

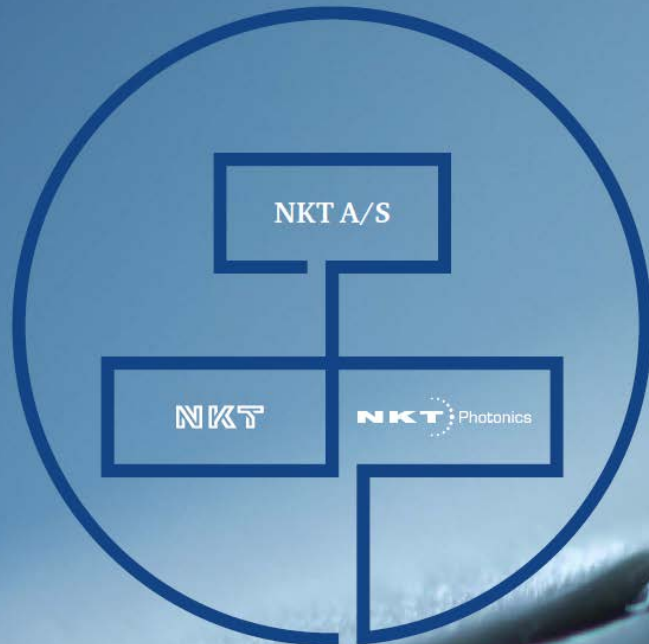
# EPIC Online Technology Meeting

Fibre sensing - April 6<sup>th</sup>, 2020

Martin Laging

# Company structure of NKT A/S

NKT A/S was founded in 1891 and has been listed on the Danish stock exchange since 1898. Today, it consists of two standalone companies: NKT, a leading provider of power cable solutions, and NKT Photonics, a leading supplier of fiber lasers and photonic crystal fibers. Both companies are headquartered in Denmark and have operations across the world.



2019 Revenue: 1.342,4 EURm  
Employees: 3,671



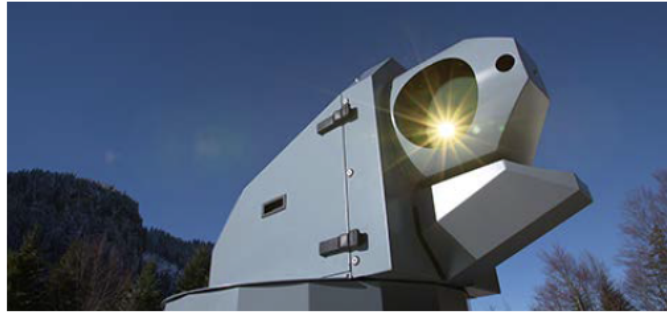
2019 Revenue: 74,6 EURm  
Employees: 403



# Koheras Lasers

## Examples of current main applications

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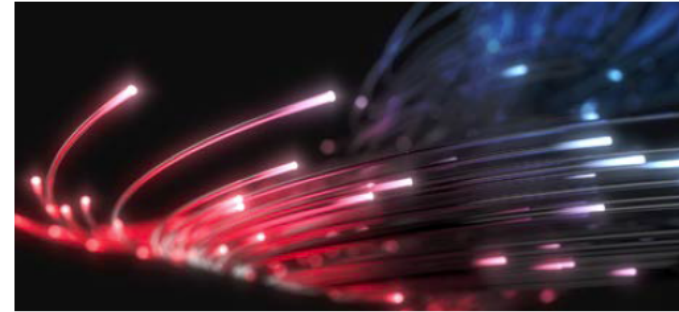
### Lasers preventing drone attacks

In 2018, small drones closed Gatwick Airport for more than two days, incurring costs estimated at several million EUR. Small, fast-moving drones are an increasing concern around high risk areas such as airports, ships or stadiums. Lasers from NKT Photonics are used in projects aimed at safely tracking and disabling these quickly and effectively.



### Koheras lasers in Space

NKT Photonics currently has several Koheras low-noise lasers in orbit on board the ESA SWARM satellites that measure the magnetic field of the Earth. Space-qualifying a laser is no simple task, but the robust monolithic design of the Koheras fiber lasers makes them well-suited to harsh environments. They have been operating for several years in space, where they help scientists better understand the planet and help smartphones navigate with higher precision by mapping the magnetic poles.



### Koheras lasers keep communication safe

NKT Photonics is supplying thousands of Koheras lasers to a large-scale secure data network project in India. The lasers are the key component in the fiber-optic intrusion detection and location system that monitors the several thousand km long network. The system ensures that the communication lines are secure, and that data cannot be siphoned out of the system without detection. Similar systems are also used for perimeter security at airports and other critical infrastructure.

# Industry-grade Koheras Lasers



- Inherently **single frequency**, mode-hop free
- **Ultra low phase noise** & narrow linewidth (**Hz level**)
- Low vibration & acoustic sensitivity
- Ultra long term wavelength stability ( **$\sim 0.1$  pm/°C**)
- Wide wavelength **tuning** range (**1000 pm**)
- Fast **wavelength modulation** (**20 kHz**)
- Optional: **PM output** (**>23 dB**)
- Wide range of **wavelengths** (**1030-1120 nm & 1535-1580 nm**)
- Multi-wavelength systems **up to 16 channels**
- Serviceable, **remote laser control & diagnostics**
- All-fiber based, **low cost of ownership**
- **+15.000** lasers delivered

# Specifications BASIK MIKRO E15



Technical parameter	Koheras BASIK MIKRO E15
Wavelength range	1535-1580nm (ITU, custom)
Output power	40mW
Linewidth	<0.1kHz
Phase noise	-130 dB(rad/vHz/m) @ 20 kHz
RIN	-135 dBc/Hz @ 10 MHz
PER	>23dB
Thermal tuning range	1000pm
Wavelength stability	<0.2pm/°C (case temp.)
Operating case temp. range	10-60°C
Power consumption	<3W (at nominal temperature)
Size	7 x 2 x 15 cm <sup>3</sup>
Reliability	Internally documented high reliability
Serviceability	Remote diagnostics via TeamViewer or logfile
Ease of use, LCO	Simple operation, no replacable parts

# Challenge us, let's talk about:

- **Your visions**
- **New applications in Fiber Sensing / DAS**
  - Oil & Gas
  - Pipeline
  - Perimeter
  - Railway
  - Smart city
  - Anything you have in mind
- **Your demands**
  - Specifications
  - Volumes, Upscaling, Cost, Service



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