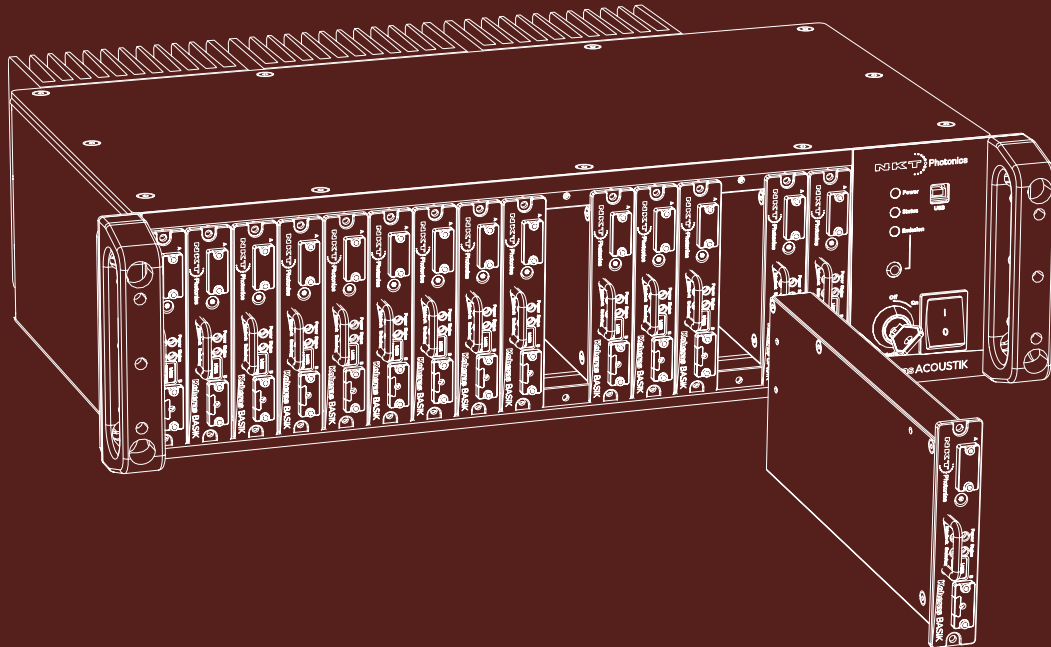


Koheras ACOUSTIK

Product Guide

Revision 1.2 10-2023



PRODUCT GUIDE

This guide includes information for the following NKT Photonics products:

Koheras ACOUSTIK

16 slot multi-channel rack-mountable modular laser system



CAUTION: Do not open the laser module. The laser is equipped with warranty labels (see [Figure 45](#)) on the covers of the module. The warranty is void if the system is opened.

Manufactured by:

NKT Photonics A/S

Blokken 84, Birkerød-3460 Denmark

The information in this publication is subject to change without notice.

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Specifications are listed as metric units. Imperial units listed are conversions.

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Guide Overview

This product guide is intended to provide functional, operational and installation information for the Koheras ACOUSTIK multi-channel laser system. The guide is divided in 3 sections as follows:

- **Koheras ACOUSTIK Description** - introduces the modular laser system, its functionality, interfaces and system variants.
- **Installing the Laser** – includes the details on how to install the laser system and connect optional interfaces.
- **Operating the Laser** – provides information and procedures on how to configure and control the modular laser system and its inserted modules.



WARNING: Do not operate the laser before first reading and understanding all warnings, cautions and handling information stated within the documents:

Koheras ACOUSTIK Safety, Handling and Regulatory Informationf



NOTE: The paper copy of this document is included with your laser however it can also be downloaded from:

<https://www.nktphotonics.com/lasers-fibers/support/product-manuals/>



WARNING: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

BOOSTIK amplifiers If you have inserted a 2 W BOOSTIK laser amplifier into an BASIK, you need to ensure Class 4 laser safety labeling is affixed to the system paneling. See “[System labeling update](#)” on page 26.

Terminology This guide refers to the Koheras ACOUSTIK as the “laser system” or simply “system”. The Koheras ACOUSTIK is specifically built to contain laser modules within its slots as components of a multi-laser system. In specific cases where a distinction is required, this guide uses the actual module names. Further, other NKT Photonics literature may refer to the Koheras ACOUSTIK as a frame or cabinet. These terms are one and the same as the term “system” within this guide.

Target audience This guide is for technical personnel involved in the selection, planning and deployment of lasers in laboratory and industrial settings. The guide assumes a reasonable knowledge level of lasers, photonic principles and electrical interface connectivity.

Chapters inside This guide includes the following chapters:

- Chapter 1 “**Description**” — Describes the system including its general operational principles, management and interfaces.
- Chapter 2 “**Mechanical Installation**” — Includes information on how to correctly install the system. Information within this chapter include a focus on providing adequate temperature regulation.
- Chapter 3 “**Connecting the ACOUSTIK**” — This chapter provides the information on how to physically connect the safety interlock, power, the optical connections, and optional external signaling.
- Chapter 4 “**Communicating with the ACOUSTIK**” — Provides information and procedures on how to setup a PC with ACOUSTIK and module control software and connect it to the system.
- Chapter 5 “**Enabling Emission**” — Contains procedures on how to safely turn the laser emission on and off using the CONTROL application.
- Chapter 6 “**Using CONTROL**” — Includes descriptions of all CONTROL menus, settings, and panel items.
- **Appendices** — The guide includes multiple appendices including laser specifications, support contact details, accessory descriptions and miscellaneous procedures supporting the laser operation and installation.

Added information and safety notices The lasers inserted into an ACOUSTIK system can cause serious injury and property damage. This guide use the following symbols to either highlight important safety information or provide further information in relation to a specific topic.



NOTE: Highlights additional information related to the associated topic and/or provides links or the name of the NKT guides describing the additional information.



CAUTION: Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.



WARNING: The laser safety warning alerts you to potential serious injury that may be caused when using the laser.

Revision This section records the document revision details.

Date	Revision	Changes
2021-09	1.0	First release - documents rewritten and overhauled from earlier releases.
2022-03	1.1	The following updates are included: <ul style="list-style-type: none">• Replaced misapplied serial monitor section with “Device monitor” on page 80.• Minor grammar corrections and improvements in language clarity.• Some figures have also been modified for clarity.
2023-10	1.2	Updated the style of the document.

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SECTION 1

KOHERAS ACOUSTIK DESCRIPTION

This section provides a description of the laser and its system types. It includes the following topics:

- “Description” on page 19
- “Front and rear panels” on page 21
- “Modulation” on page 24
- “Miscellaneous” on page 24
- “Control” on page 24
- “Status LEDs” on page 25
- “System labels” on page 26

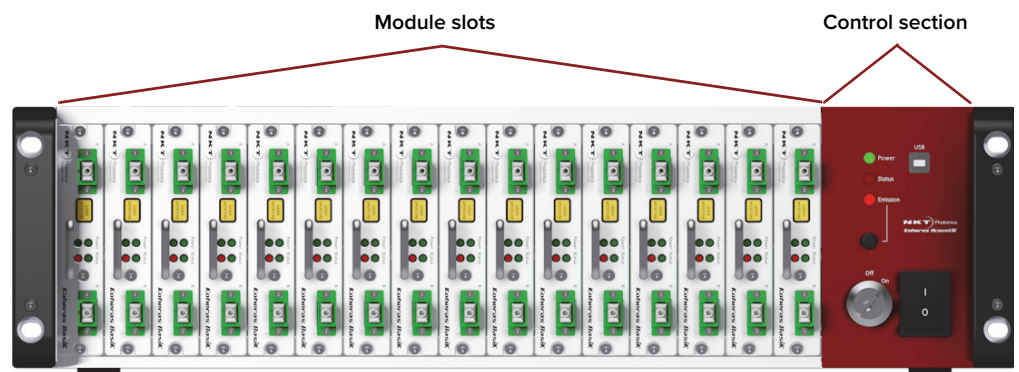
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Description

The Koheras ACOUSTIK is a rack or table mounted 16 slot modular laser system designed to integrate multiple Koheras BASIK fiber laser modules and optional BOOSTIK amplifier modules (2 maximum). Modules are inserted into the system's slots and interconnect through a backplane electrical connector. Inserted BASIK modules require one slot each and BOOSTIK modules occupy two slots. The ACOUSTIK includes a control section that provides power, signaling¹ and data communications to all inserted modules. The control section's functionality includes:

- system controller – Provides overall management and operation of all modules.
- DC Power – Supplies DC power to all inserted modules including an AC main power ON/OFF switch.
- Safety – Interconnects the inserted modules with a single safety interlock circuit including door and key switch control.
- Control interfaces – Serial USB or Ethernet connectivity connects a control PC to all inserted modules and the system controller.
- Modulation and trigger I/O – External input and output ports for wavelength and emission control of inserted modules.
- Status LEDs - Summary indicators for all inserted modules.
- Emission button – Enables emission for all inserted modules

Figure 1 ACOUSTIK front panel



Optical output **BASIK modules only**

You can insert up to 16 BASIK modules into an ACOUSTIK. In a standard system, optical output is distributed from each individual module using either FC/APC or SC/APC connectors. Fiber distribution of up to 16 main outputs and 16 monitor outputs is managed through mechanical means and fiber bend radius limits must be observed.

1. Modulation and trigger signaling – BASIK modules only

BASIK with BOOSTIK modules

Due to heat dissipation limitations, an ACOUSTIK laser system can only be operated with a maximum of 2 BOOSTIK amplifier modules. Further, the amplifiers must be installed in specific slots as described in “[Mechanical Installation](#)” on page 31. When amplifier modules are needed, a full installation includes 2 BOOSTIK amplifiers and 12 BASIK modules.

When paired with a BASIK laser module, a BOOSTIK module can extend the output power of the system by up to 2 W. The the main output fiber from a Class 3B BASIK is connected directly to the input of a BOOSTIK amplifier which then boosts the optical power to a Class 4 rating at its optical output.

Multiplexed optical output

The Koheras ACOUSTIK system is specified with or without optical multiplexing. Without multiplexing, the individual optical outputs of each module is employed.

When the multiplexed optical output feature is included, the optical output of inserted modules is combined into a signal optical output on the rear panel of the laser. As this is an advanced feature that requires a customized design, contact NKT Photonics to discuss your application suitability for the multiplexed option.



NOTE: BOOSTIK modules are not supported for use with the multiplexed output option.

Figure 2 Multiplexed optical output port



Slot configurations [Table 14](#) of [Appendix E](#) shows the supported ACOUSTIK module configurations that can be inserted into the system slots. You can insert either one or two BOOSTIK modules in specific slots only and all other available slots can be fitted with BASIK modules as required. The system can be fitted from as little as one module to a full slot configuration.



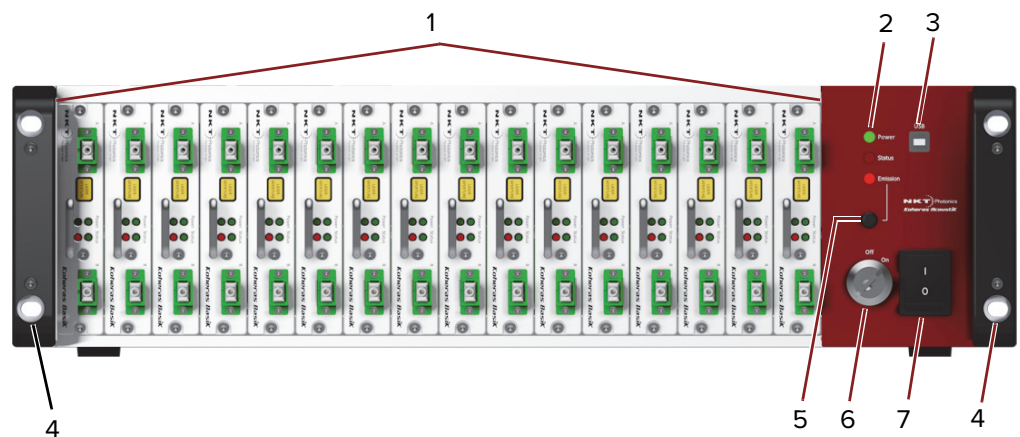
NOTE: Proper cooling of an ACOUSTIK system and its inserted modules must be maintained and is described in the chapter “[Mechanical Installation](#)” on page 31.

Front and rear panels

Front panel Figure 3 shows the front panel of the ACOUSTIK laser system. The front panel provides access to 16 slots. A single slot can house a Koheras BASIK module that connects to a backplane connector. For Koheras BOOSTIK modules, two slots are needed, however only the backplane connector in the right side slot connects to the module's rear panel electrical connector.

The front panel also incorporates controls and indicators for managing the inserted modules. These include: status LED indicators, an emission button, a security and interlock key switch, and an AC mains switch. To connect a management PC (with CONTROL), a USB port is located on the upper right panel of the control section.

Figure 3 ACOUSTIK front panel layout - BASIK modules only



- | | | | |
|---|-----------------------|---|-------------------------|
| 1 | 16 module slots | 5 | Emission control button |
| 2 | Summary status LEDs | 6 | Key switch |
| 3 | USB type B port | 7 | AC mains switch |
| 4 | Rack mounting flanges | | |

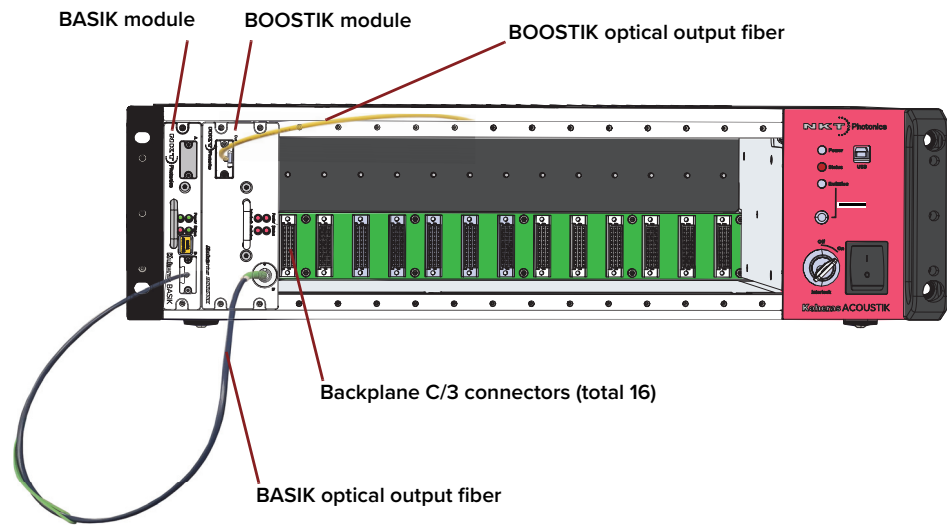
System slots

At the back of each slot, mounted on the system backplane, a female 30 pin C/3 connector connects to each module's electrical connector. When a module is pushed into the slot, the connectors are aligned by a hole in the rear panel of the module which slides over an alignment pin projecting out from the backplane.



NOTE: BOOSTIK modules occupy two slots, but only connect to the C/3 connector of the right slot.

Figure 4 System with a single BASIK and BOOSTIK module installed



Summary status indicators

These LEDs indicate the status for all inserted modules - see “[Status LEDs](#)” on [page 25](#).

USB type B port

This is the system management port, use a USB cable to connect this port to a PC. You can control the inserted modules using the NKT Photonics CONTROL application.

Emission control button

Pressing the button enables or disables emission from all modules inserted and ready in the system.

Key switch

The key switch must be ON to enable the interlock and permit emission. Remove the key to prevent unauthorized laser operation.

AC mains switch

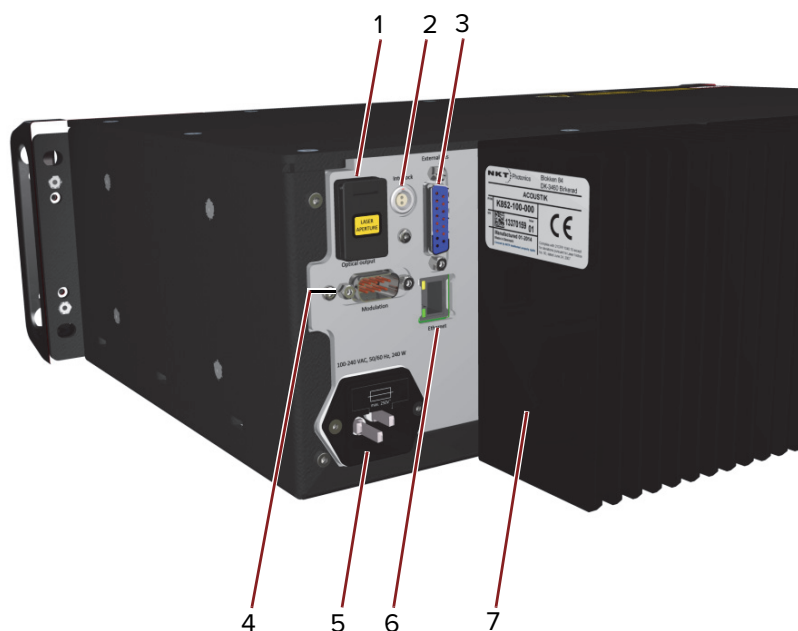
ON/OFF AC power switch that turns the system controller ON and supplies DC power to all inserted modules.

Rack mounting flanges

The front panel includes flanges on each side for mounting the system onto a standard 19 inch rack. For more information on installing the system, see “[Mechanical Installation](#)” on [page 31](#).

Rear panel [Figure 5](#) shows the rear panel connectors and part of the cooling fin array that maintains the inserted modules at their optimum operational temperature.

The rear panel provides connectivity for control signals, safety interlock, accessories, and AC mains.

Figure 5 ACOUSTIK rear panel layout

- | | | | |
|---|---|---|-----------------------------|
| 1 | Multiplexed optical output – OPTIONAL | 5 | AC mains input |
| 2 | LEMO door interlock connector | 6 | 10/100 BASE-T Ethernet port |
| 3 | External bus female D-sub 15 pin connector | 7 | Cooling fins |
| 4 | Modulation & Trigger I/O male D-sub 9 pin connector | | |



NOTE: Pin assignments of connectors are described in [Appendix C](#)

Multiplexed optical outlet

FC/APC or SC/APC connector – this is an optional feature used when the optical outputs of the inserted modules are multiplexed onto a single optical output – see [“Multiplexed optical output” on page 20](#). The majority of systems do not support this feature and instead of an outlet, a metal cover plate is installed.

LEMO connector

2 pin door interlock circuit – connect it to a door interlock circuit using the supplied LEMO plug connector assembly, see [“Connecting the safety interlock” on page 37](#).

Modulation and Trigger

Male D-sub 9 pin connector providing pins for wavelength input/output and trigger signal connectivity for inserted BASIK modules, see [“Modulation” on page 24](#).

AC mains input

AC inlet - standard IEC C14 AC inlet connector

Ethernet

10/100 Mbps BASE-T Ethernet port to connect CONTROL to the laser over IP – see [“Connecting a PC to the ACOUSTIK using Ethernet” on page 49](#).

External Bus

Female D-sub 15 pin connector – connects the system and inserted modules to other systems or accessories. The connector provides an RS-485 bus control interface, 12V DC power, and an extension of the interlock safety circuit for connected accessories. If no accessories are connected, the bus interlock defeater included with the ACOUSTIK is placed on the connector to loop back the interlock safety circuit.

Modulation

The Koheras ACOUSTIK system provides a single point port for connecting external wavelength and amplitude modulation signals that are fed to the inserted BASIK modules through the system backplane. Signals on the pins are only used by modules that support the modulation features.

For more information about setting wavelength modulation for Koheras BASIK sub-modules and system, see “[Wavelength modulation](#)” on page 70.

For information concerning amplitude modulation capability, contact NKT Photonics, see “[Support contact details](#)” on page 90.

Miscellaneous

Safety



WARNING: BASIK modules inserted into the system are rated as Class 3B lasers and BOOSTIK 2W modules are rated Class 4. These laser devices are therefore hazardous. Before turning on the laser and amplifier modules, ensure to read and understand all safety statements of the document:

Koheras ACOUSTIK Safety, Handling and Regulatory Information

A paper copy of this document is included with your laser. If you do not have access it, you can download a copy from:

<https://www.nktphotonics.com/lasers-fibers/support/product-manuals/>

Control

System and laser management

The ACOUSTIK system, inserted modules, and any associated accessories are controlled using NKT Photonics’ CONTROL software installed on a PC. Additionally, the front panel also includes emission on/off functionality and a key switch for added operational safety.


A management PC with CONTROL installed on it, can connect using either the USB serial port on the front panel or the 10/100 BASE-T Ethernet port on the rear panel.

[Section 2](#) includes chapters on using CONTROL and how to manage and operate the system and any inserted modules.

Status LEDs

The front panel houses three status LEDs as described in [Table 1](#). The LEDs are located on the front panel as shown in [Figure 3](#).

Table 1 Status LEDs

LED Name	Condition	Description
Power	ON Green	AC mains connected and the system power switch is in the ON position.
	ON Red	Fault with the DC power supply NOTE: When the system is switched ON or OFF the LED momentarily flashes red – this is <u>NOT</u> a fault.
	OFF	System switched OFF or no AC mains power
Status	OFF	One of the following: <ul style="list-style-type: none"> • Interlock is reset but there is no emission from the system • Alternatively, firmware is being uploaded to the system main control board. During firmware upgrade, the interlock cannot be reset and no emission from the system is possible.
	ON Amber	Interlock requires a reset – cycle the key switch from the OFF to the ON position.
	Flashing Amber	The system main control board is scanning for modules inserted into the system and accessories connected to the external bus.
	ON Green	Laser emission enabled and stable on all inserted modules.
	Flashing Green	Laser emission enabled from inserted modules but at least one module has not stabilized.
	ON Red	One of the following: <ul style="list-style-type: none"> • Either one or multiple sub-modules inserted in the system have autonomously shutdown. Other modules/channels continue to operate, i.e. the system control section does not shut them down. • The system control section has shutdown all modules/channels. • BOOSTIK emission failed to turn ON emission due to no input power. • Interlock circuit opened during emission. <p>In the first three cases above use CONTROL to check for an actual error code. If the interlock circuit opened, check the key switch position and interlock circuit continuity.</p>
	Flashing Red	Firmware is being uploaded to modules in the Koheras ACOUSTIK system or accessories connected to the External Bus.
Emission	ON Red	Laser module emission is ON. 
	OFF	Laser emission is OFF.



NOTE: DO NOT OPERATE the system and inserted modules (lasers) until you are familiar with the controls and have taken all precautions necessary as described in

the document: *Koheras ACOUSTIK Safety, Handling and Regulatory Information*.

System labels

A Koheras ACOUSTIK system has a number of labels placed on it that indicate hazards, regulatory, or manufacturing information. The labels are located on the panels described in [Table 2](#) with the panels shown in [Figure 6](#) and [Figure 7](#).

System labeling update If you inserted a 2 W BOOSTIK into an ACOUSTIK, before operating the ACOUSTIK, ensure to check that Class 4 labeling has been added to the system. Contact NKT Photonics if you require a new label kit, or if you have been supplied with an update labeling kit, apply the labels in the kit to the ACOUSTIK system as shown in [Figure 6](#).

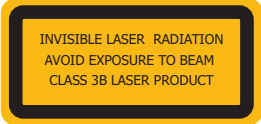
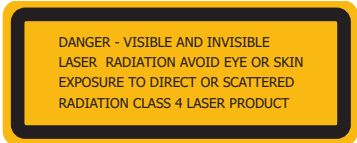
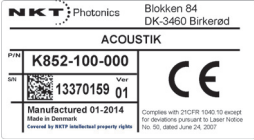
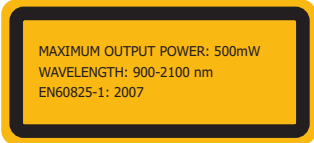



Figure 6 Top panel label locations



Figure 7 Rear panel label location



Table 2 System labels

Label	Panel	Description	
Classification - Emission Hazards	Top	Safety information stating the laser emission hazards and the laser’s class rating.	
Classification - Emission Hazards <i>BOOSTIK 2 W installed</i>	Top	Safety information stating the laser emission hazards and the laser’s class rating.	
Manufacturing	Rear	Manufacturing information including address, part and serial number, date manufactured and regulatory compliance.	
Product Information	Top	Safety label showing the emission specifications of the laser	
Product Information <i>BOOSTIK 2 W installed</i>	Top	Safety label showing the emission specifications of the laser	
Laser Radiation Warning	Top	Safety information alert indicating this area of the laser is near a source of dangerous laser emission.	
Laser Aperture	Fiber connector	Safety information alert indicating the location of the aperture where laser radiation is emitted from the laser. If the module includes a separate monitor output, this is a class 1 laser output and does not require a a label. (Optional, see Multiplexed)	

SECTION 2

INSTALLING AN ACOUSTIK SYSTEM

This section describes how to install the laser and includes the chapters:

- “Mechanical Installation” on page 31
- “Connecting the ACOUSTIK” on page 37

2 Mechanical Installation

Install the system either on a flat surface or rack-mounted in a standard 19 inch rack. This section provides information on inserting modules and mounting or placing the system to for optimal function and ensure that heat generated by the laser is adequately dissipated.

General

The system must be installed on a level surface or rack that is free from vibrations. The ambient temperature surrounding the system should be stable and free from any sources that could cause temperature fluctuations. It is important to note that temperature changes and vibrations may affect operation of the inserted modules and result in abnormal operation.



CAUTION: For reliable operation, the system and its modules should not be exposed to corrosive agents or excessive moisture, heat sources or dust.

Operating environment

- Operating temperature range: +15° C to +60° C
- Protection from dust (Pollution degree 2, Office environment)
- Operating relative humidity: 0 to 70% (non-condensing)

Heat dissipation

Within the system, each inserted module generates heat during operation. The heat generating components of the modules are thermally connected from the backplane to the cooling fins mounted on the rear panel. When compared with active cooling, using passive cooling fins avoids undesired phase noise affecting the laser optical output. However, the installation must also ensure that adequate airflow is available at the cooling fins to sufficiently dissipate the generated heat.

BOOSTIK modules BOOSTIK amplifier modules inserted in the ACOUSTIK generate considerably more heat than BASIK modules. To maintain the operating temperature of the modules follow the recommendations in [Table 3](#).

Table 3 BOOSTIK installation recommendations

Item	Recommendation	Value
# of BOOSTIK modules	Maximum 2 BOOSTIK modules per ACOUSTIK system.	≤ 2

Item	Recommendation	Value
Installation slots	See Table 14 on page 99 .	Slots
	Do not install two BOOSTIK modules in adjacent slots.	1-5 6-10
	Slots 15-16 not recommended.	11-14
Operating temperature		< 50°C
Ambient temperature of the installation environment	Airflow type	
	<i>Restricted air flow</i>	≤ 30°C
	<i>Free air flow</i>	≤ 35°C
	<i>Fan-forced air flow</i>	> 35°C

BOOSTIK operating temperature

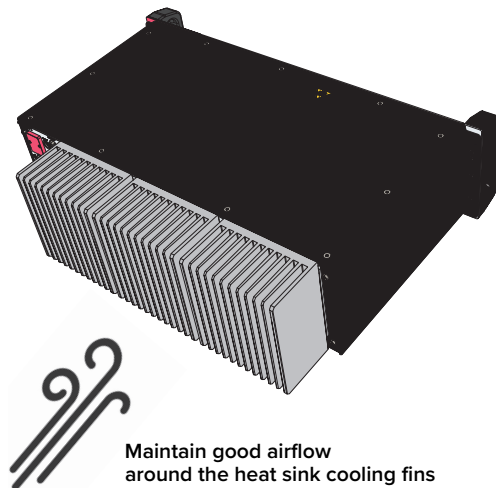
In general, the actual operating temperature of a BOOSTIK module inserted in an ACOUSTIK system depends on the following:

- Ambient temperature
- Overall airflow around the ACOUSTIK.
- Total number of inserted and operational modules.
- Connected seed laser module type: C15, E15, X15, or Y10
- Actual output power level of the BOOSTIK.
- Slot spacing between modules.



CAUTION: Only insert amplifier modules in certain slots according to the configurations listed in [Table 14 on page 99](#). Operating the ACOUSTIK with more than two BOOSTIK modules inserted, or inserting BOOSTIK modules in slots not matching the configurations in [Table 14](#), may result in thermal damage to the ACOUSTIK or its inserted modules.

Figure 8 Rear panel heat sink



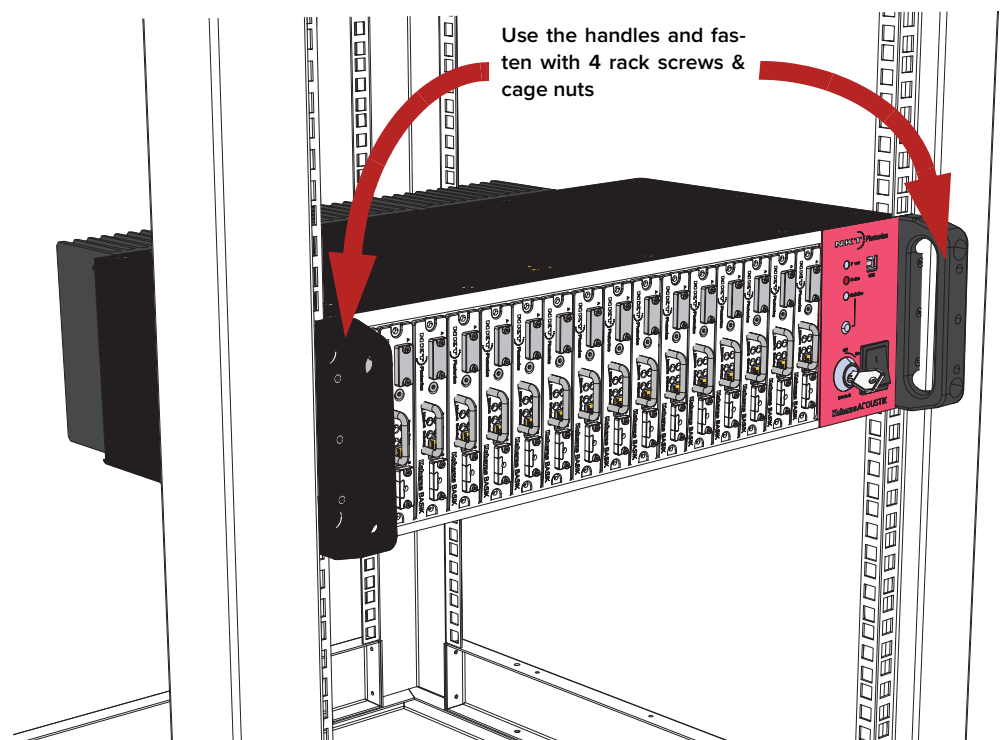
Rack mounting the system

The ACOUSTIK system can be mounted in a standard 19 inch rack using rack mounting screws and cage nuts. The system is 3U (units) high and the system can be placed on top of each other within a rack. For example, using a 42U rack, there is room to mount up to 14 Koheras ACOUSTIK systems.

Mounting recommendations

The system is equipped with hand holds next to the mounting flanges to help balance and support the laser when you are mounting it in a rack. Further, when a Koheras ACOUSTIK system is installed in a rack, ensure to fasten the system using all four mounting holes in the system flanges, two holes on each side.

Figure 9 ACOUSTIK installed in a 19 inch rack



CAUTION: To avoid injury and damage, NKT Photonics recommends that when rack mounting the Koheras ACOUSTIK system two persons are present. One person can position and support the system while the other fastens it to the rack.

Front and rear rack mounting

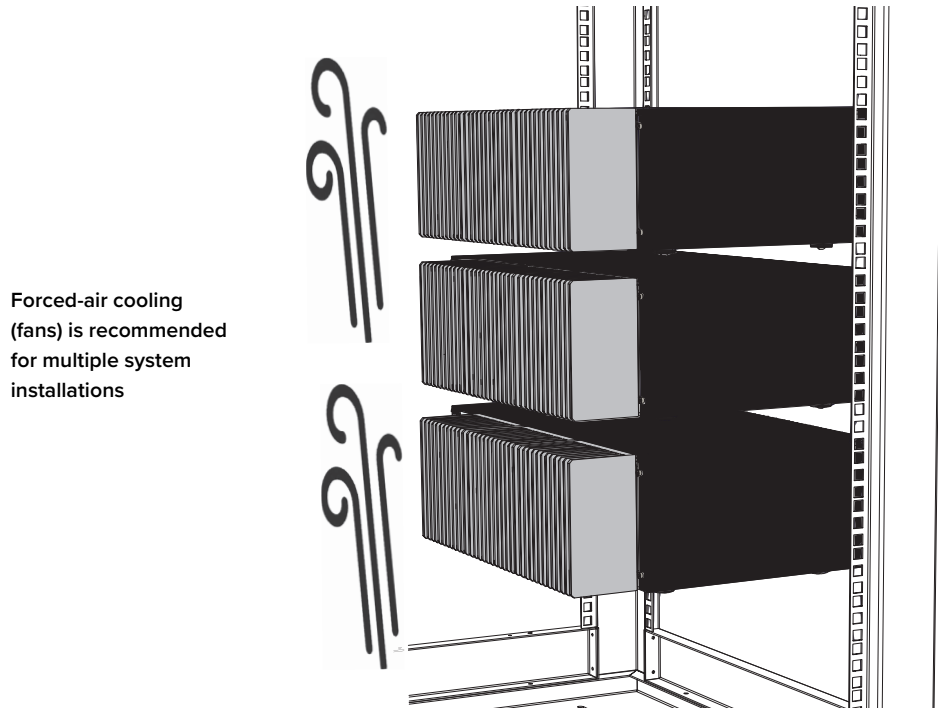
If the 19" rack used for the installation is deep enough, it is possible to install an ACOUSTIK system from both the front and rear of the rack. This effectively doubles the number of systems that can be installed in the rack. For example, up to 28 ACOUSTIK systems can be installed in a 42U rack of this type.

Rack-mounted cooling Once mounted in a rack, it is important that there is adequate airflow at the rear of the laser so that the cooling fins can effectively dissipate the heat generated by the laser – see “Heat dissipation” on page 31.

Forced air cooling

When multiple ACOUSTIK system are installed in a single rack, it is recommended to use forced air cooling. .

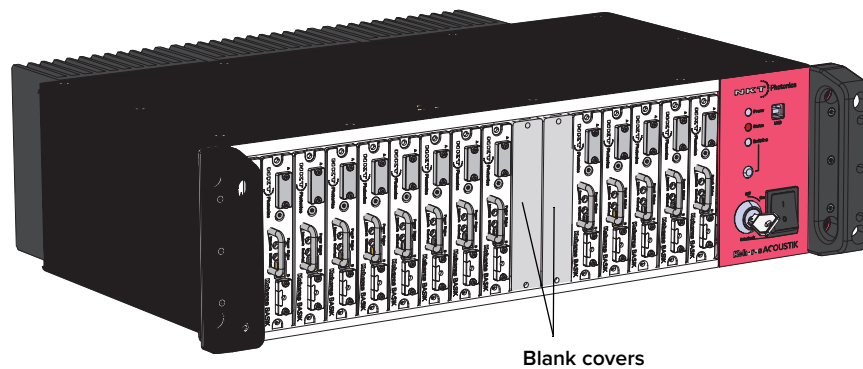
Figure 10 Cooling a multiple system installation



i **NOTE:** The vibration sensitivity of the installed laser modules requires rack cooling fans installed with vibration isolation.

Blank covers For systems that are not fully populated, place a blank cover over each unoccupied slot. Figure 11 shows blank covers installed in slot positions 10 and 11.

Figure 11 Blank cover installed



Placing the system on a surface

For installations where the system is placed on a level surface such as a table or otherwise, the system is equipped with four (4) rubber feet on its bottom panel. Ensure to include adequate space at the rear of the system so that the cooling fins can effectively dissipate the heat generated by the modules in the system.

Additionally, the surface should be free from vibrations and any source that could cause temperature variations.

Operating and storage environment

[Appendix A](#) details the required ambient operating and storage environment specifications.



WARNING: Although The Koheras ACOUSTIK itself is a 16-slot system, it houses both class 3B and class 4 laser products, therefore its operation facility and condition must comply with the standards listed below or similar:

- CFR21 1040.10 & Laser Notice LN50
- IEC / EN 60825-1

3

Connecting the ACOUSTIK

This chapter provides information on connecting the system and its modules.

For information on how to connect:

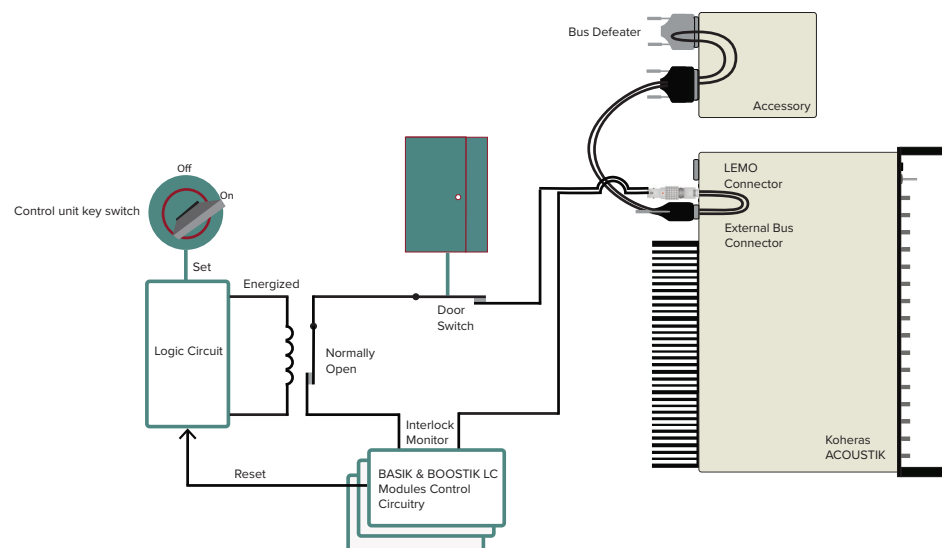
- The safety interlock – see “Connecting the safety interlock” on page 37
- Power – see “Connecting power” on page 40
- Modulation signal inputs and outputs – see “Connecting modulation signals” on page 40
- The optical output – see “Connecting modulation signals” on page 40
- Trigger – see “Connecting modulation signals” on page 40

Connecting the safety interlock

To comply with safety regulations and help provide a safe operating environment, the safety interlock of the ACOUSTIK system must be connected to a switch activated by an access door to its operating area. Each inserted module is connected to the system interlock circuit and when a connected door switch is opened or the circuit is shorted to ground, each module interlock circuit detects this and disables their respective emission.

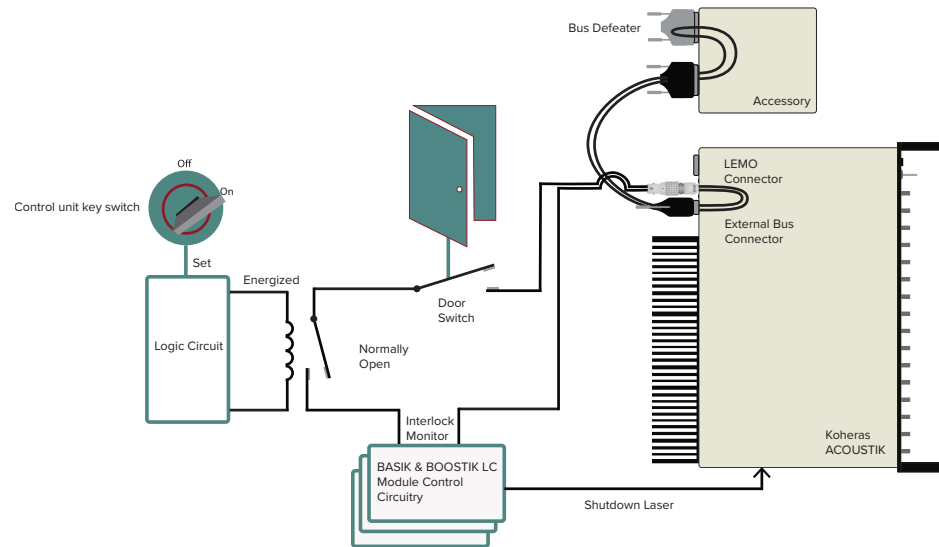
Interlock operation Emission can only be enabled when the connected interlock circuits are closed. There are two circuits: one circuit is connected through a door switch and another through the external bus to any connected accessories.


Figure 12 Interlock connected to a door switch - Laser ON





If either the door switch or the external bus circuit opens (see Figure 13), the inserted modules detect this and disable emission.

Figure 13 Interlock connected to a door switch - Laser SHUTDOWN



- 
CAUTION: Do not short-circuit the LEMO interlock connector. Short-circuiting the interlock circumvents safety regulations and NKT Photonics does not take liability for any injuries or damage caused by doing so.

- 
CAUTION: The switch connected to the interlock must be of an approved type. Further, the switch must be installed in a manner so that its operation cannot be fixed in the open state using a tool.

- 
WARNING: If the interlock is bypassed using an interlock deflector, personnel may be exposed to hazardous laser radiation. To reduce the risk to personnel, the person or group responsible for operation of the equipment must undertake a risk assessment and provide personnel with appropriate personal protective equipment and safety training.

Connecting an interlock door switch To connect a safety door switch to the LEMO interlock connector of the system, follow the steps in [Procedure 1](#).

Procedure 1 Connecting the door interlock circuit

Action

- 1 Install a switch that opens when the door accessing the ACOUSTIK installation enclosure is opened. The switch must comply with safety regulations.

- 2 Using a cable with a maximum wire length of five meters and at a minimum 26 AWG, connect the switch to a LEMO connector. For cable lengths longer than five meters, it is recommended to use shielded cable.

- 3 Perform a continuity test using a multimeter:
 - a. First connect the multimeter leads to the interlock plug terminals.
 - b. Confirm when the enclosure door is closed, the meter shows the circuit as closed.
 - c. Confirm when the enclosure door opens, the meter shows the circuit as open.

- 4 Insert the LEMO connector into the LEMO interlock connector on the rear panel of the system.

LEMO connector (door switch circuit)

LEMO Plug

The laser is shipped with a pre-wired LEMO interlock plug. If you need a new LEMO plug assembly contact NKT Photonics, see [“Support contact details” on page 90](#). The plug should be used to connect the door interlock circuit as described in [Procedure 1](#).

Figure 14 Pre-wired LEMO connector



Bus def eater

You must connect a bus def eater to the External bus output port of the last device in an External bus chain topology. For example, in [Figure 12](#), the bus def eater is placed on the bus output connector of a connected accessory, the last device connected to the External bus chain.

The External bus pins include an extension of the interlock circuit. The def eater plug loops the circuit at the last device connected to the External bus chain. When no accessory is employed, the def eater is placed on the ACOUSTIK system external bus connector.

If no def eater is used, the interlock circuit is left in the open state and disables the modules inserted in the system in the same manner as a connected door switch circuit in the open state. A def eater is included with the ACOUSTIK

system, it is a standard male sub-d 15 pin connector with the necessary pins looped back – see [Table 13 on page 91](#).

NOTE: When no accessories are connected to the ACOUSTIK system as is the typical case, place the bus def eater on the rear panel External bus connector of the ACOUSTIK.

Figure 15 External bus def eater



Connecting power

Power is supplied to an ACOUSTIK system through its rear AC input connector. The connector is a standard C14 inlet designed for use with a C13 AC power cord. Electrical and cable specifications are listed in [Table 4](#).

Table 4 Power specifications

Item	Description
Maximum power consumption	300 W
AC mains Input	100-240 VAC @ 50-60 Hz
AC connector (inlet)	IEC 60320 C14 connector
Power cord	Regional AC power cord with IEC 60320 C-13 connector.

Connecting modulation signals

Input and output wavelength modulation signals are described in the document:

Koheras BASIK Product Guide

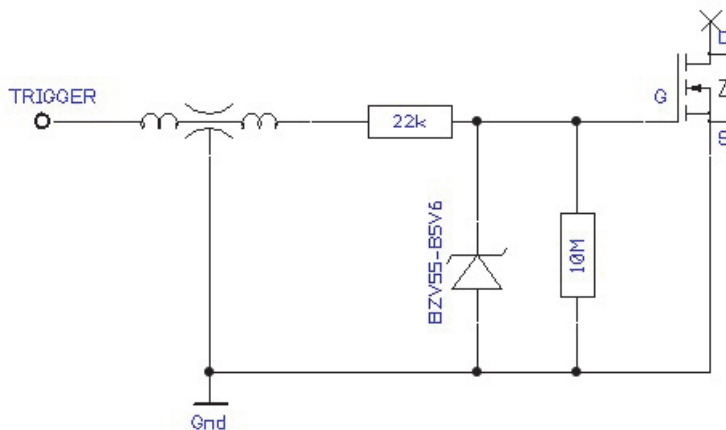
Connect modulation signals to the D-sub 9 pin connector on the rear panel, see [“Modulation input/output” on page 91](#) for the pin assignments of the connector.

Connecting the trigger input or output

The laser includes a trigger logic input/output pin of the *Modulation* connector (see Table 12). When used as an input, a signal on the pin 1 of the connector can trigger emission, and when set as an output, a signal on the pin indicates laser emission.

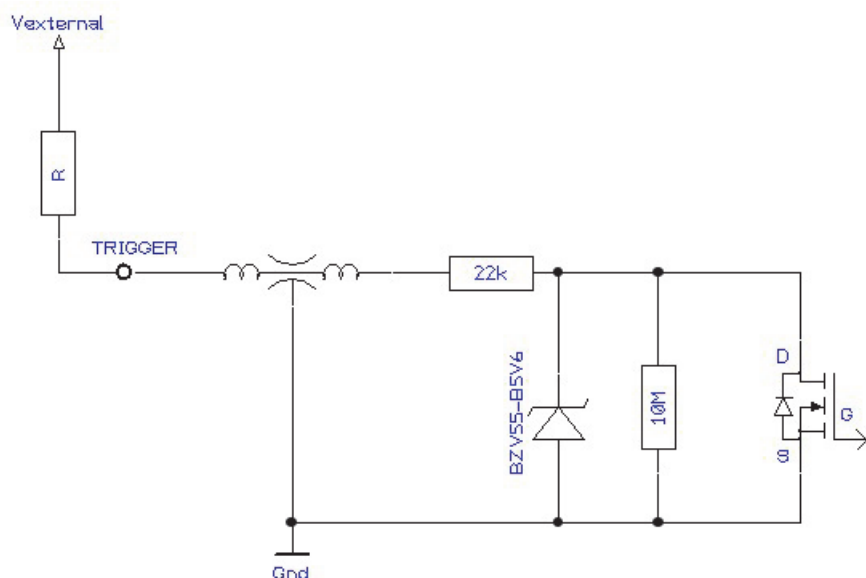
Input trigger When the trigger pin is set as an input, a positive active high signal applied to the trigger pin enables emission. The diagram Figure 16 shows a schematic of the trigger input.

Figure 16 Trigger input circuit



Output trigger When the trigger feature is set the pin as an output, the trigger pin should be connected to an external pull-up resistor. The diagram shown in Figure 17 shows a schematic of the trigger output circuit.

Figure 17 Trigger output circuit



Trigger signal Based on the schematics of [Figure 16](#) and [Figure 17](#), high and low voltage levels can be calculated by the equations:

$$V_{\text{high}} = V_{\text{external}}$$

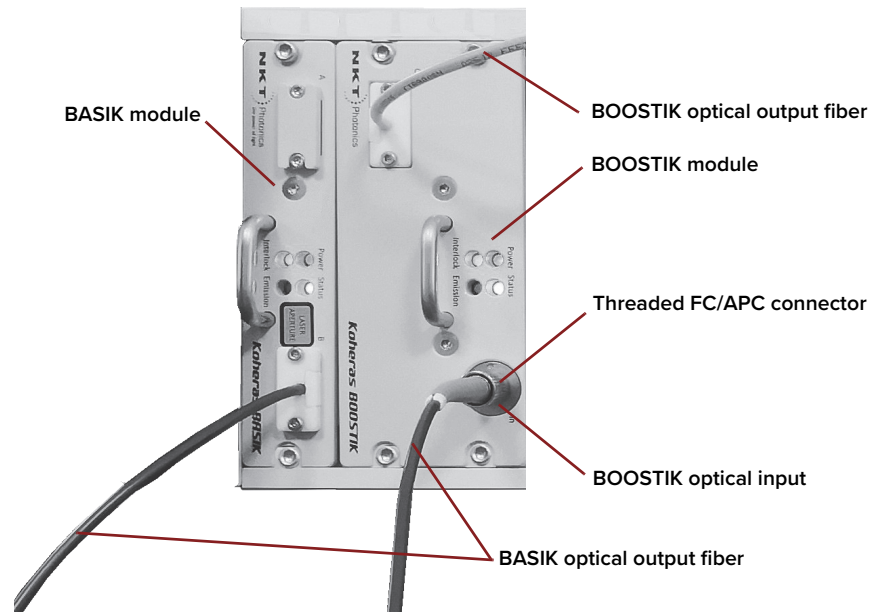
$$V_{\text{low}} = V_{\text{external}} \times 22\text{k} / (22\text{k} + R)$$

Connecting BASIK optical output to a BOOSTIK input

The optical output fiber from a BASIK module connects directly to the optical input of a BOOSTIK module using a threaded FC/APC connection.

Checking optical connectors Before connecting the optical output connectors of each Koheras module, ensure to check the connector tips using a fiber microscope. Using the microscope, check for any deformities, damage, residue or other contaminants at the optical tip of the connector. Either clean the connector using a suitable process or contact NKT Photonics support if replacement is necessary.

Figure 18 ACOUSTIK – single BASIK and BOOSTIK modules



SECTION 3

OPERATING THE ACOUSTIK SYSTEM

This section describes how to install the laser and includes the chapters:

- “Mechanical Installation” on page 31
- “Connecting the ACOUSTIK” on page 37

This section describes how to manage and operate the laser and includes the chapters:

- “Communicating with the ACOUSTIK” on page 47
- “Enabling Emission” on page 53
- “Using CONTROL” on page 63

4

Communicating with the ACOUSTIK

An ACOUSTIK system and its inserted modules are controlled using:

- NKT Photonics' CONTROL application (GUI) installed on a PC.

This chapter focuses on how to obtain and install CONTROL and then setup communications between a PC and the laser using either a USB or Ethernet connection.

CONTROL software

ACOUSTIK systems are shipped with NKT Photonics CONTROL software installer on a USB key. You can also download the most recent CONTROL application installer from the following link:

<https://www.nktphotonics.com/support>

CONTROL is capable of controlling, configuring and monitoring the laser.

Installing the software After downloading the CONTROL installer onto a PC, double click the installer and follow the built-in wizard. Details on installing the application is available in [Appendix D](#).

Connecting the ACOUSTIK to a PC with CONTROL

Connect the ACOUSTIK system to a PC with CONTROL installed on it using either a USB or Ethernet cable. Follow the steps in:

- [Procedure 2](#) to connect to the ACOUSTIK system using a USB cable.
- [Procedure 3](#) to connect to the ACOUSTIK system using an Ethernet cable.

Procedure 2 Connecting a PC to the ACOUSTIK using a USB cable

Action
1 Using a USB Type A-B cable, connect an available USB Type A port of the CONTROL PC to the system' USB Type B port. – see Figure 3 .
2 Connect power to the ACOUSTIK system and press the AC mains button to the ON position – see Connecting power on page 40 .
3 When power in the system is turned on, the front panel Status LED flashes amber briefly while the control section scans the backplane bus and external bus for available modules and accessories plugged into the system. Modules are assigned addresses from 1 to 16 corresponding to the slot positions.

Once the bus scan and module assignments are completed, the Status LED changes to ON amber.

Action

4 If necessary, wait for the Windows device manager to install the USB drivers on your PC needed for the USB connection to the ACOUSTIK.

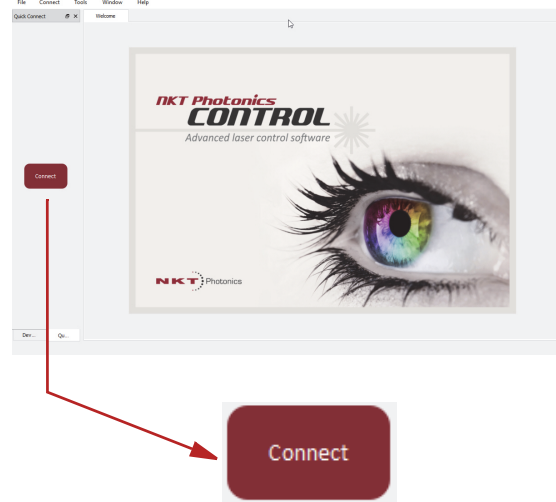
5 Launch CONTROL software by either:

- clicking on Windows – Start – Programs – NKT Photonics –CONTROL
- or –
- double clicking the CONTROL shortcut on the desktop

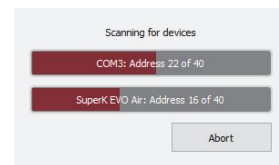


6 The CONTROL window opens.

Click on the *Connect* button in the *Quick Connect* panel.

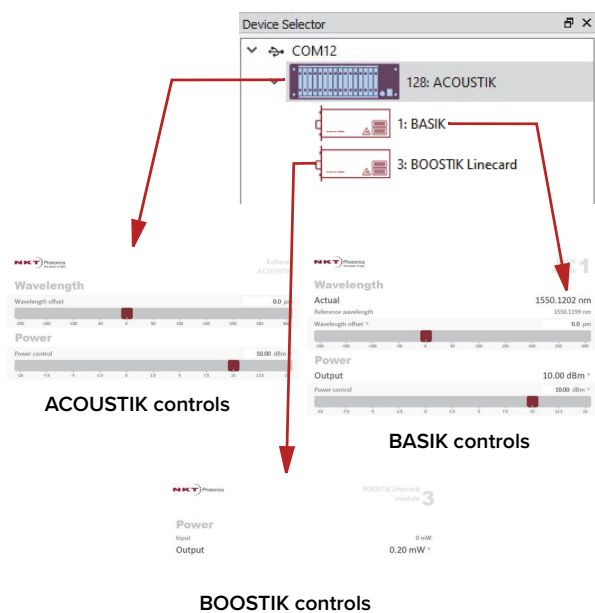


7 CONTROL automatically scans for any connected NKT Photonics products available on its COM ports and (configured) Ethernet ports.



8 The CONTROL, STATUS and other panels for the ACOUSTIK system open - see Figure 19 on page 63.

Under the ACOUSTIK icon, in the *Device Selector* panel, are icons representing each module inserted in the system. Click on the ACOUSTIK icon to access system level control and status panels. Click on a module icon to access individual laser or amplifier module control and status panels.

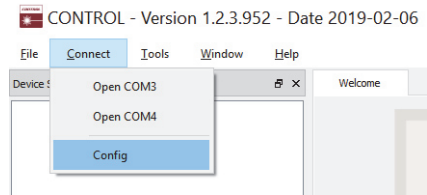


Ethernet connection To connect an ACOUSTIK system to a PC using Ethernet, the PC and the system must have their Ethernet ports connected to the same or separate IPv4 subnets. If separate subnets are used, ensure they are reachable from each other.

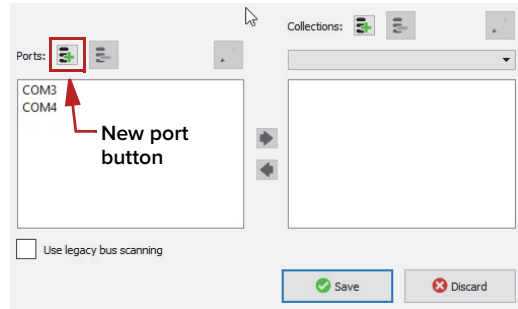
Procedure 3 Connecting a PC to the ACOUSTIK using Ethernet

Action

- 1 Connect the system to CONTROL over a USB connection – follow [Procedure 2](#).
- 2 Configure the ACOUSTIK IP address under *Settings - Ethernet* – see [Ethernet on page 77](#)
- 3 Disconnect the USB connection in CONTROL.
- 4 In CONTROL, click on the *Connect* menu item and select *Config* from the list to open the *Port Configuration* window.



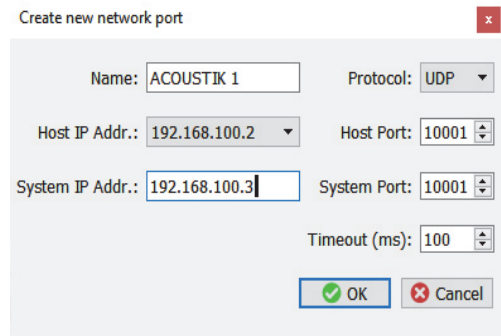
- 5 In the *Port Configuration* window, click on the *Create new port* button.



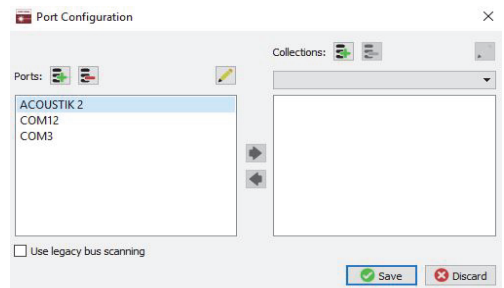
Action

6 The *Create new network port* window appears. Configure the port parameters as follows:

- Name* – Enter a name for the Ethernet connection (e.g. ACOUSTIK 1).
 - Host IP Addr.* – Click on the drop-down menu and select the host IP address assigned to the Ethernet port that connects to the ACOUSTIK.
 - System IP Addr.* – Enter the IPv4 address assigned to the ACOUSTIK system in step 2.
 - Protocol* – Select either UDP or TCP. UDP is the default and recommended.
 - Host Port* – Enter a TCP or UDP port number used by the management PC as set in step 2 – default: 10001.
 - System Port* – Enter the TCP or UDP port used by the ACOUSTIK system as set in step 2 – default: 10001.
- NOTE:** Connecting multiple systems over IP to the same CONTROL PC, requires a unique local system port for each system.
- Timeout (ms)* – Enter a timeout value in milliseconds. When CONTROL sends a request to the laser, it waits for a reply from the system until this timeout value expires, default: 100 milliseconds.
- Click OK to accept the configuration of the new network port.

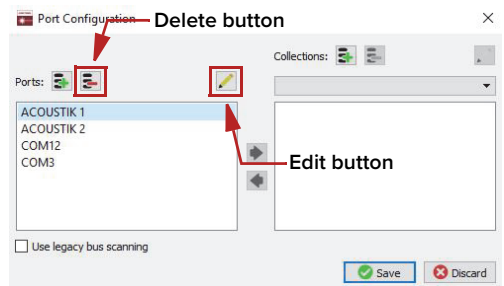


7 Click the *Save* button to save the configuration of the new Ethernet network connection.



8 To delete or modify a configured network port:

- a. Highlight the port and click the delete button.
- or -
- b. Click the *edit* button.
- c. Click *Save* when finished.

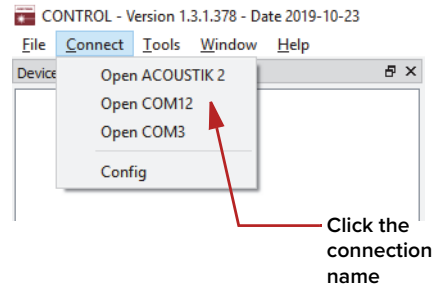


9 Using a CAT5 or better shielded Ethernet cable, connect the system' Ethernet port either directly to a CONTROL PC Ethernet port or to a subnet accessible by the PC.

Action

- 10 From the *Connect* drop down menu, click on the Ethernet network connection to connect CONTROL to the ACOUSTIK system.

NOTE: If CONTROL cannot access the port configured, verify connectivity by executing a PING test from the PC.
NOTE: You can also click the *Quick Connect* button. Ethernet connections are prioritized over USB.

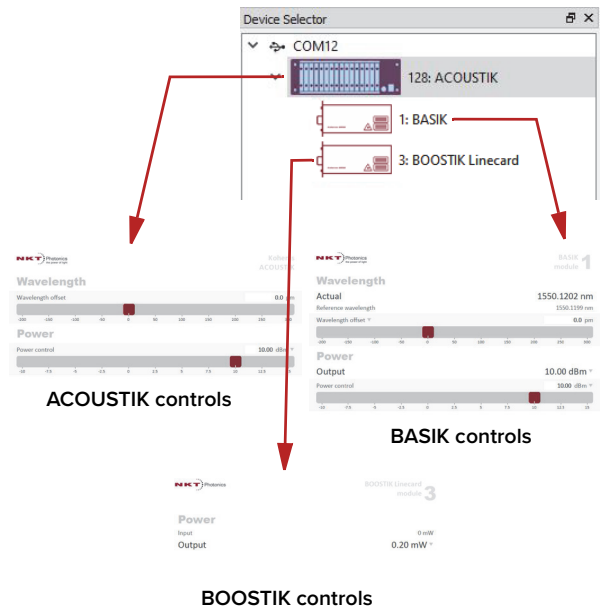


- 11 The CONTROL and STATUS panels for the ACOUSTIK system open.

Under the ACOUSTIK icon, in the *Device Selector* panel, are icons representing each module inserted in the system.

Click on the ACOUSTIK to access system level control and status panels.

Click on a module icon to access individual laser or amplifier module control and status panels.



5 Enabling Emission

An ACOUSTIK system features the capability to enable emission from all modules simultaneously or from individual modules. This chapter describes procedures for both.

Safety

Before you enable emission from the inserted modules in an ACOUSTIK, ensure that you are completely familiar and follow all safety information and recommendations stated within this document and the document:

Koheras ACOUSTIK Safety, Handling and Regulatory Information

You must follow all safety regulations required at the location where the laser is operated.

Preparation

Emission from the system is ready to be enabled when the following steps are completed:

1. The ACOUSTIK is securely installed and connected according to the procedures in [“Mechanical Installation” on page 31](#) and [“Connecting the ACOUSTIK” on page 37](#). This means the system is installed in the recommended environment with power applied and at the very minimum a door switch interlock and the included bus defeater installed.
2. The system is connected to a PC through either a USB or Ethernet connection and the PC has CONTROL installed on it and is connected and running according to the procedures in [“Communicating with the ACOUSTIK” on page 47](#).
3. The required modules are inserted into the system slots and they are firmly mated with the rear backplane connector. Additionally, using two supplied screws, the front panel of each module is fastened to the ACOUSTIK system.
4. If BOOSTIK modules are inserted, the output fiber connector from a BASIK module are connected to the input of the BOOSTIK.
5. All optical output connectors are placed so that any emission is contained within the working application such as for example, a beam dump that can safely absorb the emitted beam power.



WARNING: Enabling emission from the modules inserted in an ACOUSTIK emits hazardous laser Class 3B and with BOOSTIK modules, Class 4 radiation. Ensure to observe and implement all safety regulations, warnings and cautions in this guide and the *Koheras ACOUSTIK Safety, Handling and Regulatory Information* document before continuing.



WARNING: Ensure all fiber connector facets (tips) are clean. Optical power transmitted through a connector may burn particles on the connector face damaging it.



NOTE: When connecting an output fiber patch cord, ensure to match it with an appropriate fiber type.



CAUTION: Do not enable emission from the ACOUSTIK if any modules within it have been exposed to temperature and humidity beyond the operating specifications. The Koheras lasers are designed to operate in a non-condensing environment from +15°C to +60°C. Before enabling emission, allow the modules at least 30 minutes to stabilize at the operating room temperature. Turning on lasers that are too cold or hot may lead to damage.

Enabling emission from all modules

To enable emission from all modules inserted in an ACOUSTIK system, follow the steps in [Procedure 4](#).



NOTE: The modules are equipped with internal temperature sensors that monitor the temperature of sensitive components. If these components are outside their specified temperature range, emission is disabled.

Procedure 4 Enabling emission from all inserted modules

Action

1 Connect to the ACOUSTIK system using the procedures in [Communicating with the ACOUSTIK](#).

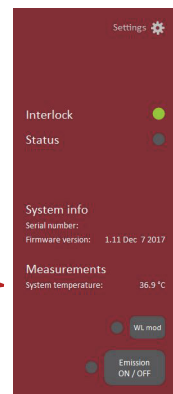
2 Select the system by clicking on its icon in the Device selector of CONTROL – see “Navigation” on page 66..

When the system is selected, the control and status panels display summary indicators and controls for all inserted modules.



Status panel of the the ACOUSTIK system

Control panel displays the ACOUSTIK system selected



Koheras
ACOUSTIK

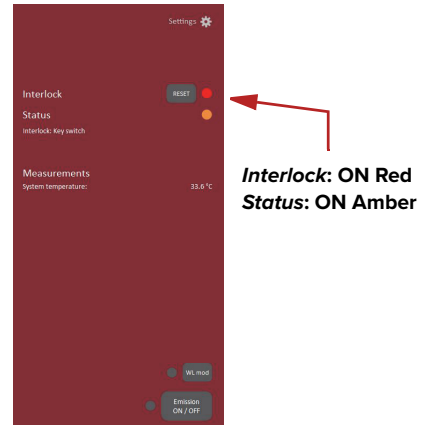
Action

3 Ensure the front panel key switch is set to the ON position.



4 Observe the *Interlock* indicator in the *status panel*, if it is Red and the *Status* indicator is Amber, check for the following conditions:

- a. The door interlock circuit is open – [Connecting the safety interlock](#)
- b. The external bus is not looped back with a bus def eater – [Connecting the safety interlock](#)
- c. The key switch is set to OFF – return to step 3.

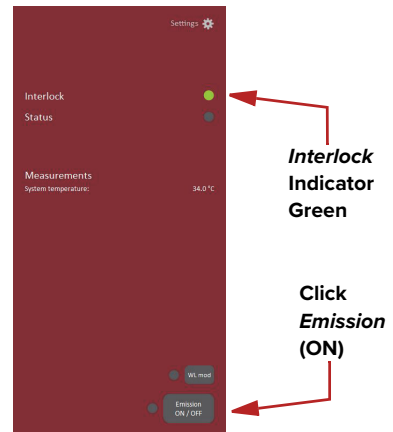


5 To enable emission for all inserted ACOUSTIK modules, click the Emission button once. The emission indicator (next to the Emission button) is lit Red.

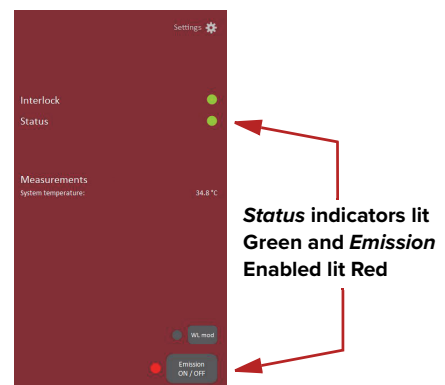
NOTE: Emission is enabled for all inserted modules.

The Status indicator is lit:

- Green – all laser modules are operating normally.
- Flashing Green – at least one laser module has not stabilized.
- Red – a system error or interlock opened with emission enabled. (Emission is disabled.)



6 Observe that the status panel (for the ACOUSTIK system) is shown with indicators in the emission enabled state.



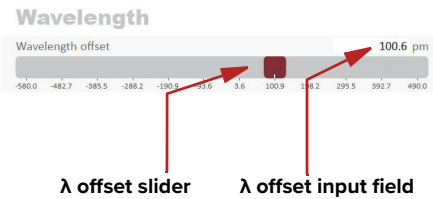
Action

7 Observe status and parameters of individual modules in the [Module overview](#) panel.

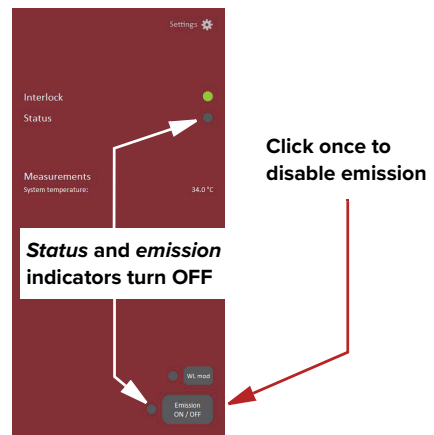
Module	Reference WL	Actual WL	WL offset	Actual WL offs	Status	Power setpo
1:	1550.1199 nm	1550.1186 nm	0.0 pm	-1.3 pm	●	1.00 mW
2:	1550.1199 nm	1550.1202 nm	0.0 pm	0.3 pm	●	1.00 mW

Status indicators for individual modules

- 8
- a. Set the reference wavelength offset for all inserted modules using the slider in the Wavelength offset setting control. To adjust the wavelength, click-hold the slider to change its position.
 - a. Alternatively, enter the wavelength in nanometer units by typing the value into the offset input field at the upper right corner.



9 To disable emission – click the *Emission* button once.



Enabling emission from an individual BASIK module

To enable emission from an individual BASIK module inserted in an ACOUSTIK system, follow the steps in [Procedure 5](#).

(i) NOTE: The modules are equipped with internal temperature sensors that monitor the temperature of sensitive components. If these components are outside their specified temperature range, emission is disabled.

Procedure 5 Enabling emission from an individual BASIK module

Action

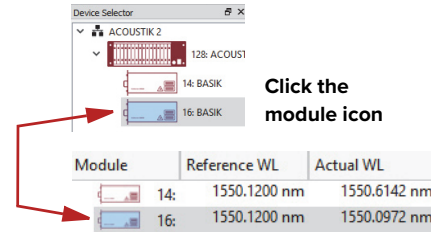
1 Connect to the ACOUSTIK system using the procedures in [Communicating with the ACOUSTIK](#).

2 Select the module to enable; click on its icon in the *Device Selector* or the *Module Overview* panel (see [Module overview](#)).

When a single BASIK module is selected, the control and status panels display indicators and controls for the selected module only.

NOTE: Koheras BASIK controls are described in the NKTP document:

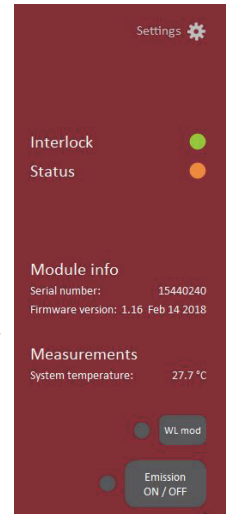
Koheras BASIK Product Guide



Click the module icon

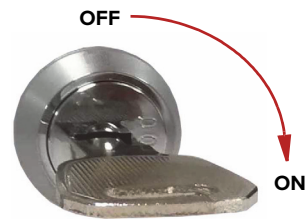
Status panel of the selected module

Control panel displays the selected module with slot #



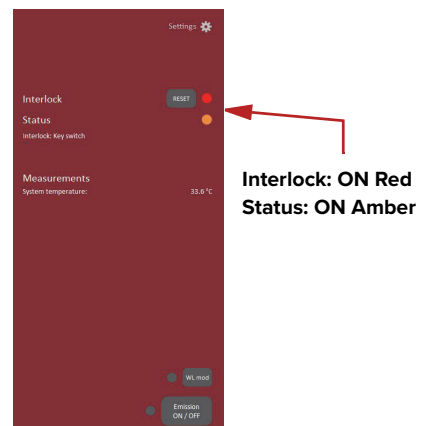
BASIK module 16

3 Ensure the front panel key switch is set to the ON position.



4 Observe the *Interlock* indicator in the *status panel*, if it is Red and the *Status* indicator is Amber, check for the following conditions:

- The door interlock circuit is open – [Connecting the safety interlock](#)
- The external bus is not looped back with a bus defeater – [Connecting the safety interlock](#)
- The key switch is set to *OFF* – return to step 3.



Action

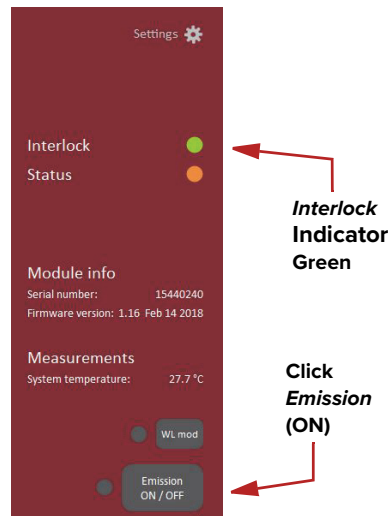
5 When the module is selected and the *Interlock* indicator is Green, click the *Emission* button once to enable emission.

The emission indicator (next to the *Emission* button) turns ON Red.

NOTE: Only the selected module's emission status changes. For other modules in the system, their emission status remains unchanged.

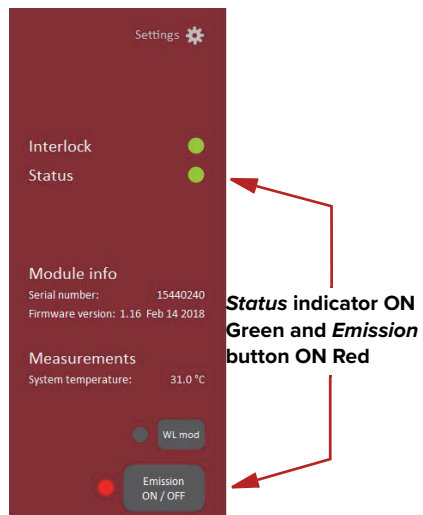
If the Status indicator turns:

- ON Green – the module is operating normally.
- Flashing Green – the module has not stabilized.
- Red – a system error or interlock opened with emission enabled. (Emission is disabled.)



6 Observe that the status panel shows the indicators in the emission enabled state.

- Interlock – ON Green
- Status – ON Green
- Emission – ON Red

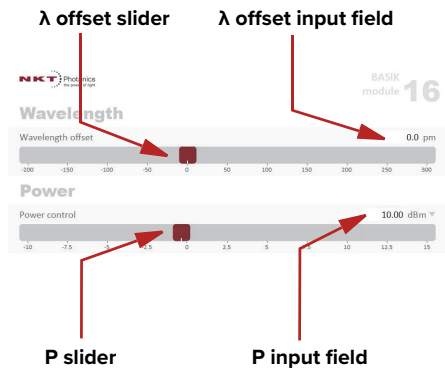


Further, observe that in the *Module overview* panel, the *Status* and *Emission* column indicators for the selected module are ON Green and Red respectively.

Status	Power setpoint	Actual power (	Power setpoint	Actual power (	Emission
●	16.00 mW	0.18 mW	12.04 dBm	-7.41 dBm	● OFF
●	10.00 mW	10.01 mW	10.00 dBm	10.00 dBm	● ON

Action

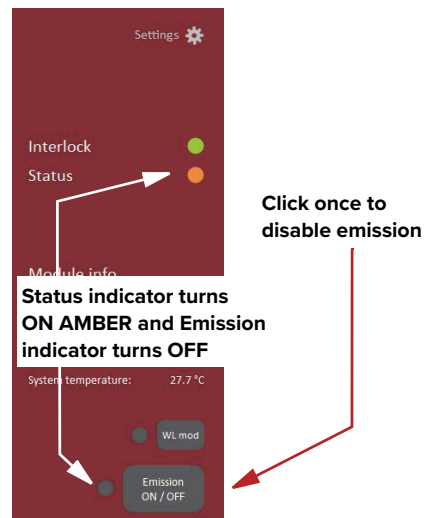
- 7 a. In the Control panel, set the reference wavelength (λ) or its offset using the *Wavelength or offset* slider control. To set it, click hold and move the red slider to adjust the setting.
- b. Alternatively, you can directly enter the wavelength (nm) or offset (pm) by typing the value into the wavelength input text field at the upper right side of the control.
- c. Set the laser's emitted power using the *Power* slider. To change the power, click hold the red slider to adjust its position along the bar.
- d. Alternatively, you can directly enter the output power in dBm or mW by typing the value into the power input text field at the upper right side of the control



- a. **NOTE:** To set the scale units, click on the downward pointing arrows for both the wavelength and power settings.



- 8 To disable emission – with the module still selected, click the Emission button once.



Enabling emission from an individual BOOSTIK module

To enable emission from an individual BOOSTIK module inserted in an ACOUSTIK system, follow the steps in [Procedure 6](#).



NOTE: The modules are equipped with internal temperature sensors that monitor the temperature of sensitive components. If these components are outside their specified temperature range, emission is disabled.

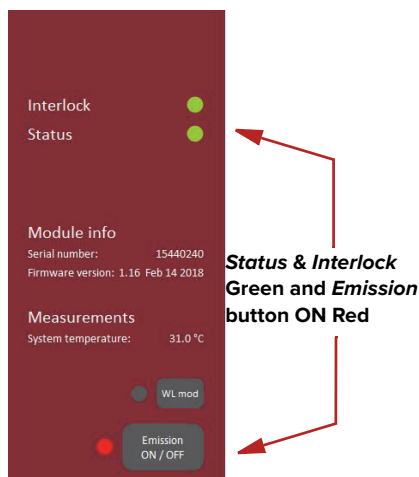
Procedure 6 Enabling emission from an individual BOOSTIK module

Action

1 Enable emission from the BASIK seed laser module connected to the optical input of the BOOSTIK - see [Procedure 5](#).

2 The status panel of the ACOUSTIK light source connected to the ACOUSTIK should show the following indicators:

- *Interlock* – Green
- *Status* – Green
- *Emission* button – Red

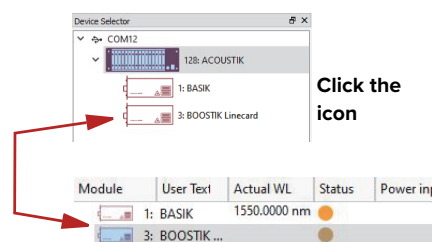


3 Select the BOOSTIK; click on its icon in the *Device Selector* - or - the *Module Overview* panel (see [Module overview](#)).

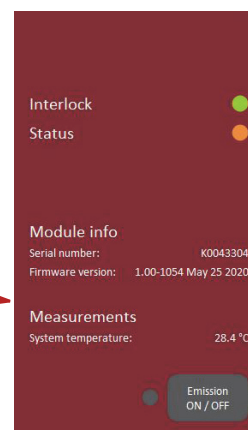
The control panel and status panel displays indicators and controls for the selected ACOUSTIK module.

NOTE: BOOSTIK controls are described in the NKTP document:

Koheras BOOSTIK User Guide



Status panel of the selected BOOSTIK



Header displays the selected module with connector slot #

BOOSTIK Linecard module **3**


Action

- 4 Before turning ON the BOOSTIK, check that the input from the BASIK module is ON.
 - a. In the **Module overview** panel, locate the *Power input* field for the BOOSTIK and check that the module measures a power level between 10 to 200 mW. If so, proceed to step 5.
 - b. If no power is measured or it is low, locate the *Actual power* field for the source BASIK module.
 - If there is no *Actual power* and emission is OFF, repeat **Procedure 5**.
 - If the emission power is low or you cannot enable emission, swap the ACOUSTIK module.

User Text	Power input (	Power setpoint	Actual power (	Emission
BOOSTIK ...	10 mW	55.00 mW	3.70 mW	OFF
: BASIK		10.00 mW	9.69 mW	ON

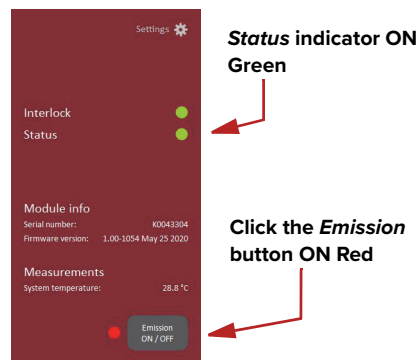
Power measured at the BOOSTIK input

BASIK Emission ON

- 5  **Warning:** Hazardous Class 4 emission present, avoid both eye and skin exposure.

Click the *Emission* button once to turn ON the BOOSTIK amplifier.

The *Status* indicator changes to ON Green and the *Emission* button indicator turns ON Red.

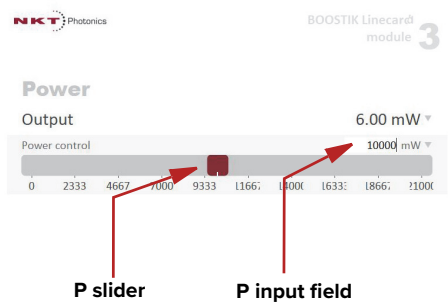


Actual power field measures output power

Module	User Text	Power input (	Power setpoint	Actual power (	Emission	Interlock
3:	BOOSTIK ...	10 mW	55.00 mW	56.00 mW	ON	Green
1:	BASIK		10.00 mW	9.73 mW	ON	Red

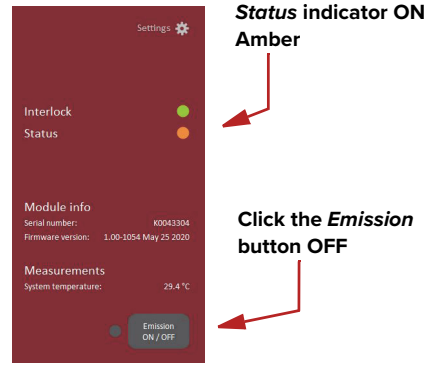
Note: *Error code 60* - BOOSTIK emission enabled with no input. Enable BASIK emission and re-enable BOOSTIK emission to clear the error.

- 6
 - a. Set the emitted power level using the slider in the *Power* setting control. To change the power, click-hold the red slider to change its position.
 - b. Alternatively, enter the power level in mW or dBm units by typing the value into the text input field at the upper right corner of the slider control.



Action

- 7 To disable emission from the amplifier, click the *Emission* button once.
The *Status* indicator changes to ON Amber and the *Emission* button indicator turns OFF



6 Using CONTROL

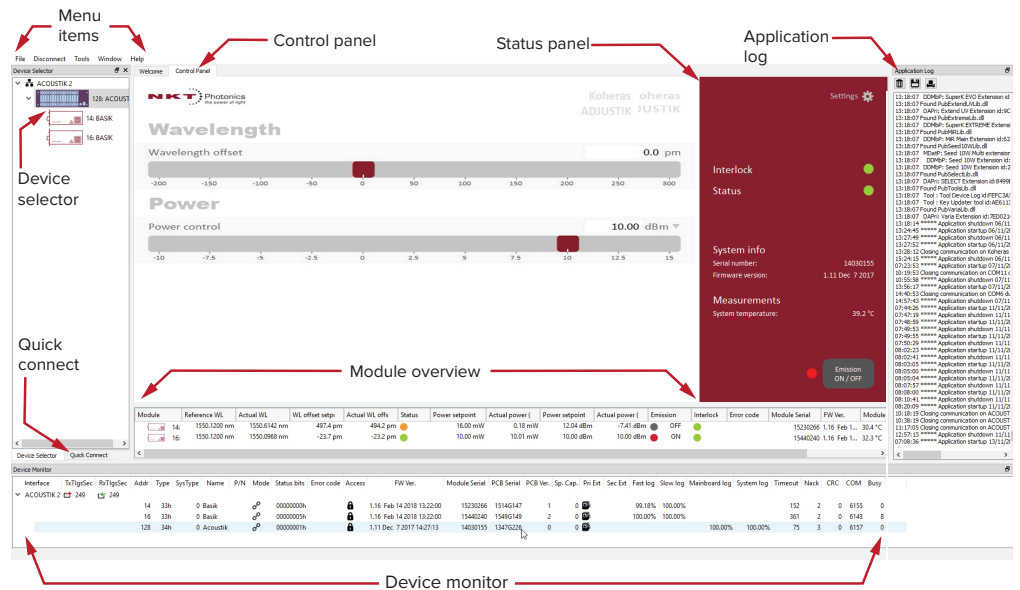
CONTROL overview

The CONTROL interface includes multiple panels and a selection of menu drop down items in the upper left corner. You can add or remove the displayed panels and panels can be dragged within the main window or into separate windows. [Figure 19](#) shows the CONTROL panels which are briefly described [Table 5](#) with links to more details descriptions.

Table 5 CONTROL panels and menu items

Panel	Function	See
Status Panel	This panel displays the selected device status, emission control and a CONTROL settings menu.	Status panel - ACOUSTIK system on page 67
Menu Items	Four drop down menus with multiple functions.	CONTROL menu items on page 79
Quick Connect	Provides a button when clicked, scans all available PC ports for connected NKTP products.	Connecting to the ACOUSTIK on page 65
Control Panel	The control panel provides controls for the laser. For example, It provides configuration controls such as the wavelength and power.	Control panel on page 82
Module Overview	Displays wavelength, power, status and general readings for each inserted ACOUSTIK module.	Module overview on page 82
Application Log	This panel displays a debugging log that can be saved to a file.	Application log on page 81
Device Monitor	To also help debugging issues, this panel displays multiple port and device module parameters.	Device monitor on page 80

Figure 19 GUI panel navigation



Relocating panels You can drag the different panels of CONTROL to any location within the main interface or into a separate floating panel. **Procedure 7** describes how to relocate a panel within the main window.

Procedure 7 Relocating panels

Action

- 1 Left click and hold the top title bar of the panel.
- 2 While holding the left mouse button down, drag the panel to another location in the main window.
- 3 In the new location, when the background turns blue, release the mouse button – see **Figure 20**.
- 4 Alternatively, drag the panel out from the main window and release the mouse button. A separate window for the panel is created. (see **Figure 21**)

Figure 20 Panel dragged to a new location in the main window -

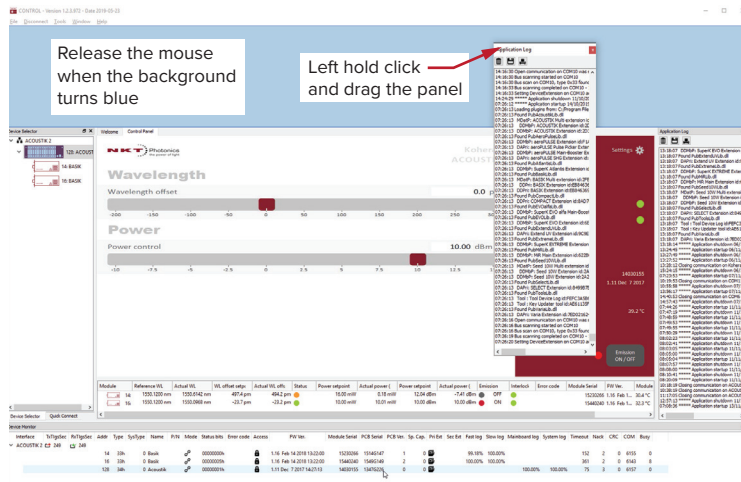
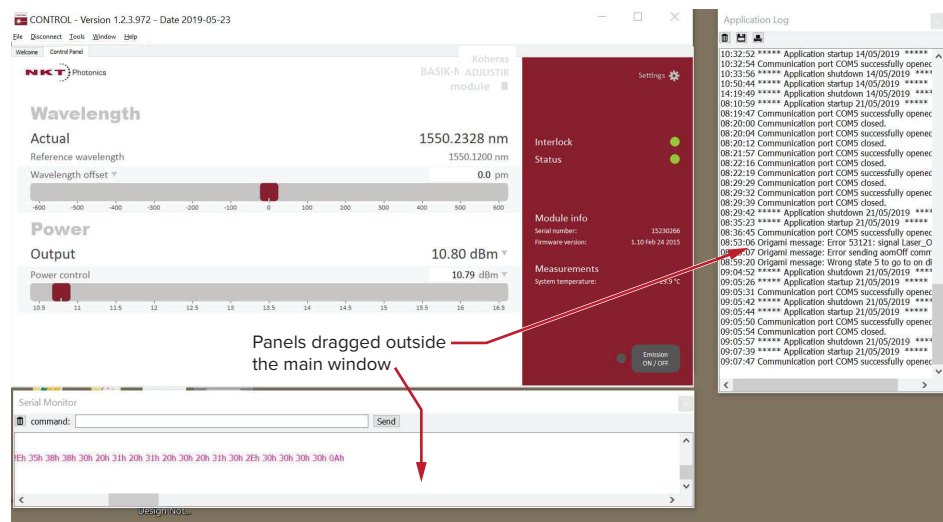
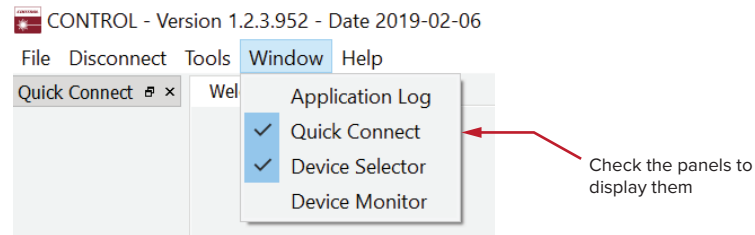


Figure 21 Panels dragged outside the main window



Toggle panels visible Use the Menu > Window drop down menu to check and uncheck panels to be displayed. A blue check mark indicates the panel is displayed.

Figure 22 Toggling panel visibility

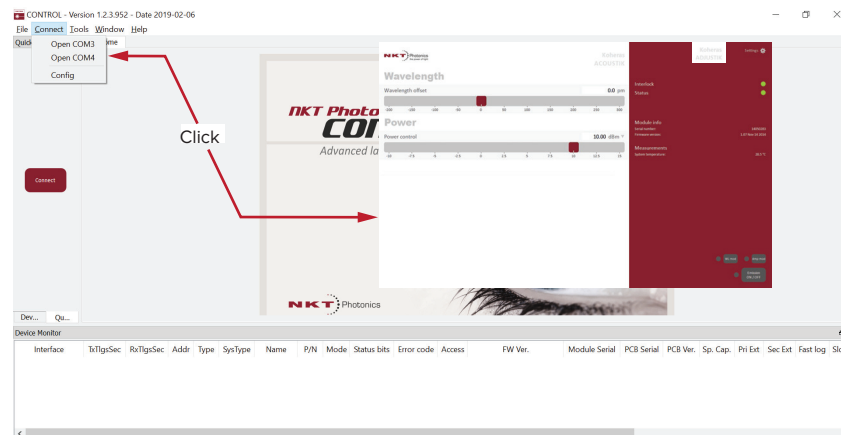


NOTE: To close a panel, click the X at the upper right corner of the panel.

Connecting to the ACOUSTIK When CONTROL is launched, the *Welcome* screen is displayed as in [Figure 23](#). In the menu bar, click the *Connect* drop down menu and then click on the COM port your laser is connected to. *Control* and *Status* panels are displayed when the laser connects to the GUI.

See “Connecting the ACOUSTIK to a PC with CONTROL” on page 47

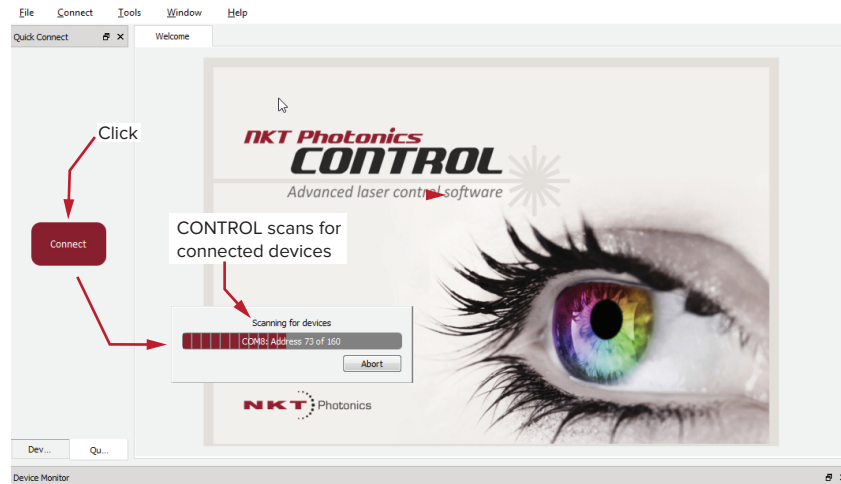
Figure 23 Welcome screen and connecting



Quick connect

Click the *Quick Connect* tab and the *Connect* button (Figure 24). CONTROL scans all available ports for NKTP devices that it can connect to. Once CONTROL finishes the scan, a list of the devices is presented.

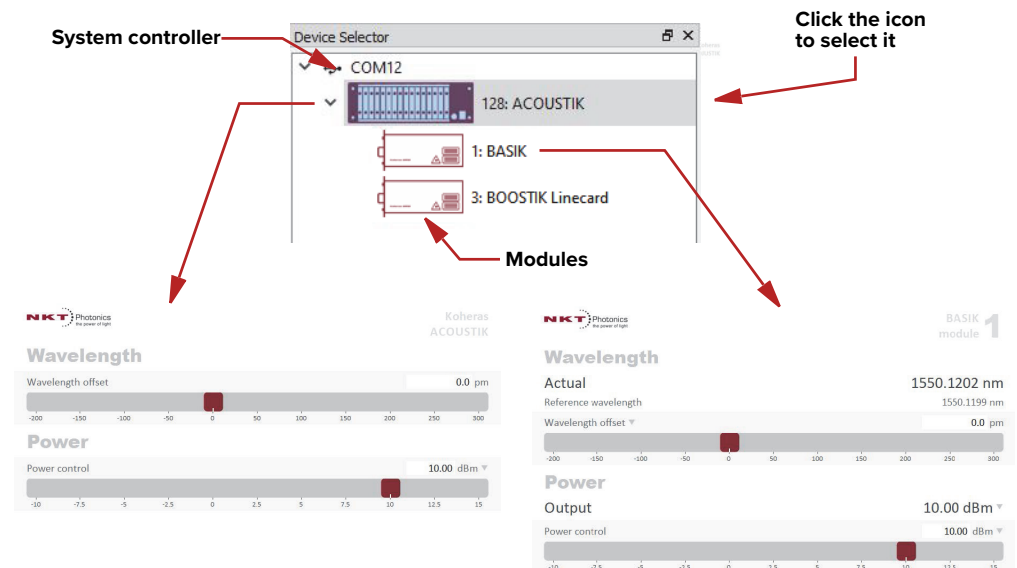
Figure 24 Connect button



Navigation

CONTROL can connect to either the system controller or the individual modules in the system slots. To select the system controller or a module, click on the icons in the *Device Selector* panel of control as shown in Figure 25.

Figure 25 Selecting the controller or a module to display in CONTROL



NOTE: When the controller of the system is selected, information about the system is displayed along with summary information of all modules. When a module is selected, the CONTROL interface only displays the selected module controls and status information.

ACOUSTIK modules - CONTROL interface Clicking on the module icon presents the CONTROL interface for the individual module. Refer to the documents:

Koheras BASIK Product Guide

Koheras BASIK MIKRO Product Guide

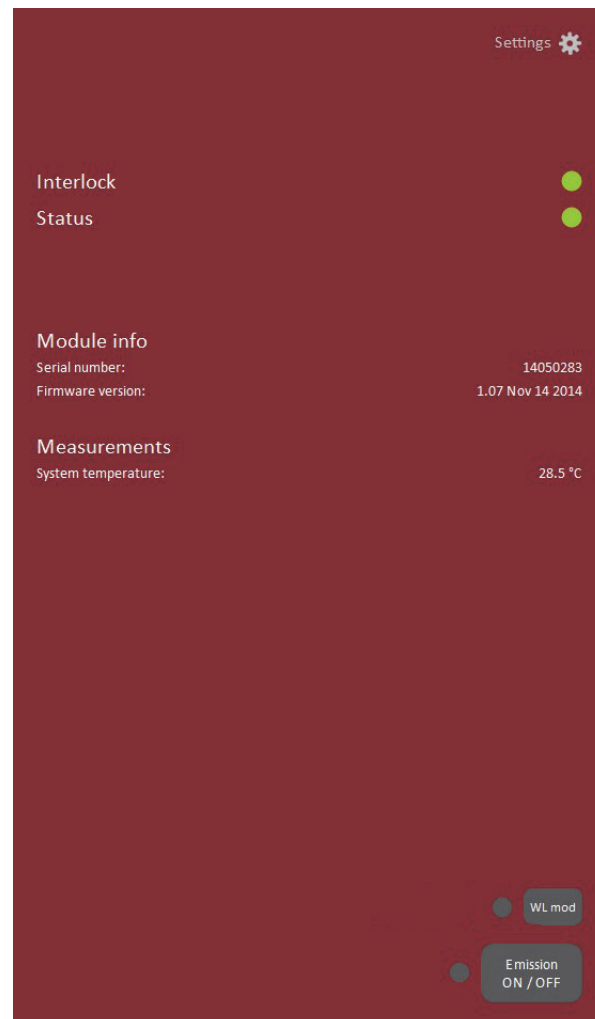
Koheras BOOSTIK LC User Guide

for information on using CONTROL directly with the modules.

Status panel - ACOUSTIK system

The status panel for the system provides status indicators, error messages, emission control function and a settings drop down menu.

Figure 26 Status panel



Status indicators The panel displays the following indicators:

Interlock

Indicates if the door interlock and external bus interlock circuit of the system is closed or open.

- ON Green – Interlock circuit closed
- ON Red – Interlock circuit open

Status

Indicates the overall status of all inserted modules.

- ON Green – Emission from all inserted modules has stabilized.
- Flashing Green – Emission from one or more of the inserted modules has not stabilized (warming-up).
- Flashing Amber – The system is scanning for inserted modules or connected accessories.
- ON Amber – Interlock error or interlock reset required
- ON Red:
 - One or more of the inserted modules has shutdown (self-initiated). Other modules in the system continue to operate. An error code is displayed beneath the status indicator.
 - The control section has shutdown all inserted modules in the system. An error code is displayed beneath the status indicator.
- OFF – Interlock circuit is closed but emission is not enabled on any inserted module.

System info The System Info section shows the following:

- system serial number
- system firmware version

Measurements Displays the system system temperature.

WL mod button and indicator


Button


The *WL mod* button turns wavelength modulation ON or OFF for inserted BASIK modules.

Indicator

GREEN – wavelength modulation is ON.


GREY – wavelength modulation is OFF.

 **NOTE:** The *WL mod* button and indicator is only displayed by CONTROL when at least one inserted BASIK includes the wavelength modulation feature.

 **NOTE:** If the *WL mod* button is turned ON, inserted modules not supporting the wavelength modulation feature are unaffected.

Emission button Clicking the *Emission* button enables emission on all inserted modules. If any modules fail to enable emission, other modules are unaffected. See “[Enabling emission from all modules](#)” on page 54.

The *Emission* button indicator turns ON RED when at least one or more modules have emission enabled. Otherwise, it is OFF GREY.

 **NOTE:** BOOSTIK LC modules receiving input from a seed module that fails to enable emission, is also unable to turn on.





WARNING: Class 3B laser emission is emitted from inserted ACOUSTIK modules when the Emission button LED is ON RED.



WARNING: Class 4 laser emission is emitted from inserted ACOUSTIK modules when they are turned on using their emission button - see [Procedure 6](#) on page 60.

CONTROL settings

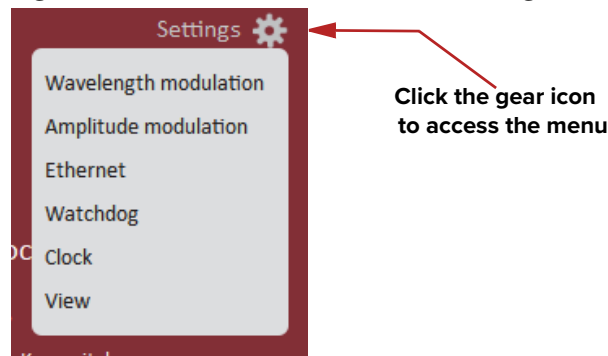
CONTROL settings for the system are accessible by selecting the ACOUSTIK in the *Device Selector* panel and clicking the gear icon  in the upper right corner of the Status panel. Clicking the gear icon displays a menu of setting items as shown in [Figure 27](#).

 **NOTE:** The number of items in the settings menu may vary depending on the module types inserted in the ACOUSTIK system.

IMPORTANT The settings described in this section are the ACOUSTIK system settings - when a module is selected in the *Device Selector* panel, the settings

menu is for the single module only. Refer to the module documentation for information on these settings.

Figure 27 ACOUSTIK CONTROL settings



Setting Item	Function	See
Wavelength modulation	Sets up wavelength modulation for inserted BASIK modules.	Wavelength modulation on page 70
Amplitude modulation	Sets up amplitude modulation for inserted BASIK modules.	Wavelength modulation on page 70
Ethernet	Sets the IP configuration of the system Ethernet port.	Ethernet on page 77
Watchdog	Enables and sets the watchdog timeout.	Watchdog on page 78
Clock	Sets the system clock time.	Clock on page 78
View	Provides a check box to enable displaying the system information on the status panel.	View on page 79

Wavelength modulation **General**

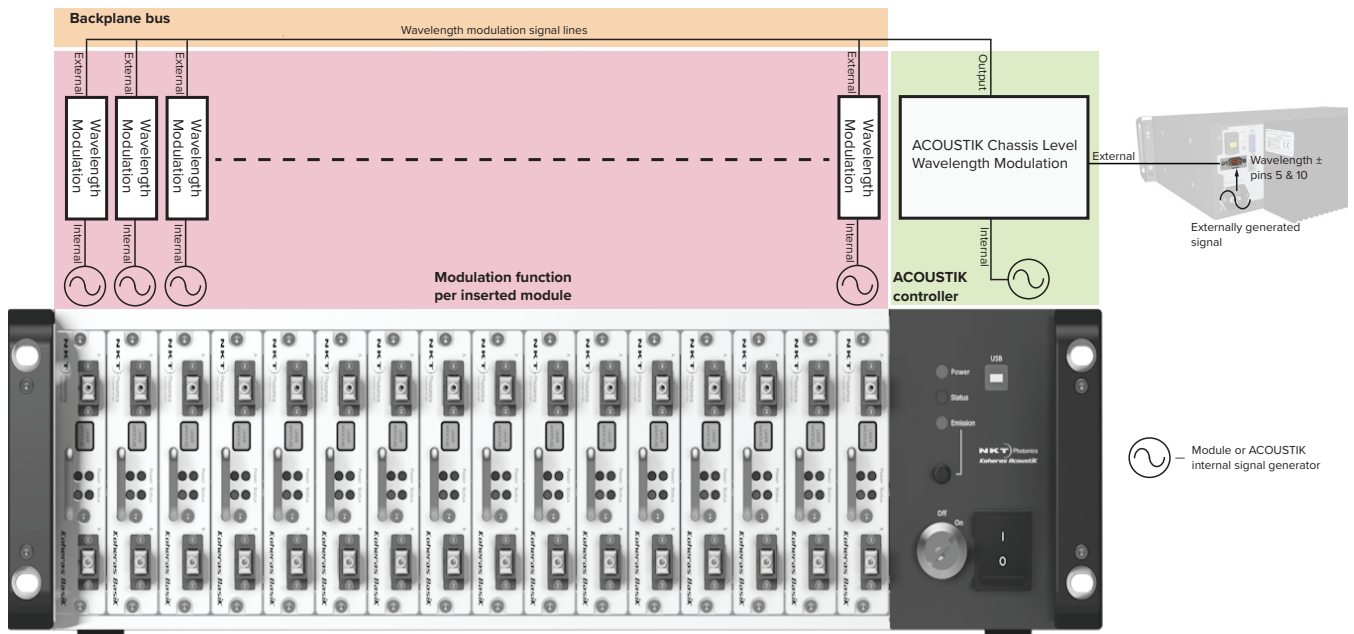
Wavelength modulation occurs on a per BASIK module basis. This means each BASIK module is configured to use its internal generator source signal or an external source signal to modulate the wavelength. [Figure 28](#) shows the modulation function for each inserted module. The (modulation) *Source* for each module is set to either internal or external. When the source is set to internal, a module uses its internal function generator to modulate the wavelength. When modules are set to use an external source, the module uses the signal from the backplane bus lines that transmit a wavelength modulation signal.

The source of the wavelength modulation signal on the backplane lines is determined by the *Modulation Source* setting of the ACOUSTIK system controller. The controller can be set to supply either its internal generator as the signal source for the backplane or use a signal connected to the External Wavelength \pm pins (see [Table 12](#)) on the rear panel 9 pin sub-D connector.



NOTE: Alternatively, any inserted BASIK module can also be configured to output its internal generator signal to the backplane signal lines.

Figure 28 Wavelength modulation - source selection



The menu for the ACOUSTIK system controller wavelength modulation settings is shown in Figure 29. Note that you can individually set the wavelength modulation settings for each inserted BASIK module and the system controller. Select the device in the *Device Selector* panel and then view its wavelength modulation settings.

Figure 29 Wavelength modulation - source selection

Wavelength modulation

Source Internal ▼

Type Sinusoidal ▼

Coupling DC ▼

Range Narrow ▼

Phase shift compensation On ▼

Frequency 35000.000 Hz


Narrow modulation gain 25.0 %

Level 60.0 %

Offset 10.0 %

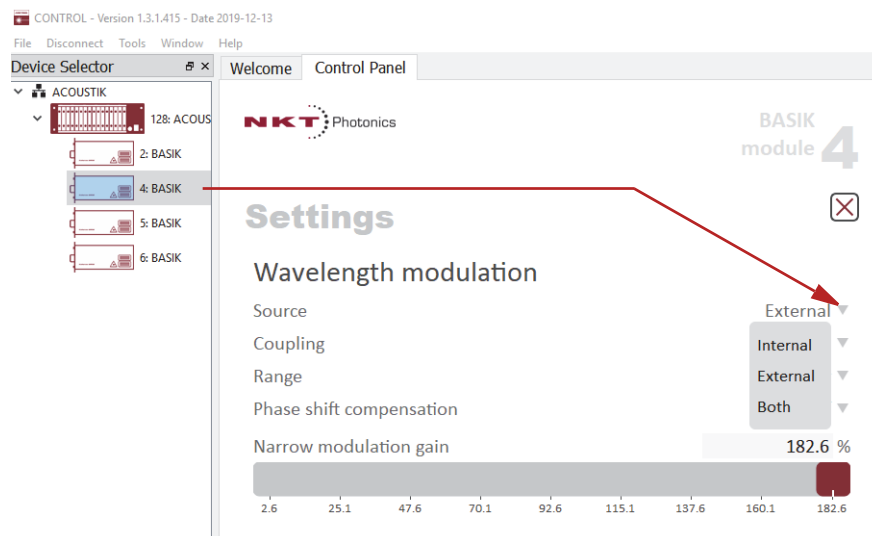
Source (modulation)

When using CONTROL to set the wavelength modulation source, perform the following.

1. Select and highlight the desired module in the *Device Selector* panel.
2. From the *Settings*  drop down menu, select *Wavelength modulation*.
3. Set the source for the module to either *Internal*, *External* or *Both*. See [Figure 30](#).
 - **Internal** – wavelength is modulated using the module’s internal function generator.
 - **External** – wavelength is modulated by the signal on the bus set by the ACOUSTIK controller setting.
 - **Both** – both internal and external signals are used simultaneously to modulate the wavelength.

– continued on the next page –

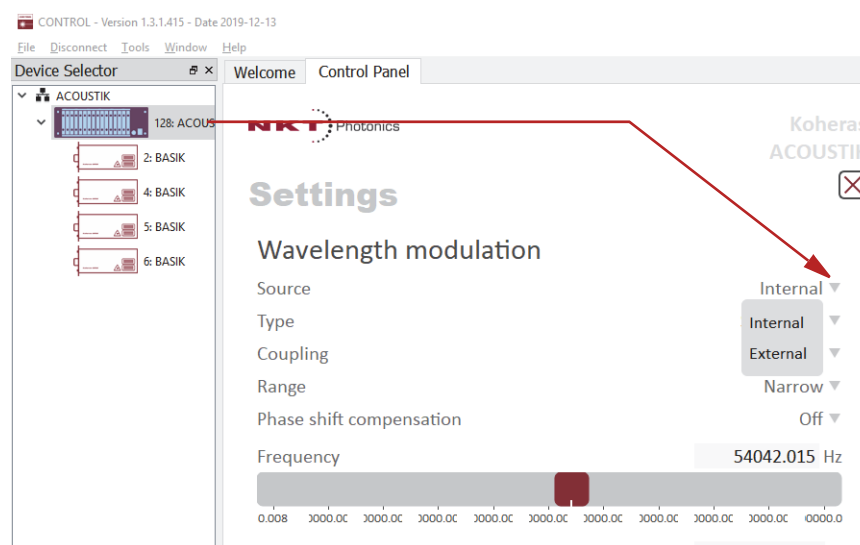
Figure 30 Wavelength modulation - module source selection



4. If the BASIK module is set to *Internal*, go to step 8.
5. For BASIK modules set to *External* or *Both*, select and highlight the ACOUSTIK system in the device selector panel.
6. From the *Settings* (gear) drop-down menu, select *Wavelength modulation*.

7. Set the modulation signal source for the ACOUSTIK controller to either *External* or *Internal*. See [Figure 31](#).
 - **Internal** – The system wavelength modulation signal lines (backplane bus) transmit the ACOUSTIK’s internal function generator signal to the wavelength input of each inserted BASIK module.
 - **External** – The system wavelength modulation signal lines (backplane bus) transmit the external signal connected to the Wavelength± pins of the D-sub 9 pin connector on the rear panel of the ACOUSTIK to each inserted BASIK module.

Figure 31 Wavelength modulation - ACOUSTIK source selected



8. End



NOTE: The *Settings - Wavelength modulation* menu item is only available for an ACOUSTIK system when at least one inserted BASIK module includes the wavelength modulation feature.



CAUTION: You can set a BASIK module in the system as the signal source. DO NOT set more than one module as the source.

ACOUSTIK system – External source connection

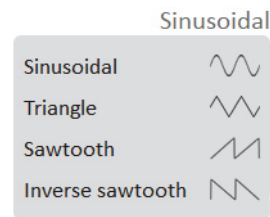
As [Figure 28](#) shows, you can connect an external modulation signal source to rear panel D-sub 9 pin connector of the ACOUSTIK system. Refer to the pin assignments as described in [Table 12 on page 91](#). For signal generation circuit examples, refer to the BASIK module documentation for further information on using wavelength modulation.

Type (modulation - internal mode)

If the modulation source is set to *Internal*, you can set the type of signal waveform that is generated internally by the ACOUSTIK. Click the *Type* drop

down menu arrow and select either *Sinusoidal*, *Triangle*, *Sawtooth* or an *Inverse sawtooth* waveform.

Figure 32 Internal generator waveform selection (Modulation Type)



i **NOTE:** Selecting *Sawtooth* sets a sawtooth modulation signal with a rising ramp such that the wavelength increases continuously until its maximum is achieved leading to an instant drop in wavelength. The *Inverse Sawtooth* is a sawtooth modulation signal with a falling ramp opposite to the *Sawtooth* modulation signal.

Coupling (modulation)

You can select to couple the modulation signal using either AC or DC coupling. Click on the *Coupling* drop down menu arrow and select either *AC* or *DC* coupling. This setting is broadcast to and set on all inserted modules that include the functionality.

i **NOTE:** Refer to the BASIK module documentation for further information on the *Modulation Coupling* setting of the module.

Range (modulation)

Sets the modulation *Range* to either *Wide* or *Narrow* on all modules inserted in the system that support wavelength modulation.

i **NOTE:** Refer to the BASIK module documentation for further information on the *Modulation Range* setting of the module.

Frequency (internal generator - internal only)

When the wavelength modulation source of the ACOUSTIK controller is set to *Internal*, the frequency of the internal generator signal can be adjusted. The range of frequency adjustment depends on the signal type:

- Sinusoidal or Triangle – from 0.008 to 100000 Hz
- Sawtooth or Inverse Sawtooth – from 0.001 to 200 Hz

To adjust the frequency, use either the slider or the text input field at the upper right corner of the slider.

Narrow and Wide modulation gain (internal source only)

You can use this slider to increase the gain of an external modulation signal input applied to the Wavelength+/- pins. Increasing the gain directly increases the wavelength modulation achievable with the signal (modulation depth).

Level (internal generator power - internal source only)

You can set the output power level of the internal function generator to between 0 and 100%. Use the slider or the text input field in the upper right corner of the *Level* slider to adjust the modulation level.

Offset (internal generator - internal source only)

The offset of the internal modulation signal can be adjusted between -100 and +100% depending on the modulation level. For example, if the modulation level is set to 40%, the offset can be adjusted between -60 and +60%. The sum of the modulation level and the absolute offset can be a maximum of 100%.

Phase shift compensation

Turning this setting ON, extends the modulation bandwidth when the *Range* setting is set to narrow modulation gain.

Integrating Update Interval

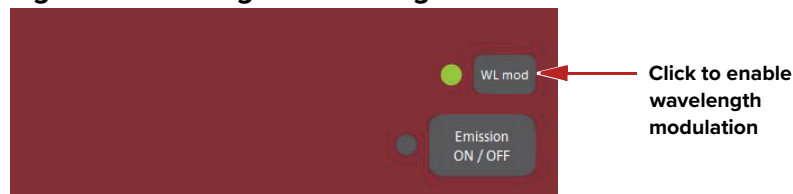
The integrating update interval sets the update interval for a software integrating function. The function is only available on X15 type BASIK modules with *Coupling* configured as *DC* and *Range* set to *Narrow*.

Signal output (module only)

Set this parameter to *Enable* to output a BASIK module's internal generator signal to the system backplane. Ensure the ACOUSTIK system is not supplying the modulation signal and only one module has the parameter enabled.

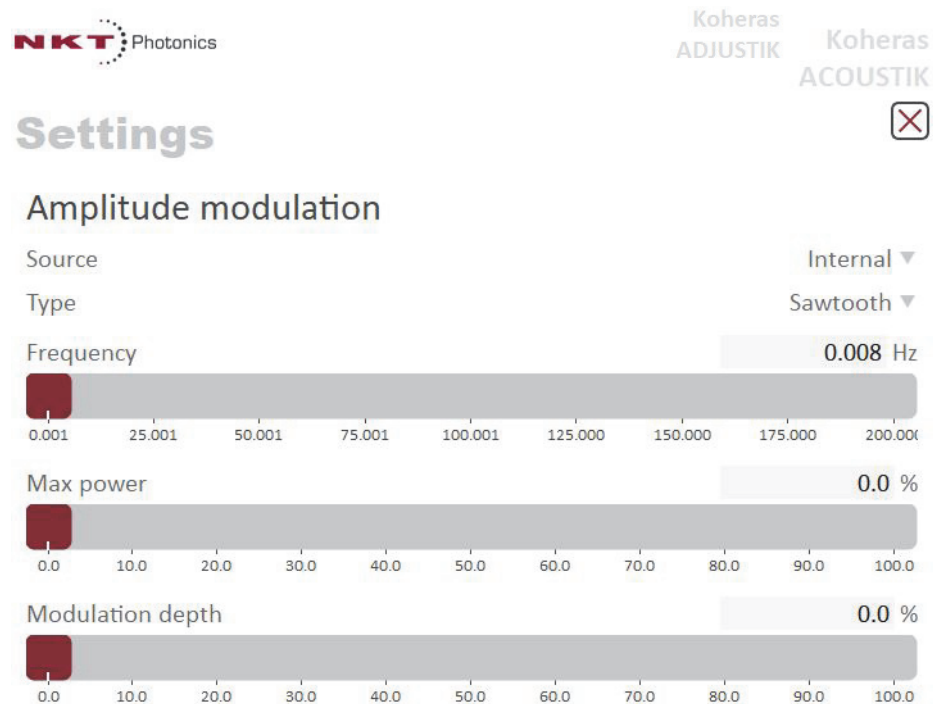
Turning ON wavelength modulation on inserted BASIK modules

To enable wavelength modulation for all modules with the function, select the ACOUSTIK system in the Device selector and in the status panel lower left click the WL mod button. The indicator next to the button turns ON green. Clicking the button one more time, turns off wavelength modulation on all inserted modules (that have the function).

Figure 33 Turning on wavelength modulation

Amplitude modulation Similar to “Wavelength modulation”, inserted BASIK modules can have their optical output power modulated by either an internal generator of the system or an external source.

Figure 34 Amplitude modulation settings



NOTE: The Amplitude Modulation settings menu item is only available if there is at least one BASIK module inserted in the system with the amplitude modulation function.

External (amplitude modulation)

Inserted BASIK modules with the feature, modulate their optical output power based on the signal received at the rear panel modulation input/output connect. The signals received are transmitted over the backplane signal lines to all inserted modules.

Internal (amplitude modulation)

Inserted BASIK modules with the feature modulate their optical output power based on a signal generated by the system controller. The system controller transmits the signal over the backplane signal lines to all inserted modules.

Type (amplitude modulation)

Selects the amplitude modulating waveform generated by the system controller. Select either Sinusoidal, Triangle, Sawtooth or Inverse sawtooth.

Frequency (amplitude modulation)

The frequency of the internal generator amplitude modulation signal can be adjusted. The range of frequency adjustment depends on the signal type:

- Sinusoidal or Triangle – from 0.008 to 100000 Hz
- Sawtooth or Inverse Sawtooth – from 0.001 to 200 Hz

To adjust the frequency, use either the slider or the text input field at the upper right corner of the slider.

Max Power

Use the slider or text input field to set the modulation signal's power level in percent.

Modulation depth

Use this slider or text input field to set the maximum deviation in percent that the modulation signal affects the optical output power. A lower value reduces the modulation achievable and vice versa for a higher percentage.

Ethernet Configures the network settings of the system when using an Ethernet management connection. Configure the settings in this panel first (over USB) before setting up a network connection in CONTROL following [Procedure 3 on page 49](#).

Figure 35 Ethernet setting

Settings		Koheras ADJUSTIK
Ethernet		
System IP address		190.180.170.002
System port		10001
Host IP address		190.180.170.001
Host port		10001
MAC address		40:D8:55:1C:C1:BB

System IP address

Enter the IP address assigned to the ACOUSTIK system. Note that the IP address must be reachable from the subnet that the PC with the CONTROL application is connected to.

System port

The *System port* sets the port address the ACOUSTIK uses for reception of TCP or UDP packets. The *System Port* address set in the network connection of CONTROL must match this address – default: 10001.

Host IP address

To help prevent unauthorized access, the Koheras ACOUSTIK can be configured to only accept packets from a single IP address assigned to the management PC.

Configure the *Host IP address* to the IP address of your management PC. When set, the ACOUSTIK only accepts packets with a source address that matches the *Host IP address* set and ignores all others. When set to 000.000.000.000 (default setting), the ACOUSTIK accepts packets with any source IP address.

Host port

The *Host port* sets the port address the ACOUSTIK uses for transmission of TCP or UDP packets. The *Host Port* address set in the network connection of CONTROL must match this address – default: 0.



NOTE: If the *Host port* is set to 0, the ACOUSTIK uses the same port address for transmission as for reception i.e. the *System port* setting. The ports addresses set in ACOUSTIK and CONTROL must match.

MAC Address

A unique *MAC address* of the ACOUSTIK is displayed only and cannot be set.

Watchdog The Koheras ACOUSTIK features a watchdog for monitoring of USB or Ethernet communication. If CONTROL is disconnected from the system, the watchdog disables emission on each module after a set timeout expires.

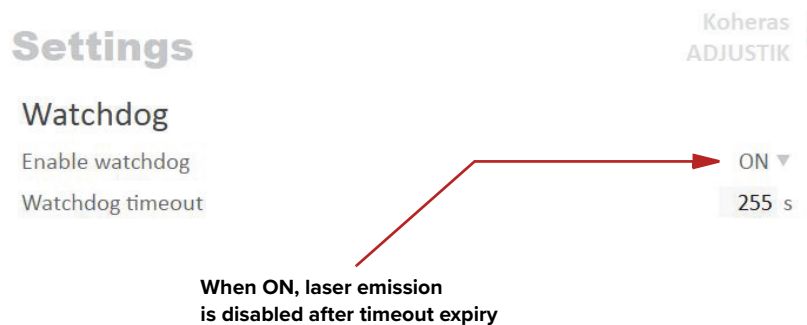
Enable Watchdog

To turn the watchdog on, select ON from the drop-down menu next to Enable watchdog. To turn the watchdog off, select OFF.

Watchdog timeout

When CONTROL communications is disconnected, the Watchdog timer starts. When it reaches the Watchdog timeout setting, the emission from each ACOUSTIK module is disabled. The Watchdog feature must be set to ON, then set the timeout value from 1 to 255 seconds using the text input box.

Figure 36 Watchdog setting



Clock Within the Clock setting menu the system date and time can be read or set automatically by updating the settings from a connected PC.

Date

Displays the system date in the format DD/MM/YYYY.

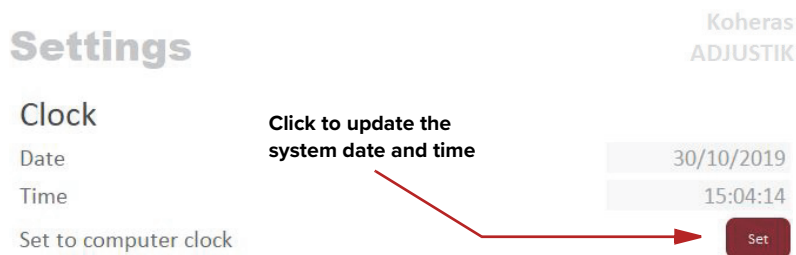
Time

Displays the system time in 24 hour format: HH:MM:SS.

Set to computer clock

Click the Set button to updated the system time and date from a connected PC's current time and date setting.

Figure 37 Clock setting



View Check the System info and Measurements box to display the laser serial number, firmware release number or system temperature within the status panel.

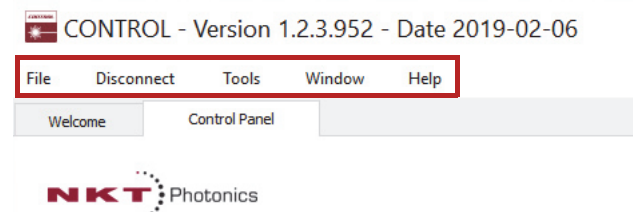
Figure 38 View setting



CONTROL menu items

There are four drop down menus in the main control window as highlighted in Figure 39. Click on the items in the menu to reveal the drop down menus.

Figure 39 Menu items



Menu Item	Function
File	Exits the GUI program
Connect / Disconnect	Disconnects the currently connected device from GUI.
Window	Selects whether or not to display the Application Log and the serial monitor.
Help	Displays the current version of GUI and provides access to the included GUI user help.

Device monitor The device monitor shows a live streaming display of transmit and receive parameters for the laser’s communication ports and any connected device modules.

The display parameter values are continuously updated and are useful to help debug issues with connected devices. The parameters are described in [Table 6](#).

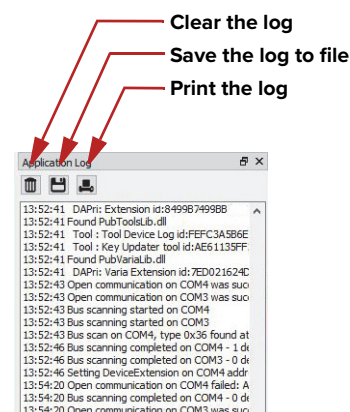
Table 6 Device monitor parameters

Parameter	Description
Interface	The PC port interface the device(s) is connected to. Click the “greater than” symbol to the left of the port to display the connected device(s) parameters.
TxTlgsSec	The number of telegrams per second being transmitted to the connected device.
RxTlgsSec	The number of telegrams received per second from the connected device.
Addr	The address of the connected module.
Type	The type of the connected module; read from the module.
SysType	The system type, default 0 – can be used to describe system variants and is read from the module.
Name	The name of the connected device module.
P/N	The device module part number.
Mode	The mode or status of the connected module: <i>connected</i> , <i>disconnected</i> , or <i>disabled</i> .
Status bits	The actual status bits read from the connected module.
Error code	The actual error code read from the connected module.
Access	Protected/Locked status of the module.
FW Ver.	The device module’s firmware release date.
Module Serial	The serial number of the device module.
PCB Serial	The device module’s printed circuit board serial number.
PCB Ver,	The version of the device module’s printed circuit board.
Sp. Cap/	The module speed capability in bits per second as read from the module – values: 0=(default) 115200, 1=230400, 2=460800, 3=921600
Pri Ext	Primary extension/GUI loaded for this module. Hover over the icon to list more details – Note that there can only be 1 primary.

Parameter	Description
Fast Log	0%-100% collected. Note only if the module has a fast log and only internal modules have fast and slow logs.
Slow Log	0%-100% collected. Note only if the module has a slow log.
Mainboard Log	0%-100% collected. Note only if the module has a main log. Only main boards have main and system logs.
System Log	0%-100% collected. Note only if the module has a system log. Only main boards have main and system logs.
Timeout	Time in milliseconds since the last telegram was received from the device module.
Nack	Total number of negative acknowledgments received from the device module.
CRC	Total number of received telegrams with CRC failures.
COM	Total number of communication errors with framing or protocol errors. Hover over the icon to list more details.
Busy	Total number of busy responses from the module. Busy responses occur when a module receives a message but cannot process it due to its current work load.

Application log In addition to the Serial Monitor, the Application Log panel is used for debugging serial communications. The panel displays time stamps for both COM port open and close times and also general status information. You can clear, save and print the log data using the buttons in the upper left corner.

Figure 40 Serial Monitor



The panel is enabled by placing a check mark on the Window pull down menu next to the Application Log item.

To close the panel click on the upper right corner "X".

Control panel

Wavelength offset

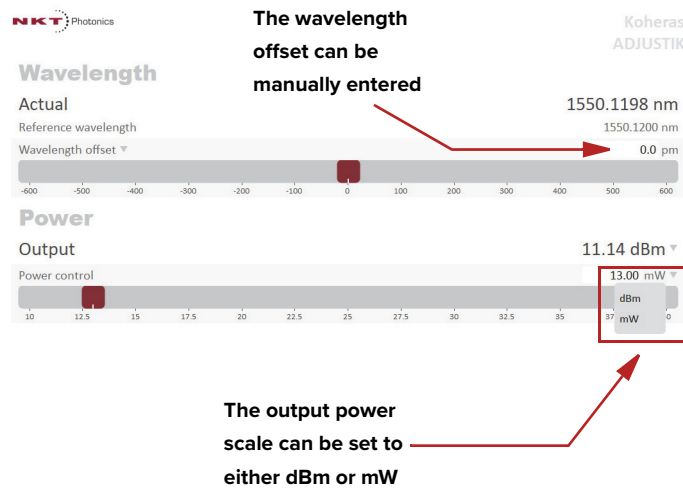
Use the slider or text input field to set a wavelength offset for all inserted BASIK modules. The range shown is in picometers increments.

Power

Use the slider or text input field to set the power level of all inserted BASIK modules. The scale of the slider can be selected to either dBm or mW units.

NOTE: The slider control and text input field are only active when at least one inserted BASIK module supports adjusting power.

Figure 41 Operating mode set to power



Module overview

When CONTROL connects to a Koheras ACOUSTIK system, a Module overview panel is displayed beneath the Control and Status Panels. As shown in [Figure 42](#), each row in the overview represents an inserted module and the column fields display the module parameters and statuses. Clicking on a row, selects the actual module and switches to the Control and Status panel views for the module.

Figure 42 Module overview - all fields selected

Module	User Text	Reference WL	Actual WL	WL offset setpt	Actual WL offs	Status	P
	1: BASIK	1550.0000 nm	1549.9999 nm	0.0 pm	-0.1 pm	●	
	3: BOOSTIK Lineca...					●	

Power input (mW)	Power setpoint	Actual power (mW)	Power setpoint (dBm)	Actual power (dBm)	Emission	Interlock
0 mW	10.00 mW	0.00 mW	10.00 dBm	-327.67 dBm	●	●
	55.00 mW	0.20 mW	17.40 dBm	-6.98 dBm	●	●

Error code	Module Serial	FW Ver.	Module Temp
	K0030268	1.16 Feb 14 201...	30.1 °C
000:060	K0043304	1.00-1054 May ...	28.4 °C

The following information is available from each of the available fields:

Table 7 Module overview fields

Column heading	Description
Module	system slot number
Reference WL	Base wavelength of the module in nm
Actual WL	Output wavelength of the module in nm
WL offset Setpoint	Wavelength offset set with CONTROL in pm
Actual WL offset	Measured wavelength offset in pm.
Status	Module status indicator
Power setpoint (mW)	Power level set with CONTROL in mW
Actual power (mW)	Measured power level in mW
Power setpoint (dBm)	Power level set with CONTROL in dBm
Actual Power (dBm)	Measured power level in dBm
Emission	Displays status of module emission: <ul style="list-style-type: none"> • Red ON - emission enabled • OFF - emission disabled
Interlock	Displays status of the interlock circuit: <ul style="list-style-type: none"> • Green ON - Interlock circuit closed • Red ON - Interlock circuit open or key switch off.
Error code	Error code for an existing module fault - contact NKTP support of the error persists.
Module Serial	Factory serial number of the module.

Column heading	Description
FW. Ver.	Firmware currently executing on the module.
Module Temp	Temperature within the module.
User Text	Text describing the module – see View on page 79 .

Toggling and sorting the overview fields In the module overview, you can sort the order of the fields and select the fields to display.

Setting the field order

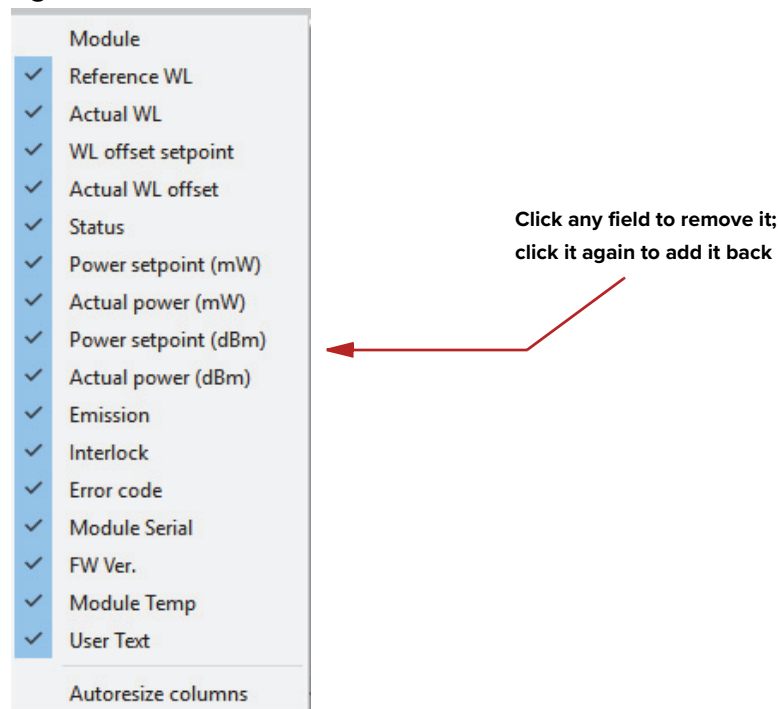
With your mouse, click-hold on a field in the header and drag it to a new location to change the order of the fields in the header.

Toggling fields on and off

Right-clicking on any of the fields in the header displays the menu shown in [Figure 43](#).

To remove a field from the overview, click once on the any of the fields (except for Module) to uncheck it. Clicking once on an unchecked field, adds it back to the overview.

Figure 43 Module overview field selection



APPENDICES

The appendices include:

- [Appendix A on page 87](#): Specifications
- [Appendix B on page 89](#): Service and Support
- [Appendix C on page 91](#): Interface Pin Assignments
- [Appendix D on page 93](#): CONTROL Installation
- [Appendix E on page 99](#): ACOUSTIK Slot Configuration Rules

A Specifications

Table 8 Mechanical dimensions

All system models	
Size (H x W x D)	130 x 463 x 348 mm (5.12 x 18.23 x 13.70 in)
Weight	~ 10 kg (~22 lb)

Table 9 Operating and storage environment

All system Models	
Operating Temperature ⁱ	15°C to 60°C (59°F to 140°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Operating Relative Humidity	0 to 70% non-condensing

i. Case temperature

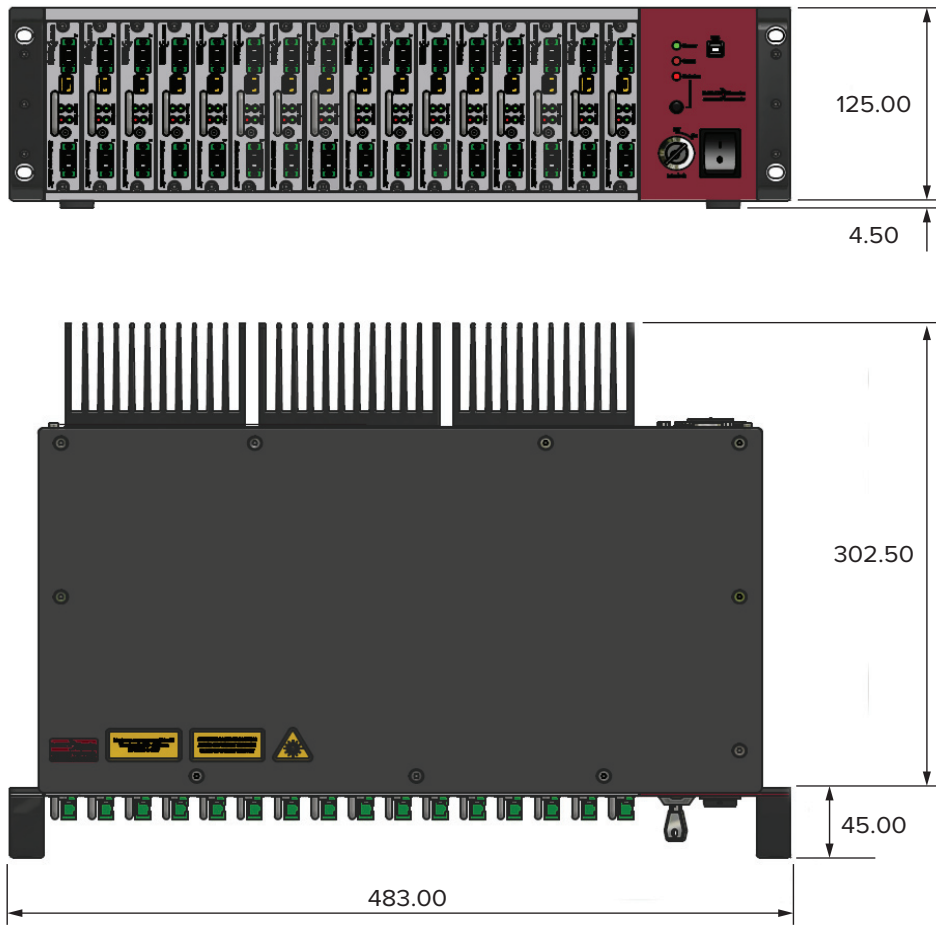
Table 10 Electrical

All system Models	
Supply Voltage	100 – 240 VAC@ 50-60 Hz
Maximum Power Consumption	300 W

Table 11 Safety and regulatory compliances

Safety	Regulatory
EN 60825-1:2014: Safety of laser products Part 1: Equipment classification and requirements [Laser Class 4]	EN 61326-1:2013: Electrical equipment for measurement, control and laboratory use
EN 61010-1:2010: Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General requirements	EMC requirements – Part 1: General requirements 2004/108/EC Electromagnetic Compatibility 2011/65/EC Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS)

Figure 44 Mechanical dimensions



B Service and Support Information

Servicing the laser

The Koheras ACOUSTIK has no user serviceable components. In case of malfunction, contact NKT Photonics using the support channels in section “Support contact details”.



CAUTION: Do not open the system. The Koheras ACOUSTIK is equipped with warranty labels (see [Figure 45](#)) on its system panels. It is strictly prohibited to remove any panel of the system. The warranty is void if the system is opened.

Should the system malfunction, and it cannot be serviced on site, it must be shipped to the NKT Photonics office in Birkerød, Denmark.

Figure 45 Warranty seal



CAUTION: The system contains electro-static discharge (ESD) sensitive components. To avoid permanent ESD damage, use ESD protection precautions when handling the laser. Always connect the laser’s earth point to a ground earth within your facility.


Support contact details

If you need help or have questions regarding your Koheras ACOUSTIK or any of its modules, contact NKT Photonics through our website below.

Support website 1. Go to:

<https://www.nktphotonics.com/support>

2. Scroll down and click or press:



Contact Support

3. Select the type of help required, fill in the form, and click or press *Submit*.

Shipping address NKT Photonics A/S
Blokken 84
DK-3460 Birkerød
Denmark

C Interface Pin Assignments

Modulation input/output

The Modulation input/output interface on the laser is a male D-sub 9 pin connector. The pin assignments are described in [Table 12](#).

Table 12 Modulation connector pin assignment

Pin #	Signal	Description
1	Trigger	Logic input/output for either control or indication of laser emission. Active high. See Trigger for more information.
2	GND	0 volt ground
3	Amplitude-	Negative branch of differential input/output for amplitude modulation.
4	AGND	0 volt analog ground for modulation signals
5	Wavelength-	Negative branch of differential input/output for wavelength modulation.
6	GND	0 volt ground
7	Amplitude+	Positive branch of differential input/output for amplitude modulation.
8	AGND	0 volt analog ground for modulation signals
10	Wavelength+	Positive branch of differential input/output for wavelength modulation.

External bus

The External bus connector on the rear panel of the laser is a female D-sub 15 pin connector. The pin assignments are described in [Table 13](#).

Table 13 External bus pin assignment

Pin #	Signal	Description
1	NC	Not connected
2	RS485-	The negative/inverted link of the RS485 communication signal.
3	Interlock loop+	Positive connection of the interlock loop. Must be connected to Interlock loop- (pin no. 4) to enable laser emission from the system.
4	Interlock loop-	Negative connection of the interlock loop. Must be connected to Interlock loop+ (pin no. 3) to enable laser emission from the system.
5	Emission	Collector output with an internal 270 Ω resistor in series. Outputs a logic high when the Koheras ACOUSTIK system has laser emission ON. To indicate emission with an LED, its anode can be connected directly to this pin and its cathode connected to the GND (pins 5,6, 13 or 14).
10	RS485+	The positive/non-inverted link of the RS485 communication signal.
11	Not in use	For future use, do not connect anything to this pin.

Pin #	Signal	Description
12	Interlock Logic Output	Outputs a logic high (5V) when the interlock circuit is closed and has been reset. This signal can be used to control safety related precautions on the External Bus.
5,6,13,14	GND	0 volt ground.
7,8,15	+12 V	12 volt supply voltage for external accessories. Maximum 4 A in total.

D CONTROL Installation

Installing CONTROL

Download the installer from:

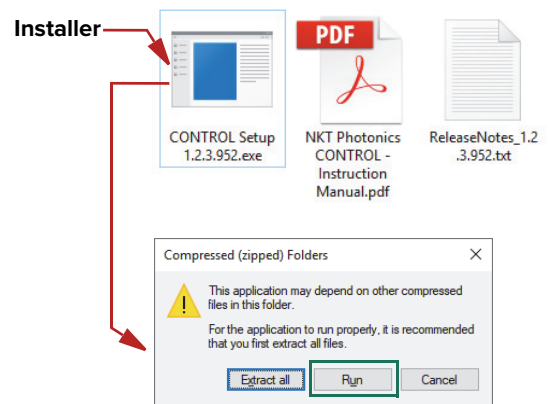
<https://www.nktphotonics.com/support>

Follow the steps in [Procedure 8](#).

Procedure 8 Installing CONTROL

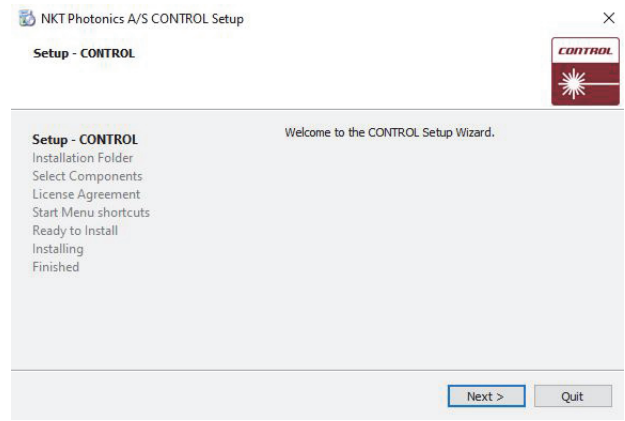
Action

- 1 On the PC, launch the installer package and then click the Run button.



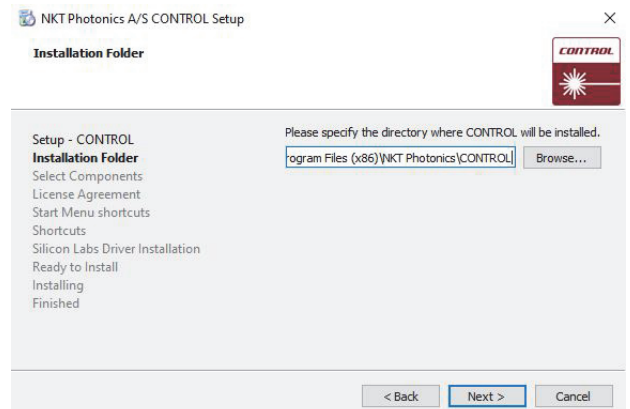
- 2 The installation wizard appears.

Click Next to continue.



- 3 Accept to use the default installation directory or select another directory by clicking the *Browse* button.

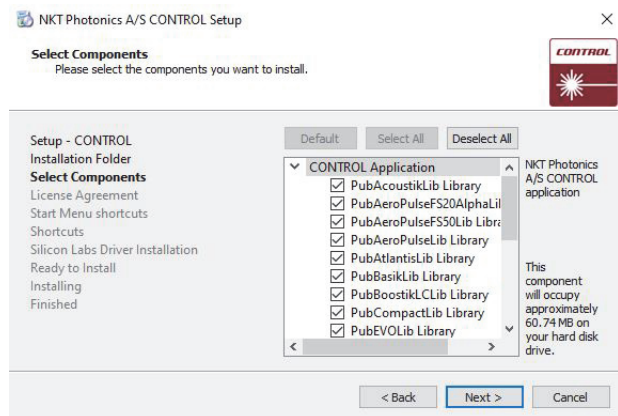
Click *Next* to continue.



Action

- Uncheck the components you do not require. By default, all components are installed.

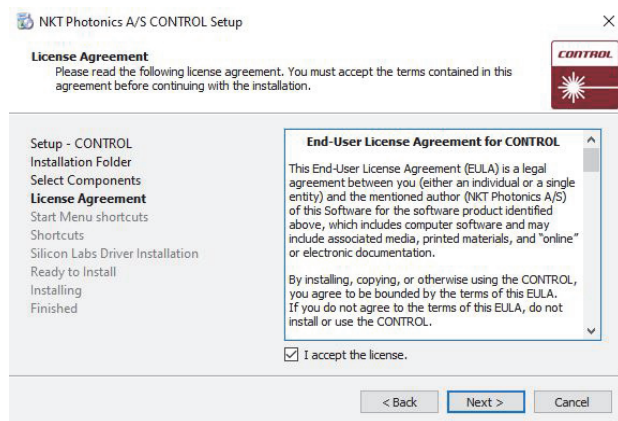
Click *Next* to continue.



- Read the End-User License Agreement, and check “I accept the license.” box.

Not checking the box ends the installation wizard.

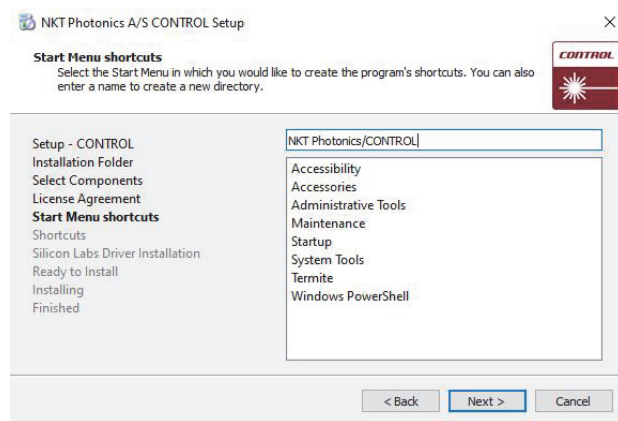
Click *Next* to continue.



- The wizard creates a start menu folder with program short-cuts.

Use the default name or enter a new name for the folder.

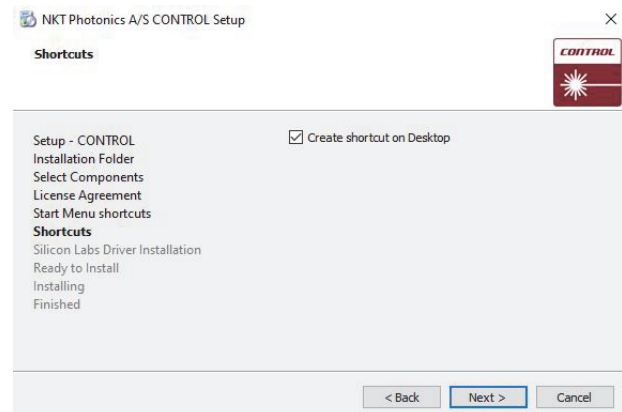
Click *Next* to continue.



Action

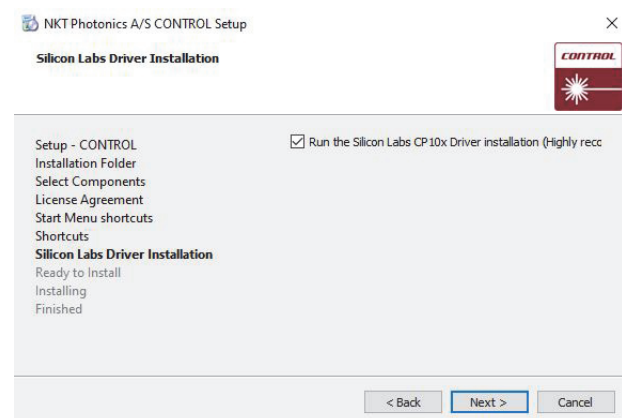
- 7 Check the box to create a desktop shortcut to access Control.

Click *Next* to continue



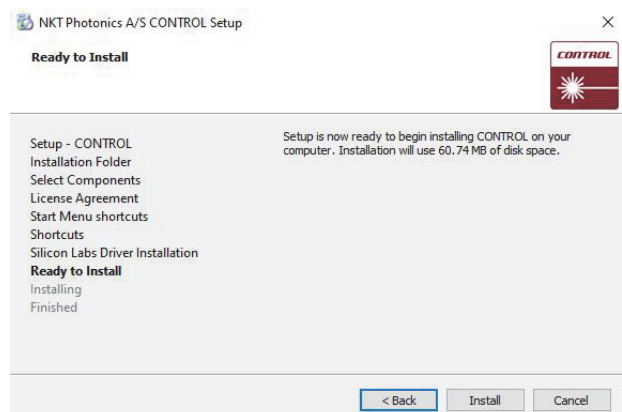
- 8 Check the 'Run the Silicon Labs CP10x driver installation' box and click *Next*.

Note: USB connectivity fails if you do not install the driver.



- 9 Click *Install* to install NKT CONTROL software on your PC.

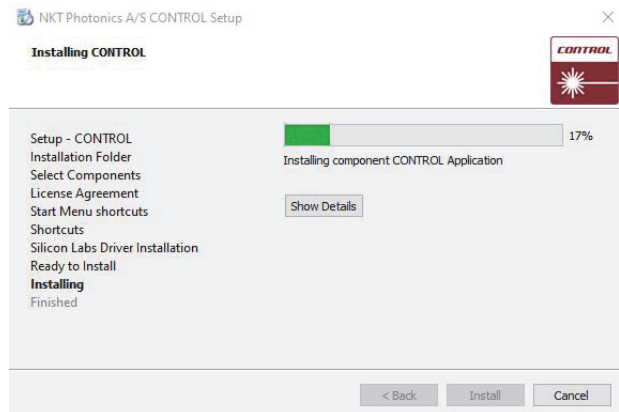
Click *Cancel* if you want to abort the installation.



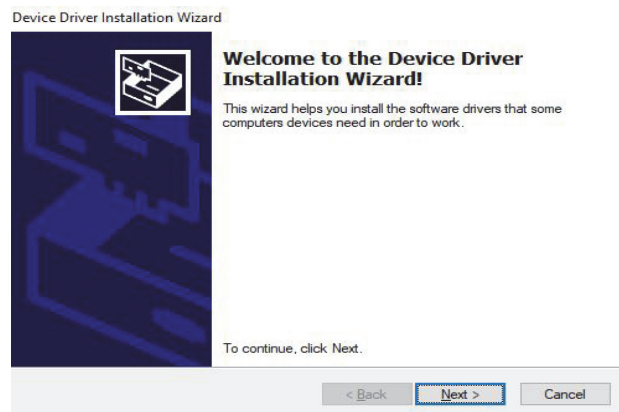
Action

10 The wizard displays a progress meter for the installation.

Note: a normal install should only take a few seconds.

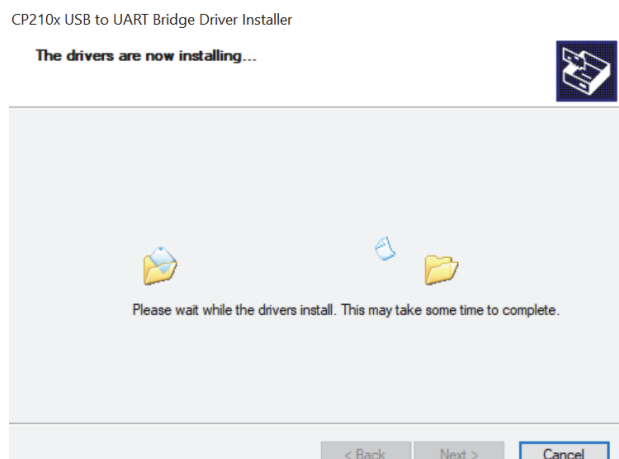


11 Click *Next* to install the UART drivers for the PC USB port.



12 The drivers are installed.

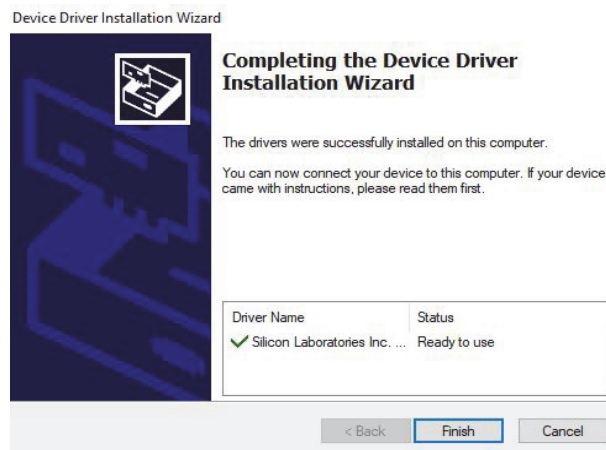
Note: Depending on your computer this occurs so fast you may not see this.



Action

13 The Silicon Labs drivers is installed successfully.

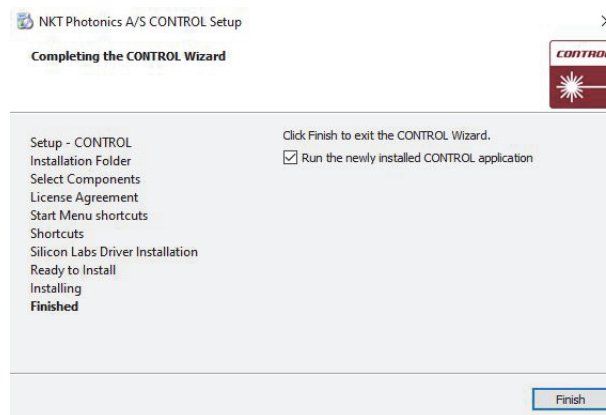
Click *Finish* to end the driver installation.



14 CONTROL is now installed.

Check the Run box to launch CONTROL when the *Finish* button is clicked.

Click *Finish* to end the installation wizard.



End of Procedure

E ACOUSTIK Slot Configuration Rules

Table 14 shows supported configurations of modules inserted in the ACOUSTIK slots according to the following:

- BOOSTIK modules are only supported in the slot configurations shown.
- 1 to 16 BASIK modules are supported. Adding a BOOSTIK module reduces the maximum number of BASIK modules by 2.
- Inserting and operating more than 2 BOOSTIK modules inserted in an ACOUSTIK is not supported. Only 0, 1, or 2 BOOSTIKs are supported per ACOUSTIK.
- BOOSTIK modules cannot be installed in adjacent slots.
- Each configuration shows the ACOUSTIK fully populated, unoccupied slots should be equipped with blank covers.
- One BASIK module is required for each BOOSTIK.

Table menu B=BASIK seed laser module

BLC=BOOSTIK Line Card laser amplifier module

Table 14 ACOUSTIK slot configurations¹

Config Nr.	# of BOOSTIK Inserted	ACOUSTIK system Slot #															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	1	BLC		B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	1	B	BLC		B	B	B	B	B	B	B	B	B	B	B	B	B
4	1	B	B	BLC		B	B	B	B	B	B	B	B	B	B	B	B
5	1	B	B	B	BLC		B	B	B	B	B	B	B	B	B	B	B
6	1	B	B	B	B	B	BLC		B	B	B	B	B	B	B	B	B
7	1	B	B	B	B	B	B	BLC		B	B	B	B	B	B	B	B
8	1	B	B	B	B	B	B	B	BLC		B	B	B	B	B	B	B
9	1	B	B	B	B	B	B	B	B	BLC		B	B	B	B	B	B
10	1	B	B	B	B	B	B	B	B	B	B	BLC		B	B	B	B
11	1	B	B	B	B	B	B	B	B	B	B	B	BLC		B	B	B
12	1	B	B	B	B	B	B	B	B	B	B	B	B	BLC		B	B
13	2	BLC		B	B	B	BLC		B	B	B	B	B	B	B	B	B
14	2	B	BLC		B	B	B	BLC		B	B	B	B	B	B	B	B
15	2	B	B	BLC		B	B	B	BLC		B	B	B	B	B	B	B
16	2	B	B	B	BLC		B	B	B	BLC		B	B	B	B	B	B

1. Maximum number of BASIK (B) modules fitted with each BOOSTIK configuration.

Config Nr.	# of BOOSTIK Inserted	ACOUSTIK system Slot #															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	2	BLC	B	B	B	B	BLC	B	B	B	B	B	B	B	B	B	B
18	2	B	BLC	B	B	B	B	BLC	B	B	B	B	B	B	B	B	B
19	2	B	B	BLC	B	B	B	B	BLC	B	B	B	B	B	B	B	B
20	2	BLC	B	B	B	B	B	BLC	B	B	B	B	B	B	B	B	B
21	2	B	BLC	B	B	B	B	B	BLC	B	B	B	B	B	B	B	B
22	2	B	B	BLC	B	B	B	B	B	B	B	B	B	B	B	B	B
23	2	B	B	B	BLC	B	BLC	B	B	B	B	B	B	B	B	B	B
24	2	BLC	B	B	B	B	B	B	BLC	B	B	B	B	B	B	B	B
25	2	B	BLC	B	B	BLC	B	B	B	B	B	B	B	B	B	B	B
26	2	B	B	BLC	B	B	BLC	B	B	B	B	B	B	B	B	B	B
27	2	B	B	B	BLC	B	B	BLC	B	B	B	B	B	B	B	B	B
28	2	B	B	B	B	B	BLC	B	B	B	BLC	B	B	B	B	B	B
29	2	B	B	B	B	B	B	BLC	B	B	B	BLC	B	B	B	B	B
30	2	B	B	B	B	B	B	B	BLC	B	B	B	BLC	B	B	B	B
31	2	B	B	B	B	B	BLC	B	B	B	B	BLC	B	B	B	B	B
32	2	B	B	B	B	B	B	BLC	B	B	B	B	BLC	B	B	B	B
33	2	B	B	B	B	B	B	B	BLC	BK	BLC	B	B	B	B	B	B
34	2	B	B	B	B	B	B	B	B	BLC	B	BLC	B	B	B	B	B
35	2	B	B	B	B	B	BLC	B	B	B	B	B	BLC	B	B	B	B
36	2	B	B	B	B	B	B	BLC	B	B	BLC	B	B	B	B	B	B
37	2	B	B	B	B	B	B	B	BLC	B	B	BLC	B	B	B	B	B
38	2	B	B	B	B	B	B	B	B	BLC	B	B	BLC	B	B	B	B
39	2	BLC	B	B	B	B	B	B	B	B	BLC	B	B	B	B	B	B
40	2	B	BLC	B	B	B	B	B	B	B	B	BLC	B	B	B	B	B
41	2	B	B	BLC	B	B	B	B	B	B	B	B	BLC	B	B	B	B
42	2	B	B	B	BLC	B	B	B	B	B	BLC	B	B	B	B	B	B
43	2	BLC	B	B	B	B	B	B	B	B	B	BLC	B	B	B	B	B
44	2	B	BLC	B	B	B	B	B	B	B	B	B	BLC	B	B	B	B
45	2	B	B	BLC	B	B	B	B	B	B	BLC	B	B	B	B	B	B
46	2	B	B	B	BLC	B	B	B	B	B	B	BLC	B	B	B	B	B
47	2	BLC	B	B	B	B	B	B	B	B	B	B	BLC	B	B	B	B
48	2	B	BLC	B	B	B	B	B	B	B	BLC	B	B	B	B	B	B
49	2	B	B	BLC	B	B	B	B	B	B	B	BLC	B	B	B	B	B
50	2	B	B	B	BLC	B	B	B	B	B	B	B	BLC	B	B	B	B

Item:
Customer Revision:
NKT Photonics Revision:
Release Date:

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10-2023

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