

Koheras BOOSTIK HP

High-power, low-noise single-frequency fiber laser



Single frequency, low noise

Ideal for quantum applications

The Koheras BOOSTIK HP is a new generation maintenance-free, single-frequency fiber laser system with a unique combination of narrow linewidth, excellent beam quality, and high output power.

The turn-key 19” rack system includes control electronics and power supply and is an ideal laser for experimental research within quantum computing, metrology, and sensing. This new generation features high optical isolation and fast shutdown on reflection, improving its robustness against disturbing back-reflections.



Koheras BOOSTIK HP

Applications

Quantum computing

Quantum metrology and sensing

Fundamental physics research

Time and frequency standards

Atomic trapping and cooling

Laser interferometry

Benefits

The Koheras BOOSTIK HP comes with improved amplitude stability and intensity noise, and the low-noise drive electronics are designed to preserve the unique low-noise characteristics of Koheras seed laser technology.

The collimated output provides superior beam quality and ensures high pointing stability. The mechanical collimator interface is designed for plug-and-play with the Koheras HARMONIK frequency-converted systems without the need for individual module alignment.

The Koheras BOOSTIK HP system is controlled by our well-proven and user-friendly NKTP CONTROL software interface, making this system very easy and seamless to operate.

Narrow linewidth, high beam quality and output power

The Koheras BOOSTIK HP is a maintenance-free single-frequency laser with a unique combination of narrow linewidth, excellent beam quality, and high output power.

Depending on the wavelength needed, the Koheras BOOSTIK HP system is available with the unique low-noise Koheras seeder technology E15, X15, and Y10. Available output powers are 10 and 15 W for all wavelength ranges.

Standard center wavelengths

The standard center wavelengths are 1550.12 nm for the E15/X15 and 1064.00 nm for the Y10. If another wavelength is needed, we can supply a customized system with a center wavelength ranging from 1545-1565 nm for the E15/X15 and 1030-1086 nm for the Y10.

Ideal for quantum optics

With its ultra-stable and narrow linewidth, the BOOSTIK HP laser system is ideal for applications such as quantum optics, computing, and other phenomena like optical trapping, optical lattice, Bose-Einstein condensate, atom interferometry, and squeezing. Other possible application areas are non-linear optics pump source (SHG, DFG, OPO) and laser-based metrology such as precision laser interferometry and spectroscopy.

Koheras BOOSTIK HP

Reliability

The Koheras range of single frequency fiber lasers is based on telecom-grade fiber components and built to last thousands of hours with no service or maintenance.

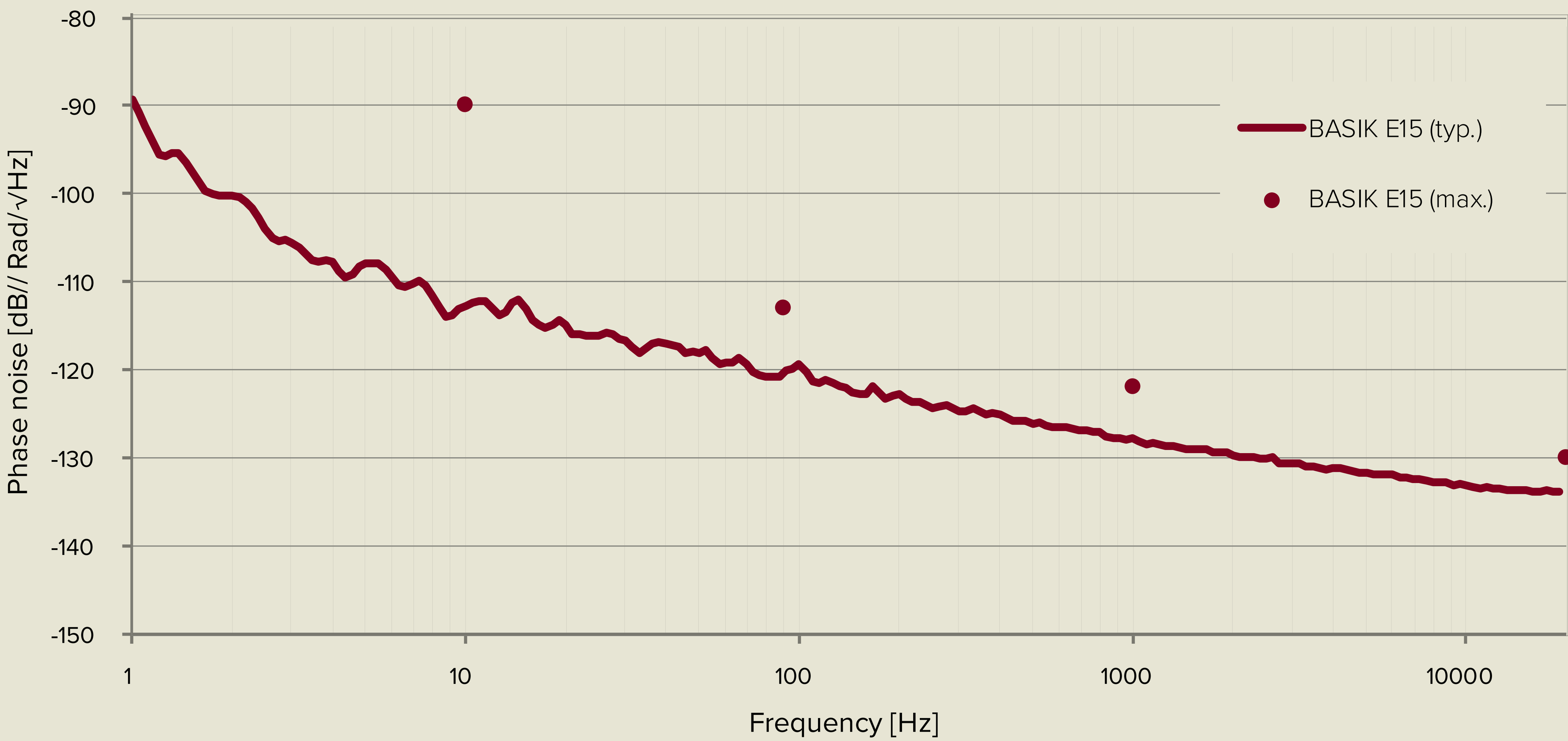
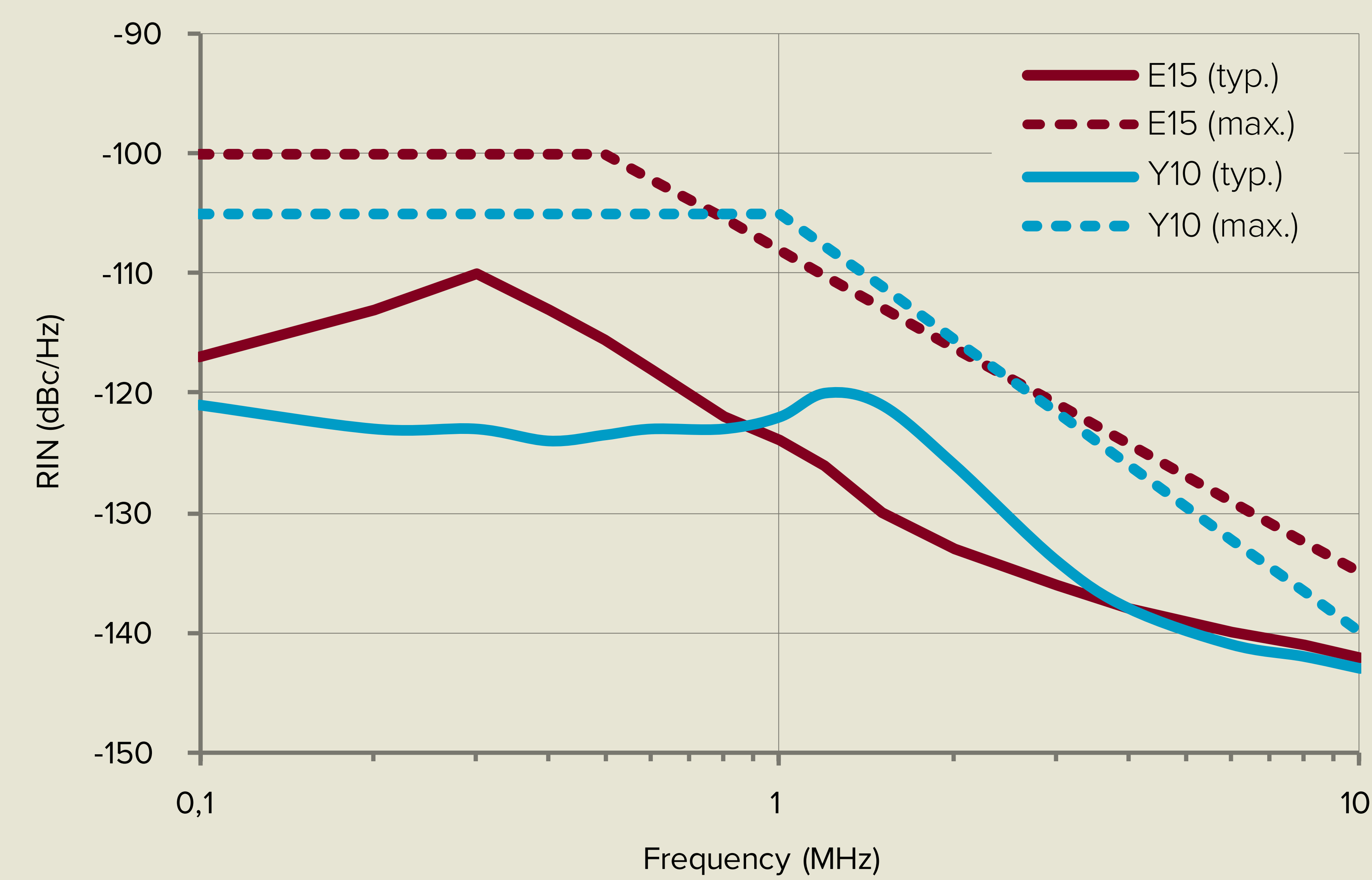
With several thousand lasers installed in environments varying from fully climate controlled national standards laboratories to the demanding environment on oil rigs and submarines, the Koheras line is the most robust single-frequency laser range on the market with an unmatched reliability track record.

Features and benefits

Ultra-low frequency noise

The BOOSTIK HP systems offer an ultra-low phase noise as well as a low RIN.

The plots below compare RIN versus frequency and phase noise versus frequency.



Features and Benefits

- Up to 15 W output power
- Narrow linewidth
- Ultra-low phase noise
- Stable single-frequency operation
- High wavelength stability
- Excellent beam quality ideal for frequency conversion
- Unlimited center wavelength selection in the ranges 1030-1086 and 1545-1565 nm
- Up to 1000 pm coarse wavelength tuning
- Frequency locking via kHz frequency modulation
- Polarization-maintaining fiber output
- Optically isolated
- Plug-and-Play
- Industrial design
- Robust and maintenance-free

Full wavelength freedom

Choose the operating wavelength of the BOOSTIK HP system freely in the 1 or 1.5 μm range.

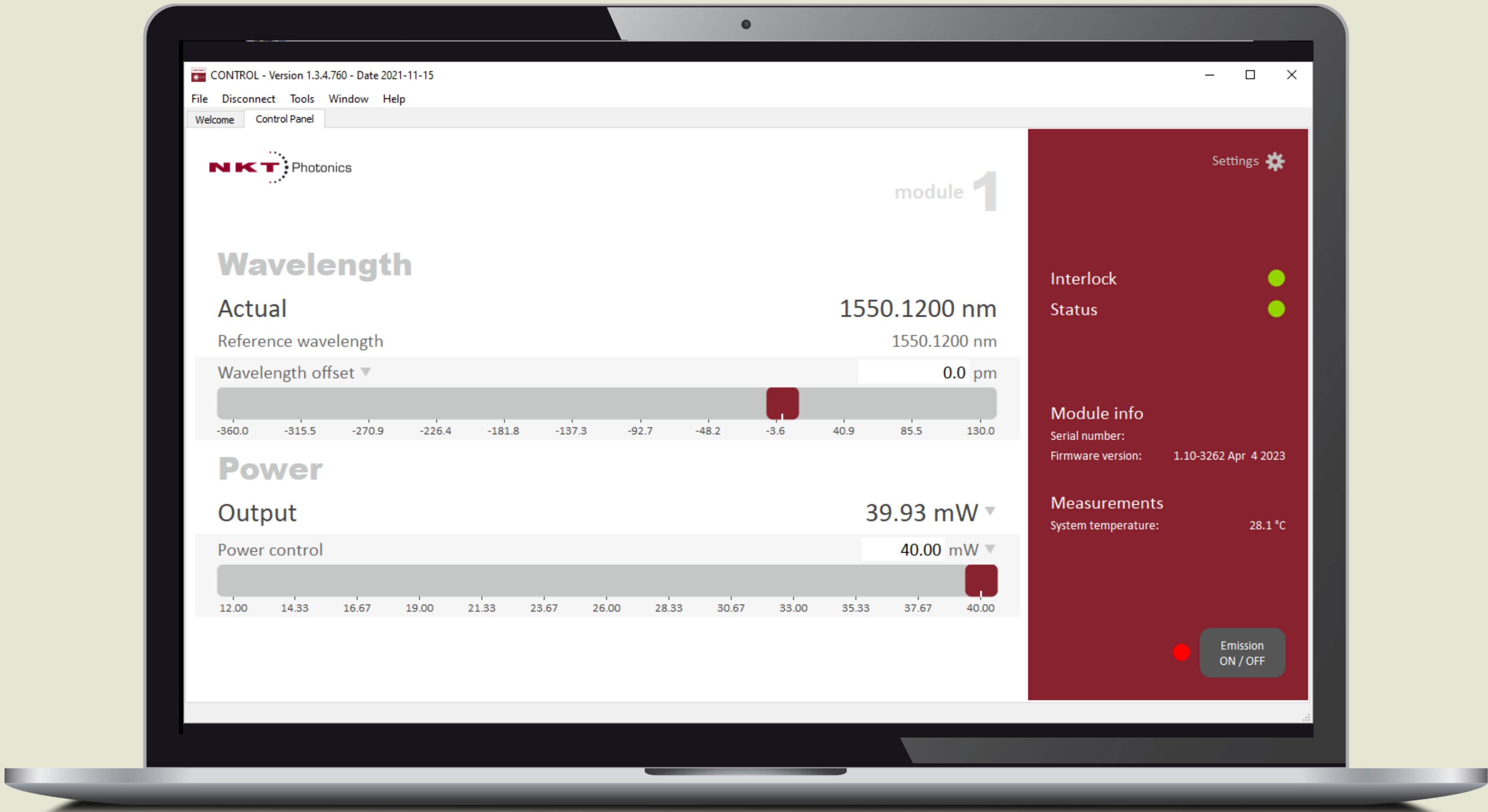
The excellent beam quality enables efficient frequency conversion, for instance with the Koheras HARMONIK frequency conversion module.

Koheras BOOSTIK HP

NKT Photonics CONTROL

Like other NKT Photonics lasers, the Koheras BOOSTIK HP can be controlled by our intuitive CONTROL software that gives easy access to all laser functions.

The software automatically detects all units attached to the computer. It is easy to use and supports touch input as well as traditional mouse and keyboard control.



Specifications

Koheras BOOSTIK HP

Optical

Model	E15	Y10
Center wavelength [nm] ¹	1535 - 1580	1030 - 1086
Laser emission	CW - inherently single frequency	CW - inherently single frequency
Beam quality	M2 < 1.1	M2 < 1.3
Output power [W] ²	10 or 15	10 or 15
Output power regulation [%] ³	30 - 100	30 - 100
Linewidth [kHz] ⁴	Standard Linewidth	
	Reduced Linewidth	
	< 0.1	< 20
	Not applicable	
Max. phase noise [dB((rad/√Hz)/m)]	-90 @ 10 Hz	
	-110 @ 100 Hz	
	-120 @ 1 kHz	
	-130 @ 20 kHz	
RIN peak [MHz]	Approximately 0.7	Approximately 1.5
RIN level [dBc/Hz] ⁵	< -100 @ peak	< -105 @ peak
	< -135 @ 10 MHz	< -140 @ 10 MHz
Long term stability (RMS, 1h @ 25°C) [%] ⁶	< 1 %	< 2 %

Specifications (continued)

Optical

Model	E15	Y10
Optical S/N (50 pm res.) [dB]	> 50 (depending on wavelength)	> 50 (depending on wavelength)
Polarization	Linear (PM)	Linear (PM)
Min. thermal wavelength tuning range [pm]	± 350	± 240
Total thermal wavelength tuning range [pm]	1000	700
Fast wavelength modulation range [GHz]	8	10
Fast wavelength modulation [kHz]	Up to 20	Up to 20
Optical monitor output (from seed)	FC/APC	FC/APC
Output fiber termination	Collimator	Collimator
Typical beam diameter @ waist 1/e ²	≈2 mm	1.1 mm
Output isolation [dB]	> 25	> 25
PER (min/typical) [dB]	17/20	17/20

1) The center wavelength is selectable within the specified range. For options outside the range, please contact us.
2) Depends on the center wavelength.
3) The range can be larger depending on the center wavelength and output power.
4) Lorentzian.
5) RIN suppression is available in the range 1535-1580nm for E15 and 1106-1112nmfor Y10. Ask for more information.
6) After a 30-60-minute warm up, ambient around 18-25 degrees (APC mode).

Specifications

Koheras BOOSTIK HP

Electrical/Mechanical/Environmental

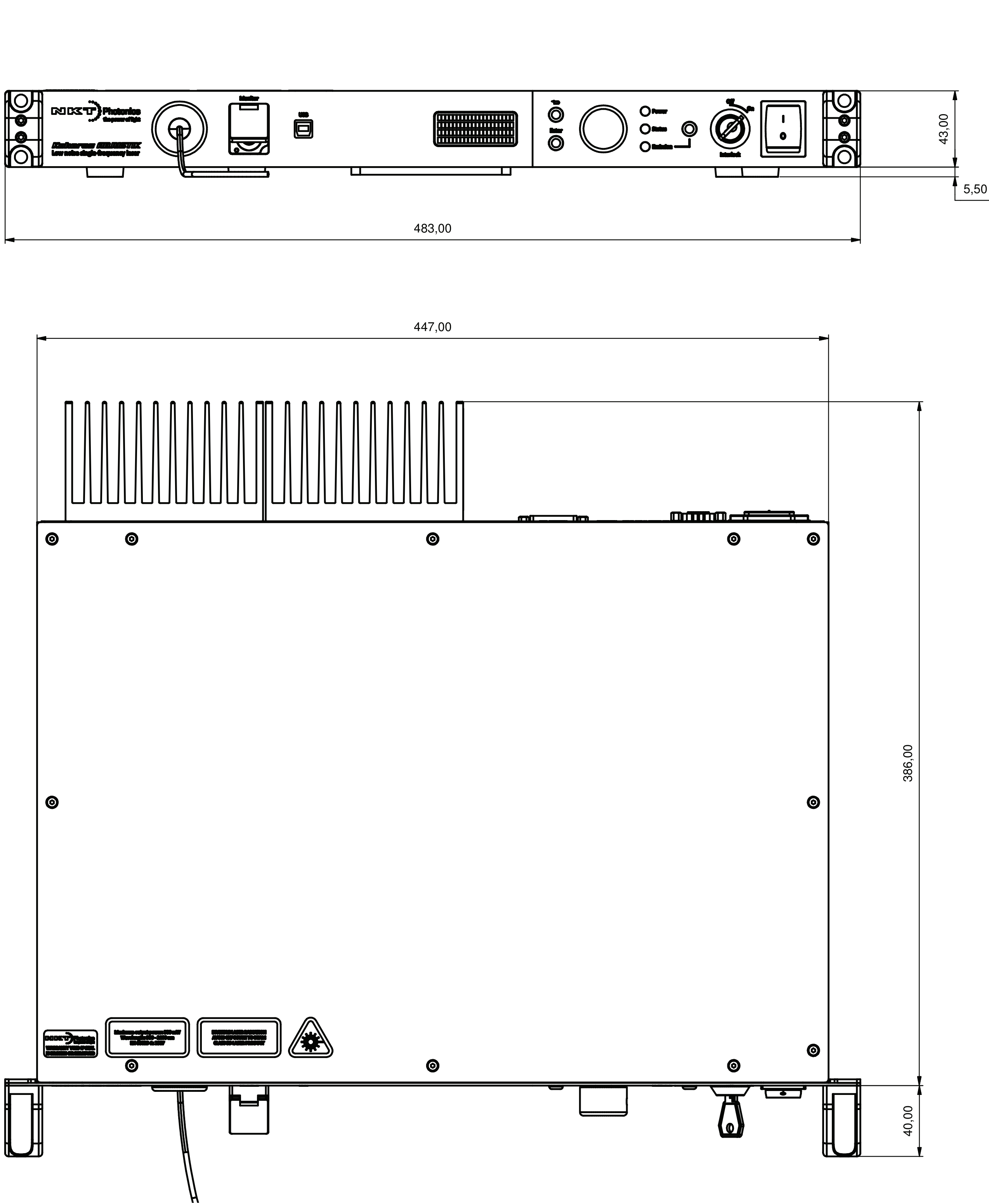
Seeder	
Power supply requirements [VAC, Hz]	100-240 VAC, 50-60 Hz
Digital interface	USB 2.0, Ethernet 10/100
Frequency modulation	DB9 male, differential 2x5 V
Fiber output type	Standard: FC/APC pigtail, appr. 1 m
Monitor output	Yes, FC/APC bulkhead
Dimensions (WxHxL) [mm³]	483 x 50.1 x 382.1 (19” 1U)
Weight [kg]	6

Amplifier	
Power supply requirements [VAC, Hz]	90-240 VAC, 47-63 Hz
Fiber pigtail length [m]	1.5
Connectors	Collimated
Operation temperature [°C]	15 – 35
Storage temperature [°C]	-20 – 65
Dimensions (WxHxL) [mm³]	483 x 130.5 x 526 (19” 3U)
Weight [kg]	< 15

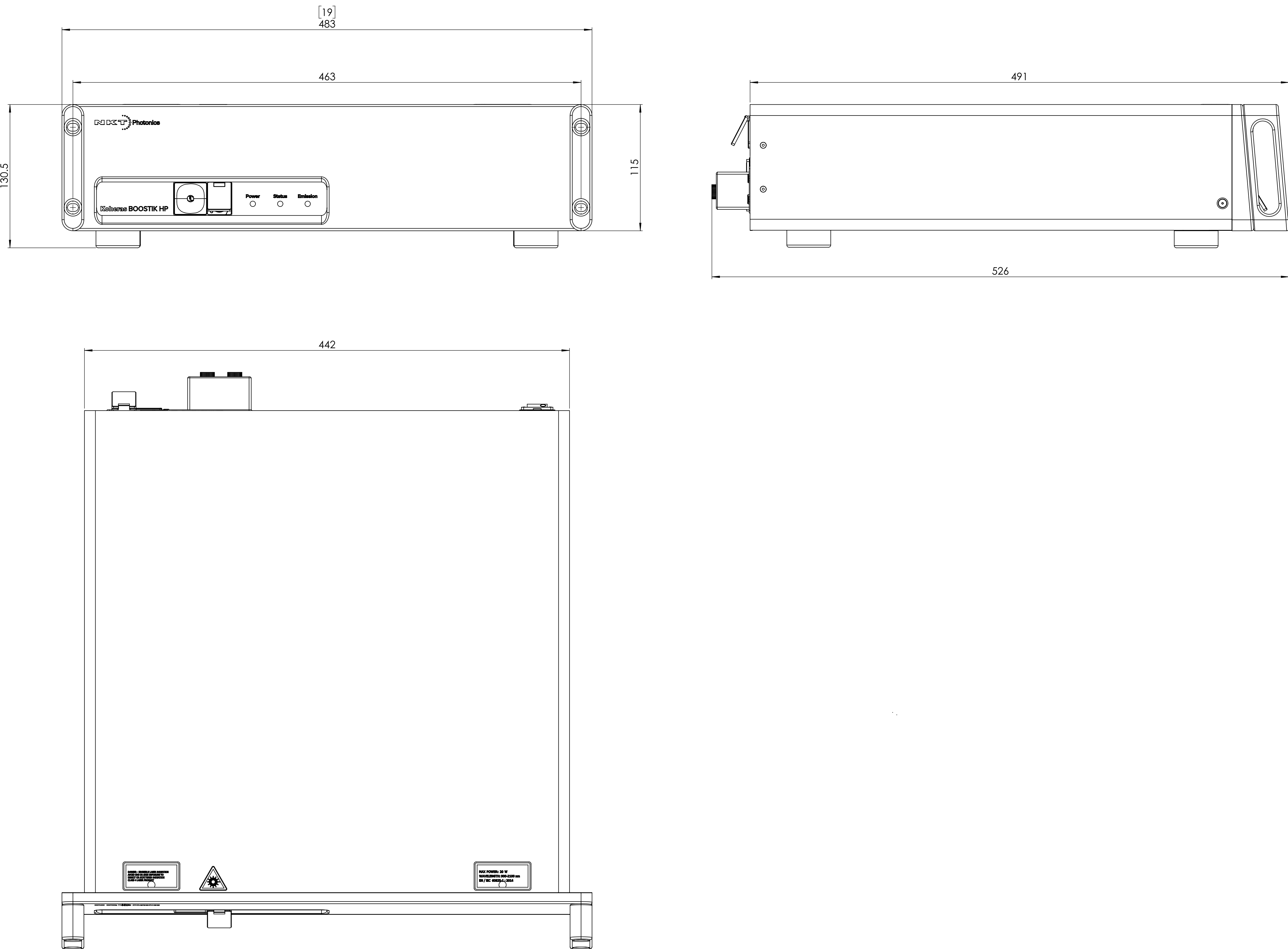


Technical Drawings

Seeder



Amplifier



Koheras BOOSTIK HP

All NKT Photonics products are produced under our quality management system certified in accordance with the ISO 9001:2015 standard.



SOLUTIONS FOR INNOVATORS