Koheras BASIK

Ultra-low phase noise OEM fiber laser

INDUSTRIAL ROBUSTNESS

Ideal for coherent sensor applications

The Koheras BASIK is an industrial fiber laser featuring the ultra-low phase noise and narrow linewidth normally only found in costly scientific systems.

The fiber laser is very robust and can be easily integrated into multi-channel systems, such as our Koheras ACOUSTIK.

Applications

- Metrology
- Atomic physics
- Seismic sensing
- Laser vibrometry
- Quantum physics
- Wind LIDAR systems
- Sensor interferometry
- Frequency conversion
- Coherent communication
- Motion and intrusion detection

KOHERAS BASIK

High performance and low cost

The Koheras BASIK is an industrial fiber laser that gives you the best of two worlds:

The ultra-low phase noise and narrow linewidth from the scientific systems and the low cost and robustness from the industrial systems.

Tunable center wavelength and output power

The center wavelength can be chosen freely in the 1535-1580 nm range for the X15 and E15 models or the 1030-1120 nm range for the Y10 model. Depending on the model, the output power is in the range of 10-40 mW.

Ideal for coherent sensor applications

The BASIK laser is ideal for coherent sensor applications like security and asset monitoring and other applications e.g. within metrology that require very low noise, high wavelength stability and ultra-stable single-frequency operation, free of mode hops.

Compact modules for OEM integration

This range of lasers are packaged as compact modules made especially with industrial OEM integration in mind.

Model	Standard wavelength	Optional wavelengths	Output power	Polarization-maintaining output	Fast modulation
X15	1550.12 nm	1535 - 1580 nm	30 mW [1]	Yes	Yes
E15	1550.12 nm	1535 - 1580 nm	40 mW [1]	Optional	Optional
Y10	1064.00 nm	1030 - 1120 nm	> 10 mW	Yes	Yes

1) Adjustable output power

FEATURES

Fast wavelength modulation and thermal tuning

A key advantage of our distributed feedback fiber laser techno-logy is the freedom to choose the operating wavelength.

Standard systems are available at 1550.12 nm and 1064.00 nm and we offer special systems anywhere in the 1535 – 1580 nm range and 1030 – 1120 nm range.

The laser offers a wide thermal tuning range, optionally combined with fast wavelength modulation e.g. for external stabilization.

### The market's lowest frequency noise

The BASIK laser features a very low frequency noise, unparalleled in industrial OEM laser modules.

The robust, single-frequency operation and low noise make the BASIK lasers a strong choice for coherent sensing applications where ultra-low frequency noise is a key laser parameter for the sensitivity and accuracy of a sensing system.

The plot below compares frequency and phase noise of the laser models X15 and E15. The graphs represent typical measurements while the dots indicate the guaranteed maximum values.

Features

- Narrow linewidth
- Ultra-low phase noise
- Stable single-frequency operation
- High wavelength stability
- Plug and Play
- Industrial OEM pagkaging
- Robust and maintenance-free
- Multi-channel system or stand-alone
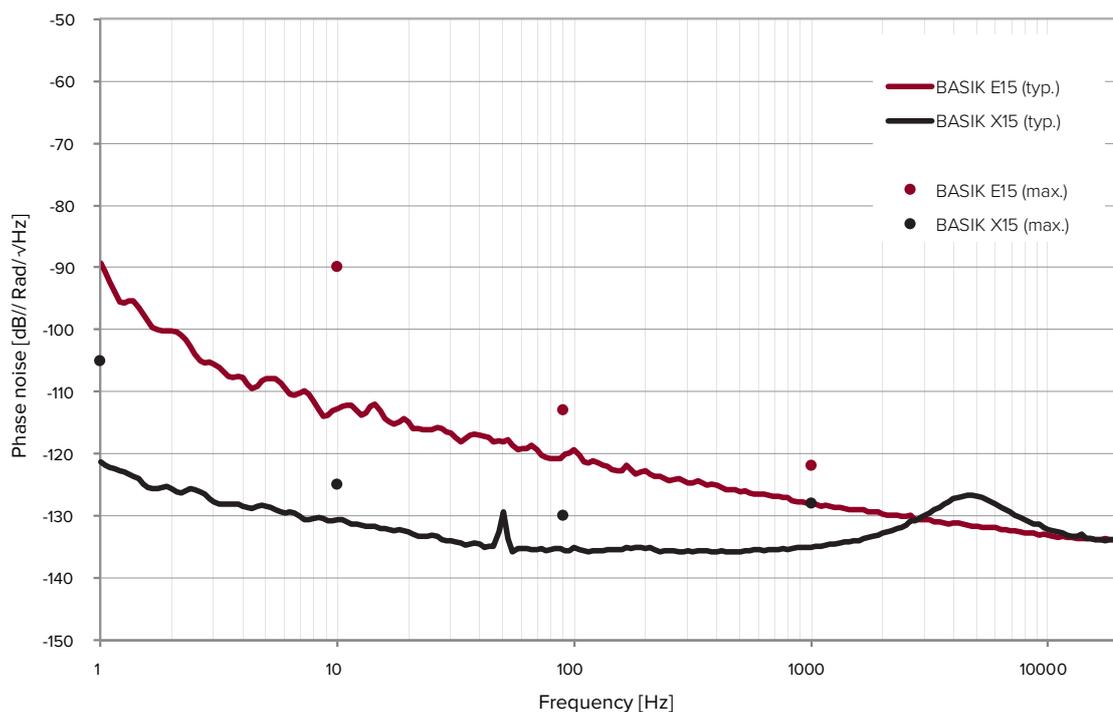
OPTIONS

Fast wavelength modulation

The BASIK module can be supplied with easy and user-friendly fast wavelength modulation in order to lock the laser to an external stable reference and get an even higher wavelength stability than provided by the free-running laser.

Multi-channel integration

If several wavelengths are needed, BASIK modules can be coupled with our 16-channel ACOUSTIK integration rack. The ACOUSTIK provides power and control to all BASIK modules for easy integration. Channels can be added and changed as needed.

Polarization-maintaining fiber output

The standard output is single mode fiber. However, we always offer a polarization maintaining option to ensure a fixed orientation of the polarization. This may be required in case the laser output needs to be externally modulated or frequency converted.

Easy to control via a graphical user interface

For easy control, the BASIK is available with an optional USB interface kit and can be controlled via our NKTP CONTROL graphical user interface.

Options

- Center wavelengths in the 1535–1580 nm and 1030–1120 nm ranges
- Fast wavelength modulation
- Multi-channel integration
- Polarization-maintaning fiber output
- Graphical user interface
- Optical monitor output
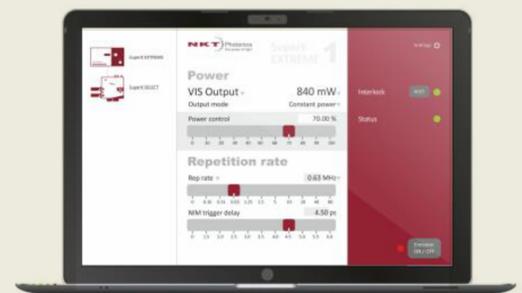
Software
— NKT Photonics CONTROL

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

The software automatically detects all units attached to the computer. You can control several lasers simultaneously. It is easy to use and supports touch input as well as traditional mouse+keybord control.

SPECIFICATIONS

Optical

Model	X15	E15	Y10
Laser emission	Continuous wave - inherently single frequency		
Beam quality	$M^2 < 1.05$	$M^2 < 1.05$	$M^2 < 1.05$
Linewidth [kHz] [1]	< 0.1	< 0.1	< 20
Max. phase noise [dB((rad/√Hz)/m)]	-105 @ 1 Hz (typ.)	-	-
	-125 @ 10 Hz	-90 @ 10 Hz	-
	-130 @ 100 Hz	-110 @ 100 Hz	-
	-128 @ 1 kHz	-130 @ 20 kHz	-
Max. phase noise [(μrad/√Hz)/m]	5.6 @ 1 Hz (typ.)	-	-
	0.6 @ 10 Hz	32 @ 10 Hz	-
	0.3 @ 100 Hz	3.2 @ 100 Hz	-
	0.4 @ 1 kHz	0.3 @ 20 kHz	-
RIN peak [MHz]	Appr. 0.7	Appr. 0.7	Appr. 1.5
RIN level [dBc/Hz]	< -100 @ peak	< -100 @ peak	< -105 @ peak
	< -135 @ 10 MHz	< -135 @ 10 MHz	< -140 @ 10 MHz
Optical S/N (50 pm res.) [dB]	> 50 (typ. > 55) [2]	> 50 (typ. > 55) [2]	> 65 (typ. > 70)
Min. thermal wavelength tuning range [pm] [3]	± 125	± 350	± 240
Total thermal wavelength tuning range [pm]	350	1000	680

Options			
Fast wavelength modulation range [GHz] [4]	0.5	8	10
Fast wavelength modulation [kHz] [4]	Up to 20	Up to 20	Up to 20
PM output - PER [dB] [4]	> 23	> 23	> 23
Monitor optical output	FC/APC	FC/APC	FC/APC

1) Lorenzian.
2) >47 dB (typ. > 52 dB) for non-PM version.
3) Relative to center wavelength at room temperature. If the laser case temperature is outside the interval of approximately 10-50 °C, the range of detuning from the center wavelength may be reduced.
4) Default for X15 and Y10.

SPECIFICATIONS

Mechanical/Electrical/Environmental

Power supply requirements [VDC]	12
Power consumption [W]	Typical 4, max. 10
Electrical interface	30 pin DIN41612 male
Fast modulation drive voltage [V]	Differential 2x5 with common-mode voltage at 2.5
Connectors	Standard: FC/APC pigtail
	Optional: Bulkhead/pigtail FC/APC, SC/APC
Monitor output	Optional
Operation temperature [°C] [1]	15 – 60
Dimensions (WxHxL) [mm^3]	111 x 22.5 x 220
Weight [kg]	0.6
Humidity non-condensing [% RH]	0 – 70

1) Module temperature. For other temperature options, please contact us.

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.

Service and warranty extensions

The Koheras warranty and service package ensures trouble free operation of your Koheras laser.

The Standard Package gives you a two year warranty extension plus remote diagnostics of key laser parameters through a remote connection to the system.

Our Premium Package adds a guarantee that we always stock a laser with your specifications - ready to ship - should you need it.

Standard package
- Extension of warranty period to 2 years
- Remote diagnostics
- Preventive laser health checks

Premium package
- All the benefits of the standard package
- Pre-produced custom-specific laser in stock

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

FORCE Certification
Systemcertificering
DS/EN ISO 9001 - Kvalitet

INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

CLASS 3B LASER PRODUCT