



EAGLE C-OCT-S-90

Ultra-compact high performance OCT spectrometer with fast hardware-near interface for volume production

Ibsen 
photonics



Ultra-compact design with uncompromised roll-off performance

Ibsen Photonics EAGLE C-OCT-S-90 is a high-performance, compact 90 nm OCT spectrometer, built around our high-speed M-DISB-191 electronics platform.

With 90 nm bandwidth across a 2048 pixel CMOS sensor, the spectrometer is capable of measuring depths up to 4 mm (in air) with an axial resolution down to 4.1 μm (in air). Its ultra compact form factor, measuring just 130 x 75 x 36 mm and weighing only 600 grams, is enabled by innovative optical engineering and the optimized footprint of the M-DISB-191 electronics.

Despite its compact size, the EAGLE C-OCT-S-90 delivers the same exceptional optical performance as industry-standard OCT spectrometers equipped with 10 μm pitch cameras. Its diffraction-limited design ensures a compact form factor without any compromise to roll-off performance.

If your project requires features beyond the standard capabilities of the EAGLE C-OCT-S-90, we also provide tailored solutions to meet specific needs. Don't hesitate to contact our sales team to explore the best approach for your spectrometer project.

Key specifications of EAGLE C-OCT-S-90

- 795 nm to 885 nm wavelength range
- Resolution: 0.05 nm (typical)
- 2048 tall pixel camera with 7 x 200 μm pixel size
- Frame rate 61 kHz (2048 pixels) and 101 kHz (1024 pixels binning)
- High efficiency, transmission grating based design

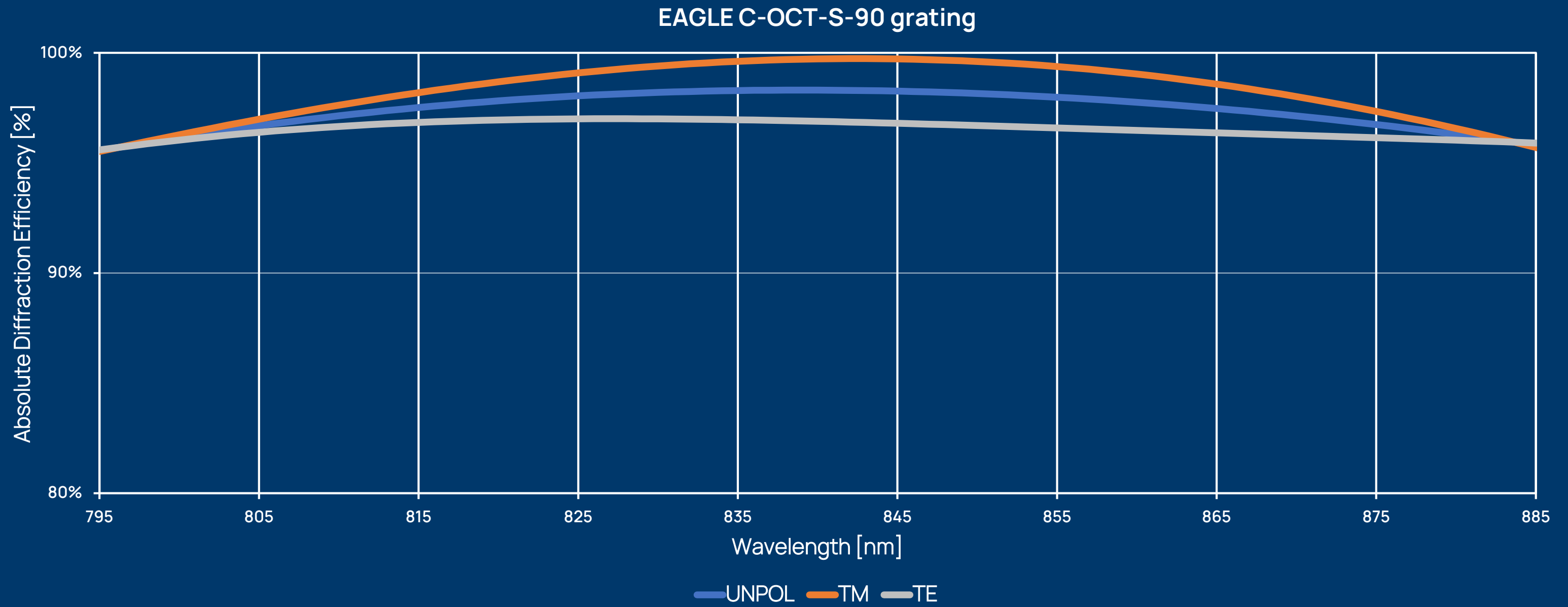
Camera interface

The EAGLE C-OCT-S-90 features Ibsen's in-house developed M-DISB electronics, paired with the Hamamatsu S17122 CMOS detector. This combination delivers line rates of 61 kHz for all 2048 pixels in a 12-bit data format, and 101 kHz when using pixel binning or a region-of-interest (ROI) reduced to 1024 pixels (and 2 mm measurement depth).

The M-DISB's MIPI interface, which provides a near-hardware, low-latency connection that eliminates the need for costly frame grabber cards or the overhead of a USB connection. This allows for direct interfacing with image signal processors, resulting in a cost-optimized, high-performance system ideal for large-volume production.

Technical Specifications EAGLE C-OCT-S-90

	EAGLE C-OCT-S-90	Comments
Optical entrance	FC/UPC adapter	
Wavelength range	795 - 885 nm	Other ranges available upon request
Resolution	0.05 nm	Average resolution across wavelength range
Numerical aperture	0.13	To match SMF Corning HI780 fiber
Camera	Ibsen Photonics M-DISB-191	
Frame rate	61 kHz (2048 pixels) 101 kHz (1024 pixels binning)	
Electrical interface	MIPI CSI-2 interface 12-bit Raw	Developers kit for USB3 available
Number of pixels	2048 x 1 pixels	
Pixel size	7 μm x 200 μm	
Detector	Hamamatsu S17122	
Operating temperature range	10 to 45 °C	Non-condensing
Storage temperature range	-10 to 50 °C	
Wavelength shift with temperature	< 0.002 nm/°C	
Dimensions	130 mm x 75 mm x 36 mm	Including camera
Weight	592 grams	Including camera



Transmission Gratings

The compact EAGLE C-OCT-S-90 spectrometer utilizes the Ibsen Photonics OCT transmission grating. The grating provides high and even diffraction efficiency, as evidenced by the absolute diffraction efficiency graph displayed above. The design also provides very low polarization dependence as an added benefit.

Every grating used in the compact EAGLE C-OCT-S-90 spectrometer platform is a master grating fabricated at Ibsen Photonics' cleanroom facility in Denmark.

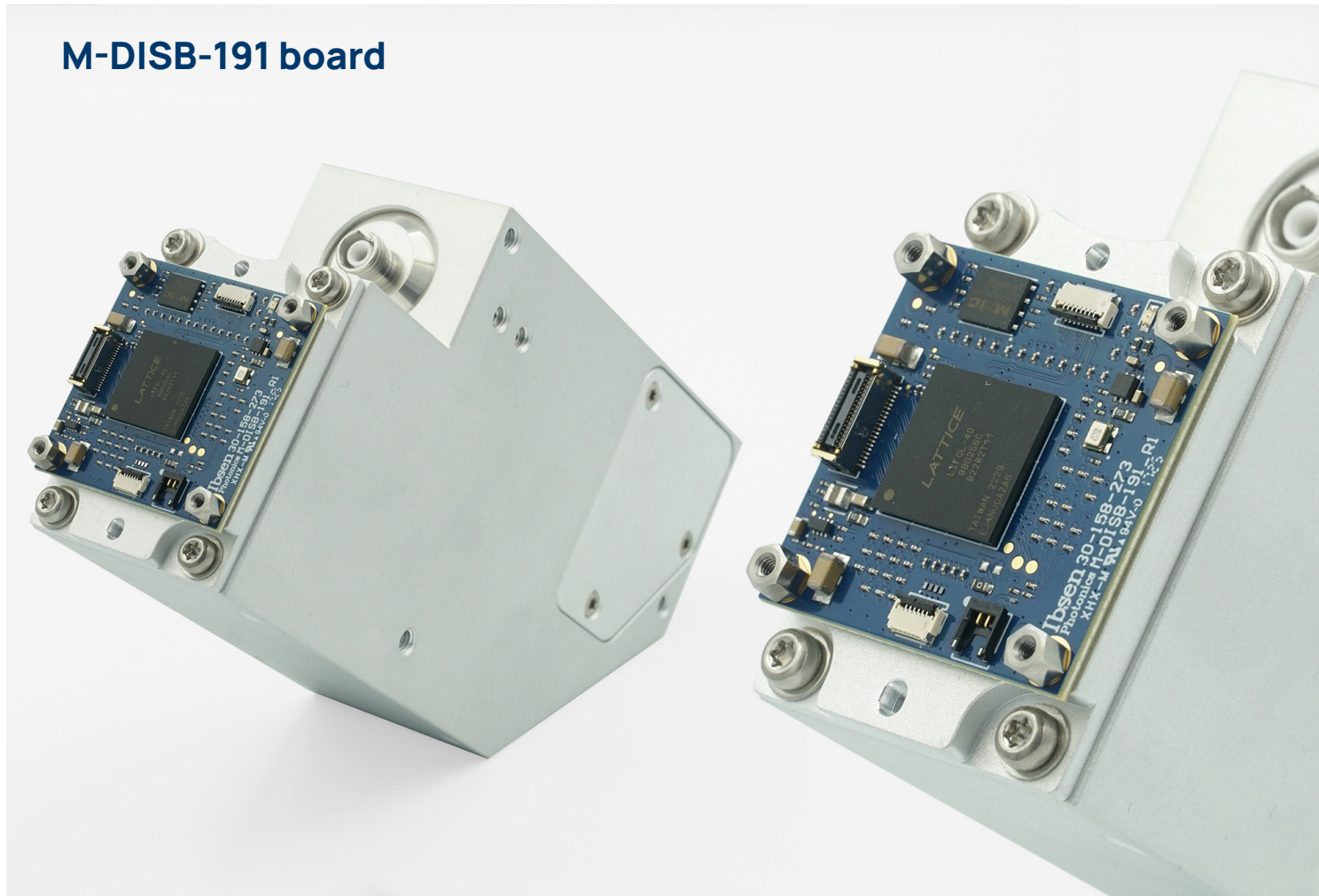
High Speed DISB electronics

The M-DISB-191 (MIPI Digital Image Sensor board – 191) is a high speed electronics board designed around the MIPI (Mobile Industry Processor Interface) communication protocol and Hamamatsu's S17122 linear CMOS detector. The M-DISB-191 offers a feature rich FPGA based platform that allows for full control of the 2048 pixel S17122 detector with line rates up to 61 kHz (for 2048 pixels) and additional functionality including on-board wavelength calibration coefficients, configurable well depth and HSYNC/VSYNC external triggering, making it an ideal choice for applications such Optical Coherence Tomography (OCT).

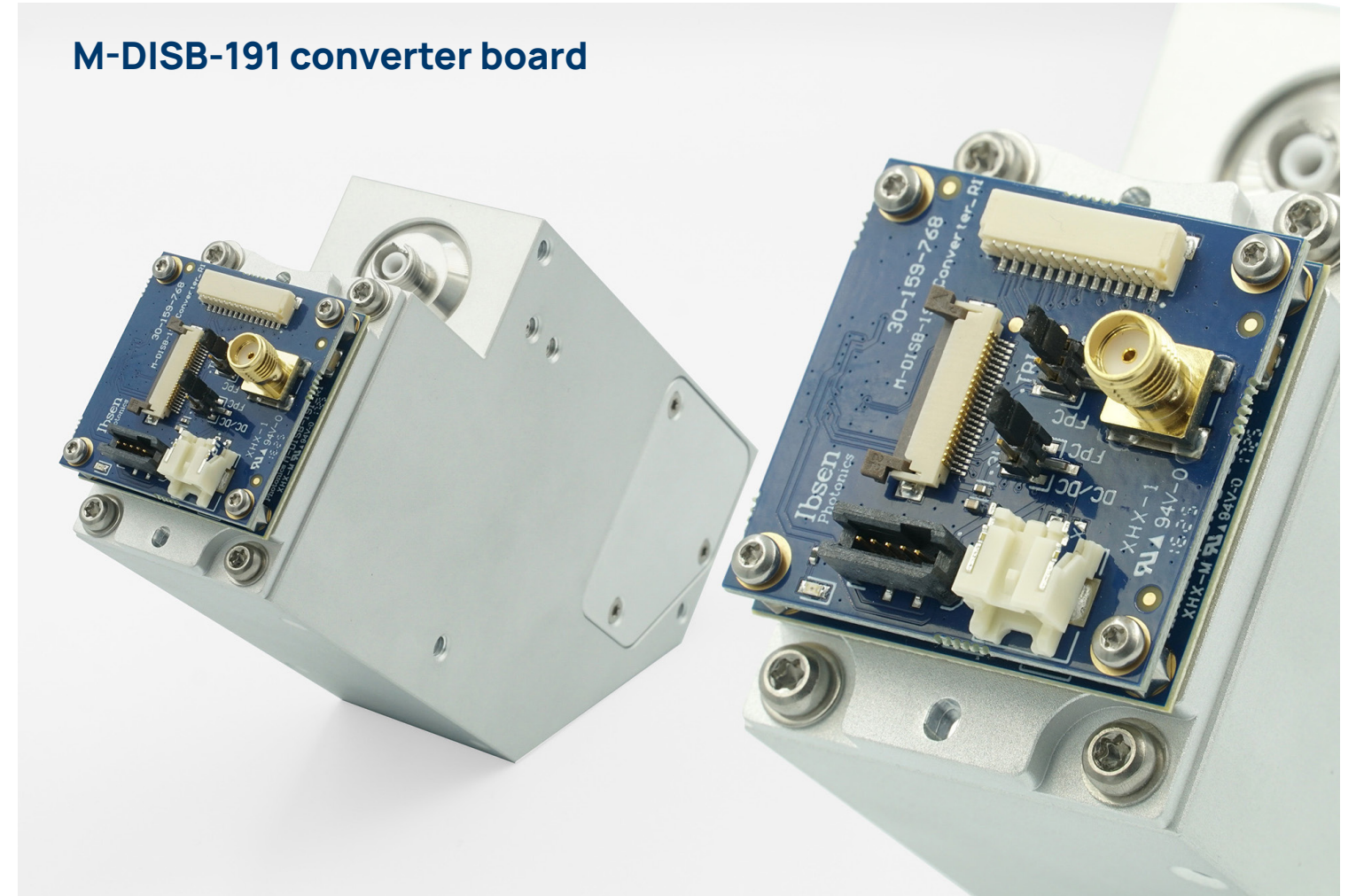
Key features

- Line-rates of 61 kHz with Hamamatsu S17122 (2048 pixel readout)
- Support of Region-of-interest (ROI)
- On-board wavelength calibration coefficients
- Form-factor of 36 x 36 mm²
- External triggers for HSYNC/VSYNC
- 4 levels for configurable well depth
- Single power supply input of 3.3V
- Test pattern generator for easy test and debugging

M-DISB-191 board



M-DISB-191 converter board



Technical Specifications M-DISB-191

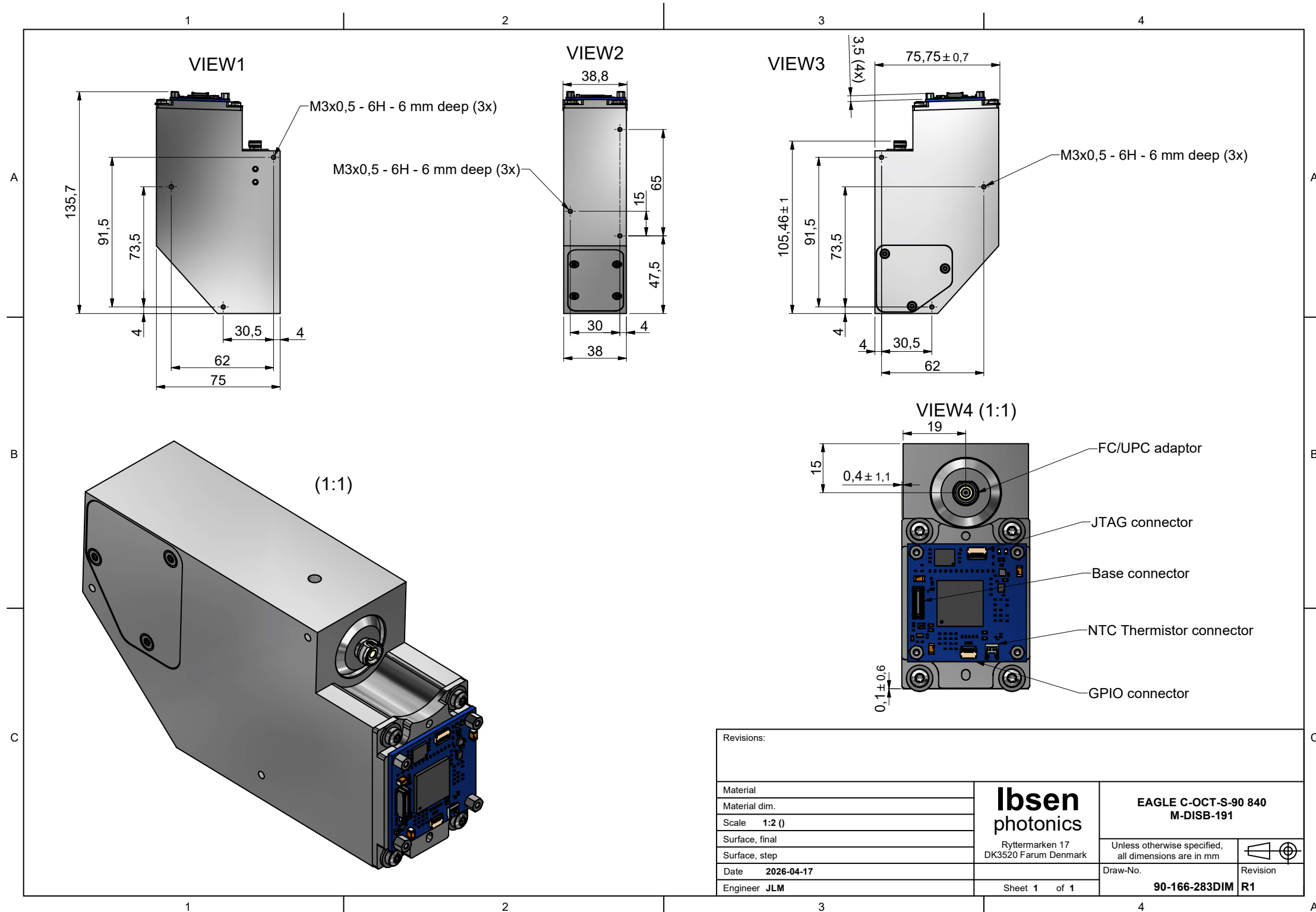
Parameter	Value	Unit	Comments
Detector	Hamamatsu S17122		Linear CMOS detector
No. pixels	2048	pixels	
Pixel size	7 x 200	µm	
Line-rate	61	kHz	101 kHz with pixel binning enabled
Pixels binning	Yes (pairs)		Binned to 1024 pixels with 14 µm pitch
Transfer protocol	MIPI CSI-2		2 lanes
ADC resolution	12	bit	
ADC offset	0-1023	ADC counts (12bit)	Set individually for the two readout ports (i.e. pixels 1-1024 and 1025-2048)
No. of trigger modes	3		1. Internal trigger 2. External trigger with exposure time set by trigger pulse width 3. External trigger with exposure time set by register value
Min. exposure time	2.225	µs	Adjustable in 25 ns increments
Min. line period	16.25	µs	Adjustable in 25 ns increments
Well depth	27, 44, 240 or 380	ke-	Adjustable in four levels via register settings
Voltage supply	3.3	v	
Current	262	mA	Typical value
Power draw	863	mW	Typical value
Dimensions	36 x 36	mm ²	

Technical Specifications M-DISB-191 Converter board

Paramater	Value	Unit	Comments
Voltage supply	4.5 - 28	V	Jumper can be used for 3.3V input
Power connector	2 pin PA connector (JST SM02B-PASS-TB)		
Trigger port	SMA (LINX SMA001-SMD-G-T)		
GPIO port	14 pin Header (JST SM14B-SRSS-TB)		
MIPI port	22 pin FPC/FFC (FH12-22S-0.5)		Compatible with 22 pin Raspberry Pi Camera cable
Dimensions	36 x 36	mm ²	

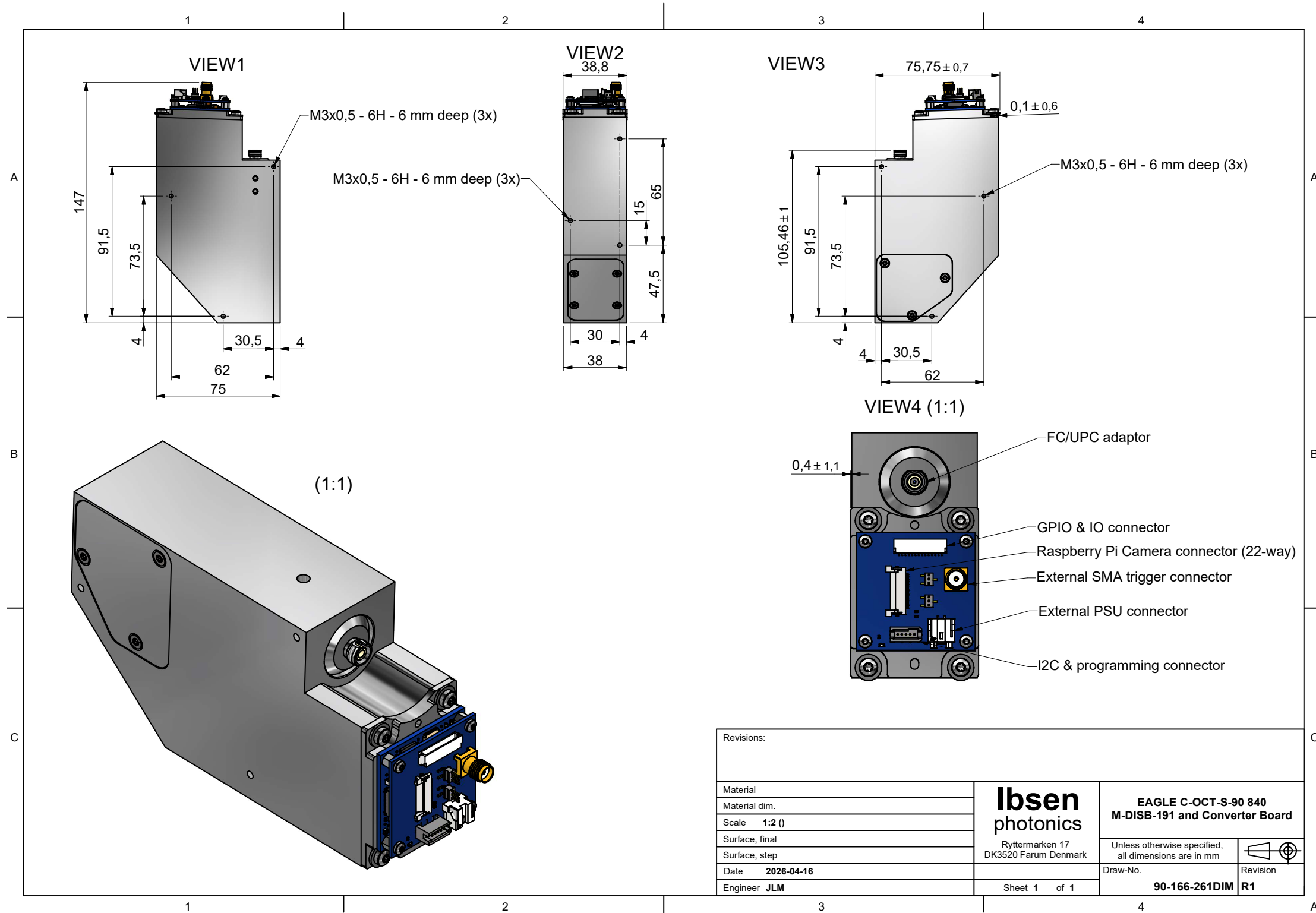
Mechanical Drawings

EAGLE C-OCT-S-90 including M-DISB-191 board



Mechanical Drawings

EAGLE C-OCT-S-90 including M-DISB-191 board and M-DISB-191 Converter board



About Ibsen Photonics

Founded in 1991 by Per Ibsen, Ibsen Photonics has grown from a visionary startup into a global leader in the design and manufacture of the world's best gratings and spectrometers.

As a strong, long-term strategic partner for leading industrial companies, we are committed to helping our customers increase sales and win market share. Our deep expertise and collaborative approach ensure that every product we deliver is not just a component, but a competitive advantage.

Today, Ibsen Photonics is owned by Foss A/S - a leader in analytical solutions. Our team combines entrepreneurial agility with operational excellence. With over 30 years of experience and an average employee tenure of 10+ years, we bring unmatched expertise to every project, ensuring improved performance, on-time launches, and consistent supply. Headquartered in Denmark, our 85+ experts drive innovation from R&D to manufacturing, achieving an annual turnover of more than 20 M€.

Working with Ibsen Photonics

The core expertise of Ibsen Photonics lies in opto-mechanical design, grating technology and metrology. We master the entire cycle - from optics, grating simulation, and design to optical and semiconductor production technologies, high-volume assembly, packaging, and testing. Over the years, we have developed and patented numerous innovative designs, technologies, and processes.

Our customers are large to medium-sized manufacturers of advanced optical devices and instruments, where our products serve as critical components. With a highly organized production process, we ensure smooth instrument production, low unit-to-unit variation, a high first-time yield, no field returns, and minimal rework.

Our spectrometers are produced under strict quality control in our assembly facility in Denmark, certified to ISO 9001, ISO 13485, ISO 14001 and ISO 45001. This confirms Ibsen's capability to consistently produce high quality products that meet market standards and all regulatory requirements. Collaborate with our team to speed up your innovation.

Contact us

Ibsen Photonics A/S
Ryttermarken 17
DK-3520 Farum
Denmark

Telephone:
+45 4434 7000



Email:
sales@ibsen.com

