

SuperK SELECT

Multi channel tunable AOTF filter

- Wavelength tuning over 400-2400 nm
- 8 simultaneous, freely tunable channels
- Dual VIS/nIR, VIS/IR, nIR/IR port access
- Easy connection to SuperK EXTREME
- Fiber or free space, collimated beam output
- Easy to use SuperKontrol software interface
- Fast wavelength switching and modulation

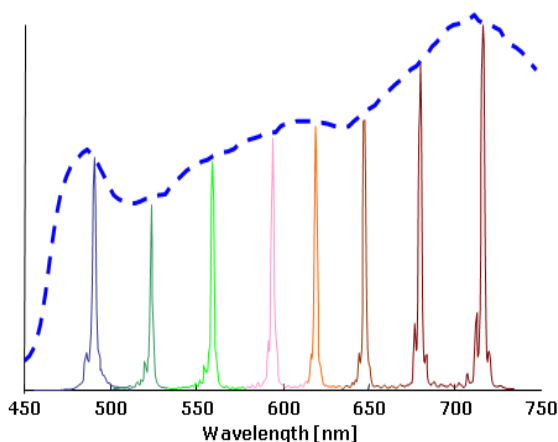
The SuperK SELECT is a tunable wavelength filter based on Acousto-optic Tunable Filter technology (AOTF). AOTFs tune over one octave of optical frequency and the SuperK SELECT can integrate two AOTF crystals to provide wide spectral coverage. The SuperK SELECT provides an easy to use and flexible access any wavelength in the SuperK spectrum.

The SuperK SELECT has on-board intelligence. When connected to the SuperK EXTREME, the SuperKontrol software automatically recognizes and initializes the SELECT. No drivers or configuration needed.

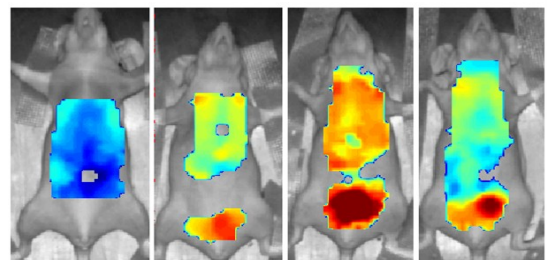
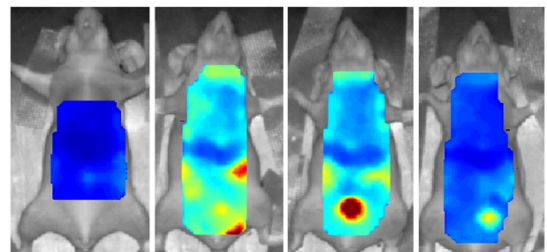
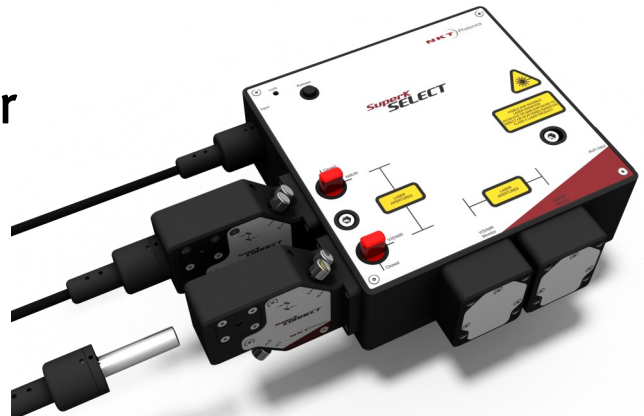
SuperK SELECT also features a built-in RF switch for toggling between the two AOTFs without physical cable connection changes.

Options

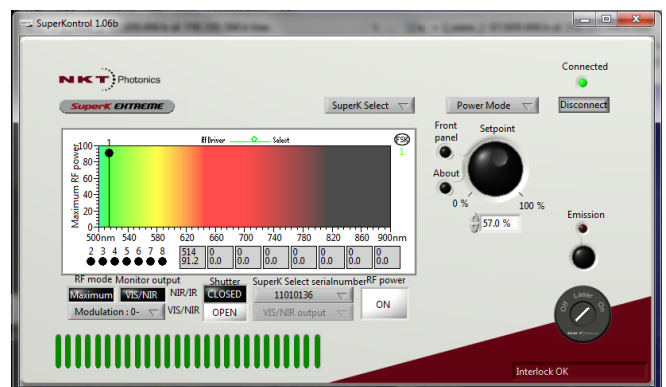
- Chose between 7 different AOTF crystals
- Power Lock option for ultra stable output
- SuperK COMMAND fast wavelength switching and modulation



Independent power and wavelength control of up to 8 simultaneously lines per AOTF. Visible wavelength range is shown.



SuperK EXTREME together with a SuperK SELECT optimized in the nIR used for in-vivo fluorescent lifetime imaging in a anaesthetized mouse (courtesy of ART Inc, Canada)



SuperKontrol software allows easy use of the SuperK SELECT

Specifications are subject to change without notice. SuperK SELECT 111221

Options and add-ons

AOTF crystals

The most important option for the SuperK SELECT is the choice of AOTF crystals as they must be carefully selected to cover the needed wavelength range. 7 different AOTF crystals are available covering the wavelength range from 400 nm to 2000 nm. Specifications for the different crystals are listed in the table to the right and the possible crystal combinations are listed below.

AOTF1/AOTF2	VIS-nIR 500-900nm	nIR1 640-1100nm	nIR2 800-1400nm	IR 1100-2000nm
UV-VIS 400-650nm	X	X	X	X
VIS (1x) 430-700nm	-	X	X	X
VIS (4x) 450-700nm	-	X	X	X
VIS-nIR 500-900nm	-	-	X	X
nIR1 640-1100nm	-	-	-	X
nIR2 800-1400nm	-	-	-	X

Specifications

AOTF Wavelength Coverage

UV-VIS	400 – 650nm
VIS (1x)	430 – 700nm
VIS (4x)	450 – 700nm
VIS-nIR	500 – 900nm
nIR 1	640 – 1100nm
nIR 2	800 – 1400nm
IR	1100 – 2000nm

Number of Tunable Lines 1 – 8 (per AOTF)

Filter Bandwidth* of AOTF (UV-VIS) 1,8 – 8,5nm

Filter Bandwidth* of AOTF (VIS 1x / VIS 4x) 0,5 – 1,85nm / 2,5 – 8,5nm

Filter Bandwidth* of AOTF (VIS-nIR) 3,5 – 14nm

Filter Bandwidth* of AOTF (nIR 1 / nIR 2) 1,8 – 5nm / 2,6 – 9,6nm

Filter Bandwidth* of AOTF (IR) 6,4 – 19,8nm

AOTF Deflection Efficiency > 90 % (1-8 channel operation)

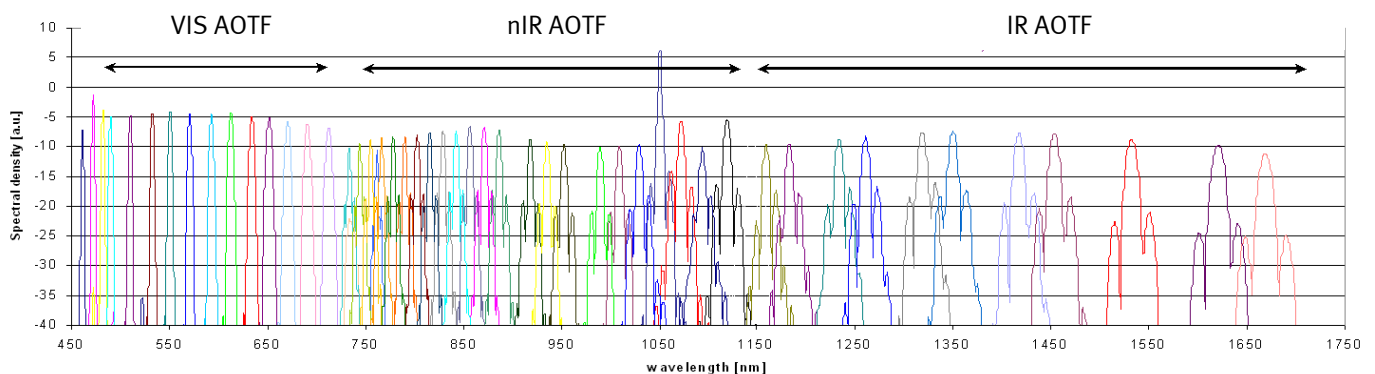
Polarization Linear

Output Mode Fiber or free space collimated

Mechanical Shutter Integrated for both ports

Laser Safety Interlock Integrated and linked to SuperK EXTREME Series

* Collimated free space output; FWHM bandwidth



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SuperK COMMAND box (fast wavelength switching option)

Wavelength sweeping or wavelength interrogation is important for a number of applications and can easily be obtained using a SuperK Supercontinuum sources with a SuperK SELECT multi channel AOTF filter equipped with the SuperK COMMAND fast wavelength switching box.

The main advantages of wavelength sweeping or wavelength interrogation using the SuperK COMMAND is the ability of changing wavelength or amplitude on a timescale shorter than 100 ns. Up to 16 wavelength channels can be enabled simultaneously for very Rapid color interrogation/switching. In addition, the Fast Wavelength Switching functionality can be utilized to high-frequency amplitude modulate the signal, thereby replacing e.g. a mechanical chopper functionality. The advantage is that the frequency can be very high and free space coupling is avoided.

Note that the timing sequence for the switching or modulation must be provided by a multifunction DAQ card (e.g. from for example National Instruments).

The SuperK COMMAND solution includes:

- Electrical COMMAND interface box
- 40 pin connection cable between RF Driver and Interface box
- Firmware supporting the SuperK COMMAND solution
- User interface (GUI) supporting the FSK solution
- Manual / Application note

For more information, please see the application note "Fast Wavelength Switching using a SuperK SELECT" available under application notes at our website www.nktp Photonics.com/support

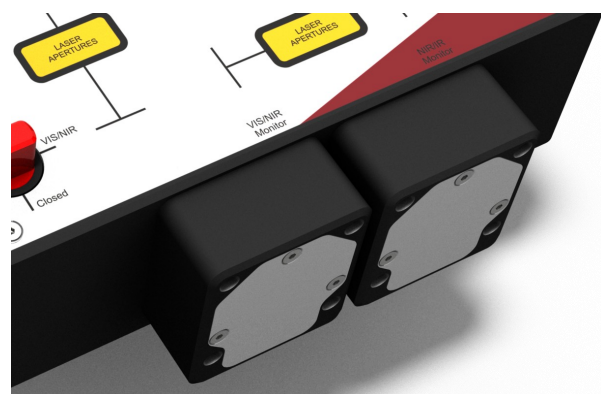


The SuperK COMMAND interface box

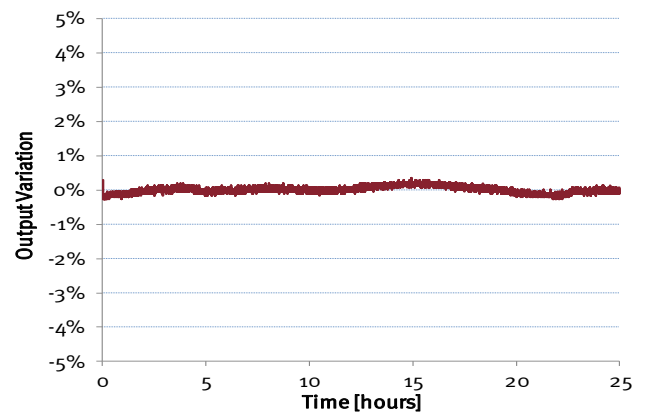
Power Lock (external power locking)

The Power Lock options enables you to lock the power output of the SuperK SELECT via a build in photo detector. Simply 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 output of the SELECT. Power Lock monitors are available for both output ports.

The long term stability of a locked output will typically be better than $\pm 0.5\%$ (over many hours) - depending on the wavelength.



Power Lock monitors on the SuperK SELECT

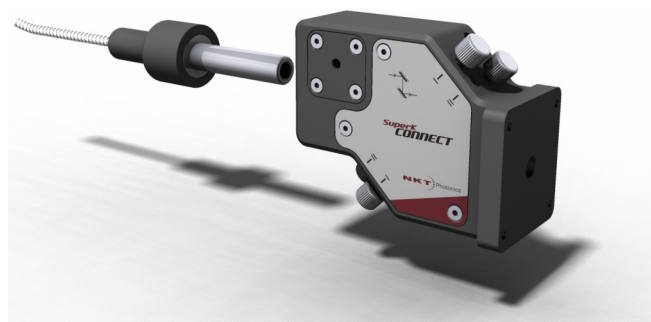


Example of output at 550 nm from the SuperK SELECT with Power Lock activated. Output variation is approximately $\pm 0.3\%$

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Fiber Delivery

SuperK CONNECT is a high performance fiber delivery system complete with broadband fibers and a range of termination options such as FC/PC connectors or high quality broadband collimators. Interfacing is handled by the CONNECT fiber coupling unit that ensure easy and stable single-mode coupling that can be disconnected and reconnected without alignment.



Configurations

FD1	FD2	FD3	FD4	FD5	FD6	FD7	FD8	FD9	FD10
UV-VIS 400-800nm	VIS 450-830nm	VIS-nIR 600-920nm	nIR1 740-1050nm	IR 1000-1750nm	Ext. IR 1200-1600nm	VIS-nIR 400-960nm	VIS - IR 830-1750nm	VIS - IR 540-1350nm	VIS-nIR 400-1100nm
SM; PM; FC-APC	SM; PM + non-PM; SM; PM + non-PM; FC-APC	SM; PM + non-PM; SM; PM + non-PM; FC-APC	SM; PM + non-PM; FC-APC	SM; PM or non-PM; FC-APC	SM; non-PM; FC-APC	LMA; PM or non-PM; FC-PC or APC	LMA; non-PM, FC-PC	LMA; non-PM, FC-PC	MM, FC-PC

Fibers with collimated output available upon request

Standard single mode fiber delivery systems for fiber-to-fiber connections

AOTF1/AOTF2	VIS-nIR 500-900nm	nIR1 640-1100nm	nIR2 800-1400nm	IR 1100-2000nm
UV-VIS 400-650nm	FD1 + FD3	FD1 + FD3 (FD4)	FD1 + FD4 (FD5)	FD1 + FD5
VIS (1x) 430-700nm	-	FD2 + FD4 (FD3)	FD2 + FD4 (FD5)	FD2 + FD5
VIS (4x) 450-700nm	-	FD2 + FD4 (FD3)	FD2 + FD4 (FD5)	FD2 + FD5
VIS-nIR 500-900nm	-	-	FD2(FD3) + FD4(FD5)	FD2(FD3) + FD5
nIR1 640-1100nm	-	-	-	FD3(FD4) + FD5
nIR2 800-1400nm	-	-	-	FD4(FD5) + FD5

Broadband LMA (single mode) fiber delivery systems for fiber to free-space connections

AOTF1/AOTF2	VIS-nIR 500-900nm	nIR1 640-1100nm	nIR2 800-1400nm	IR 1100-2000nm
UV-VIS 400-650nm	FD7	FD7	FD7 + FD9 (non-PM)	FD7 + FD8 (non-PM)
VIS (1x) 430-700nm	-	FD7	FD7 + FD9 (non-PM)	FD7 + FD8 (non-PM)
VIS (4x) 450-700nm	-	FD7	FD7 + FD9 (non-PM)	FD7 + FD8 (non-PM)
VIS-nIR 500-900nm	-	-	FD7 + FD9 (non-PM)	FD7 + FD8 (non-PM)
nIR1 640-1100nm	-	-	-	FD7 + FD8 (non-PM)
nIR2 800-1400nm	-	-	-	FD9 (non-PM) + FD8 (non-PM)

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