WE LASER
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FYLA HORIZON

User Manual

v02

2025

FYLA LASER SL

Ronda Guglielmo Marconi, 14

Parque Tecnológico Paterna

(46980), Valencia (Spain)

support@fyla.com

WARNING_____

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

_____

IMPORTANT_____

_____

CERTIFIED ISO 9001

CONTENTS

GENERAL INFORMATION

Introduction

All the instructions in this User Manual must be followed before installation and operation. Damage to persons, material or laser system can be produced from not following the steps and indications of this Manual.

FYLA cannot be held responsible for any damages which result from using or working with the system described below. The laser must be only used by qualified personnel after reading this manual carefully.

Important Indicators

WARNING_____

CONTAINS SECURITY INSTRUCTIONS. NOT FOLLOWING THEM MAY RESULT IN IRREVERSIBLE DAMAGE.

_____

IMPORTANT_____

Contains important information.

_____

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fyla@fyla.com

Warranty

FYLA LASER S.L., standard warranty guarantees its lasers to be free of defects for one year from the date of shipment but could be extended. Detailed information regarding the warranty for our products can be obtained through our sales team. Please consult with them the specific terms and conditions that apply to your purchase. This warranty is in lieu of all other guarantees, expressed or implied, and does not cover incidental or consequential loss. Damaged caused by the user to the laser and/or its accessories because of misuse (voluntary or accidental) of the equipment, will void the warranty.

Information in this document is subject to change without notice.

IMPORTANT_____

Save the shipping container and packing material for future shipping needs and keep the guarantee of your laser unit.

_____

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Laser Specifications

FYLA HORIZON SERIES SPECIFICATIONS*	
Repetition rate	80 MHz
Spectral Range	450-2300 nm
Average output power	> 3 W
Visible range (450-750 nm) average power	~ 250 mW
Pulse duration	< 10 ps @ 1060 nm | < 250 ps full spectrum* *Estimated value
Average power stability	≤ 0.5 % (std. dev.)
Polarization	Unpolarized
Output port	Single mode fibre. 1 m length (customizable)
Optical output	Collimated (450 – 1000 nm range). Single mode across full spectrum
Synchronization	TTL (SMA), NIM (SMA) Under request
Beam diameter @ 1m of distance	@ 470nm ≤ 2mm @ 580nm ≤ 2.5mm @ 725nm ≤ 3.5mm @ 1150nm ≤ 5.5mm
Spatial mode quality (M^2)	< 1.2
Cooling	Thermoelectric cooler and air cooling
Power requirements	110 – 220 V, 50/60 Hz
Power requirements tolerance	± 10 %
Operating temperature	20 – 30 ºC
Storage temperature	0 – 60 ºC
Dimensions	436 x 560 x 151 mm (WxDxH)
Control	Manual / GUI via USB
Safety Connections:	Interlock / Key

*Specifications are subject to change without notice

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/ Additional information

Laser Security:

This product is a Class 4 laser.

CAUTION – VISIBLE AND INVISIBLE LASER RADIATION AVOID EYE AND SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

Appropriate safety measures according to such laser class should be taken in its installation and use.

Warranty:

24 months warranty or > 10,000h of continuous operation.

Extended warranty on request.

Laser Identification

FYLA HORIZON SERIES IDENTIFICATION	
Series name	**Version**
HORIZON Indicates the series of the laser	vx Indicates the version of the laser

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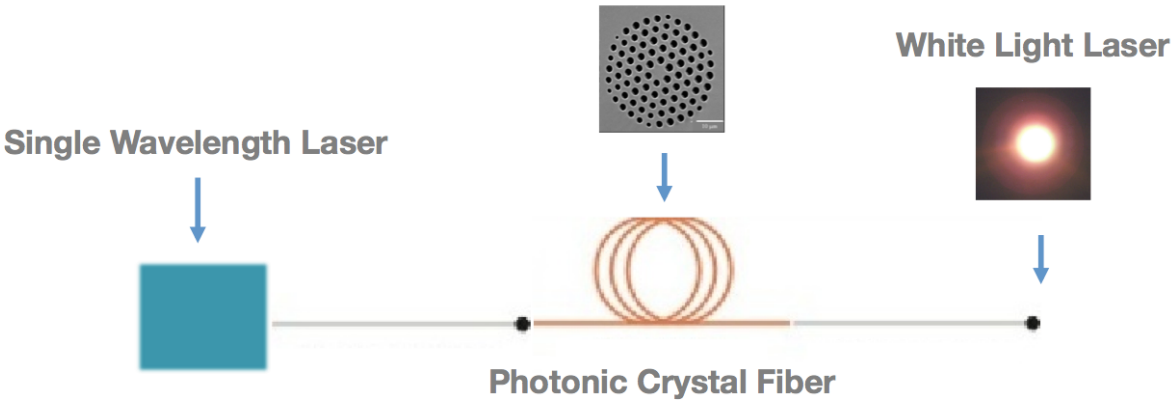
Description of the laser system and its use

The acquired equipment, FYLA HORIZON series supercontinuum laser, is intended to be used as illumination source. Supercontinuum is a white light ultra-broadband source with the properties of high brightness, spatial coherence and directionality of a laser. Consequently, it offers unparalleled performance for a wide range of applications which are even not possible with other type of light sources. The figure below illustrates a scheme of how a supercontinuum light is generated. A single wavelength laser pumps a photonic crystal fibre (PCF). The high brightness of the light confined by the PCF generates a concatenated process of optical nonlinear effects, giving rise to a laser emission with ultra-broadband spectrum.



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USER SAFETY

Introduction

Your safe and effective use of this product is of utmost importance to us at FYLA.

The product is safe within the following conditions according to electrical safety standards:

- Temperature range of 5 to 40 ºC.
- Overvoltage category: II
- Temporary overvoltage that occurs in the electric power network
- Relative humidity: max. 80% for temperatures until 31ºC.
- Altitude: < 2000m
- Pollution degree: 2

Please read the following laser safety information before attempting to operate the laser.

Laser Safety

Standard 60825-1 specifies that to classify laser products that emit at multiple wavelengths, if these are comprised in the additive spectral regions for the eye and / or the skin, the laser product is assigned to a class when the sum of the ratios of the accessible laser emission (AE) to the AELs (Accessible emission limit) of those wavelengths is greater than unity for all lower classes but does not exceed unity for the class assigned.

The company FYLA LASER, S.L. has characterized the power that the HORIZON series laser emits at each wavelength range.

Since the visible and infrared wavelengths are additive for both, eyes and skin, the class assigned to the product will be class 4.

In all cases, the accessible emission, AE, exceeds the maximum permissible emission, MPE, the radiation limit that the tissue of the eye can withstand without suffering any damage. The excess of MPE is in all cases greater than unity and, therefore, users must take protective measures to use the laser.

Nominal ocular hazard distance, NOHD, is defined as the distance from the output aperture beyond which the beam irradiance or radiant exposure remains below

the appropriate corneal maximum permissible exposure (MPE). As the output of FYLA HORIZON series supercontinuum laser is collimated, the NOHD is infinite and has not been considered in the study because it is not relevant.

The correct level of protection for laser safety eyewear, LSE, for these products depends on the wavelength. The safety glasses must meet the requirements of all wavelengths that are being used simultaneously. Please, make sure that these requirements are met when acquiring the goggles.

If protective goggles are not found on the market for the working wavelengths, collective measures (enclosures) and administrative measures (working procedures) should be applied to properly ensure operator safety.

WARNING_____

THE LASER RADIATION EMITTED FROM THIS UNIT MAY BE HARMFUL. ALWAYS FOLLOW THESE PRECAUTIONS:

- ALWAYS WEAR PROTECTIVE GOGGLES OR EYEGLASSES APPROPRIATE FOR WORKING WITH CLASS 4 LASER LIGHT.
- AVOID DIRECT EXPOSURE TO THE BEAM.
- AVOID LOOKING AT THE BEAM DIRECTLY.
- BE AWARE OF THE WARNINGS ON THE SAFETY LABELS STUCK ON THE EQUIPMENT.
- THE LASER PROVIDES A HARDWARE INTERLOCK CONNECTOR WHICH CAN BE ACTIVATED IN CASE OF MACHINE FAILURE TO STOP THE EMISSION.
- DO NOT OPEN THE LASER SYSTEM. THERE ARE NO USER-SERVICEABLE PARTS INSIDE THE UNIT.
- THE USER WILL NEVER NEED TO OPEN THE LASER SYSTEM. UNAUTHORISED OPENING OF THE LASER WILL VOID THE WARRANTY AND MAY RESULT IN UNDERPERFORMANCE OF THE LASER AND/OR IRREPARABLE DAMAGE TO THE INTERNAL COMPONENTS.

_____

IMPORTANT_____

The HORIZON device has an Interlock connector for security reasons. We recommend connecting it through a safety relay.

_____

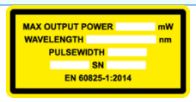
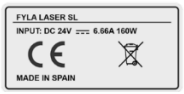
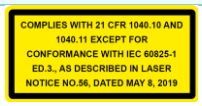
IMPORTANT_____

The HORIZON device has a functional ground connection. We recommend connecting the ground cable included with the equipment when used at radiation environments to avoid possible malfunctioning of the equipment.

_____

Labels and symbols identification

The following table explains the meaning of the different labels sticked to the laser equipment and the reference number to identify them in the following pictures. Please be aware of them and use caution when working with the laser. Please use the same labels to properly indicate the area where the laser product is used.

Labels	Explanation	Number
	Radiation warning	2
	Caution, possible risk	7
	Laser output	1
	Laser characteristics	4
	Explanation on laser radiation class and how to avoid damage	5
	General information	3
	Ground connection	6
	Performance standard label	*

* Only used with equipment to be sent to EEUU.

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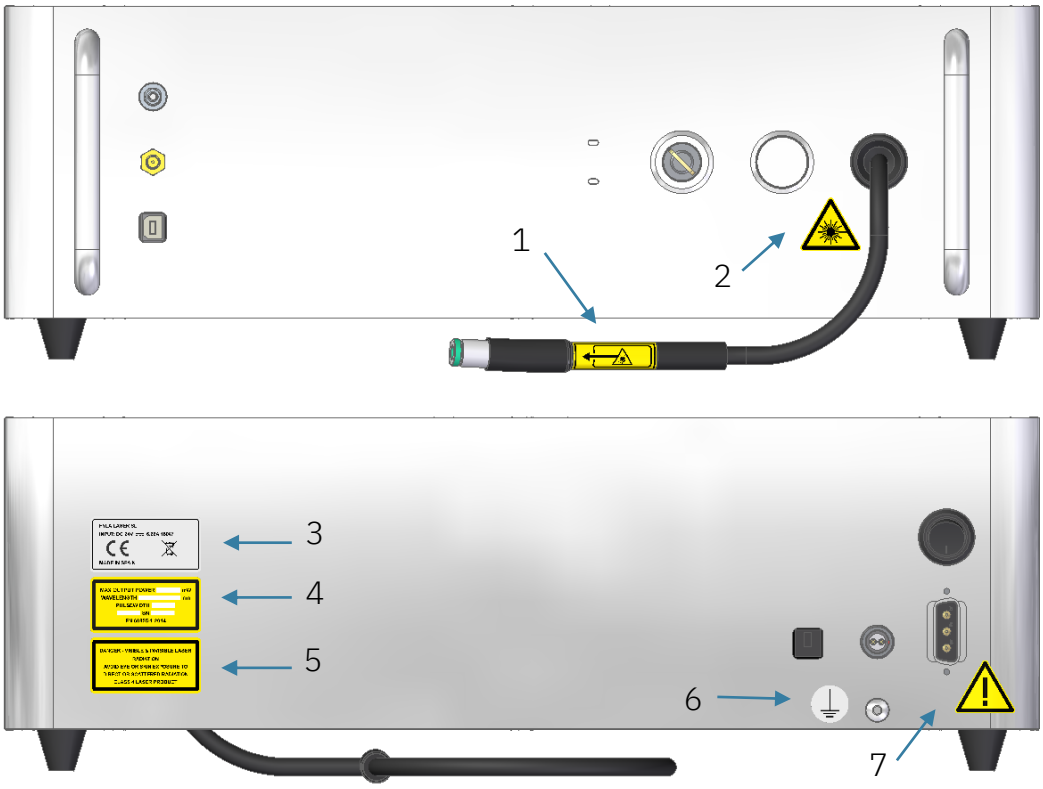

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Certification Standards

FYLA LASER, S.L declares that the device described below, due to its design and construction, as well as its manufacturing method, complies with the essential requirements of the applicable Directives, as well as the harmonized European standards of safety of laser products.

Name of the series device:	HORIZON
Type:	Supercontinuum Laser Source
CE Directives applied:	Directive on Electromagnetic Compatibility (2014/30/EU)
	Directive on Low Voltage (2014/35/EU)
	RoHS (2011/65/EU)
Harmonized Norms applied:	Safety of Laser Products EN 60825-1:2014

CE

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QUICK START

Unpacking the System

Carefully unpack the laser system and place it in horizontal position so that the laser system is supported on its rubber legs. Compare the contents against the list below and inspect them for any signs of damage. If parts are missing or you notice any signs of damage, please contact FYLA immediately.

IMPORTANT_____

Save the shipping container and packing material for future shipping needs and to keep the guarantee of your laser unit.

_____

IMPORTANT_____

To carry the laser system from one place to another make sure that the position remains horizontal at each moment.

_____

IMPORTANT_____

The function of the handles installed in the equipment is just to move the equipment when it is inside a rack setup. DO NOT USE these handles to carry the laser from one position to another in any other case.

_____

WARNING_____

DO NOT OPEN THE LASER SYSTEM. THERE ARE NO USER-SERVICEABLE PARTS INSIDE THE UNIT.

_____

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WARNING_____

THE USER WILL NEVER NEED TO OPEN THE LASER SYSTEM. UNAUTHORISED OPENING OF THE LASER WILL VOID THE WARRANTY AND MAY RESULT IN UNDERPERFORMANCE OF THE LASER AND/OR IRREPARABLE DAMAGE TO THE INTERNAL COMPONENTS.

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WARNING_____

IF THE WARRANTY STICKERS OF THE EQUIPMENT SHOW SIGNS OF HAVING BEEN REMOVED OR DAMAGED IN ANY WAY, THIS WILL VOID THE WARRANTY.

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Items within a FYLA HORIZON series unit package:

- In-fibre laser unit and packaging box
- AC Cable
- Functional ground cable
- Power supply
- USB AB Cable
- Laser Keys
- LEMO Interlock Connector
- Specifications inspection sheet

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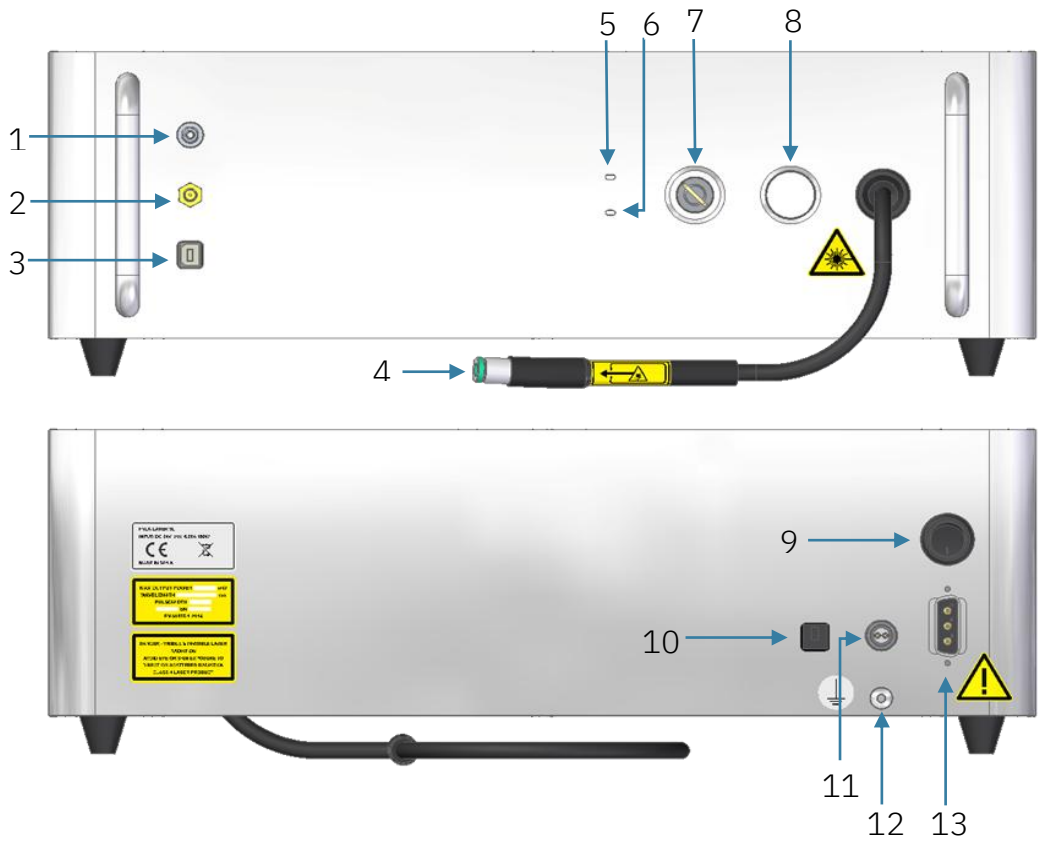
System parts



1. OPTICAL REFERENCE (FC/APC CONNECTOR)
2. ELECTRICAL REFERENCE (TTL)
3. USB PORT
4. COLLIMATED LASER OUTPUT
5. EMITTING LED INDICATOR
6. READY LED INDICATOR
7. KEY
8. ACTIVATION PUSH BUTTON
9. POWER SWITCH
10. FIRMWARE UPGRADE PORT
11. INTERLOCK
12. FUNCTIONAL GROUND CONNECTION
13. POWER INPUT CONNECTOR

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Before installing the laser, please follow the next indications to select an appropriate location of operation:

WARNING_____

AVOID LOCATIONS WHERE THE LASER IS EXPOSED TO EXTREME TEMPERATURES AND HIGH HUMIDITY.

_____

WARNING_____

AVOID LOCATIONS WHERE THE LASER IS EXPOSED TO MECHANICAL VIBRATIONS.

_____

IMPORTANT_____

The product is designed to work properly in the temperature range of 20 °C to 30 °C. The humidity must not exceed 50%. Please select a location according to these specifications.

_____

Setting Up

The laser is configured at the factory for the line voltage and frequency appropriate for your country. If you are unsure how your unit is configured, check "AC Operating Voltages" for more details or ask FYLA through sales@fyla.com or support@fyla.com

In case the functional ground connection is used, connect the functional ground cable provided with the equipment. The cable must be connected as in the following picture, with one end fixed to the functional ground connection screw of the equipment and the other end attached to your ground connection.

Unpack the system

1. Make sure that all the safety measures (pages 6 – 10) are met.
2. Place the laser on a stable surface in horizontal position and make sure that there is enough space around system to safely disconnect the power supply and LEMO Interlock connector.
3. Remove the output protection and point the laser head of the fibre in a safe direction.
4. Connect the AC Cable to the power supply and the power supply to the rear “Power input” connector.
5. Turn ON the “Power switch”.
6. Plug in the interlock connector.
7. Turn the personal key to the “ON” position. The LED “Ready” in the front panel will switch ON when the laser is ready to be used.

To start operating the laser move on to the next section.

Operation

WARNING_____

THE LASER RADIATION EMITTED FROM THIS UNIT MAY BE HARMFUL. PLEASE FOLLOW ALL THE SAFETY INSTRUCTIONS INDICATED IN THE SAFETY SECTION BEFORE OPERATING THE LASER.

_____

ON – Turn the activation push-button to “ON” position. The laser spot output will be generated after several seconds.

OFF – Turn the activation push-button to “OFF” position. The laser spot output will disappear.

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USING THE FYLA HORIZON

Manual ON/OFF Switching

Switching ON

Once the laser is powered, remove the tap of the laser output head and insert it in a proper holder. The output head of the FYLA HORIZON series supercontinuum laser is a collimator, with a standard cylindrical shape of half inch diameter, compatible with standard half inch optic holders.

IMPORTANT_____

You may perceive that the output collimator is assembled with an 8º angle with regard to the fibre patch cord longitudinal axis. THIS IS NOT A DEFECT. So please DO NOT force the fibre termination assembly to “correct” this.

_____

In fact, this helps to avoid back reflections into the system and ensures an emitted beam correctly aligned in the direction of the longitudinal central axis of the collimator.

Assure that the interlock LEMO connector is plugged in.

Insert your personal key provided by FYLA in the key switch from the front panel. Turn the switch ON by rotating the key clockwise. The TEC module is activated and brings the laser to a set point temperature of 25ºC. Wait several minutes until the temperature reaches 25ºC, then go to the next step.

IMPORTANT_____

The HORIZON laser is designed to be operated at the ambient temperature from +20 ºC to +30 ºC. Before turning on the laser, allow it at least 30 minutes to reach room temperature. The laser integrates an internal sensor which is measuring the ambient temperature.

_____

WARNING_____

TURNING ON A LASER THAT IS TOO COLD OR HOT MAY DAMAGE IT.

_____

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WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

The frontal panel “Ready” LED will switch ON when your FYLA HORIZON series supercontinuum laser is ready to be used.

To activate the laser, push the activation push-button to ON state. While the laser gets activated the white light of the button will be blinking. Fixed white light for both “Ready” and “Emitting” LED indicates ON state.

WARNING_____

IN CASE THERE IS NO LIGHT AT THE OUTPUT WHEN THE “EMITTING” LED IS ON, PLEASE TURN OFF IMMEDIATELY THE LASER AND CONTACT FYLA AT SALES@FYLA.COM/SUPPORT@FYLA.COM

_____

WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

During the activation process the SEED undergoes several attempts to be switched ON. In the case that the SEED start fails, or another error occurred the “Ready” LED in the front panel will be blinking for several seconds.

In the case of SEED start failure, the switching ON procedure will not be carried on since the optical amplifier stage can be damaged. In this case, the user should proceed to repeat the switching ON process again from step 2.

If the SEED start fails after several trials, please contact technical service.

After a successful SEED start, the laser beam will be delivered in 5-15 seconds, identifiable as a white spot when projected on a screen.

WARNING_____

THE LASER RADIATION EMITTED FROM THIS UNIT MAY BE HARMFUL. PLEASE FOLLOW ALL THE SAFETY INSTRUCTIONS FROM PAGES 6 – 10.

_____

In operation, all the indicators in the front panel should be ON (READY LED, EMITTING LED and PUSH BUTTON LED)

Switching OFF

WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

To deactivate the laser, push the activation pushbutton to the OFF state. The laser signal is deactivated but TEC remains working. The activation pushbutton can be switched ON from this intermediate position to activate the laser again.

Turn the frontal panel key OFF by rotating it counterclockwise. The frontal panel READY LED will switch OFF.

Turn OFF the rear panel power switch to switch off the power supply ONLY when both indicators, READY LED and EMMITING LED, are off.

The power supply can be disconnected, if necessary, ONLY when these previous steps have been fulfilled.

WARNING_____

DO NOT DISCONECT THE POWER SUPPLY FROM THE LASER AS A MEANS TO TURN THE LASER OFF. FOLLOW THE INSTRUCTIONS TO TURN OFF THE LASER PROPERLY. OTHERWISE, THE LASER MAY BE DAMAGED FROM WRONG DEACTIVATION.

_____

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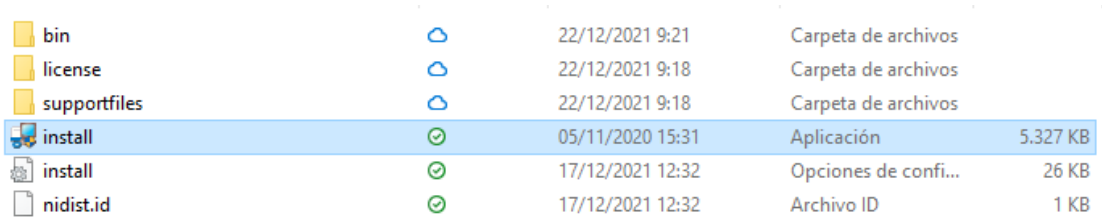
Software ON/OFF Switching

The FYLA HORIZON series supercontinuum laser can be controlled using the FYLA LASER's User Interface (UI) software. All laser functions can be controlled by the computer. The permanent communication between UI software and the laser provides you real time subsystems information.

To achieve correct communication between software and laser please follow the next steps:

1. Start Windows 7 or higher version.
2. Download the file sent by FYLA and copy the folder to your desktop.
3. Open said folder.
4. Next, open "Installer" and "Volume".
5. Click once with left button over "install".



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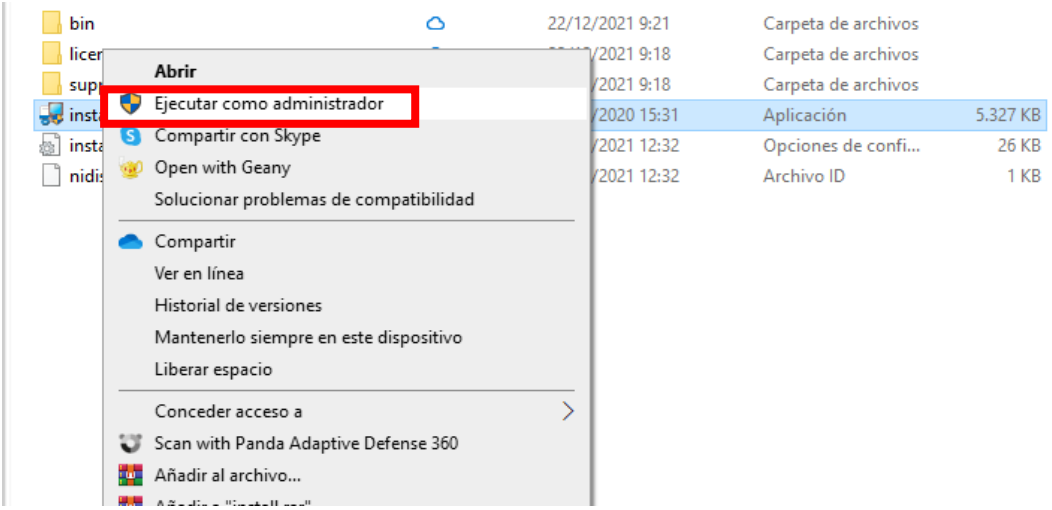
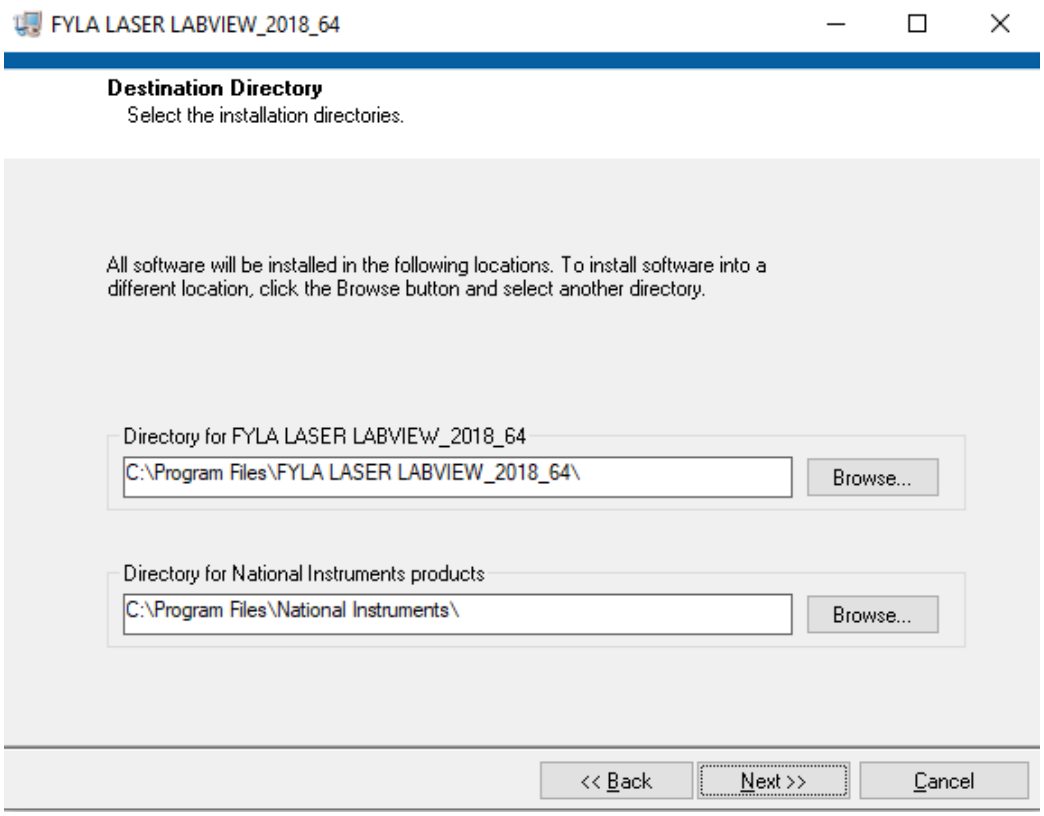
6. Click once with right button over “install” and the following submenu (see figure bellow) will appear. Click “Run as administrator” (marked in red bellow).

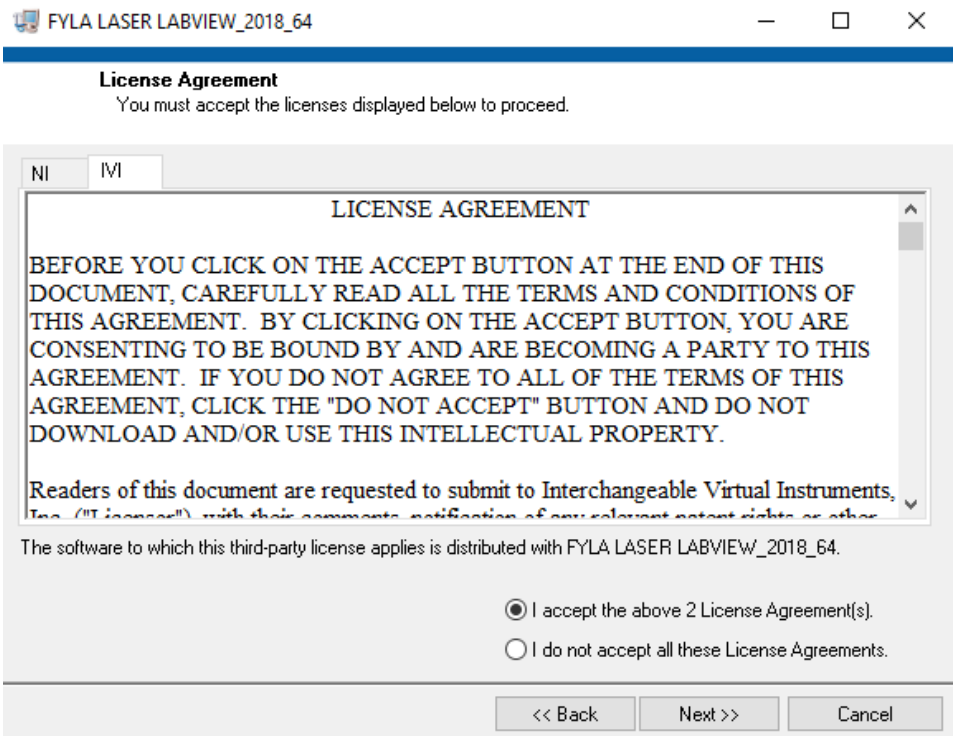


7. After that, it will appear a window. You will have to click the left option (where it says: YES).

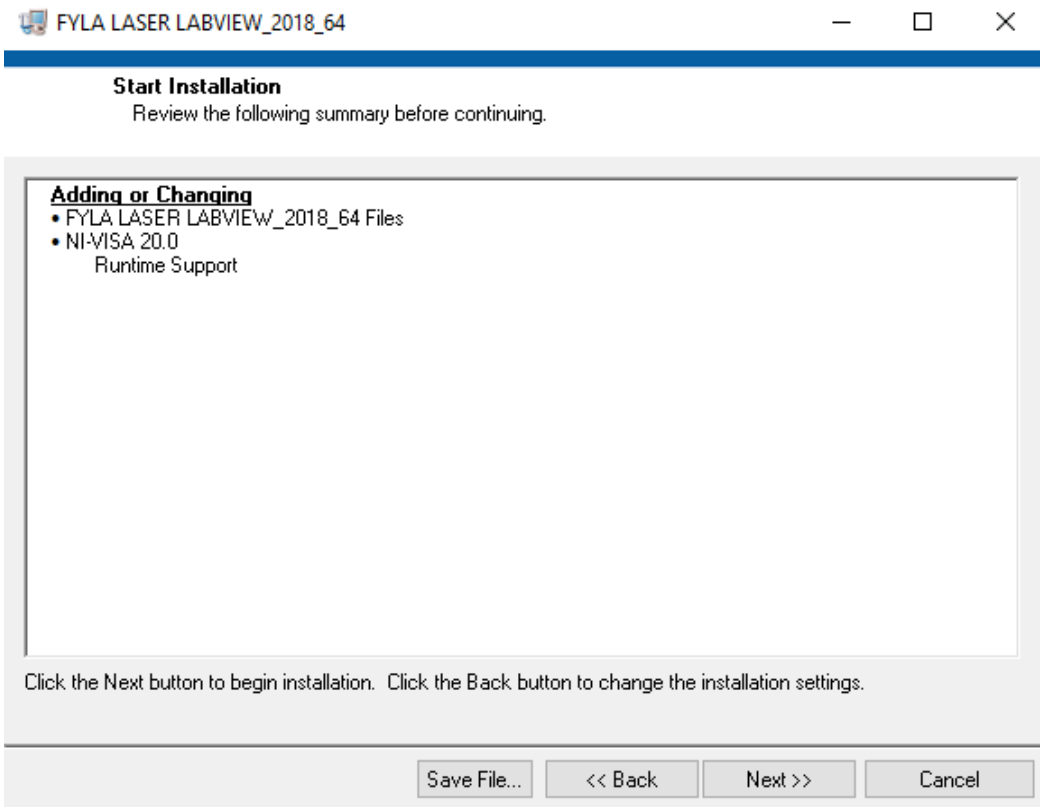
8. Then, select the destination directory and click “Next”.



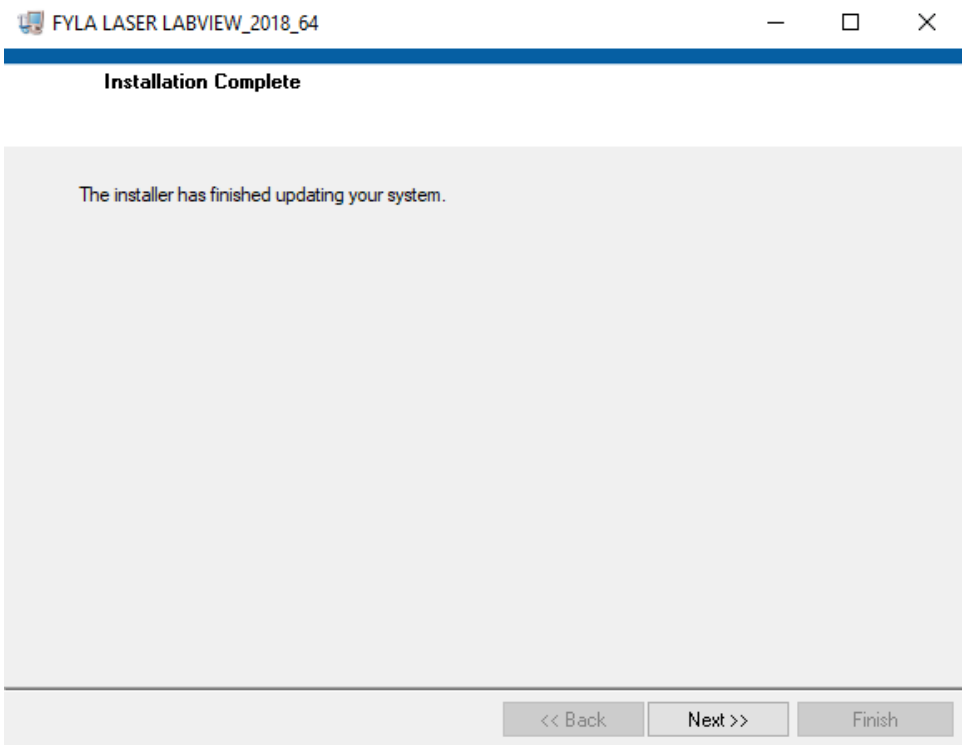
9. You will have to accept and click “Next”.



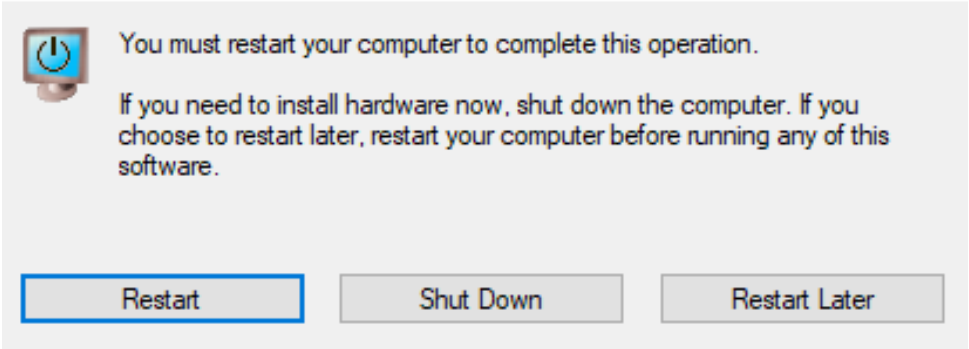
10. The installer window will look like this figure. Click “Next”.



11. Finally, click “Next”.

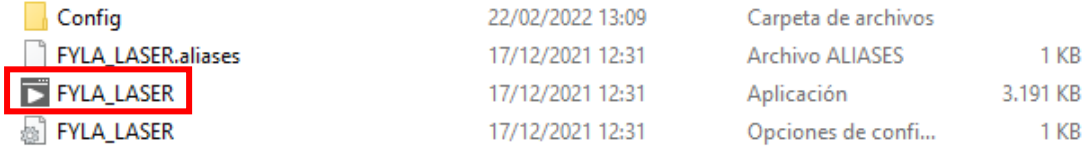


12. Choose one of the options bellow:



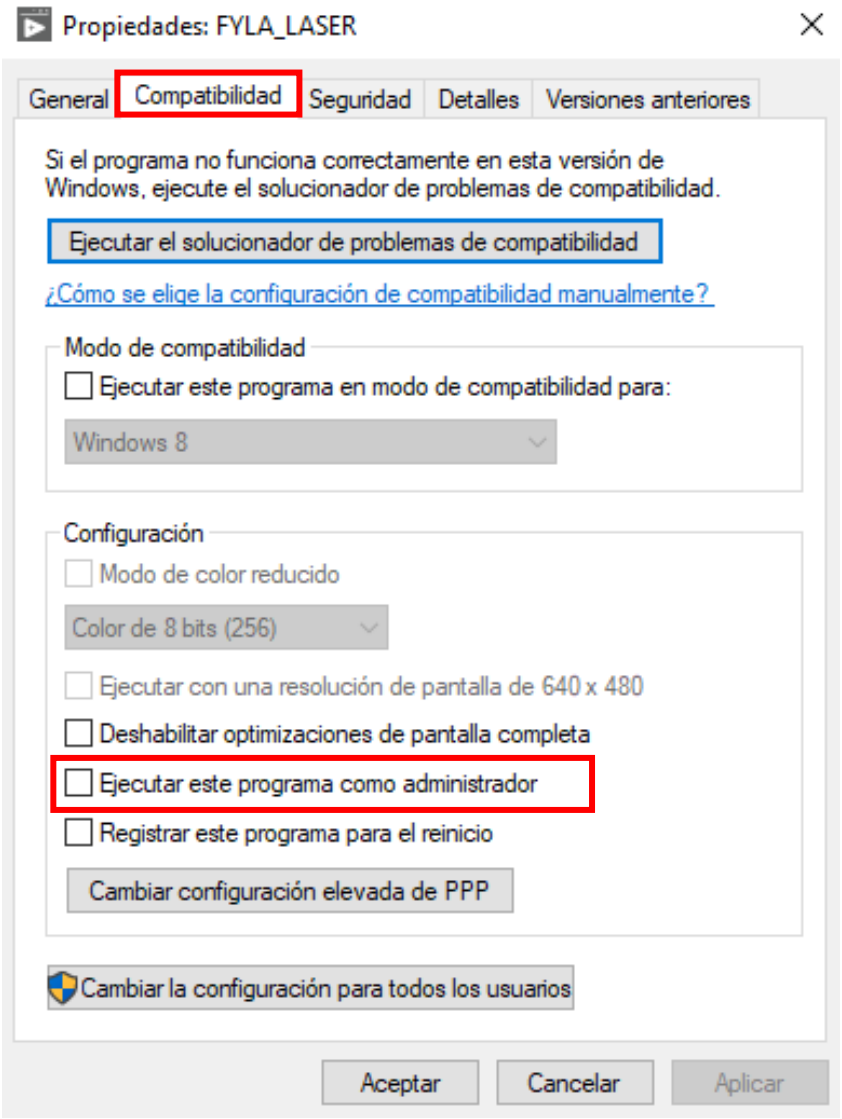
13. When the computer has been restarted, open again the first downloaded folder and enter in the “FYLA LASER” folder.

14. Finally, you will have to open “FYLA_LASER” and run as administrator.



15. Right-click on the "FYLA_LASER" file and select the last option "Properties"

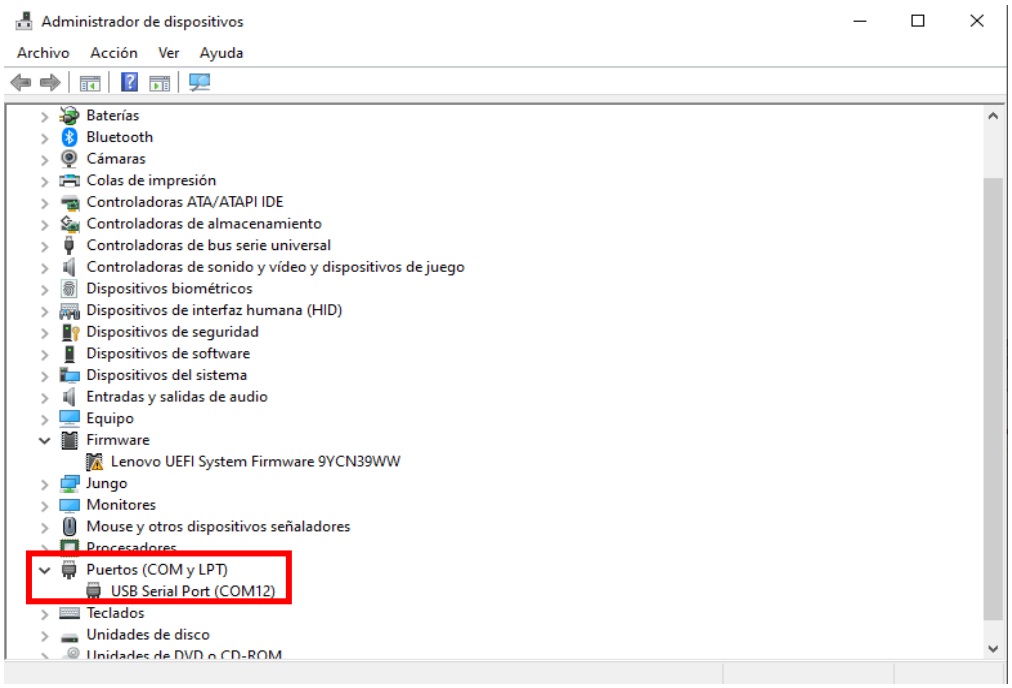
16. The next window will be displayed. Select "Compatibility" tab, then, click on "Run this program as an administrator"



17. Connect the USB cable provided by FYLA to your PC and to the laser. The USB port works in VCP (Virtual COM Port) mode. If your computer does not recognize the device automatically, please install the drivers from the following link:

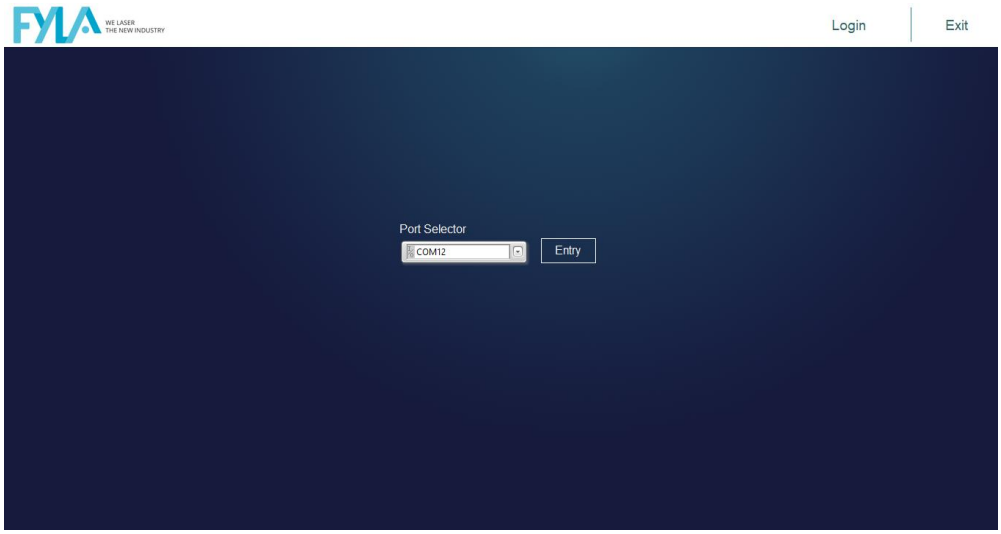
http://www.ftdichip.com/Drivers/VCP.htm

18. After the driver is installed, check the COM port number form: Device Manager / Ports (COM & LPT)

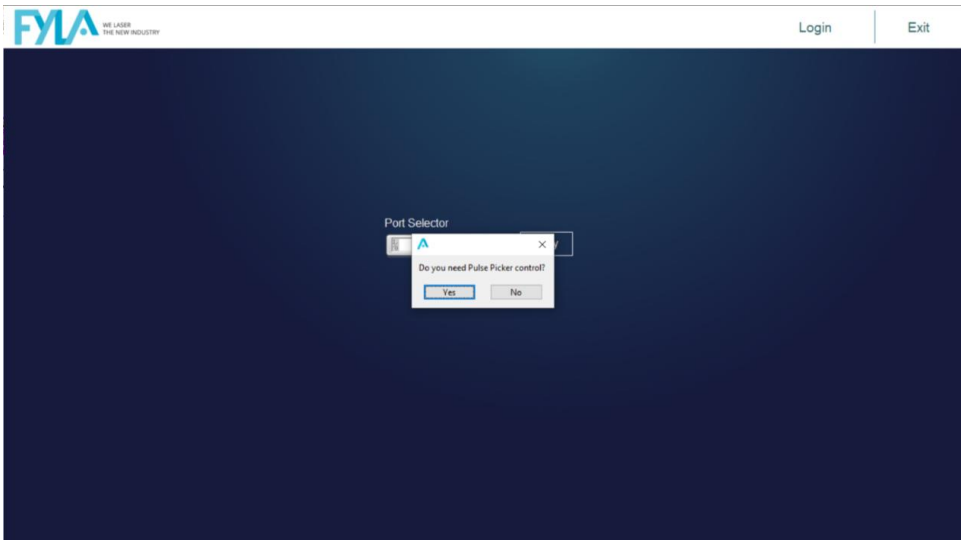


19. Next, double click on the FYLA's UI executable icon and run it as administrator. Then, the User Interface window will appear.

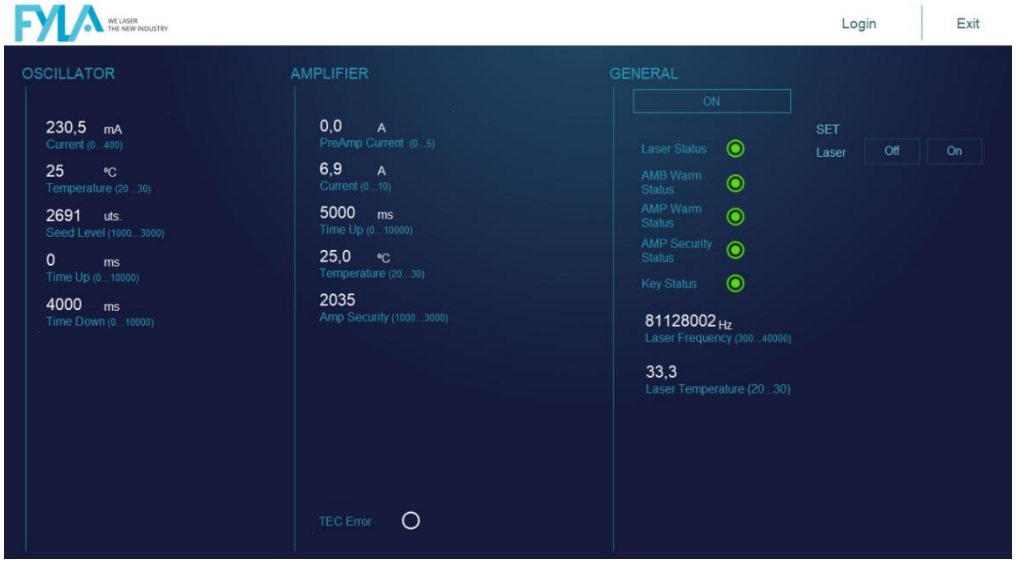
20. Choose the right port through the Port selector and click "Entry"



21. A dialogue box will also appear the first time the software is executed asking if the model of the equipment acquired is Standard or Customizable. Select the option according to the equipment the user is connecting, and the box will not appear again.



22. Next, a similar UI should appear on your screen:



The screen above shows monitors of different parameters of the laser system such as operating current, operating temperature, or the time it takes to be switched on.

Also, laser general information as Laser Frequency, Laser Ambient Temperature, or Security Status are shown.

Switching ON

Once the software is running and the system COM port is detected, remove the tap of the laser output head and insert it in a proper holder. The output head of the FYLA HORIZON series supercontinuum laser is a collimator, with a standard cylindrical shape of half-inch diameter, compatible with standard half-inch optic holders.

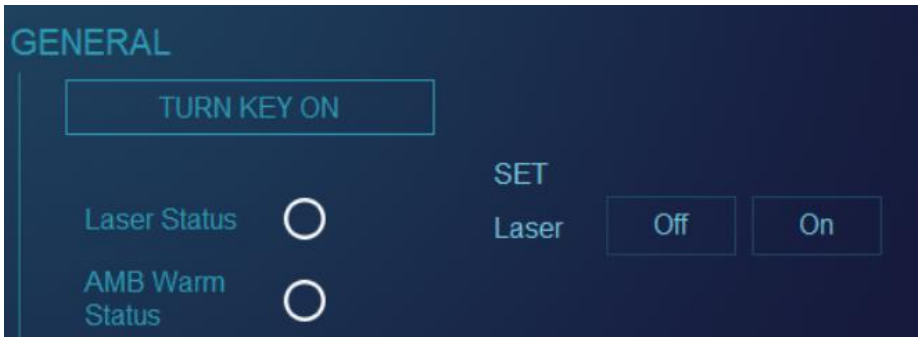
IMPORTANT_____

You may perceive that the output collimator is assembled with an 8 º angle with respect to the fibre patch cord longitudinal axis. THIS IS NOT A DEFECT. So please DO NOT force the fibre termination assembly to "correct" this.

_____

In fact, this helps to avoid back reflections into the system and ensures an emitted beam correctly aligned in the direction of the longitudinal central axis of the collimator.

The UI General box should display the message "TURN KEY ON" as in the figure below:



Ensure that the LEMO Interlock connector is plugged in.

Insert your personal key provided by FYLA in the key switch in the front panel. Turn the switch ON by rotating the key clockwise while pressing it slightly inward.

IMPORTANT_____

The HORIZON laser is designed to be operated at the ambient temperature from +20 ºC to +30 ºC. Before turning on the laser, allow it at least 30 minutes to reach room temperature. The laser integrates an internal sensor which is measuring the ambient temperature.

_____

WARNING_____

TURNING ON A LASER THAT IS TOO COLD OR HOT MAY DAMAGE IT.

_____

WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

The TEC module is activated and brings the Amplifier to a set point temperature of 25 ºC. The message “STABILIZING TEMP” will be displayed until the Amplifier temperature reaches 25 ºC.

The message “STABILIZING AMB TEMP” will be displayed while the ambient temperature is out of the range of 20 to 30ºC.

When your HORIZON Laser is ready to be used, the display will show the message “READY”.

To activate the laser, click the “ON” button near “Laser” indicator in the UI General Box.

While the laser gets activated the message “ENGINE” will be displayed. Fixed green indicator near the “Laser Status” and a message “ON” indicates laser emission.

WARNING_____

IN CASE THERE IS NO LIGHT AT THE OUTPUT WHEN THE SOFTWARE INDICATES THAT THE LASER IS ON PLEASE TURN OFF IMMEDIATELY THE LASER AND CONTACT FYLA AT SALES@FYLA.COM/SUPPORT@FYLA.COM

_____

After a successful SEED start, the laser beam will be delivered in 5-15 seconds, identifiable as a white spot when projected on a screen.

WARNING_____

THE LASER RADIATION EMITTED FROM THIS UNIT MAY BE HARMFUL. PLEASE FOLLOW ALL THE SAFETY INSTRUCTIONS FROM PAGES 6 – 10.

_____

In operation, all the indicators in the front panel of the laser system should be ON (READY LED, EMITTING LED and PUSH BUTTON LED) and the UI General box should display the message “ON”.

Switching OFF

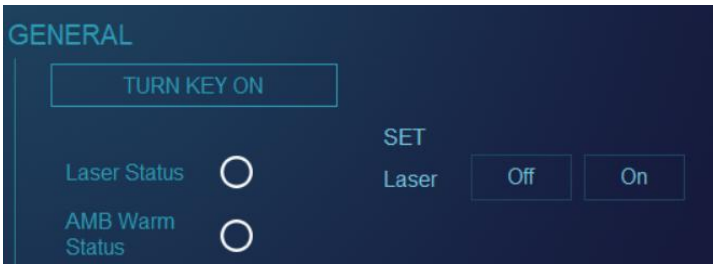
WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

To deactivate the laser, click the “OFF” button near “Laser” indicator in the UI General Box. The laser signal is deactivated but TEC remains working. The laser can be activated again from this intermediate position by clicking “ON” button again.

Turn the frontal panel key OFF by rotating it counterclockwise. The frontal panel READY LED will switch OFF and the message “TURN KEY ON” will be displayed.



Turn OFF the rear panel power switch to switch off the power supply ONLY when both indicators, READY LED and EMMITING LED, are off and the message “TURN KEY ON” is displayed by the interface.

The power supply can be disconnected, if necessary, ONLY when these previous steps have been fulfilled.

WARNING_____

DO NOT DISCONECT THE POWER SUPPLY FROM THE LASER AS A MEANS TO TURN THE LASER OFF. FOLLOW THE INSTRUCTIONS TO TURN OFF THE LASER PROPERLY. OTHERWISE, THE LASER MAY BE DAMAGED FROM WRONG DEACTIVATION.

_____

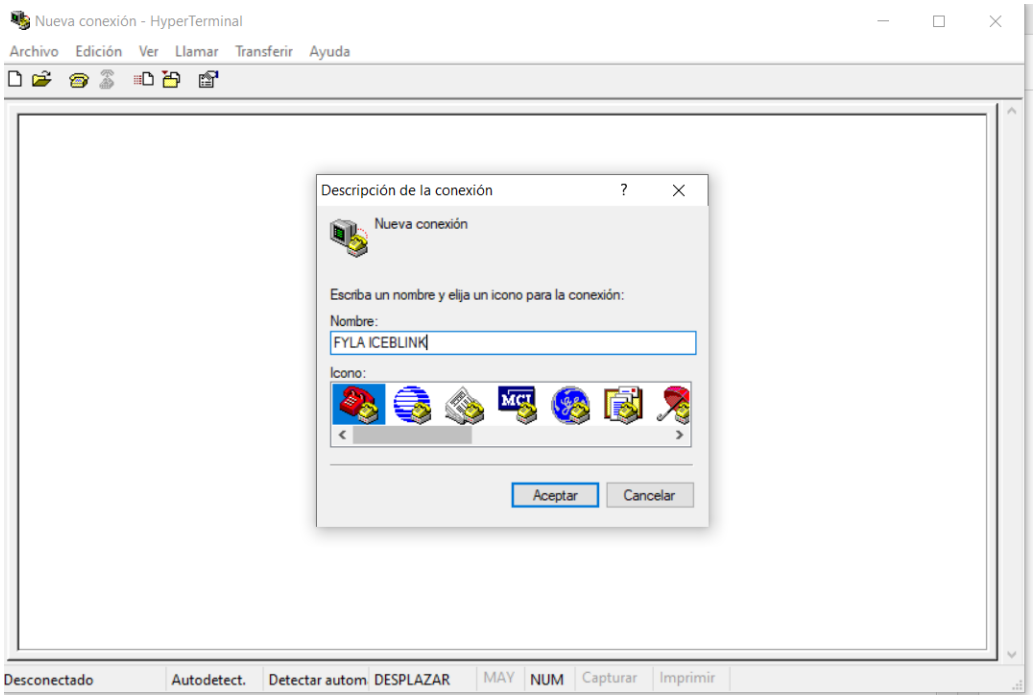
Switching ON/OFF via Serial Communication

The FYLA HORIZON series supercontinuum lasers can be controlled remotely via serial communication (RS232), using the USB connector in the front Panel. Please follow the next steps to achieve the communication:

1. Connect the USB AB cable between the PC and the equipment after the laser is ready to be used.
2. Check the number of the COM port: Control panel / Device Manager
3. Open Windows HyperTerminal and create a new connection. The name of the connection is “FYLA HORIZON”, but you can choose another name.

   The USB port works in VCP (Virtual COM Port) mode. If your computer does not recognize the device automatically, you can install the driver from this link:
   VCP Drivers - FTDI (ftdichip.com)

   Communication can be performed with any program of Terminal for RS232. In this case, we are using Windows HyperTerminal.



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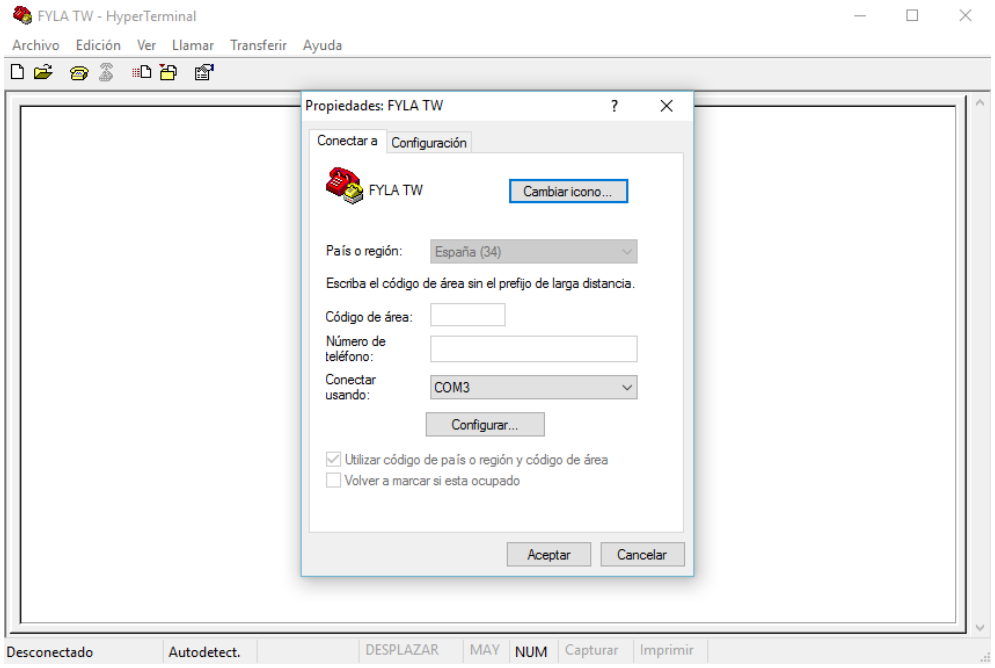
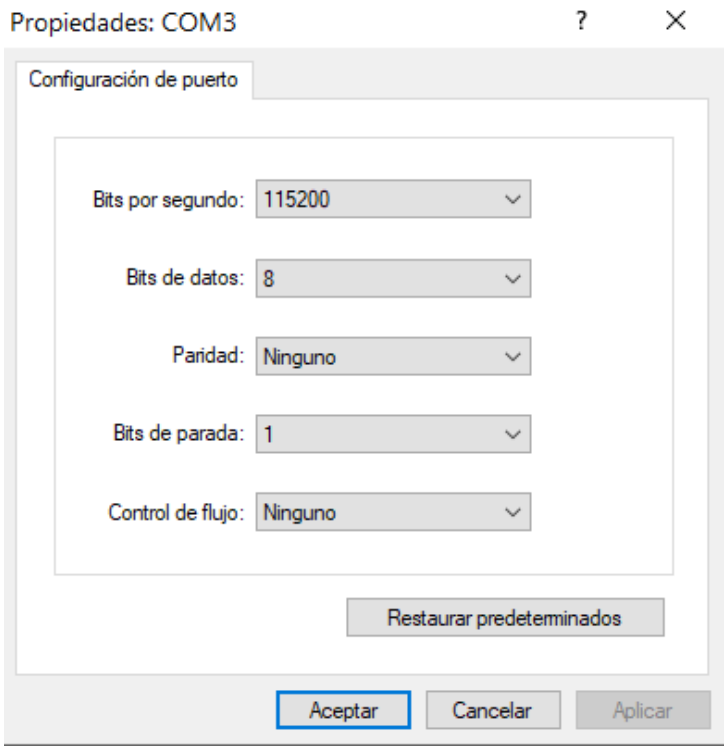
fyla@fyla.com

4. Select the detected COM port of the equipment.



5. Next, introduce the port configuration and click Accept.



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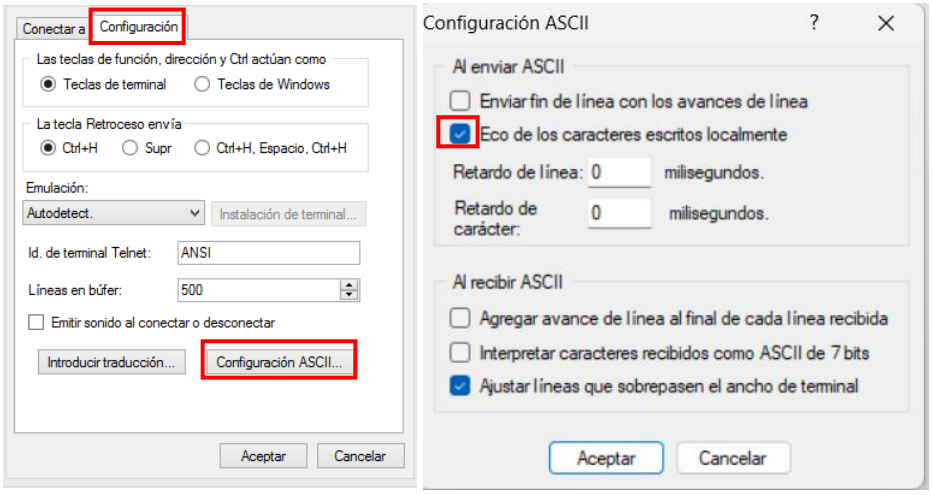
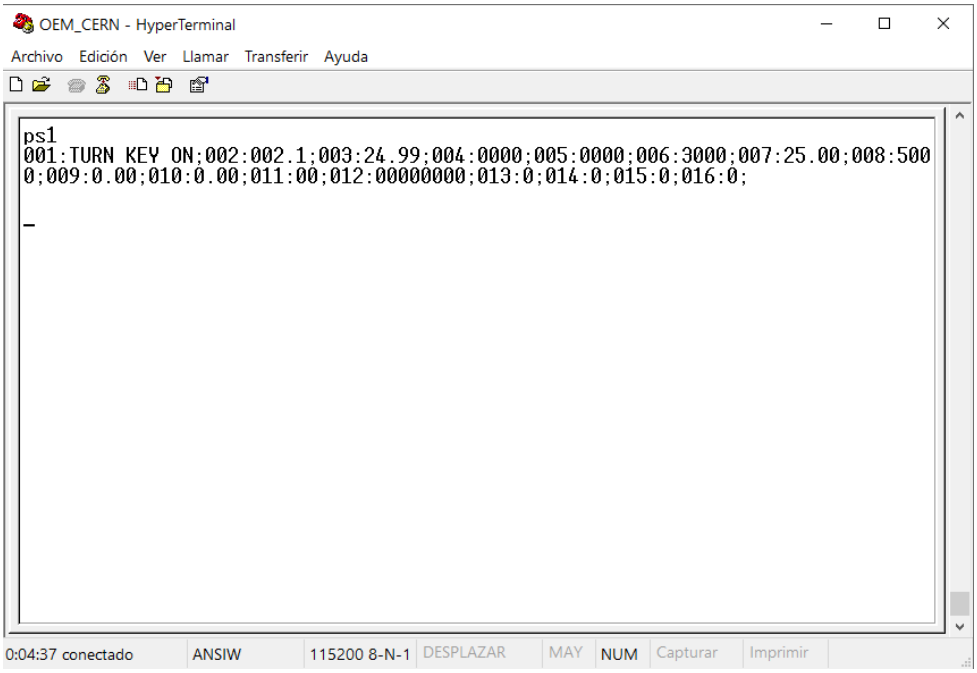
6. At this point we should be connected to the FYLA HORIZON series supercontinuum laser. In case of not visualizing the introduced commands go to: File/Proprieties/Configuration/ASCII Configuration and mark the case near Eco of characters.



7. Now, the introduced commands should be visualized. Next, write a command and press your keyboard Enter. Example: <ps1><enter>. If the introduced command is accepted the FYLA HORIZON series supercontinuum laser will answer a set of data.



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Commands List

HORIZON model	Command	Description
Standard	laser on	Switch on the laser
	laser off	Switch off the laser
	ps1	Shows general information

WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

To deactivate the laser, send the “laser off” command. The laser signal is deactivated but TEC remains working. The laser can be activated again from this intermediate position by clicking “ON” button again.

Turn the frontal panel key OFF by rotating it counterclockwise. The frontal panel READY LED will switch OFF.

Turn OFF the rear panel power switch to switch off the power supply ONLY when both indicators, READY LED and EMMITING LED, are off.

The power supply can be disconnected, if necessary, ONLY when these previous steps have been fulfilled.

WARNING_____

DO NOT DISCONECT THE POWER SUPPLY FROM THE LASER AS A MEANS TO TURN THE LASER OFF. FOLLOW THE INSTRUCTIONS TO TURN OFF THE LASER PROPERLY. OTHERWISE, THE LASER MAY BE DAMAGED FROM WRONG DEACTIVATION.

_____

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Trigger Output

The optical emission of FYLA HORIZON series supercontinuum lasers is a train of pulses with a typical pulse repetition rate (PRR) of around 80 MHz ± 1MHz. Many applications require synchronous monitoring of an individual pulse with its corresponding measured effect.

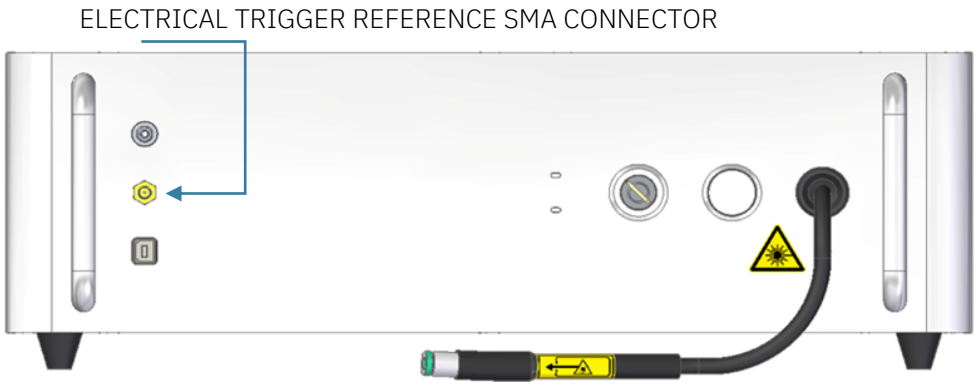
An Electrical or Optical Reference can be installed when configuring the purchase order.

Electrical Reference:

The Electrical Trigger Reference SMA Connector in the Front Panel provides a Low Voltage TTL signal generated from the photo-detected signal of the laser pulses. Each of these electric pulses corresponds in time with its correlated optical pulse at the HORIZON laser output. Hence, such signal can be used as a temporal reference for synchronous measurements (e.g., pump/probe experiments).

Typical Trigger signal values are:

- Trigger Output Frequency: 80 MHz
- Trigger Peak-to-Peak Amplitude: ~ [2,4] V
- Trigger TTL pulse width FWHM: 10 ns
- Trigger Pulse Rise-Time: 400 ps



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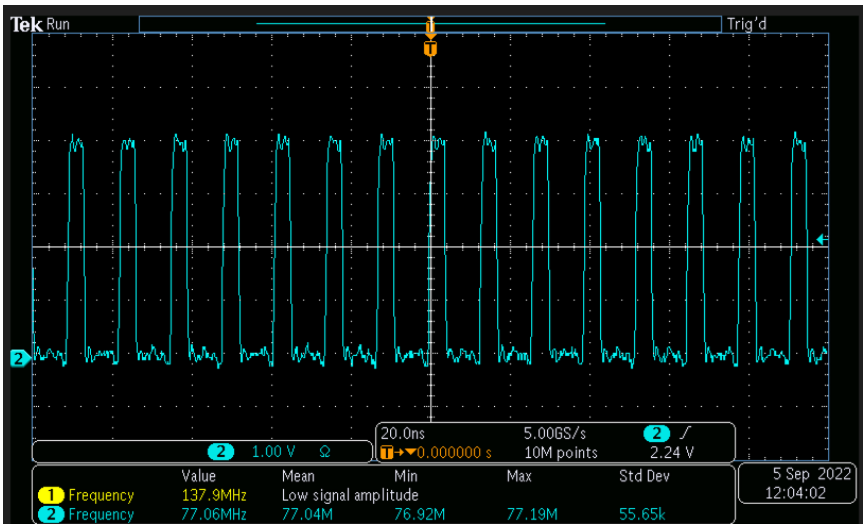
To obtain an LV TTL signal please follow the next steps:

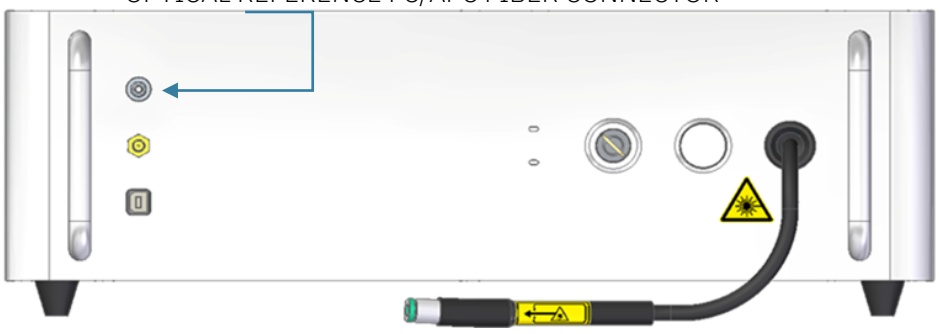
1. Switch ON the laser.
2. Connect a coaxial cable to the Electrical Trigger Reference SMA Connector in the front panel.
3. Connect the other cable extreme to a fast Oscilloscope and set the channel impedance to 50 OHM.
4. You should obtain a similar pulsed train signal as in the figure bellow:



Optical Reference:

The FC/APC OPTICAL REFERENCE connector provides an optical reference pulsed signal generated from the seed of the HORIZON laser. Such signal can be converted to electrical domain using fast photodetectors and utilized as a temporal reference for synchronous measurements (e.g., pump/probe experiments).

OPTICAL REFERENCE FC/APC FIBER CONNECTOR



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To obtain an electrical reference signal please follow the next steps:

1. Switch ON the laser.
2. Connect an FC/APC SM980 fibre to the Optical Reference Fiber Connector in the front panel and to your fast photodetector.
3. Connect the photodetectors output to an Oscilloscope.
4. You should obtain a similar pulsed train signal as in the figure bellow:

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fyla@fyla.com

WARNINGS AND FAILURE TO FUNCTION

Warnings

WARNING_____

THE LASER RADIATION EMITTED FROM THIS UNIT MAY BE HARMFUL. PLEASE FOLLOW ALL THE SAFETY INSTRUCTIONS FROM PAGES 6 – 10 BEFORE OPERATING THE LASER.

_____

WARNING_____

WHEN USING YOUR HORIZON SERIES LASER, AVOID OPTICAL BACK REFLECTIONS TO THE SYSTEM. THE SYSTEM IS PROTECTED AGAINST INCIDENTAL LOW POWER BACK REFLECTIONS. OPTICAL BACK REFLECTIONS OF > 50 mW AVG. POWER MAY ALTER THE CORRECT OPERATION OF THE LASER, AND EVEN DAMAGE IT IRREVERSIBLY. TO AVOID THIS, SIMPLY TILT SLIGHTLY REFLECTIVE OPTICAL COMPONENTS IN YOUR SETUPS SO THAT DIRECT BACK REFLECTIONS ARE ELIMINATED.

_____

WARNING_____

TURNING ON A LASER THAT IS TOO COLD OR HOT MAY DAMAGE IT. THE LASER MUST BE OPERATED WHEN THE ROOM TEMPERATURE IS SET BETWEEN 5 AND 40 ºC.

_____

WARNING_____

TURNING OFF THE LASER STRAIGHT FROM THE REAR SWITCH WITHOUT FOLLOWING THE INSTRUCTIONS FOR PREVIOUS STEPS MAY DAMAGE IT.

_____

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WARNING_____

DO NOT DISCONECT THE POWER SUPPLY FROM THE LASER AS A MEANS TO TURN THE LASER OFF. FOLLOW THE INSTRUCTIONS TO TURN OFF THE LASER PROPERLY. OTHERWISE, THE LASER MAY BE DAMAGED FROM WRONG DEACTIVATION.

_____

WARNING_____

DO NOT FORCE THE FIBER TERMINATION ASSEMBLY.

_____

WARNING_____

THE VOLTAGE THROUGH THE INTERLOCK CONNECTION IS 24 V AND THE CURRENT IS 10 AMPERES. THE SAFETY CONNECTION MUST SUPPORT 24V/10A.

_____

WARNING_____

AVOID LOCATIONS WHERE THE LASER IS EXPOSED TO EXTREME TEMPERATURES AND HIGH HUMIDITY.

_____

WARNING_____

AVOID LOCATIONS WHERE THE LASER IS EXPOSED TO MECHANICAL VIBRATIONS.

_____

WARNING_____

IN CASE OF LASER MALFUNCTION, FOR YOUR SELF-PROTECTION, DISCONNECT THE LEMO INTERLOCK CONNECTOR.

_____

WARNING_____

ANY KIND OF OPERATION OF MANTAINANCE MUST BE PERFORMED BY OUR QUALIFIED LASER TECHNICIANS OR UNDER THEIR GUIDANCE WHEN THEY SPECIFICALLY INDICATE SO.

_____

WARNING_____

DO NOT FORCE THE WARRANTY LABELS.

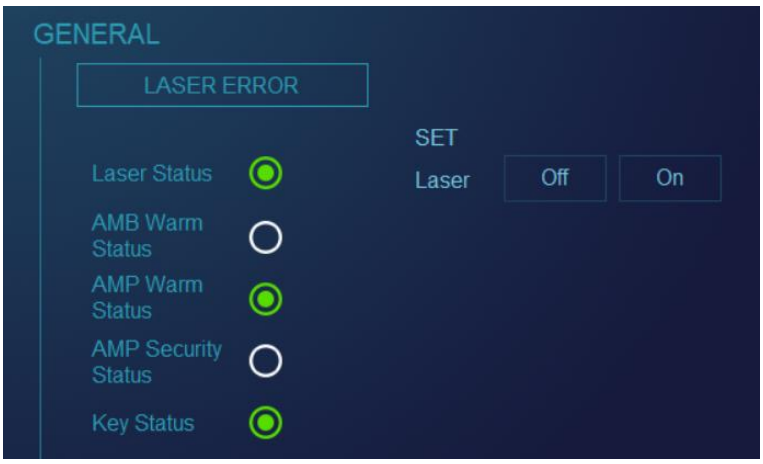
_____

Error Description

When an error occurs, the user interface displays a pop-up window indicating the error number.

If the message “LASER ERROR” is shown in the UI General box, there is no communication between PC and Laser. Please check the next points before contacting FYLA SUPPORT:

1. Laser is connected to the power supply
2. USB is properly connected to the PC
3. Virtual COM Port driver is correctly installed



Below you can find a brief description of each error code:

- Error 1:

The communication between different system modules has failed. Re-start the unit. If the message remains, please contact FYLA's technical service.

- Error 2:

The seed switching on process has not been successful. This may happen when the environmental conditions are not friendly or if the internal photodetector is not working properly. Check that you followed the initialization process correctly and restart the unit. If the message remains, please contact FYLA's technical service.

- Error 3

The amplifier temperature is out of range. This could happen when the environmental conditions are not appropriate or if the TEC system is not working in the desired temperature range. Close the error window and wait until the temperature gets in range. If the message remains, please contact FYLA's technical service.

- Error 4

The pump diode driver has registered an error (not working pump diode, no proper communication, etc). Make sure that the LEMO Interlock connector is connected properly. Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 5

The security protocol counts the pulses coming from the seed in real-time. When the counting is not correct, the system will shut down to prevent major damage. Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 6

The security protocol has a double check on the seed functioning (the fundamental stage of the laser). When the average power of this stage drops below the "safe" levels the system will shut down to prevent major damage. Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 7

The TPSR module, if integrated, has registered an error (overheating, not proper communication, etc). Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 8

The TEC driver has registered an error (overheating, not proper communication, etc). Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 9

The Amplifier Security has registered an error (no sensed light). Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

- Error 10

The ambient temperature is out of range. The internal sensor is measuring a temperature that is out of the range. Please make sure that the laser is installed in a room whose temperature is between 20 and 30ºC. Close the error window and wait until the temperature gets in range. If the message remains, please contact FYLA's technical service.

- Error 11

The temperature of the oscillator's pump diode is out of range. Close the error window and wait until the temperature gets in range. If the message remains, please contact FYLA's technical service.

- Error 12

The frequency of the seed is out of the range. The oscillator's frequency is monitored in real time. In case the measured value is out of a security range the laser is switched off automatically. Close the error window and restart the laser. If the message remains, please contact FYLA's technical service.

CUSTOMER SERVICE

Technical Support

Information and advice about the operation of any FYLA product is available from our technical support engineers. For the quickest response, ask for “Technical Support” at support@fyla.com, votgon@fyla.com and ogarcia@fyla.com including the model and serial number of your product.

Hours: 9:00 to 14:00 and 14:30 to 17:30, Monday to Thursday, Friday: 09:00 to 14:00 GMT +1 (excluding holidays).

Phone: (+34) 607971021

For e-mail inquiries, we typically respond within one business day.

Service

In the event that your device malfunctions or becomes damaged, please contact FYLA for a return authorization number and instructions on shipping the unit back for evaluation and repair/replacement.