

Overview LDD-14pin-2A-ns

LDD-14pin-2A-ns is a compact short-pulsed laser diode driver compatible with 14-pin butterfly laser diode modules for applications where pulse width ranging from 1 ns to 100 ns is required. Pulse repetition frequency can be varied between 1 kHz and 20 MHz with the maximum duty cycle of 2%. Driver circuitry requires a single 5 VDC power supply.

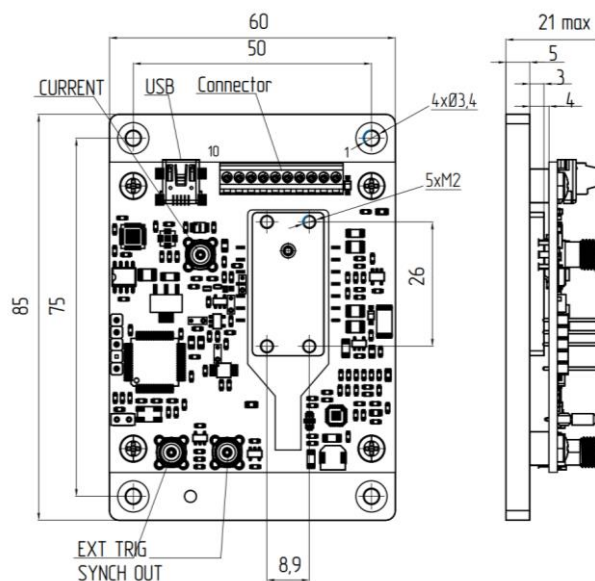
LDD-14pin-2A-ns equipped with thermoelectric cooler (TEC) controller with the maximum current of 1.5 A and a voltage of 4 V.

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

The current pulse monitor output can be viewed with an oscilloscope via on-board SMA connector allowing the user the real time current monitoring. Maximum generated laser driving current is 2 A.

The LDD-14pin-2A-ns has a TTL-compatible input for the external synchronization with a pulse generator working at frequencies up to 20 MHz.

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



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

Specifications

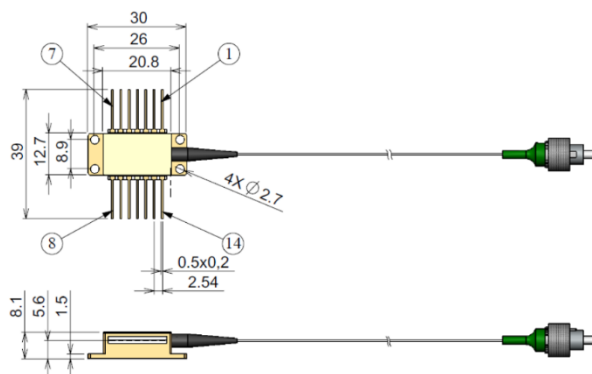
PARAMETER	MIN	TYP	MAX	UNITS
INPUT				
Voltage	4.8	5	5.2	V _{DC}
Current	-	-	3	A
External trigger (50Ω)	3.3	-	5	V _{DC}
OUTPUT				
Current			2	A
Compliance voltage	1	-	3	V
Pulse width**	1		100	ns
Pulse with step		0.2		ns
Repetition rate**	0.001		20	MHz
Rise time*	50		500	ps
Fall time*	200	-	1000	ps
TEC 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
CONTROL INTERFACE				
Interface options	USB			
CONNECTORS				
Power	10-pin terminal block			
Current	SMA Jack (73251 – 1350 Molex)			
External trigger	SMA Jack (73251 – 1350 Molex)			
Synch out	SMA Jack (73251 – 1350 Molex)			
Interface connectors	USB: Mini-USB, Type B (1734035-1 TE connectivity)			

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

** Maximum duty cycle is limited to 2%.

Compatibility

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



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.

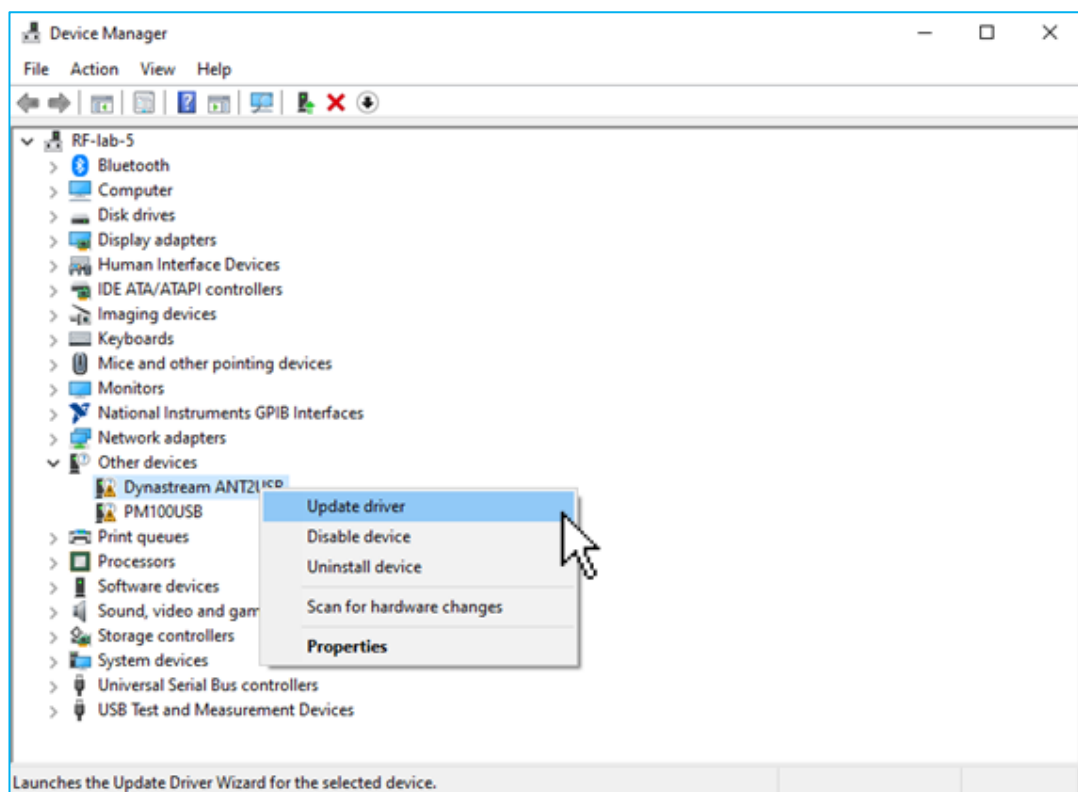
Windows Driver installation

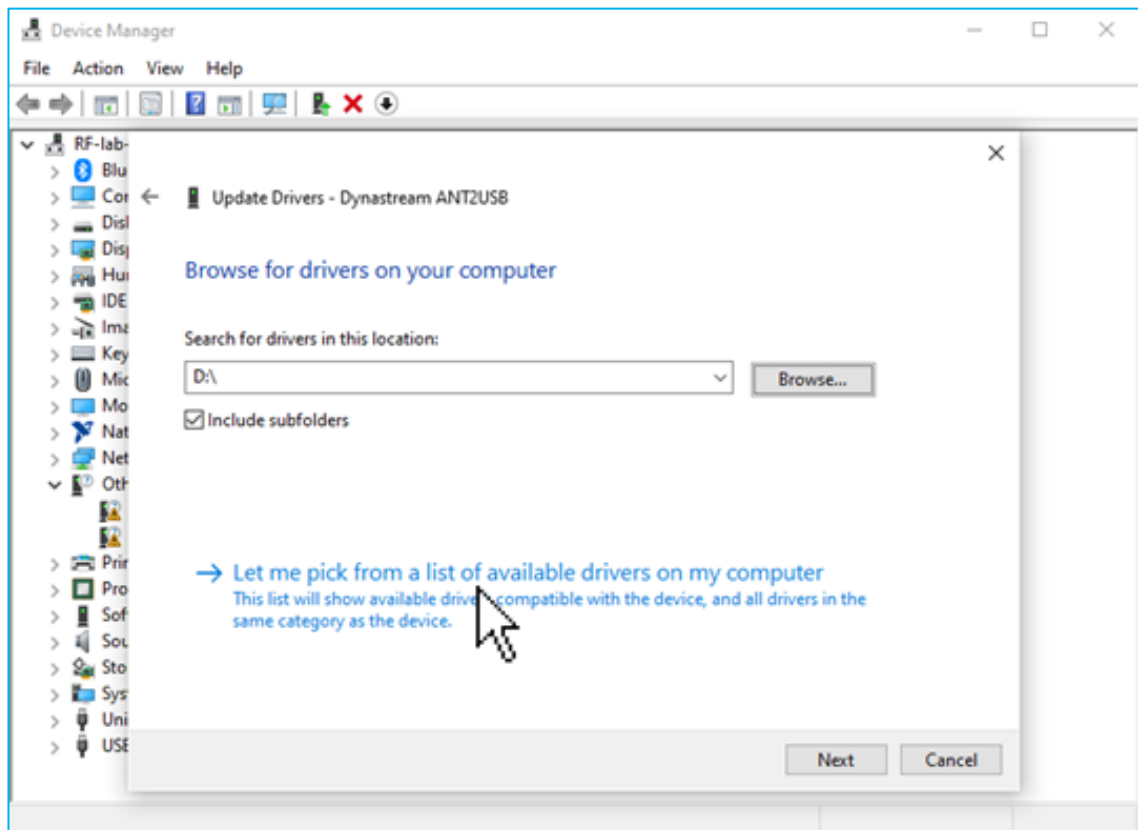
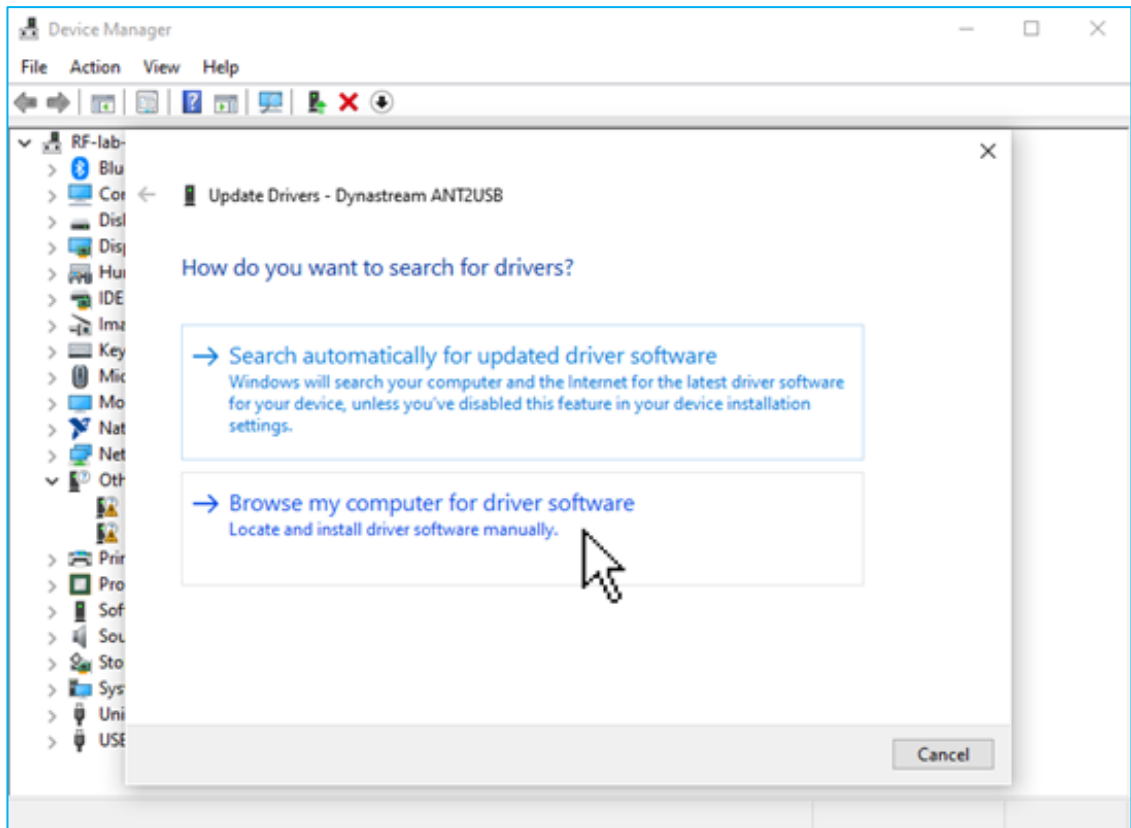
Download and unzip Windows Drivers from Innolume website.

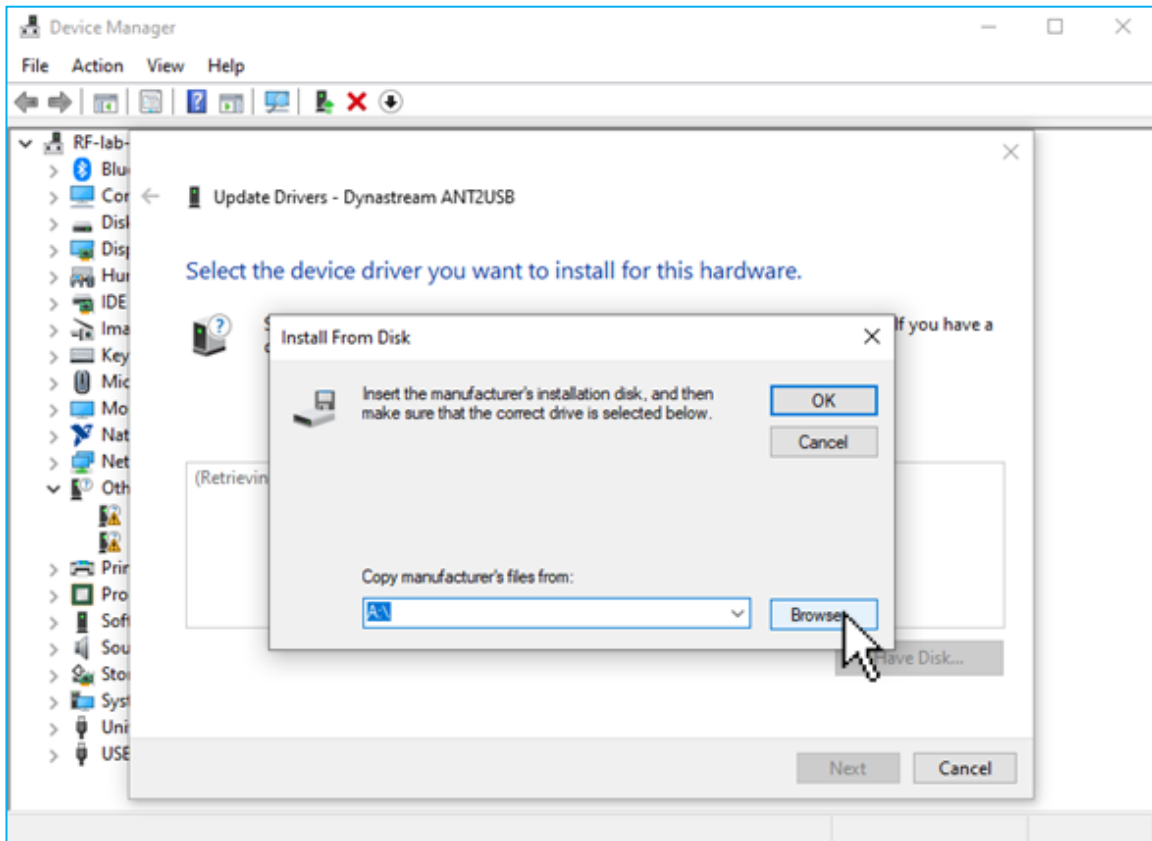
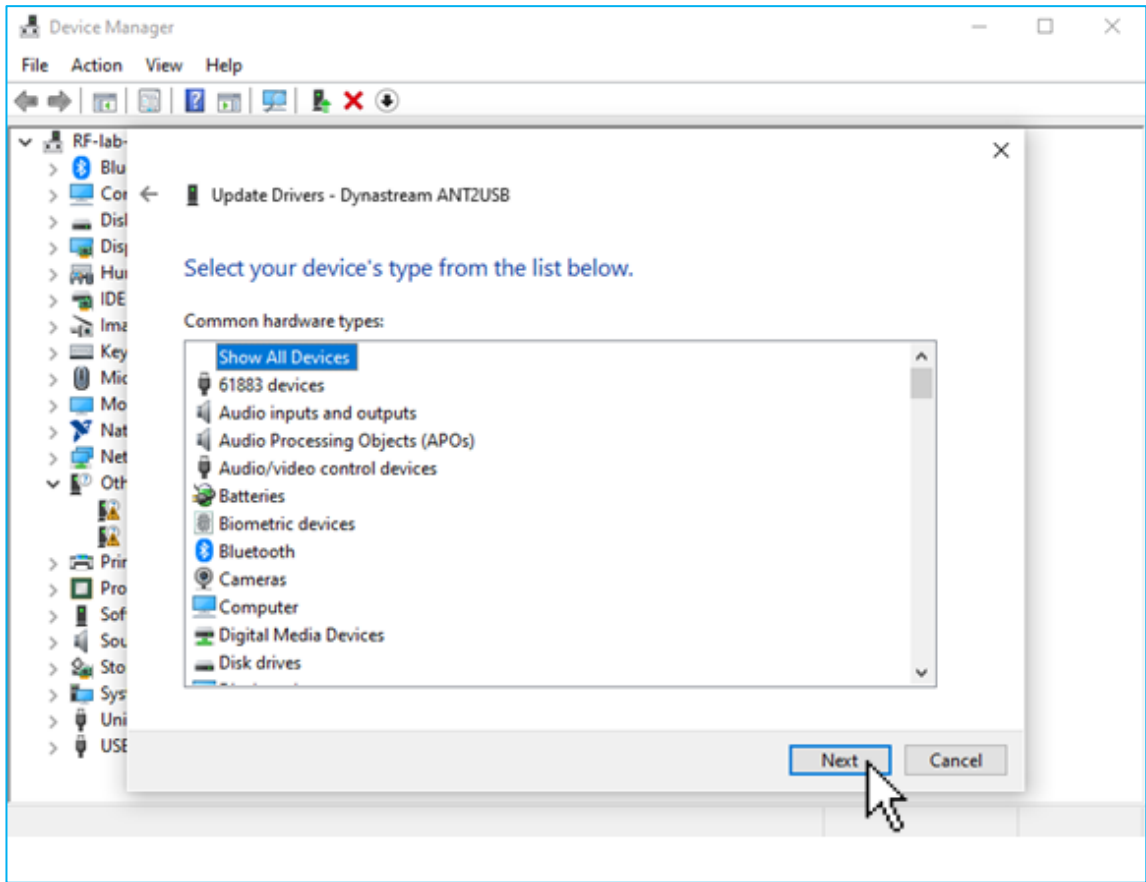
Link laser driver with the PC using standard mini-USB cable.

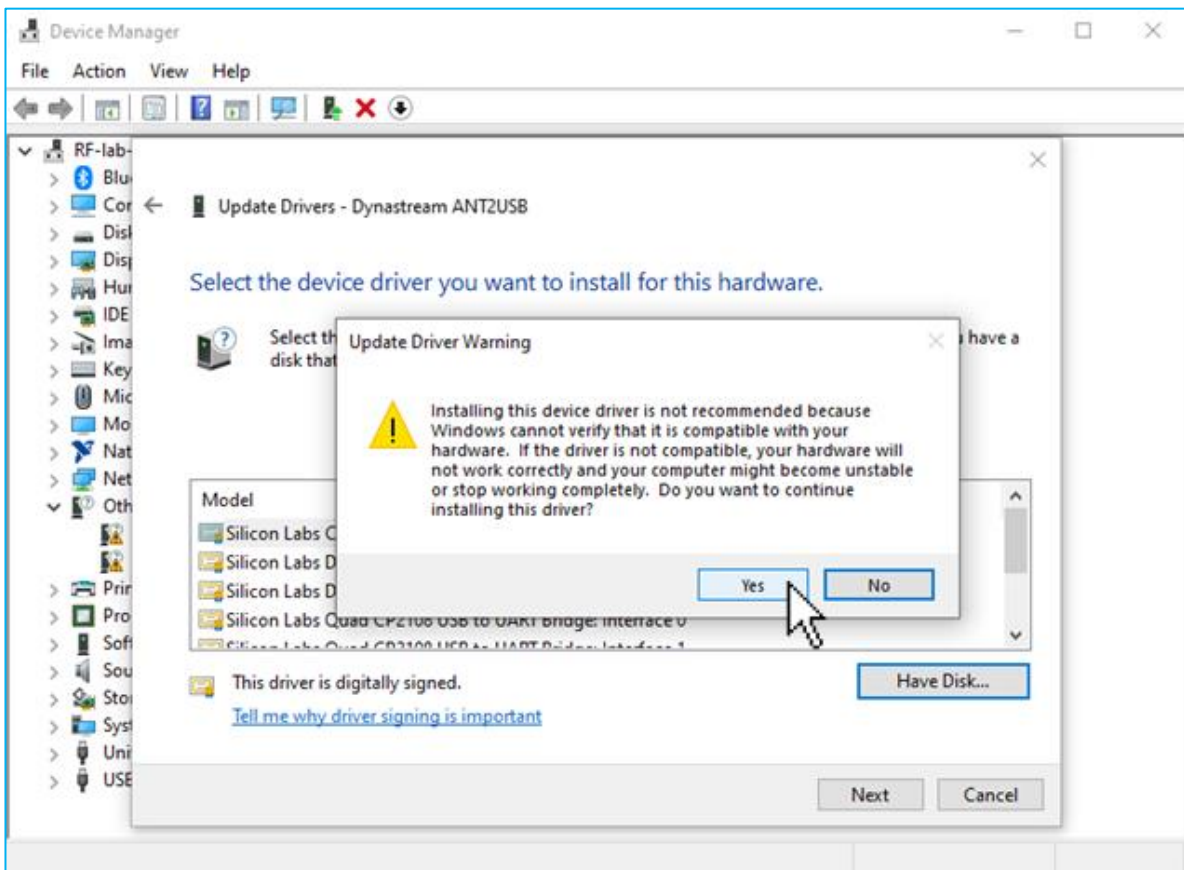
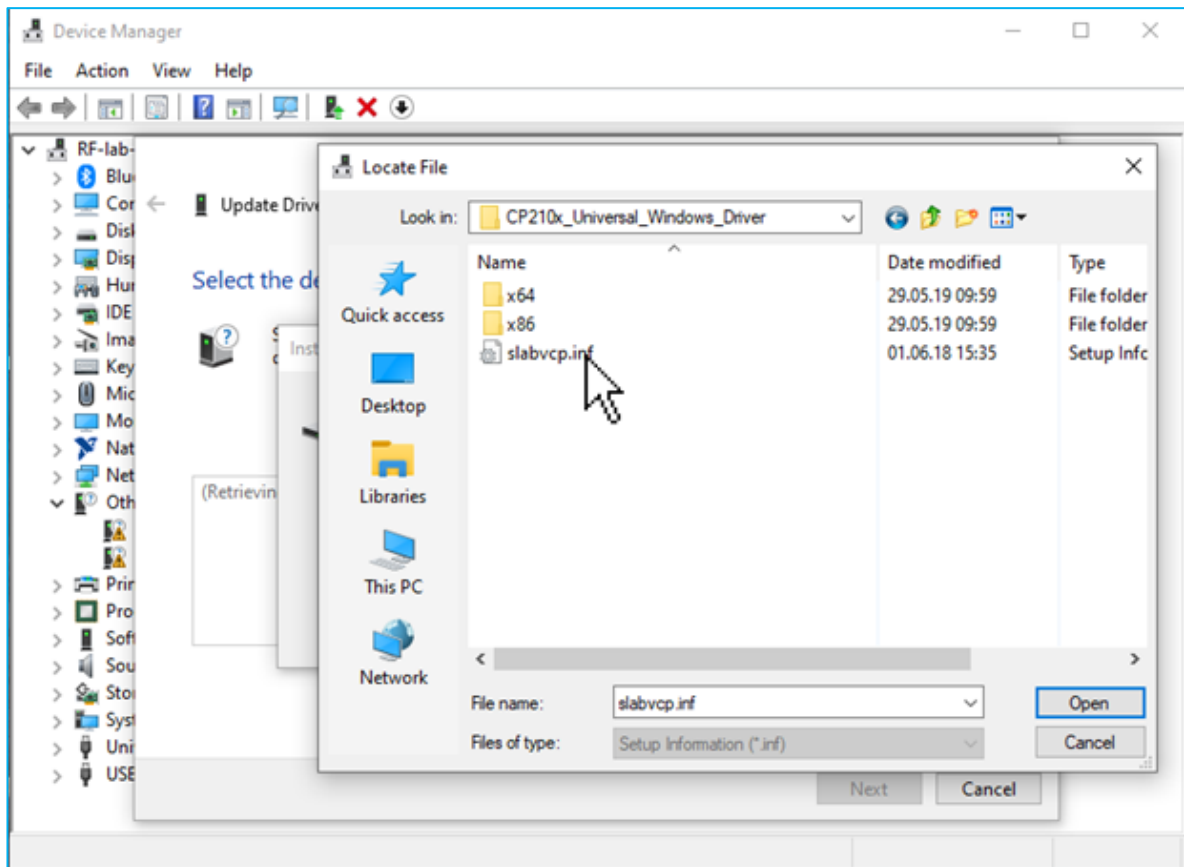
New device with a title “Dynastream ANY2USB” should appear in Windows Device Manager.

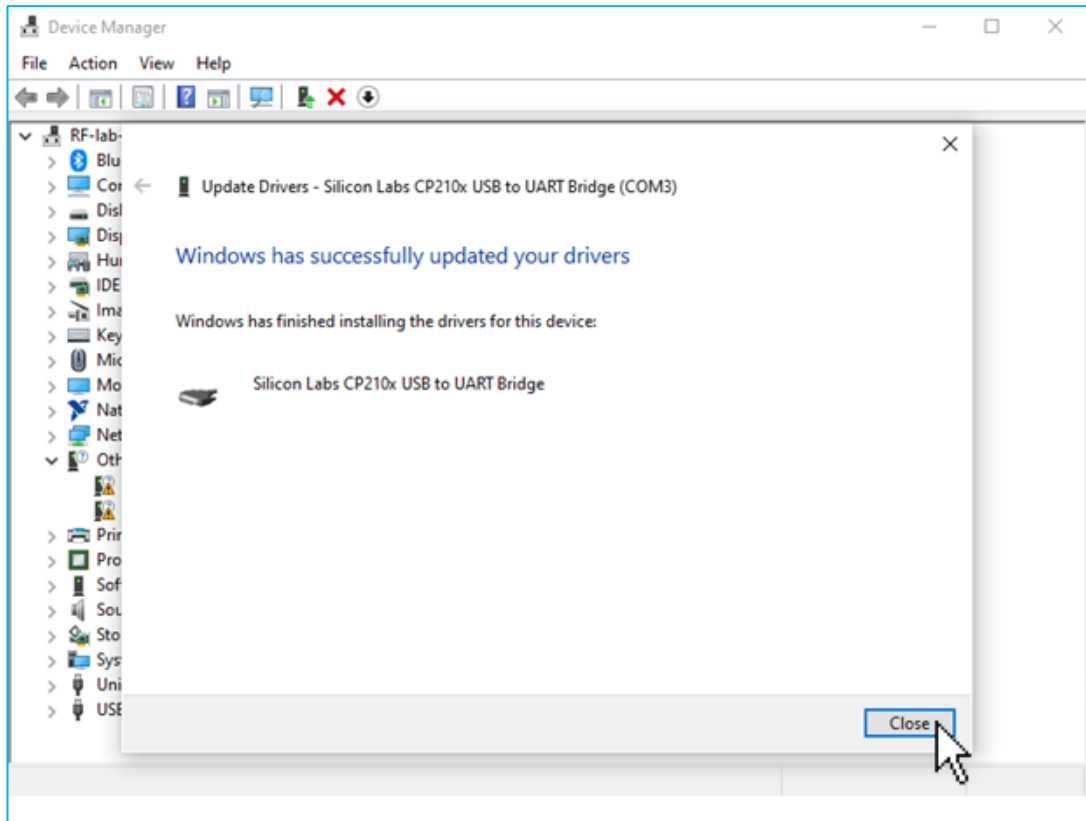
Follow the procedure shown on the screenshots below.



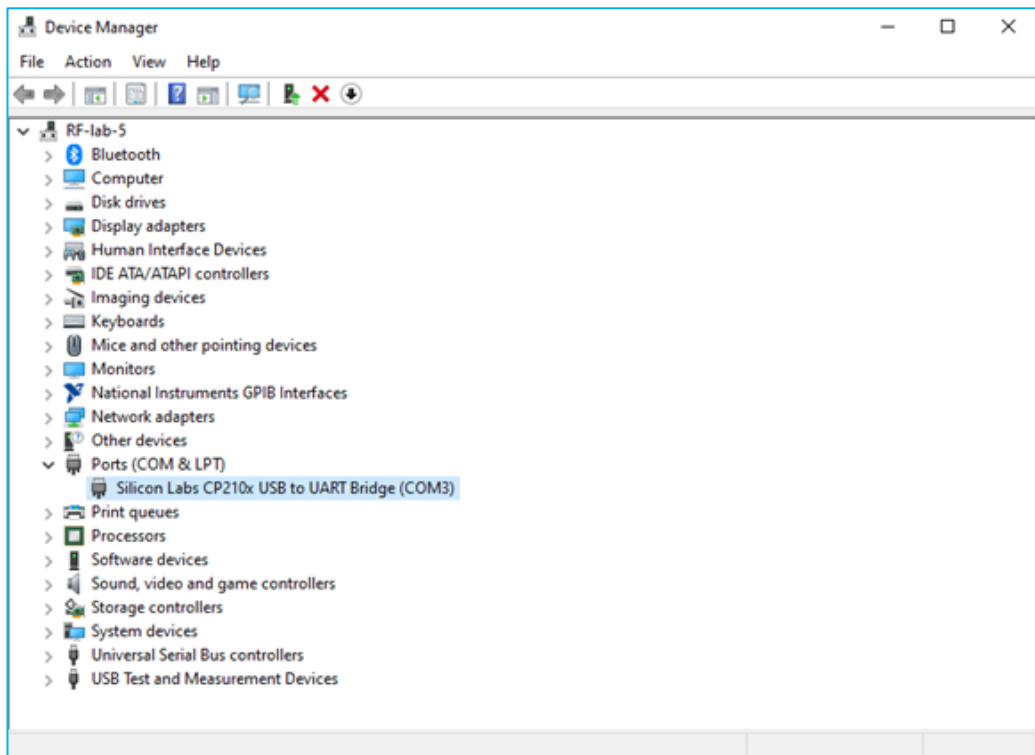








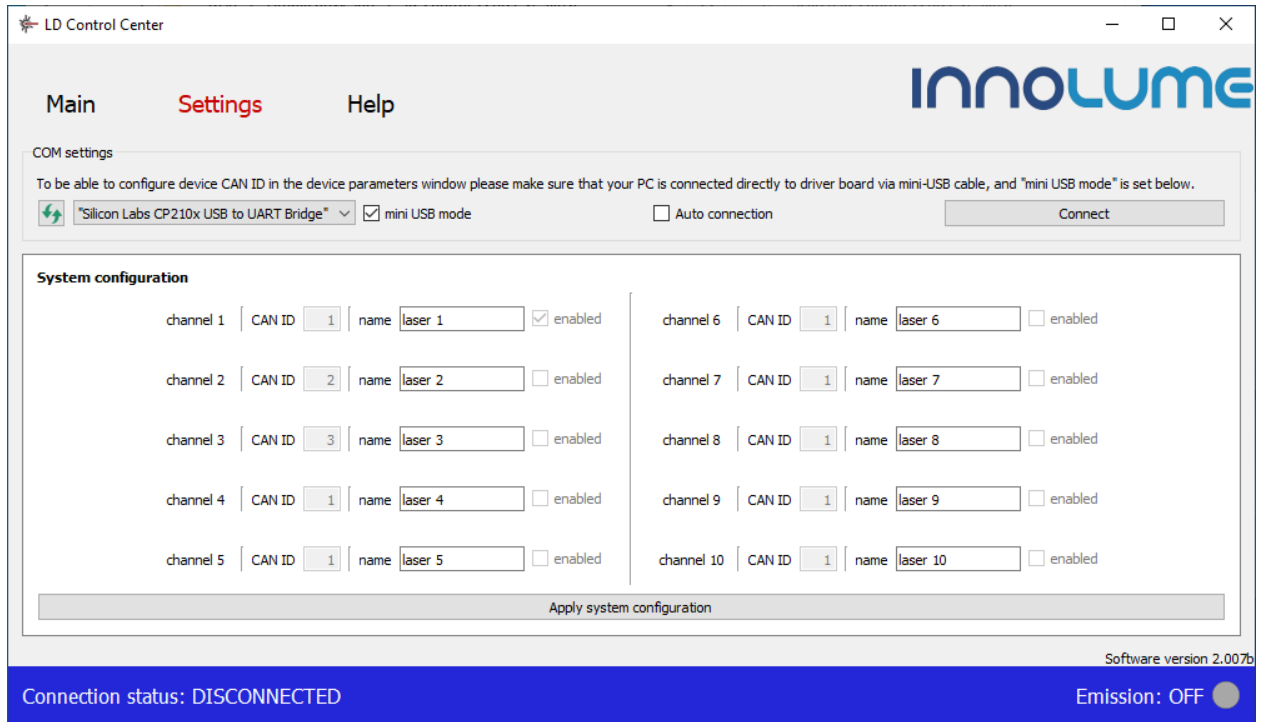
After proper installation of Windows Driver a device with title “Silicon Labs CP210x USB to UART Bridge” with an automatically assigned COM-port should appear as shown below:



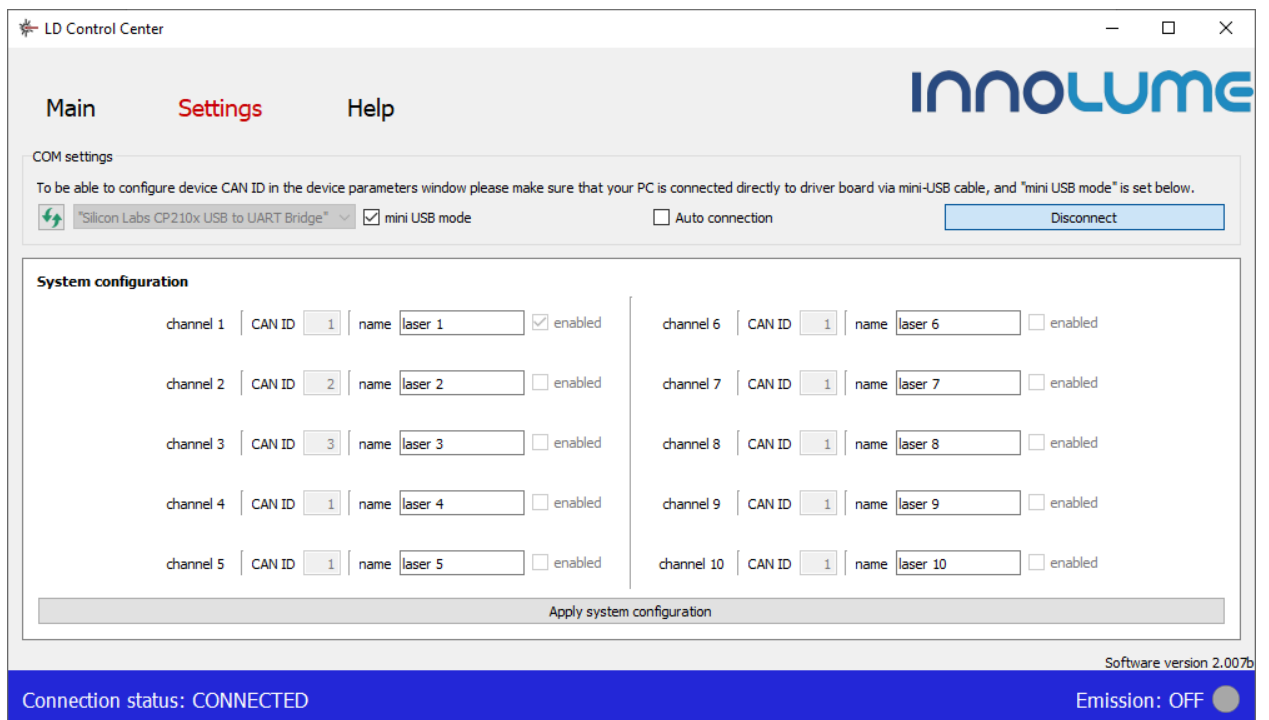
Program User Interface

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' window with the 'Main' tab selected. The title bar reads 'LD Control Center'. The main content area is titled 'laser 1 (NS Type 1.0/0.0 V 53.2/0.0 °C 1000/1000 kHz 1.0/1.0 ns Int: Normal)' and includes a power state toggle set to 'Off'. Below this, the 'NS Type Driver' section contains several controls: a 'Power state' toggle, 'Drive voltage' (1.0 V), 'Temperature' (35.0 °C), 'Repetition rate, kHz' (1000), and 'Electrical pulse duration, ns' (1.0). A dropdown menu is open, showing options: 'Int: Normal', 'Int: Burst', 'Ext: Normal', 'Ext: Burst', and 'Pulse on Demand'. To the right, a 'Read values:' section displays: Power state: OFF, Voltage: 0.0 V, Temperature: 0.0 °C, Frequency: 1000 kHz, Duration: 1.0 ns, N: 0, M: 0, and Mode: Int: Normal. The bottom status bar shows 'Connection status: CONNECTED' and 'Emission: OFF'. The software version is 2.007b.

The top line displays the current parameters.

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

Choose **repetition rate** and **electrical pulse duration**. The preset parameters are 1MHz and 1 ns.

Top **(ON/OFF)** button 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 – standard mode when driver generates pulse trains with frequency set up in a separate window for the on-board pulse generator.

Int: Burst – burst mode when driver generates bursts of pulses at predefined frequency from on-board pulse generator. User can set the number of pulses in burst N and amount of pulses skipped between bursts.

Ext: Normal – operating mode when driver starts to generate pulse train at preset frequency as a response to external TTL trigger signal. Change of the trigger signal level from LOW to HIGH starts pulse generation. Change of trigger signal from HIGH to LOW stops pulse generation.

Ext: Burst – the same as Ext: Normal, but bursts of pulses are generated in response of external trigger signal.

Pulse on Demand – external trigger signal (change of trigger signal level from LOW to HIGH) launches generation of a single pulse.

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.