SUPERK EXTREME/FIANIUM

High Power Supercontinuum fiber laser series

FULLY MODULAR, WITH EASY OPERATION AND SERVICE

The range of SuperK EXTREME/FIANIUM supercontinuum white light lasers are broad as a lamp and bright as a laser.

They deliver high brightness diffraction limited light in the entire 390-2400 nm region. By adding one of our filters, the SuperK can be converted into an ultra-tunable laser with up to 16 simultaneous lines. Our lasers are maintenance free and ensures excellent reliability and a lifetime of thousands of hours.

Applications

- Microscopy
- Fluorescence
- Lifetime Imaging
- Optical Coherence Tomography
- Spectroscopy
- White light interferometry
- Plasmonics & meta materials

SUPERK EXTREME/FIANIUM

SuperK supercontinuum sources delivers a wide spectral output covering hundreds of nanometers while keeping the high brightness and mode quality known from single line lasers. Our lasers are fully fiber monolithic ensuring excellent reliability — completely alignment and maintenance free.

The SuperK series is based on NKT Photonics world renowned Crystal Fibretechnology that has reliably delivered supercontinuum to all fields for over 15 years.
The SuperK platform is fully modular, allowing easy operation and service where accessory modules can be added without configuration—all plug &play.

Operation is simple and functions can be changed on-the-fly without powering down the system. The SuperK EXTREME/FIANIUM provides high power and exceptional lifetime together with the highest of safety standards.

The SuperK CONTROL graphic user interface ensures that users from any discipline finds the SuperK EXTREME/FIANIUM an easy tool to use.

Model	Cut-in >0.1 mW/nm	Visible power (350-850 nm)	Total power
EXR-4	535 nm	400 mW	2 W
EXU-6	390 nm	600 mW	2 W
EXW-12	455 nm	1200 mW	4 W
EXR-15	475 nm	1500 mW	4.5 W
FIU-15	410 nm	1500 mW	5.5 W
EXR-20	470 nm	2000 mW	6 W

Support and Warranty

SuperK warranty
All SuperK EXTREME products comes with industry leading reliability and are backed by our standard 2 year warranty.

Lifetime and Service
Before shipping, all our SuperK lasers undergo an extensive burn-in to ensure performance and conformity to specifications. Systems exhibiting over 10,000 hours of continuous lifetime underlines the high reliability of NKT Photonics Crystal Fibre technology.

A SuperK laser is completely maintenancefree in the entire lifetime. Should your laser be damaged, the modular platform ensures fast turnaround on service and repairs. Typically, four weeks or less after a repair is ordered.
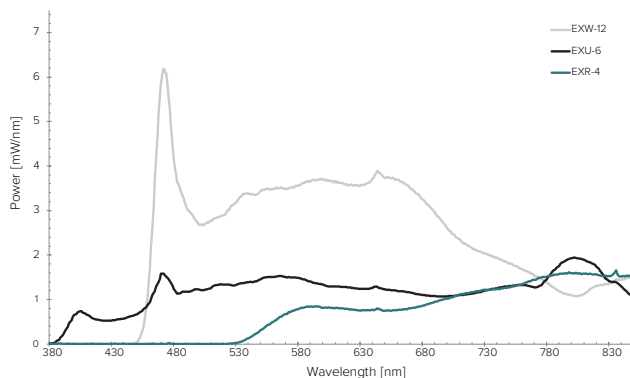
SPECTRAL POWER DENSITY

Legend: EXR-20, EXW-12, EXU-6, FIU-15

SPECTRAL COVERAGE

Legend: EXR-20, FIU-15, EXR-15
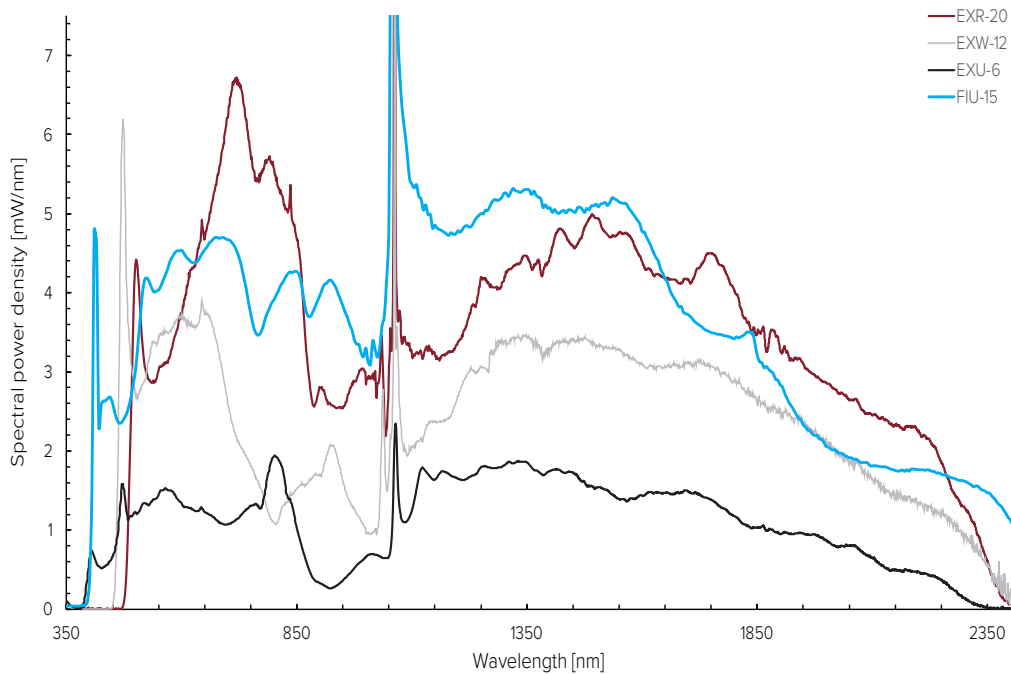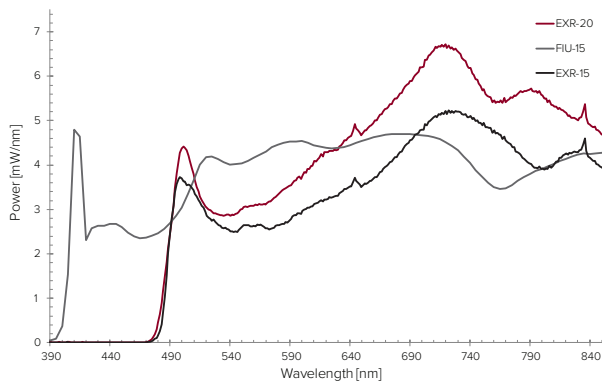
Visible power density curve of the high power lasers.
Note: FIU-15's typical single mode fiber coupling efficiency is 70% above 450nm

Legend: EXW-12, EXU-6, EXR-4

Visible power density curve of the short wavelength-optimized and low power lasers.

The SuperK EXTREME is available in four different variants:

- Violet EXU series
- White EXW series
- Red EXR series
- FUI-15

Choose the EXU series if you need short blue/violet wavelengths. The EXW series is a great all-around source providing good coverage of the visible spectrum while offering higher power than the blue EXU series.

The red EXR series are for those who need serious power or applications where the shortest wavelengths are not important.

The EXR series is our most popular model for high resolution OCT.

The FIU series suit those who require high optical powers in a broad spectral range extending all the way down to the violets.

FEATURES AND OPTIONS

Power Lock (external power locking)

The Power Lock option enables you to lock the power at any place in a setup. Simply place a photo detector at the desired location and connect the detector to the External Feedback BNC connector of the SuperK. Activate locking from the control panel and the SuperK will now lock the power level at the position of the photo detector—automatically compensating for any drift or variation in external components in the setup up to 100 Hz.

Most of our SuperK accessories are also available with a build-in Power Lock monitor for ultra stable output (typically < ± 0.5 %).

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- Fluorescence Lifetime Imaging
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Variable Repetition Rate (Pulse Picker)

Variable Repetition Rate (Pulse Picker)

The pulse picker option allows the repetition rate of the SuperK EXTREME to be easily changed on-the-fly while the system is running at full output. Repetition rates of 2-78 MHz are available as standard (down to 150 kHz on custom request), giving the user ultimate choice for lifetime measurement applications such as FLIM.

• Ideal for FLIM, FRET and diffuse optical tomography.

• NIM standard trigger output compatible with most common life time set-ups.

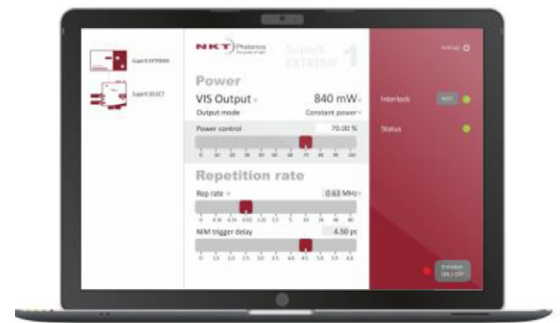|	
Repetition rate (Fixed rep.rate)[1]	78 MHz
Variable rep. rate[1]	78 – 2 MHz (23 steps)
Pulse suppression ratio	> 1:10,000
Operation mode Constant	Pulse Energy
Changing repetition rate[2]	< 1 s
Timing trigger output jitter	< 20 ps
NIM trigger output (BNC)	≈ 0 – >-0.8 V peak
Monitor trigger output (BNC)	0 – 1 V
Adjustable trigger delay timing[3]	up to 9.2 ns
Adjustable trigger delay resolution[3]	15 ps

1) Can be modified upon request.
2) The system does not need to be electrically shut down.
3) The electrical output trigger signal can be delayed up to 9.2 ns in steps of 15 ps. This enables trigger delay optimization without the need for a expensive delay box. Adjustable form front panel.

SPECIFICATIONS

Optical

Repetition rate	78 ±0.5 MHz
Power stability	< ± 0.5 %
Polarization	Random
Beam quality[2]	$M^2 < 1.1$
Collimated beam diameter	≈ 1 mm at 530 nm
	≈ 2 mm at 1100 nm
	≈ 3 mm at 2000 nm
Beam pointing accuracy[1]	< 1 mrad
Beam pointing stability	< 50 µrad
Typical single mode fiber coupling efficiency[2]	>70 %

Mechanical/Engineering

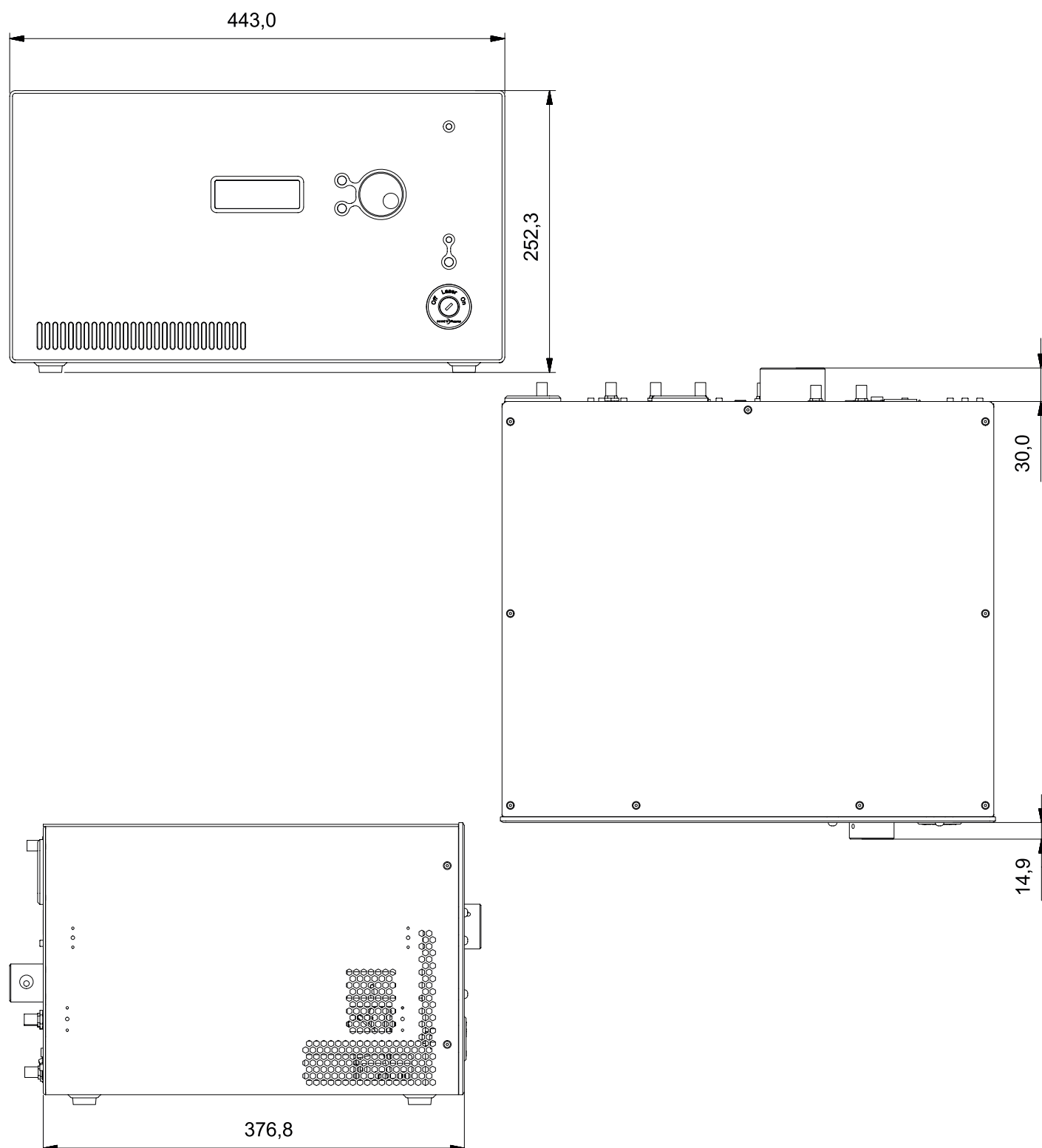|	
Computer interface	USB 2.0
Operation voltage	100-240 VAC 50/60 Hz
Power consumption	< 100 W (<120W with pulse picker)
Door interlock connector[3]	2-pin LEMO
External bus interface[4]	16-pin sub-D
System cooling	Air Cooled
Length of output fiber	1.5 m
Operation temperature	+18°C to +30°C
Storage temperature	-10°C to +55°C
Dimensions (WxHxL)	443 x 252.3 x 376.8 mm[3]
Weight	18 kg (19 kg with pulse picker)

1) Measured relative to the mechanical axis running through the center of the collimator
2) FUI-15 >450 nm
3) The SuperK Extreme is a Class 4 laser and is required to be connected to a door interlock/circuit
4) External communication and power supply port for accesories

Software
— NKT Photonics CONTROL

Like other NKT Photonics lasers, the SuperK EXTREME can be controlled by our unified CONTROL software that gives easy access to all laser functions.

The software automatically detects all units attached to the computer and you can control both the source and any filtering accessories from the same software. CONTROL is easy to use and supports touch input as well as traditional mouse+keybord control.

Software Development Kit (SDK)

The free SuperK EXTREME software development kit (SDK) enables control of the SuperK laser using third party software and hardware. The SDK contains a full description of the communication protocols as well as LabView drivers and C++/C# source code.

TECHNICAL DRAWINGS

443,0

252,3

30,0

14,9

376,8

FORCE
Certification
Systemcertificering
DS/EN ISO 9001 - Kvalitet

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

CLASS 4 LASER PRODUCT