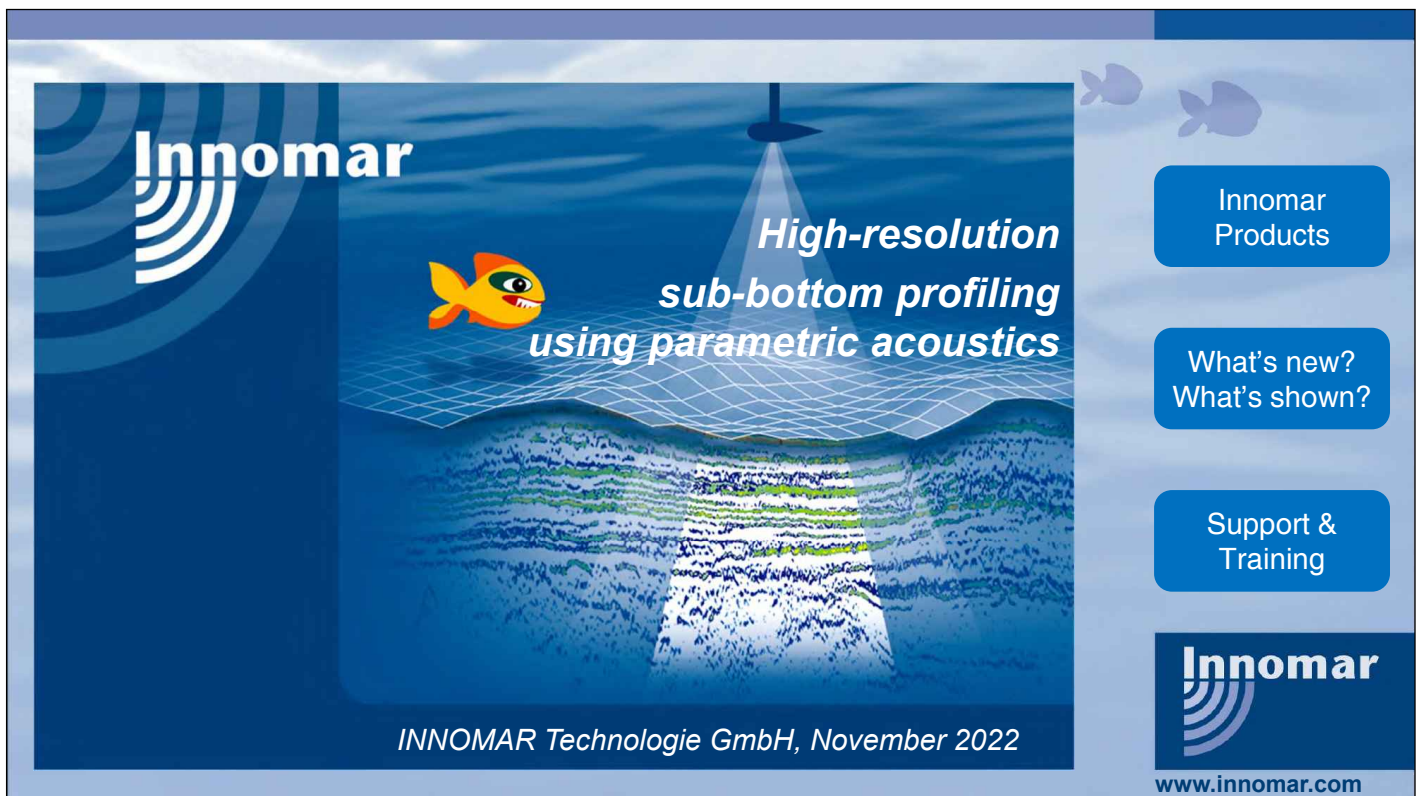


# Proceedings of the 10<sup>th</sup> Workshop “Seabed Acoustics”, Presentation P03:

## Innomar Products: News and FAQ

Dr. Jens Wunderlich  
Innomar Technologie GmbH, Germany  
([jwunderlich@innomar.com](mailto:jwunderlich@innomar.com))

10<sup>th</sup> November 2022



The slide features a central image of a ship's hull with a sonar beam illuminating a seabed profile. The seabed is shown with various geological layers in shades of blue, green, and yellow. A small orange fish is swimming in the water column. The Innomar logo is in the top left corner. The text 'High-resolution sub-bottom profiling using parametric acoustics' is centered over the image. At the bottom of the image, it says 'INNOMAR Technologie GmbH, November 2022'. On the right side, there are four blue buttons: 'Innomar Products', 'What's new? What's shown?', 'Support & Training', and the Innomar logo with the website 'www.innomar.com' below it.

**Innomar**

*High-resolution  
sub-bottom profiling  
using parametric acoustics*

INNOMAR Technologie GmbH, November 2022

**Innomar**  
www.innomar.com

Innomar Products

What's new?  
What's shown?

Support &  
Training

## Innomar's Shallow-Water Solutions



**smart**



**compact**



**light**



**standard**

• Depth Below Transducer	0.5 ... 100 m	0.5 ... 400 m	0.5 ... 400 m	0.5 ... 500 m
• Seabed Penetration	20 m	40 m	40 m	50 m
• Range Resolution	8 cm	5 cm	5 cm	5 cm
• Frequencies	100 / 10 kHz	100 / 4...15kHz	100 / 4...15 kHz	100 / 4...15 kHz
• Beam Width	±2.5°	±2°	±2°	±2°
• HRP Compensation	heave	heave	heave	heave + roll
• First / Latest Generation	2017 / 2022	2002 / 2021	2000 / 2021	1997 / 2020

→ When portability matters

→ Usable from less than one meter down to 500 meters below transducer



[www.innomar.com](http://www.innomar.com)

## Innomar's High-Power Solutions



**medium-100**



**medium-70**



**deep-36**



**deep-15**

• Depth Below Transducer	2 ... 2,000 m	2 ... 2,500 m	5 ... 6,000 m	10 ... 11,000+ m
• Seabed Penetration	70 m	100 m	150 m	250 m
• Range Resolution	5 cm	8 cm	12 cm	15 cm
• Frequencies	100 / 4...15 kHz	70 / 3...12kHz	36 / 2...7 kHz	15 / 0.5...5.5 kHz
• Beam Width	±1°	±1.5°	±1.5°	±2.3°
• HRP Compensation	H / R	H / R / (P)	H / R / (P)	H / R / P
• First / Latest Generation	2004 / 2020	2012 / 2021	2007 / 2021	2019

→ When penetration is a key requirement

→ For shallow and deep-water applications down to full ocean depth



[www.innomar.com](http://www.innomar.com)

## Innomar's Multi-Transducer Solutions

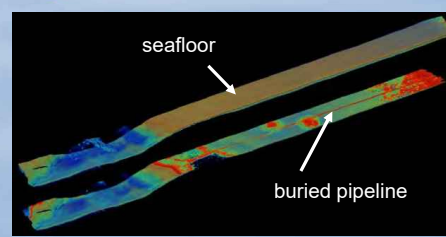
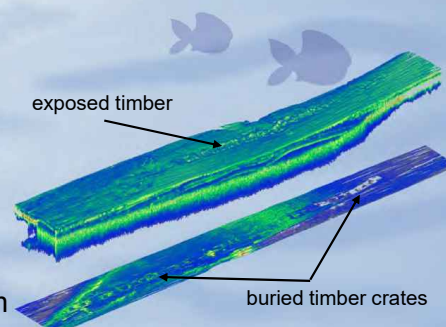


**quattro**



**sixpack**

• Depth Below Transducer	0.5 ... 30 (500) m	0.5 ... 30 (1,000) m
• Seabed Penetration	20 (50) m	20 (60) m
• Range Resolution	5 cm	5 cm
• Frequencies	100 / 4...15 kHz	100 / 4...15kHz
• Beam Width	±2.5°	±2.5°
• HRP Compensation	heave	heave
• First / Latest Generation	2015 / 2021	2017 / 2021



- When 3D sub-seabed data give additional answers
- For buried structures, archaeology, pipeline / cable and boulder detection

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## Innomar's Remotely Operated Solutions

**autonomous**



**smart**



**standard-usv**



**medium-usv**



**standard-rov**

• Depth Below Transducer	0.5 ... 100 m	0.5 ... 500 m	2 ... 2,000 m	0.5 ... 400 m
• Seabed Penetration	20 m	50 m	70 m	40 m
• Range Resolution	8 cm	5 cm	5 cm	5 cm
• Frequencies	100 / 10 kHz	100 / 4...15kHz	100 / 4...15 kHz	100 / 4...15 kHz
• Beam Width	±2.5°	±2°	±1°	±2°
• HRP Compensation	heave	heave + roll	heave + roll	heave + pitch
• First / Latest Generation	2017 / 2022	2020	2020	2003 / 2017

- When the focus is on remote / autonomous operations
- Prepared for USV / ASV integration at all scales

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## "USV" vs. "Normal" Innomar SBP models



- Same transducer, transmitter electronics, transmit beamforming
  - Same acoustic output
  - transducer with shorter cable (7 – 15m instead of 30m)
  - transducer cable optionally with inline connection
- No integrated PC (connected via Ethernet / UDP)
  - less space, lower weight and power consumption
  - lower ping rate (also in multi-ping mode)
  - preferably use short ranges
- Only one receiver per channel (HF / LF)
  - no beamforming at reception
  - lower dynamic range
- "Rack-mount" versions of all models available
  - mounts into 19" rack
  - closed frame for safety and proper air flow



## Innomar Software & File Formats

**SESWIN** → GUI for control & data acquisition

- Improved remote-control options ("usv")
- Zoom echo plot (2020)
- NAV-Data setup improved (UDP, comma separated)
- NAV-Data conversion → automatic Hemisphere (GGA)
- New Firmware Updater → for all models

**NetViewer** → QA / supervisor / client rep

- Improved version

**SESConvert** → data converter to SEGY, ASCII, ...

- Mainly bugfixes

**ISE** → post processing / QA

- ISE2: improved SES3 support, zoom, bugfixes
- ISE3: released Nov. 2021
- ISE3: improvements based on user-feedback

### Data Formats

- ~~SES (envelope, red, sample rate)~~
- RAW (16-bit full waveform)
- **SES3** (24-bit full waveform)

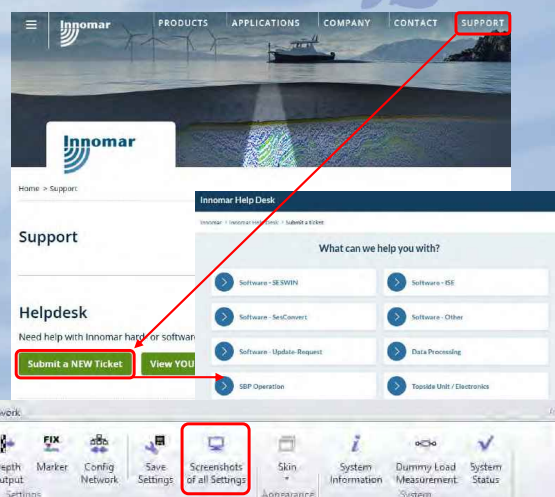


## Innomar Support

- Manuals (incl. "How to ...?" sections & FAQs)
- Training Courses → strongly recommended
- Helpdesk / Ticket System: [www.innomar.com/support](http://www.innomar.com/support)
- E-mail: [support-ticket@innomar.com](mailto:support-ticket@innomar.com)  
[support@innomar.com](mailto:support@innomar.com)
- Remote support via TeamViewer (Skype)
- Software updates → permanent download links

### Required info:

- Serial number(s) + software versions (e.g. 2022/04/C/102/E3 & E3102-4)
- SESWIN log file ("\_ses\_sys.log" from the SESWIN folder)
- SESWIN settings (automatic screen shots)
- Failure description and how to reproduce the issue / Innomar data file



## Innomar Services & Spare Parts

### Training Courses

#### TR1

Basics, Installation,  
Operation (SESWIN)

#### TR2

Data Processing  
(SesConvert, ISE)

#### TR3

3D Data Processing  
("quattro" / "sixpack")

#### TR4

Maintenance &  
Trouble Shooting

### System check / Maintenance

- Recommended every 2 ... 5 years, depending on usage
- Full system check, basic maintenance → test certificate

### Special Test Equipment

- Dummy load
- Transducer break-out box

### Spare-part kits

- Transducer mounting kit (steel/rubber washers, nuts)
- Transducer connector assembly kit
- Cable splice / moulding kit



## Innomar Training Courses

TR1	TR2	TR3	TR4
<p><b>Basics</b></p> <ul style="list-style-type: none"> <li>underwater acoustics</li> <li>sub-bottom profiling</li> <li>parametric acoustics</li> <li>Innomar SBP models</li> </ul> <p><b>Installation</b></p> <ul style="list-style-type: none"> <li>transducer mounting</li> <li>topside installation</li> <li>interfaces</li> <li>noise &amp; interference</li> <li>software</li> </ul> <p><b>Operation (SESWIN)</b></p> <ul style="list-style-type: none"> <li>typical settings</li> <li>data formats</li> </ul>	<p><b>2D Data Processing (SesConvert, ISE)</b></p> <ul style="list-style-type: none"> <li>data formats</li> <li>data conversion (SesConvert)</li> <li>ISE data (pre-) processing</li> <li>quality assurance</li> <li>reflectors &amp; targets</li> <li>data export</li> </ul>	<p><b>3D Data Processing ("quattro"/"sixpack")</b></p> <ul style="list-style-type: none"> <li>processing workflow</li> <li>data gridding</li> <li>volume rendering</li> <li>visualisation</li> </ul> <p>(TR2 required)</p>	<p><b>Maintenance and trouble-shooting</b></p> <ul style="list-style-type: none"> <li>Innomar SBP models</li> <li>system components</li> <li>system installation</li> <li>system check</li> <li>basic maintenance</li> <li>repairs &amp; STE</li> </ul> <p>(TR1 recommended)</p>

To get best results, we strongly recommend to attend the appropriate training courses



... next ...

## Coffee / Tea / Exhibition

(10:45 – 11:30)



... and some more exhibitors ...

