *T100S-HP Programming Guide*.

Labels

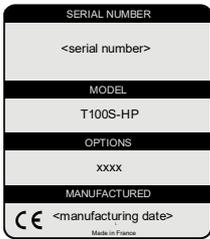
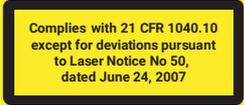
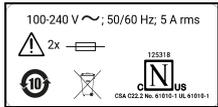
Label	Description
	Identification of the Product Indicates serial number, model number, options (if any), and date of manufacture.
	Manufacturer Identification Contact information of the manufacturer.
	Class 1M Laser Product The product is a class 1M laser product. For more details, see section <i>Optical Safety Instructions, p. 6</i> .
	Power and Compliance <ul style="list-style-type: none"> •  indicates an injury hazard. It appears on a location that requires special instructions for proper use: see section <i>Connecting the T100S-HP to a Power Source, p. 17</i>. •  : see section <i>Safety Symbols on Your Product, p. 4</i>. •  : the fuse types are described in section <i>Technical Specifications, p. 8</i>. • Compliances: see <i>T100S-HP User Guide, section Certification and Compliance, p. 61</i>.
	Warranty Seal The product cover must not be open, otherwise the warranty is not valid anymore.

Table 9: Rear Panel Labels

2. Installing and Connecting the Product

2.1 Unpacking and Installing the Product

Subject When used as a stand-alone bench-top product, this product is designed so that the feet leave enough room under the product to enable proper ventilation. The apertures (under the product) and the fan (behind the product) are used for the inside ventilation.



Caution

- Make sure there is sufficient clearance below and at the back of the product to ensure proper ventilation. The apertures (under the product) and the fan (behind the product) are used for the inside ventilation.
- If you plan to rack-mount this product, make sure to allow at least a 15-mm (0.6 inches) gap between two products.
- Always keep the unit and its surroundings clean, free of dust and dirt, even if you are not using it.
- The T100S-HP is not designed for outdoor use. Do not expose the product to rain or excessive moisture. To avoid the possibility of injury, do not operate the product in the presence of flammable gases or fumes.

Procedure

1. Pull out the product from its packaging: hold it by its two retractable handles and keep it horizontal.



Important

When unpacking, handle the product with care and do not damage the original shipping container in case the product needs to be returned to EXFO.

2. Set the product on a flat stable surface free of excessive vibration.
3. Keep the original shipping container, for use in case the product needs to be returned to EXFO for repair or servicing.
4. Allow the flow of air from the cooling fan to circulate freely around the product and remove any equipment or paper that could block the air-flow.
5. On the rear panel (see *Figure 2, p. 14*), make sure the power switch is set to **0**.
6. On the front panel, in the OUTPUT area, make sure the key-lock switch is in **STBY** position before applying power.
7. Place the T100S-HP in the wanted operating position as illustrated in *Figure 3, p. 16*. To tilt the T100S-HP upward, deploy the two retractable legs located below it.



Figure 3: Possible operating positions (bench-top)

2.2 Connecting the T100S-HP to a Power Source

Before Starting



Warning

- Make sure the product power source does not apply more than 265 Volts RMS between the supply conductors or between either of the supply conductors and the ground.
- To avoid the possibility of injury, make sure the socket outlet in which the power supply cord will be plugged is equipped with a protective ground contact, and that the electrical installation fulfills the local safety requirements.
- The T100S-HP has a chassis connected to ground via the power supply cable. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Procedure

1. Make sure the power adapter is not plugged to the wall socket.
2. Make sure the power switch is set to **0**.
3. Connect one end of the power supply cable to the rear panel of the product and plug the other end to the proper voltage mains supply point. The T100S-HP is equipped with a self-regulating power supply that adapts to both AC 110V and 230V voltages, and 50 Hz or 60 Hz frequencies.

2.3 Connecting External Optical Devices to the product

Subject

You can connect external optical components and instruments to the T100S-HP.



Caution

Keeping fiber-optic connectors clean at all times is essential to achieve optimum system performance. Refer to the cleaning instructions in *T100S-HP User Guide*, section *Cleaning and Caring for Optical Connectors and Fibers*, p. 56. The standard output connector is a FC/APC connector. Never connect another type of connector to the optical output.

Before Starting



Warning

- The use of optical instruments with this product will increase eye hazard. Do not under any circumstances look directly into the fiber end of an optical cable attached to the optical output while the device is in use for this may cause permanent eye damage and possible loss of eyesight. Note that the laser radiation is not visible to the human eye, therefore, protective cap must always be replaced on the laser output connector after use to avoid involuntary exposure to laser radiation.
- Disable the laser output before connecting or disconnecting a fiber optic cable on the product.

Procedure

1. Make sure fiber-optic connectors are clean.
2. On the front panel, in the OUTPUT area, remove the protective cap and connect external optical components and instruments to the T100S-HP via the FC/APC fiber-optic connector.



Caution

- To avoid damage to the laser output, always use a FC/APC type connector. To connect other types of connectors such as FC/PC, make sure to use the appropriate FC/APC converter.
- To help protect the laser output, leave a fiber-optic cable connected to the product while making connections to other devices. When the laser output is not connected, always install the protective cap.

3. Turning on/off and Initializing the Product

3.1 Initializing the Laser

Before Starting



Caution

If the T100S-HP has previously been shut down (see section *Shutting Down the Product*, p. 20), you must wait at least thirty seconds before initializing the laser again.



Warning

While the system initializes the laser, it performs the internal wavelength referencing just after the initialization routine: the T100S-HP produces a laser beam, even if the system is in **Disable** mode.

To avoid eye damage, do not look into the laser output or into the end of an optical cable. Even though the laser radiation is not visible, the intense infrared light can cause eye damage.

Procedure

1. Make sure the key-lock switch on the front panel is in **STBY** position.
2. Set the rear panel **MAINS** power switch to the **I** position to turn on the product.
3. Turn the front panel key to the right to set it to **ON**.



Caution

Do not switch the product off before the system is fully initialized.

- The product performs the initialization routine, the message `Initializing` appears.

The T100S-HP performs self-checks during initialization sequence. Under MODE, the LED of the APC key is lit. Power setting is set to zero before the laser is powered up.

- The message `Referencing...` appears to indicate that the system is performing its self-calibration (internal wavelength referencing). This message clears once the laser is initialized and ready for operation.

For optimum system performance, we recommend you to let the T100S-HP perform its self-calibration routine when turning on the system.

4. To skip the self-calibration step (skip `Referencing`): while the message `Initializing...` is displayed, press the **0** key.

Once the initialization routine is complete, the laser output is ready to be enabled:

- The cavity laser is tuned on its central emission wavelength (depending on the model).
- In the DATA area:
 - The first display shows the wavelength (λ)
 - The second display shows the output power (P)
 - The third display shows the message `Disabled`.

3.2 Enabling/Disabling the Laser Output

Subject For laser safety reasons, the T100S-HP laser output is not immediately enabled after system turn-on and initialization.
After the initialization routine, the T100S-HP is in Disabled mode, as shown on the third display (DATA area).



Important

For laser safety reasons the T100S-HP features a Remote Interlock connector at the rear-panel that can connect to an external remote interlock switch. When the interlock switch is open, the laser output is turned off. To enable the laser output, the interlock switch must be closed (see *T100S-HP User Guide*, section *Installing the Remote Interlock*, p. 23).

Procedure

1. To enable the laser output: in the DATA area, press the **Enable** key.
On the third display, the message `Disabled` is replaced with diode current I.
The **Enable** LED is lit to indicate that the T100S-HP is emitting a laser output.
2. To disable the laser output: in the DATA area, press the **Enable** key again and check that the **Enable** key LED is off.
On the third display, the message `Disabled` appears.

3.3 Shutting Down the Product

Subject The following procedure explains how to shut down the product. Do not turn on and off the system repeatedly and too rapidly.



Warning

Do not unplug the fiber-optic cable from the laser output connector while the laser is still enabled. Exposure to the laser beam is potentially harmful.

Procedure

1. In the DATA area, press the **Enable** key to disable the laser output and make sure the message `Disabled` appears on the third display.
2. On the front panel, in the OUTPUT area turn the key-lock switch counterclockwise to the STBY position.
The message `Parking...` displays and the optical head is automatically moved to its parking position.
3. Wait a few seconds until complete system shutdown.



Caution

During system shutdown, DO NOT TURN OFF the system with the rear panel O/I switch. The optical head must be parked when transporting the product.

4. If you want to move the product, or if it is not going to be used for a long period of time, set the MAINS power switch on the rear panel to the **O** position.



Caution

Before transporting the product, make sure the system is completely turned off.

5. If you want to initialize the laser again, wait at least 30 seconds.

For full details on how to use the T100S-HP, see *T100S-HP User Guide* available on the USB key provided with the instrument.