

Overview LDD 14pin-2A-GS

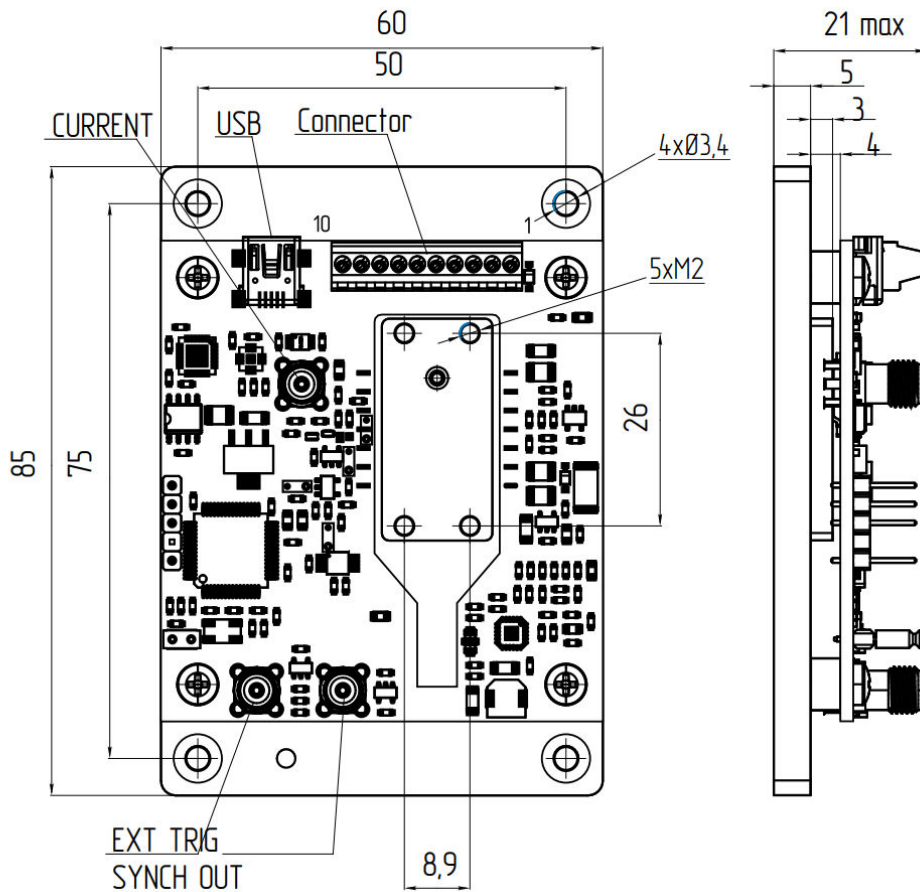
LDD 14pin-2A-GS is a short pulse laser diode driver and temperature controller for driving 14-pin butterfly packaged laser diode modules with thermoelectric cooler (TEC). The pulse repetition frequency can be varied between 1 kHz and 30 MHz. The driver circuitry operates from a single 5 V_{DC} power source.

LDD-14pin-2A-GS equipped with thermoelectric cooler (TEC) controller with the maximum current of 1.5 A and a voltage of 4 V.

The main parameters of LDD-14pin-2A-GS (output current, pulse width, repetition frequency, temperature set point) are controlled via the USB-based computer interface.

The LDD-14pin-2A-GS has a TTL-compatible input for the external synchronization with a pulse generator working at frequencies up to 30 MHz.

The LDD-14pin-2A-GS has an external output for the synchronization with the optical output.



Aluminium base plate has 4 holes for mounting with M3 screws.

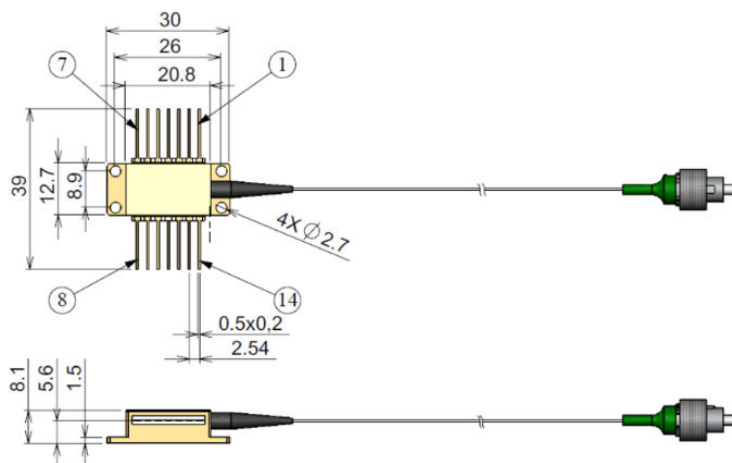
Specifications

PARAMETER	MIN	TYP	MAX	UNITS
INPUT				
Voltage	4.8	5	5.2	V _{DC}
Current	-	-	1	A
External trigger (50Ω)	3.3	-	5	V _{DC}
OUTPUT				
Current	-	-	2	A
Compliance voltage	1	-	3	V
Pulse width*	40	-	150	ps
Pulse repetition frequency*	0.001	-	30	MHz
Rise time*	40	50	60	ps
Fall time*	40	50	100	ps
TEC current	-1.5	-	1.5	A
TEC set temperature	15	25	45	°C
TEC voltage	1	-	4	V
Trigger	2	3	3.3	V
TEMPERATURE				
Operating	+10	-	+50	°C
Storage	-20	-	+70	°C
Humidity, non-condensing	-	-	95	%
CONTROL INTERFACE				
Interface options	USB			
CONNECTORS				
Power and interfaces	10-pin terminal block			
External trigger	SMA Jack (73251 – 1350 Molex)			
Synch out	SMA Jack (73251 – 1350 Molex)			
USB	Mini-USB, Type B (1734035-1 TE connectivity)			

* Output performance depends on laser diode characteristics. Performance cannot be guaranteed for all laser types.

Compatibility

Laser diode pinout compatible with the LDD 14pin-2A-GS:



Pin identification:

1. TEC "+"
2. Thermistor
3. Monitor PD anode (optional)
4. Monitor PD cathode (optional)
5. Thermistor
- 6.
- 7.
- 8.
- 9.
10. Laser Diode anode "+"
11. Laser Diode cathode "-"
- 12.
13. Case
14. TEC "-"

Mounting of laser diode

Cut the 14 pin butterfly pins to length so they will mate with the solder pads on the board. Make sure that the laser diode base is clean. Use four M2 screws to fix the butterfly package on a baser plate. Solder the pins to the Driver solder pads using a solder iron and lead free solder wire.

Connection

Wire a power supply to the 5VDC socket. Make sure the polarity is correct.

Lighting green LED indicates that the device is ready for operation.

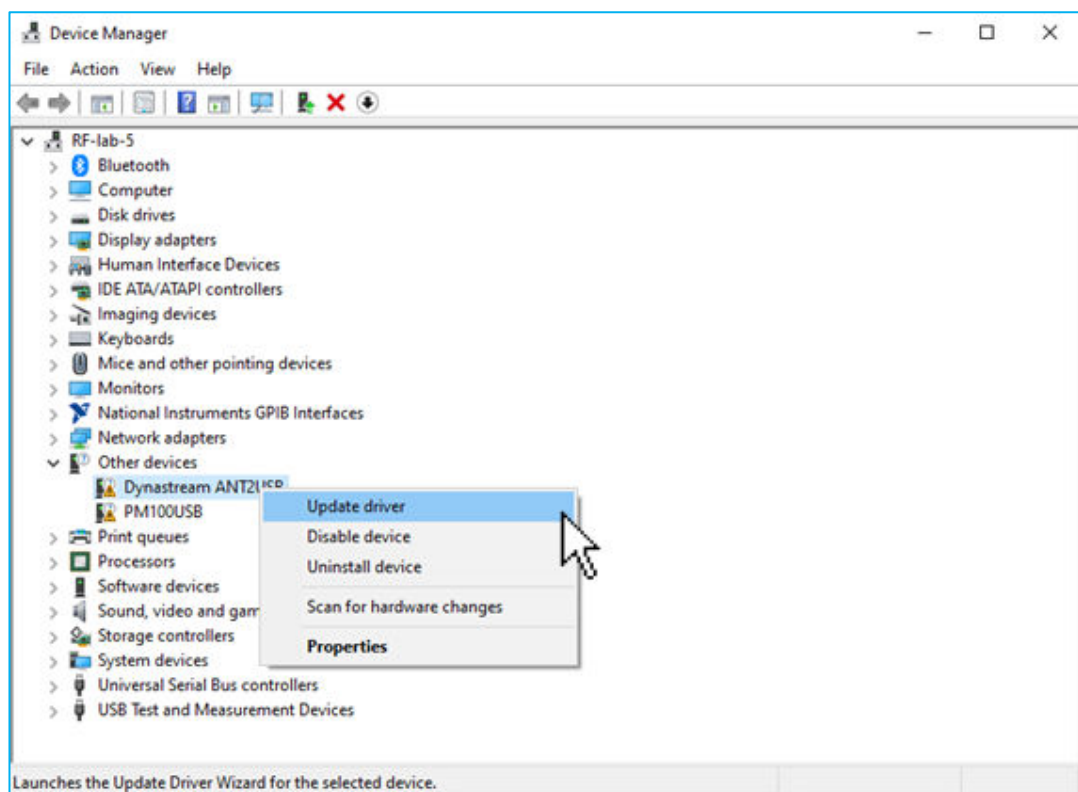
Windows Driver installation

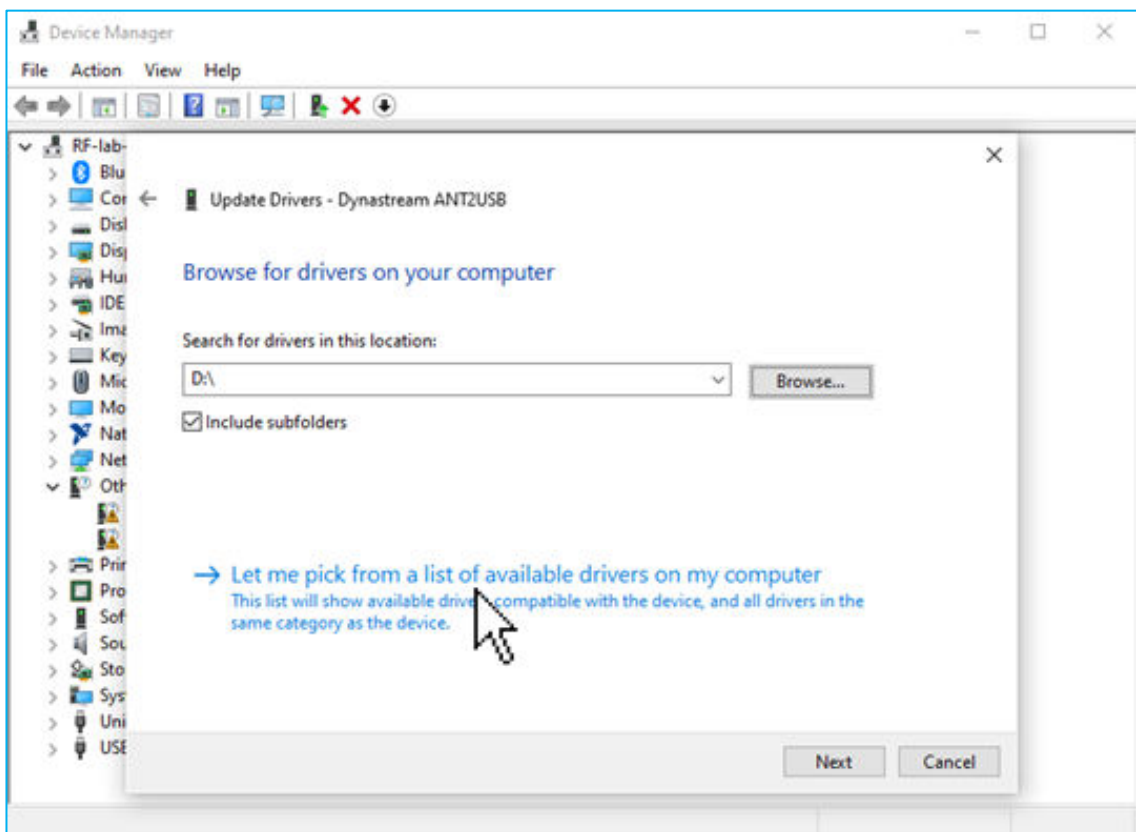
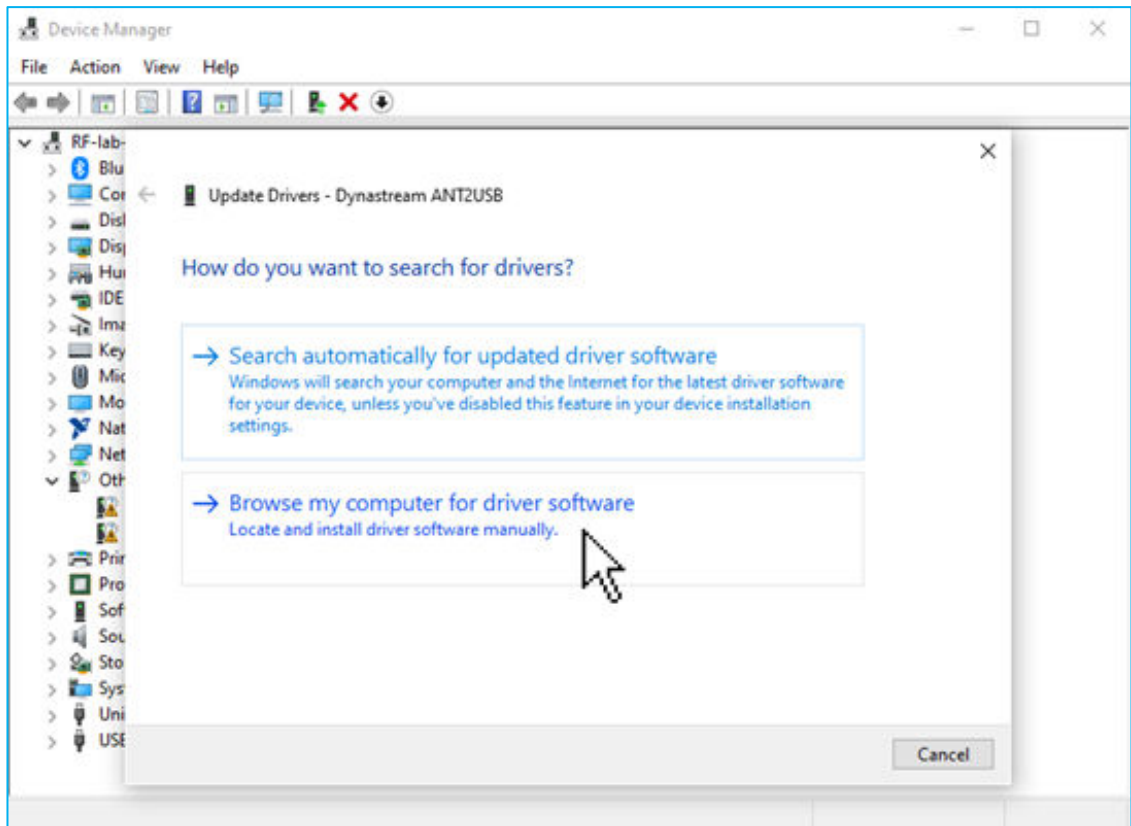
Download and unzip Windows Drivers from Innolume website.

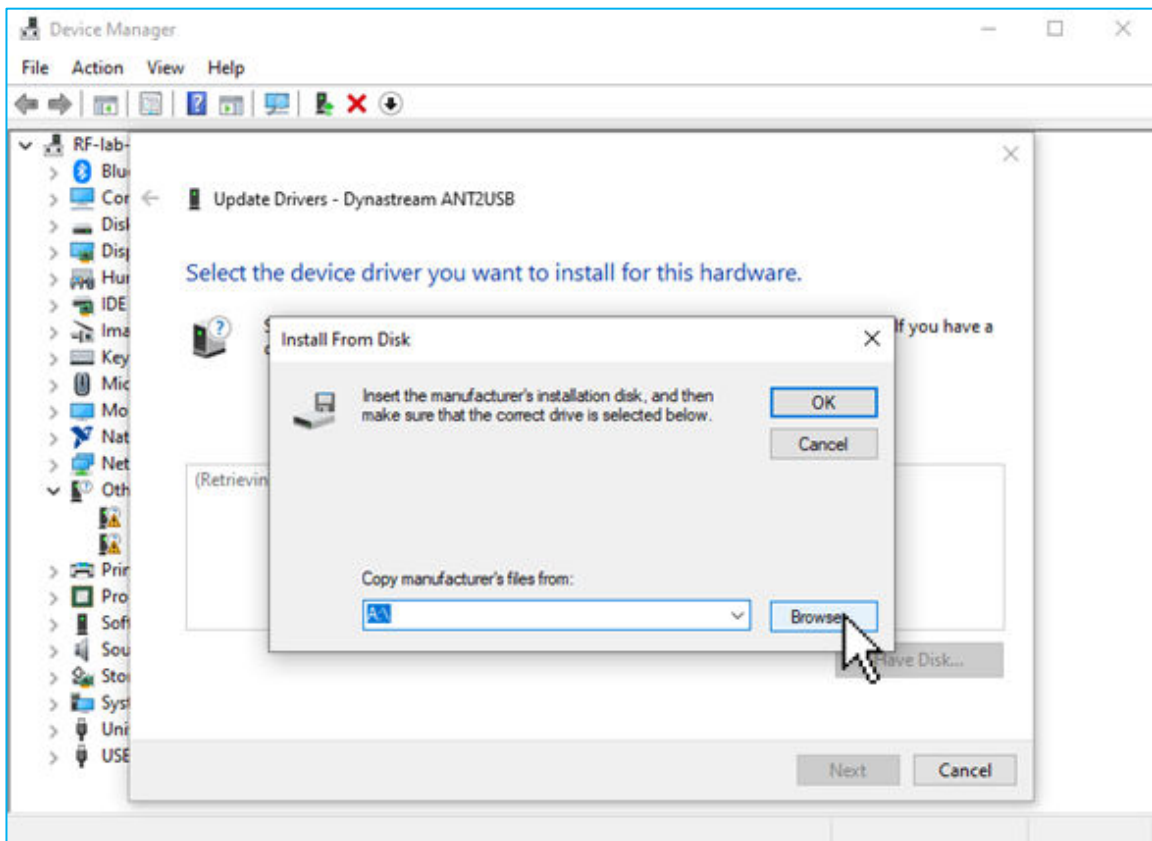
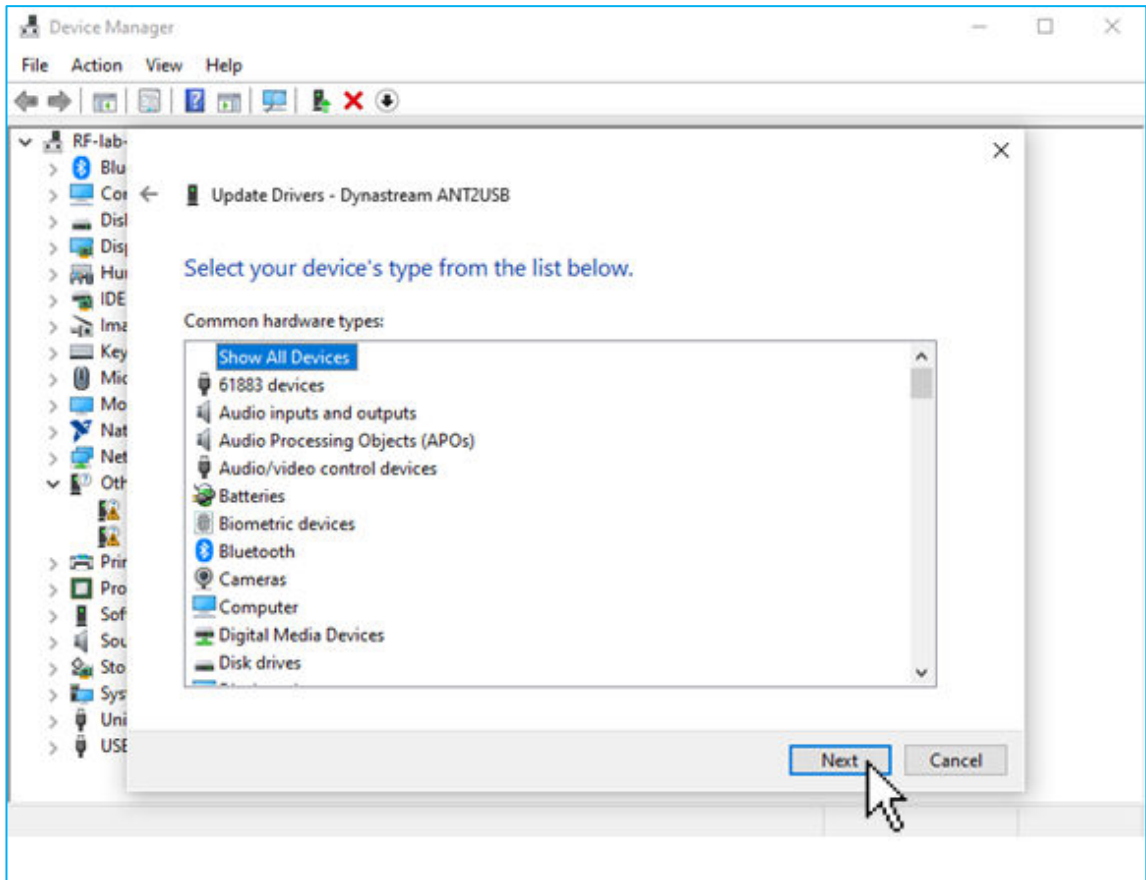
Link laser driver with the PC using standard mini-USB cable.

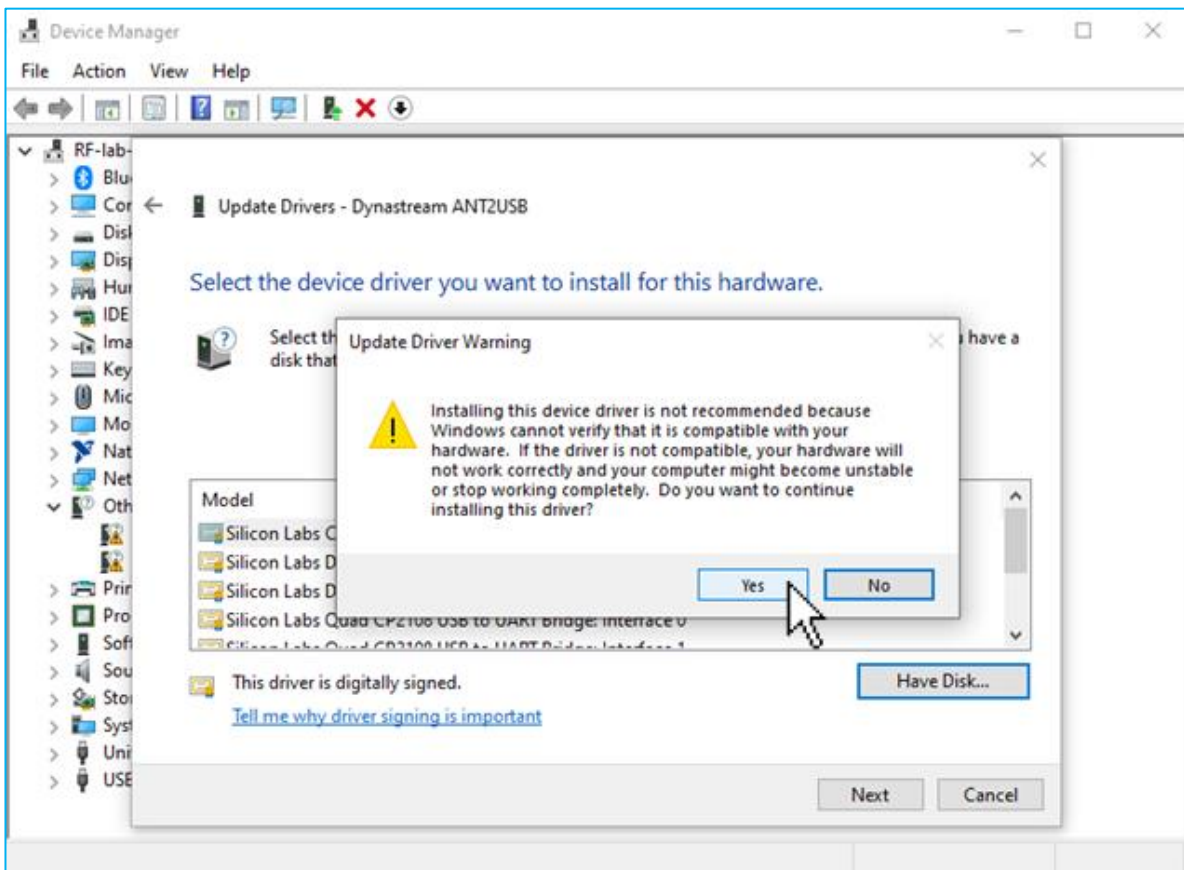
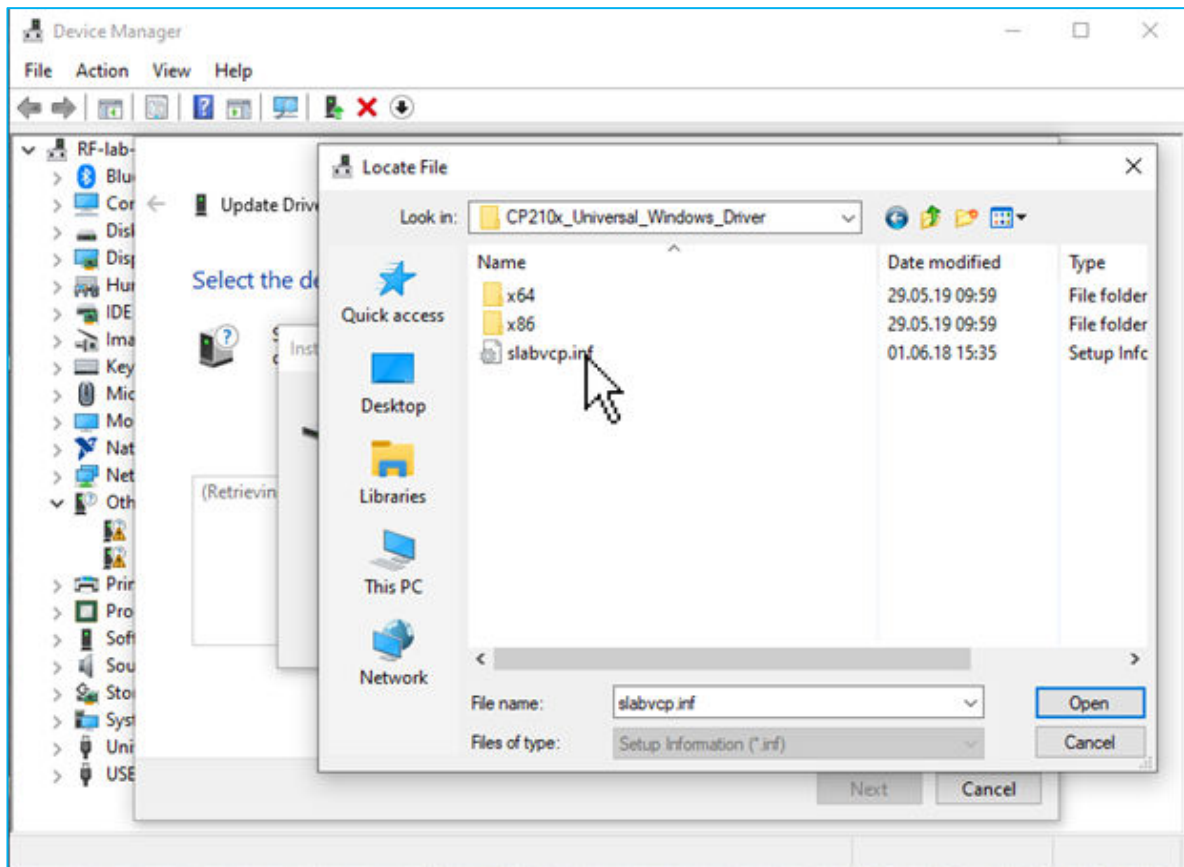
New device with a title “Dynastream ANY2USB” should appear in Windows Device Manager.

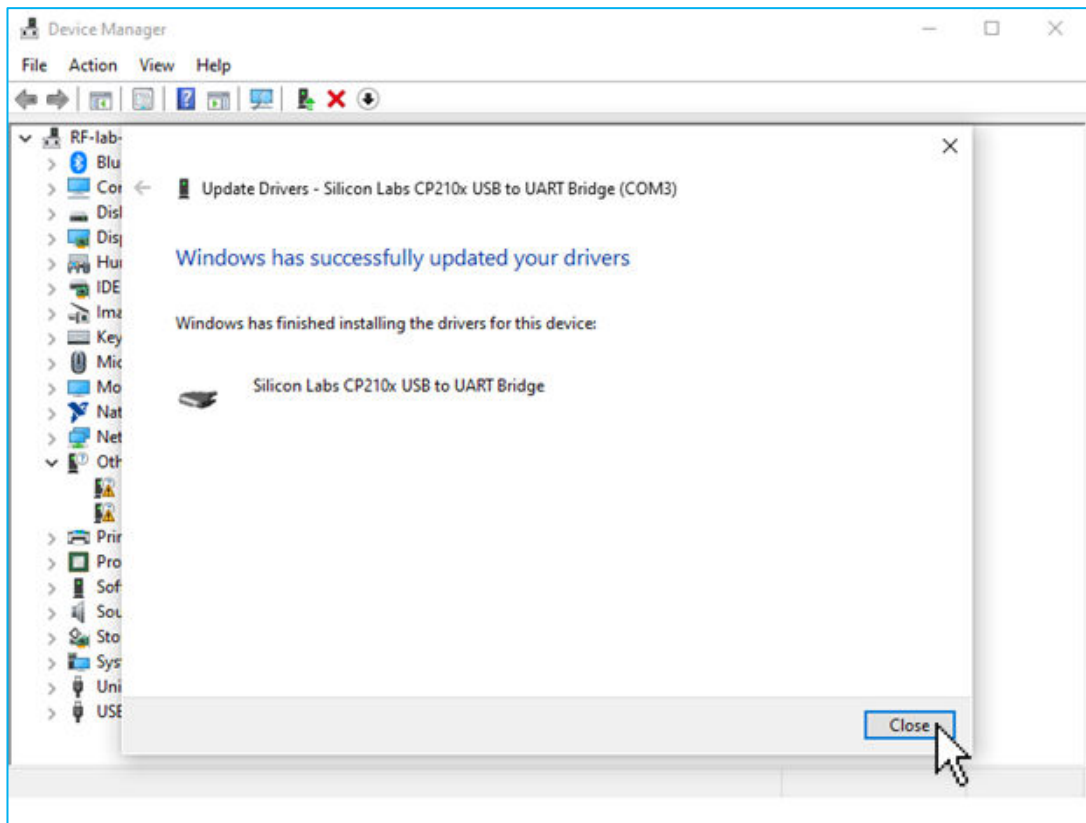
Follow the procedure shown on the screenshots below.



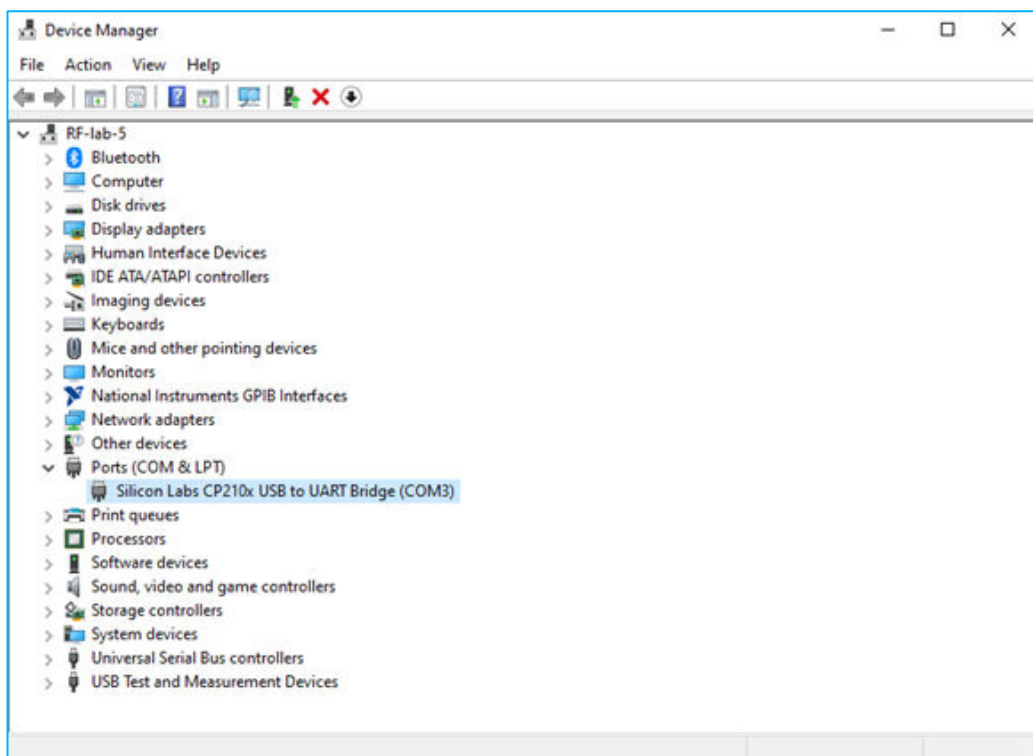








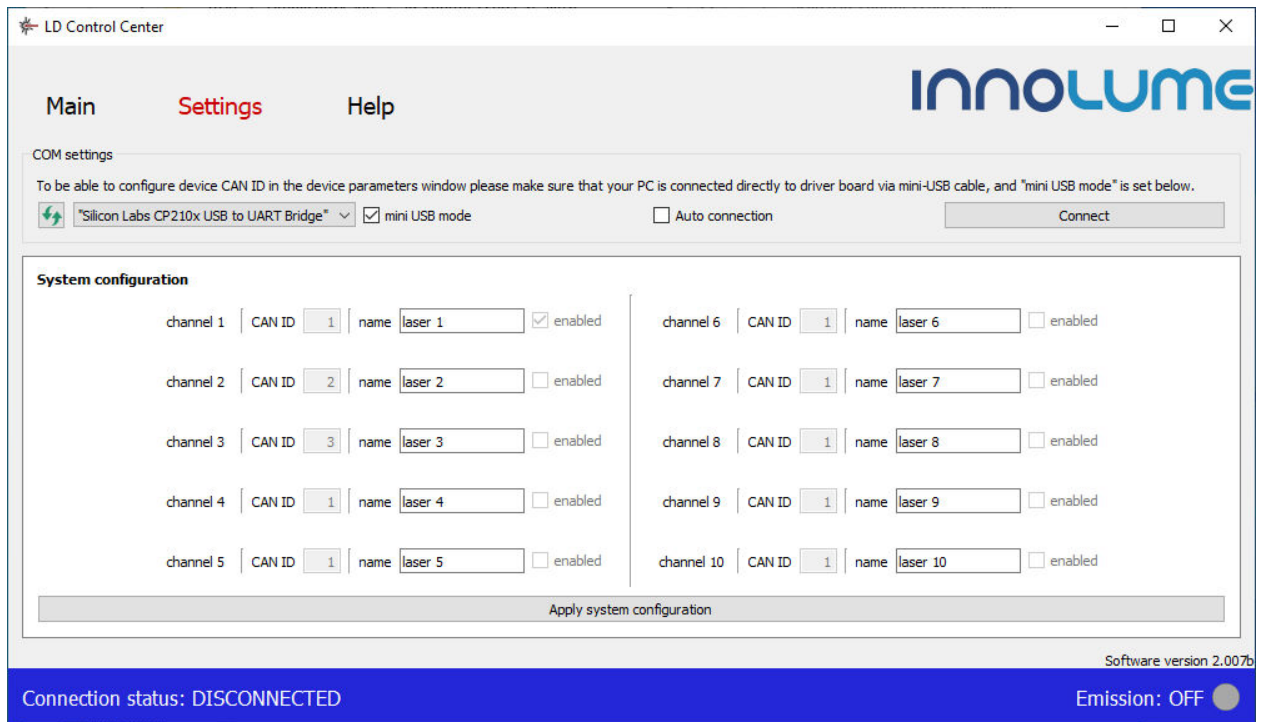
After the proper installation of Windows Driver a new device titled “Silicon Labs CP210x USB to UART Bridge” with an automatically assigned COM-port should appear as shown below:



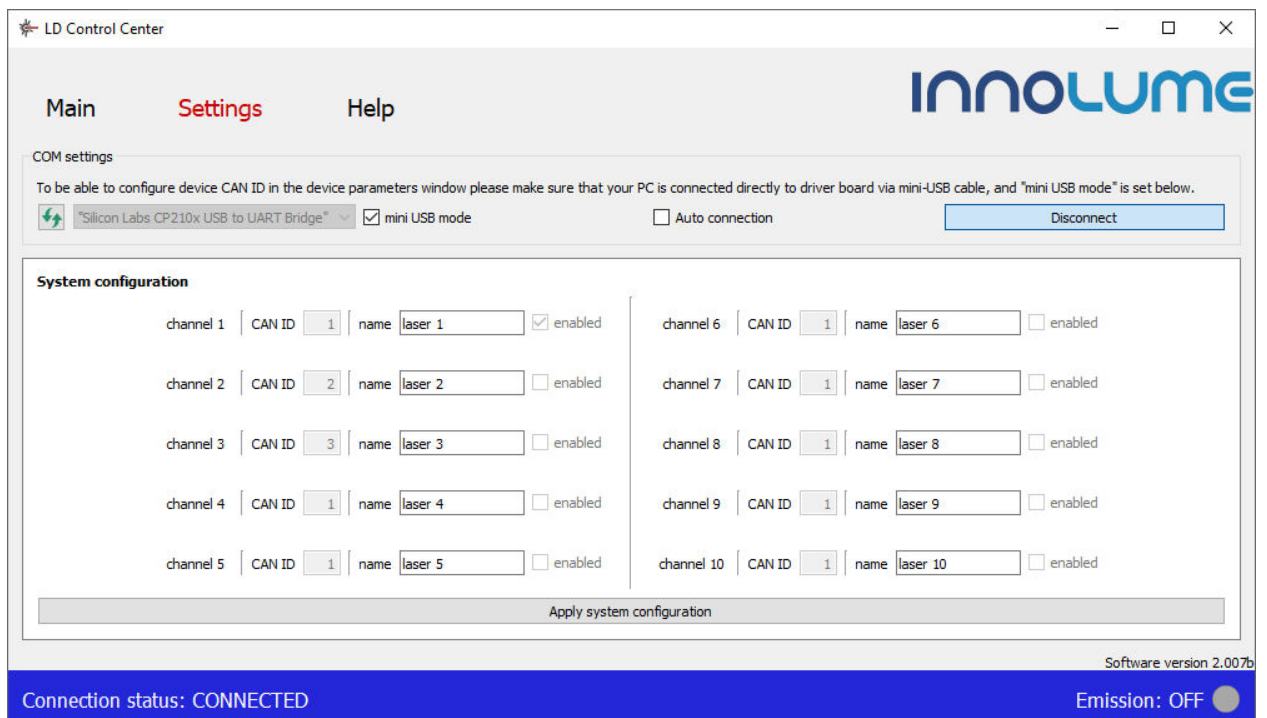
Program User Interface

The Driver Software can be downloaded from the Innolume website.

Software User Interface is shown below. First go to **Settings** tab and make sure that **mini USB mode** is checked. The device should be found automatically.



Click on **Connect** button to start laser communication between the Driver Software and the Laser Diode Driver.



Go to the **Main tab** and click on **laser 1** device:

The screenshot shows the 'LD Control Center' software window. The 'Main' tab is selected, and the 'laser 1' device is active. The interface displays the following controls and data:

- Power state:** A toggle switch is currently in the 'On' position.
- Drive voltage:** A numeric input field is set to 1.0 V, with a range from 1 V to 20 V.
- Temperature:** A numeric input field is set to 25.0 °C, with a range from 15.0 °C to 35.0 °C.
- Repetition rate:** A numeric input field is set to 1000 kHz, with a range from 1 to 50000 kHz.
- Int: Normal:** A dropdown menu is set to 'Normal'.
- N:** A numeric input field is set to 1.
- M:** A numeric input field is set to 1.
- Read values:**
 - Power state: ON
 - Voltage: 1.0 V
 - Temperature: 25.0 °C
 - Frequency: 1000 kHz
 - N: 0
 - M: 0
 - Mode: Int: Normal

A pulse diagram at the bottom shows the timing of pulses, with labels for 'Number of pulses, N≠0', 'Stop pulses, M≠0', and 'Repetition rate'. The status bar at the bottom indicates 'Connection status: CONNECTED' and 'Emission: ON'.

The top line displays the current parameters.

Enter the desired **temperature** and **drive voltage** values confirmed by pressing <Enter> button.

Choose **repetition rate**. The preset frequency is 1MHz.

The **(ON/OFF)** button on top starts or stops generation of the laser pulses.

The Dropdown-List allows for configuration of the Laser Diode Driver operation regime.

Regimes of operation

Five regimes of the Laser Diode Driver operation are available:

“Int: Normal” regime implies the normal regime of operation, in which laser pulse generation is synchronized with the internal generator based on the set Frequency (default).

“Int: Burst” regime implies generation of laser pulses by sequences with a pause. Selecting of this regime results in additional control appearance, as shown below. The value of **“Pulses in bursts”** corresponds to the number of pulses to be generated in sequence. The value of **“Pulses between bursts”** corresponds to the pause between pulse sequences defined in periods of pulse generation.

“Ext: Normal” regime implies the regime of operation, in which laser pulse generation is synchronized with an external electrical pulse generator with a fixed Frequency connected to the Laser Diode Driver via **EXT TRIG** RF connector.

“Ext: Burst” regime is similar to **“Int: Burst”** regime with laser pulse synchronization from an external electrical pulse generator with a fixed Frequency connected to the Laser Diode Driver via **EXT TRIG** RF connector.

“Pulse-on-demand” regime implies pulse generation triggered by an external electrical pulse source connected to the Laser Diode Driver via **EXT TRIG** RF connector.

Safety and operating instructions

Before turning the laser on make sure that required conditions are met.

Always wear suitable laser goggles to protect your eyes when working with lasers.

Take extreme precaution to prevent electrostatic discharge. Use wrist straps, grounded work surfaces and rigorous antistatic techniques when handling laser diodes.

Make sure that the aluminium base plate is in contact with a proper heat sink.

Do not pull the fiber. Avoid bending of the fiber with a radius smaller than 3 cm. Use the laser module with a clean fiber connector only. Before inspection and cleaning connector, always turn the laser module off.