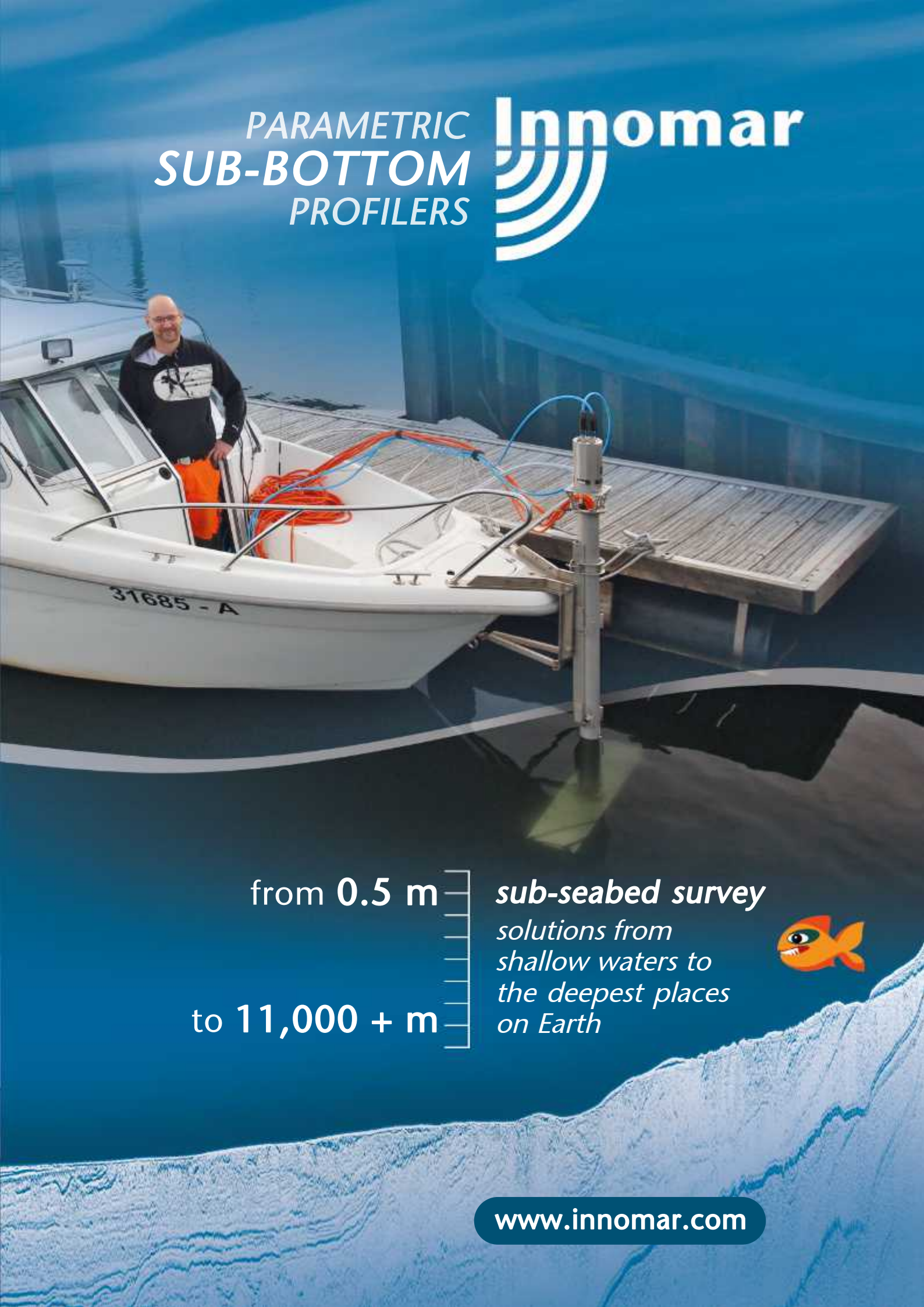

PARAMETRIC
SUB-BOTTOM
PROFILERS
Innomar
31685 - A
from 0.5 m
to 11,000 + m
sub-seabed survey
solutions from
shallow waters to
the deepest places
on Earth
www.innomar.com

Portable devices for shallow waters

from less than 1 m down to 500 m

Sub-bottom profiling in shallow waters is challenging for traditional systems and techniques due to wide-beam transducers, sidelobe patterns, ringing effects and high reverberation levels. The parametric technology used in our **smart / compact / light / standard models** offers very narrow beams of less than five degrees with highly portable transducers and a high system bandwidth with sub-decimetre resolution.

Devices can be mobilized on vessels of opportunity or autonomous platforms at various scales.

Innomar's parametric sub-bottom profilers offer advantages for many applications, such as offshore wind farms, route surveys, inshore and coastal surveys, dredging and harbours, pipeline and cable detection, marine archaeology, UXO surveys and more.

A unique feature is the possibility to work in extremely shallow waters, even **less than one metre**.

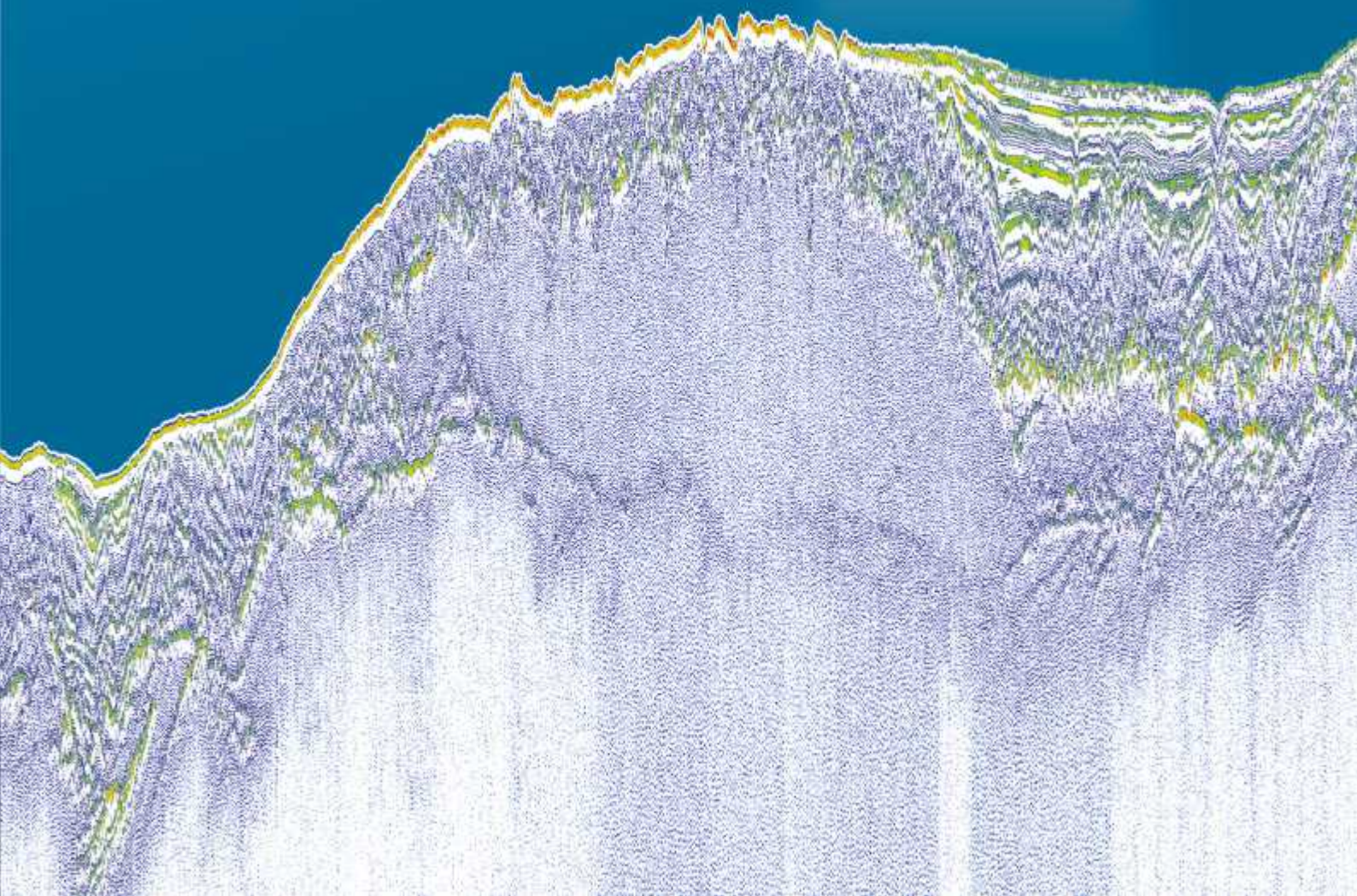
High power devices for deep waters

down to full ocean depth

Innomar's medium-100 / medium-70 / deep-36 / deep-15 models have larger transducers with increased source levels and operate with lower frequencies. Nevertheless, they provide narrow and focussed sound beams of less than 4 degrees which are electronically stabilised. Thus these systems can be applied in shallow areas where high seabed penetration is required or in deep waters for applications, such as oil and gas, reconnaissance and route surveys, scientific programs, deep sea drilling campaigns and others.

The narrow beam and small acoustical footprint guarantees very high spatial resolution at greater depths and the beam stabilisation allows for operation even under harsh offshore conditions.

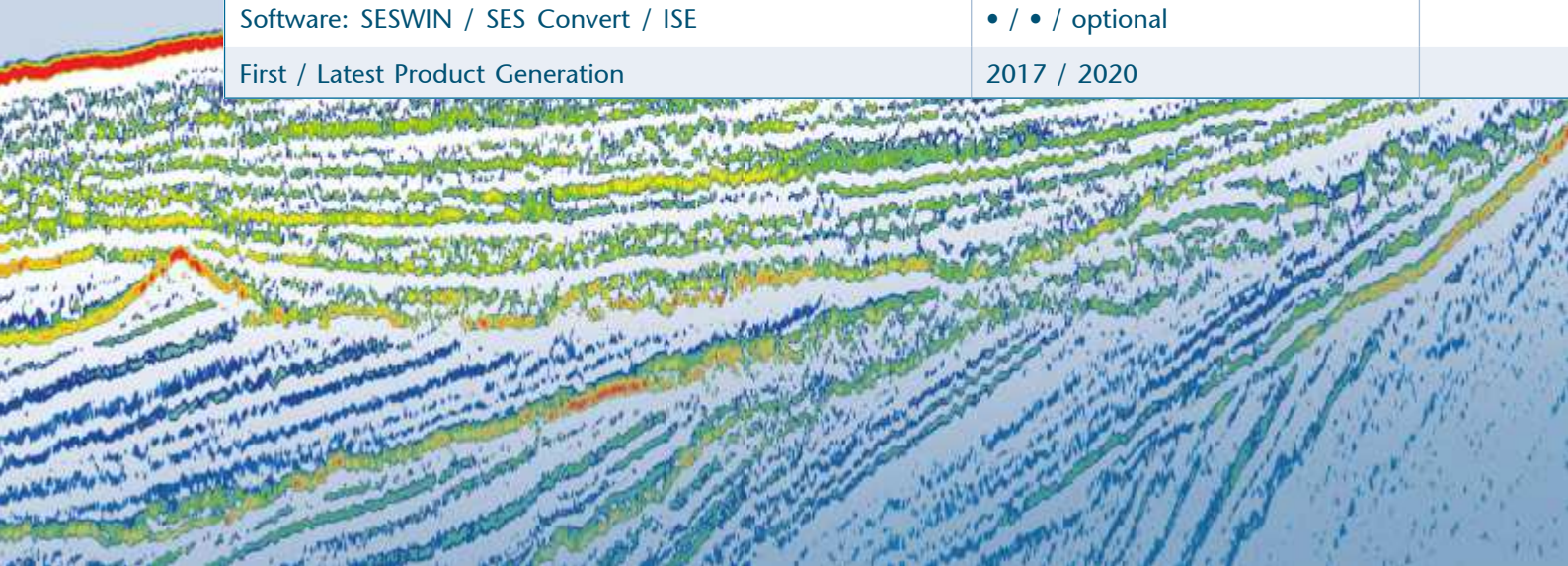
The medium-100 is available as a portable device for small boats and USV installations, whereas the other high-power models are typically hull mounted.



Shallow-Water Solutions

- when portability matters
- usable from less than one meter down to 500 meters

	smart	
Depth Below Transducer	0.5 – 100 m	
Seabed Penetration	up to 20 m	
Resolution: Sample / Range	~ 1 cm / up to 8 cm	
Primary Frequencies	~ 100 (90 – 110) kHz	
Primary Source Level / Power	> 235 dB / ~ 2 kW	
Transmit Beam Width	± 2.5°	
SBP Centre Frequencies / Band	10 kHz / 5 – 15 kHz	
Pulse Type: CW / Ricker / Chirp	• / • / –	
Pulse Width	0.1 – 0.5 ms	
Pulse Rate	up to 40 Hz	
Heave / Roll / Pitch Comp.	• / – / –	
Data Sample Rate	70 kHz @ 16bit	
Transceiver Size / Weight	[47 × 36 × 17] cm^3 / 9 kg (plastic case IP65)	
Transducer Size / Weight (excl. cable)	[27 × 21 × 6] cm^3 / 4 kg	
Depth Rating	surface	
Control PC	external / Ethernet	
Power Supply / Consumption	20 – 30 V DC / < 100 W	
Software: SESWIN / SES Convert / ISE	• / • / optional	
First / Latest Product Generation	2017 / 2020	

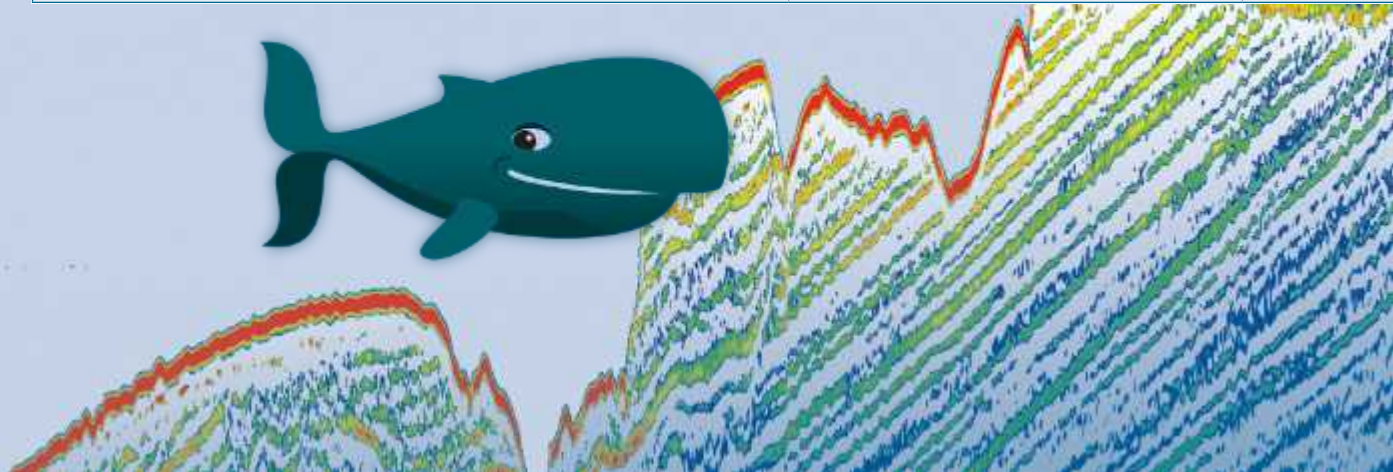


	compact	light	standard
	0.5 – 400 m	0.5 – 400 m	0.5 – 500 m
	up to 40 m	up to 40 m	up to 50 m
	~ 1 cm / up to 5 cm	< 1 cm / up to 5 cm	< 1 cm / up to 5 cm
	~ 100 (85 – 115) kHz	~ 100 (85 – 115) kHz	~ 100 (85 – 115) kHz
	> 238 dB / ~ 2.3 kW	> 238 dB / ~ 2.3 kW	> 240 dB / ~ 3.5 kW
	± 2°	± 2°	± 2°
	4 – 15 kHz / 2 – 22 kHz	4 – 15 kHz / 2 – 22 kHz	4 – 15 kHz / 2 – 22 kHz
	• / • / –	• / • / –	• / • / •
	0.07 – 1 ms	0.07 – 1 ms	0.07 – 1.5 ms
	up to 40 Hz	up to 50 Hz	up to 50 Hz
	• / – / –	• / – / –	• / • / –
	70 kHz @ 16bit	96 kHz @ 16bit	96 kHz @ 24bit
	[30 × 40 × 20] cm^3 / 15 kg (1/2 19 inch / 4 U)	[52 × 40 × 26] cm^3 / 25 kg (19 inch / 5 U)	[52 × 40 × 34] cm^3 / 35 kg (19 inch / 7 U)
	[34 × 26 × 8] cm^3 / 12 kg	[34 × 26 × 8] cm^3 / 12 kg	[34 × 26 × 8] cm^3 / 12 kg
	surface	surface	surface
	external / Ethernet	internal	internal
	100 – 240 V AC / < 150 W	100 – 240 V AC / < 250 W	100 – 240 V AC / < 300 W
	• / • / optional	• / • / optional	• / • / optional
	2002 / 2021	2000 / 2021	1997 / 2020

High-Power Solutions

- when penetration is a key requirement
- for shallow and deep-water applications down to full ocean depth

	medium-100	
Depth Below Transducer	2 – 2,000 m	
Seabed Penetration	up to 70 m	
Resolution: Sample / Range	< 1 cm / up to 5 cm	
Primary Frequencies	~ 100 (85 – 115) kHz	
Primary Source Level / Power	> 247 dB / ~ 5.5 kW	
Transmit Beam Width	± 1°	
SBP Centre Frequencies / Band	4 – 15 kHz / 2 – 22 kHz	
Pulse Type: CW / Ricker / Chirp	• / • / •	
Pulse Width	0.07 – 3.5 ms	
Pulse Rate	up to 40 Hz	
Heave / Roll / Pitch Comp.	• / • / –	
Data Sample Rate	96 kHz @ 24bit	
Transceiver Size / Weight	[52 × 40 × 44] cm^3 / 44 kg (19 inch / 9 U)	
Transducer Size / Weight (excl. cable)	[50 × 50 × 12] cm^3 / 40 kg	
Depth Rating	surface	
Control PC	internal	
Power Supply / Consumption	100 – 240 V AC / < 400 W	
Software: SESWIN / SES Convert / ISE	• / • / optional	
First / Latest Product Generation	2004 / 2020	



	medium-70	deep-36	deep-15
	5 – 2,500 m	5 – 6,000 m	10 – 11,000+ m
	up to 100 m	up to 150 m	up to 250 m
	< 1 cm / up to 7 cm	< 2 cm / up to 15 cm	< 2 cm / up to 20 cm
	~ 70 (60 – 80) kHz	~ 36 (30 – 42) kHz	~ 15 (10 – 20) kHz
	> 246 dB / ~ 7.5 kW	> 246 dB / ~ 9 kW	> 242 dB / ~ 10 kW
	± 1.5°	± 1.5°	± 2.3°
	3 – 12 kHz / 1.5 – 15 kHz	2 – 7 kHz / 1 – 10 kHz	1 – 4 / 0.5 – 5.5, 10 – 20 kHz
	• / • / •	• / • / •	• / • / •
	0.1 – 5 ms	0.15 – 5 ms	0.25 – 20 ms
	up to 40 Hz	up to 40 Hz	up to 40 Hz
	• / • / optional	• / • / optional	• / • / •
	96 kHz @ 24bit	75 kHz @ 24bit	48 kHz @ 24bit
	[52 × 40 × 44] cm^3 / 52 kg (19 inch / 9 U)	[52 × 50 × 50] cm^3 / 56 kg (19 inch / 10 U)	1 × [52 × 50 × 74] cm^3 / 95 kg 1 × [52 × 40 × 44] cm^3 / 40 kg
	[60 × 60 × 25] cm^3 / 140 kg	[92 × 88 × 18] cm^3 / 245 kg	[140 × 140 × 35] cm^3 / 925 kg
	surface	surface	surface
	internal	internal	internal
	100 – 240 V AC / < 450 W	100 – 240 V AC / < 900 W	100 – 240 V AC / < 1,000 W
	• / • / optional	• / • / optional	• / • / optional
	2012 / 2021	2007 / 2021	2019

Remotely Operated Solutions

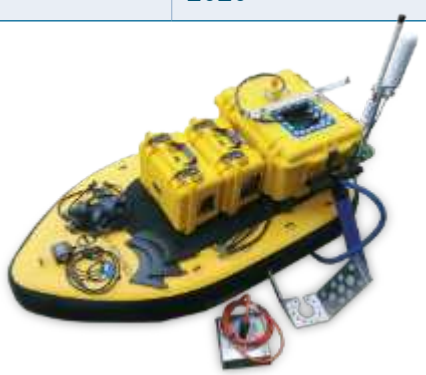
- when the focus is on autonomy
- prepared for USV integrations at all scales

	smart	
Depth Below Transducer	0.5 – 100 m	
Seabed Penetration	up to 20 m	
Resolution: Sample / Range	~ 1 cm / up to 8 cm	
Primary Frequencies	~ 100 (90 – 110) kHz	
Primary Source Level / Power	> 235 dB / ~ 2 kW	
Transmit Beam Width	± 2.5°	
SBP Centre Frequencies / Band	10 kHz / 5 – 15 kHz	
Pulse Type: CW / Ricker / Chirp	• / • / –	
Pulse Width	0.1 – 0.5 ms	
Pulse Rate	up to 40 Hz	
Heave / Roll / Pitch Comp.	• / – / –	
Data Sample Rate	70 kHz @ 16bit	
Transceiver Size / Weight	[44 × 36 × 17] cm^3 / 9 kg (plastic case IP65)	
Transducer Size / Weight (excl. cable)	[27 × 21 × 6] cm^3 / 4 kg	
Depth Rating	surface	
Control PC	external / Ethernet	
Power Supply / Consumption	20 – 30 V DC / < 100 W	
Software: SESWIN / SES Convert / ISE	• / • / optional	
First / Latest Product Generation	2017 / 2020	

autonomous

- SBP: smart or compact; Ethernet remote control, Transducer with mounting bracket
- Platform: [180 × 93 × 20] cm^3 / 16 kg
- Remote control (Atlantis cloud auto navigation, manual radio R/C)
- Control Box: [66 × 52 × 38] cm^3 / 29 kg
- Payload PSU Box: [43 × 33 × 23] cm^3 / 4kg
- Antennae: WiFi, LTE / 4G

	standard-usv	medium-usv	standard-rov
	0.5 – 500 m	2 – 2,000 m	1 – 400 m
	up to 50 m	up to 70 m	up to 40 m
	~ 1 cm / up to 5 cm	~ 1 cm / up to 5 cm	~ 1 cm / up to 5 cm
	~ 100 (85 – 115) kHz	~ 100 (85 – 115) kHz	~ 100 (85 – 115) kHz
	> 240 dB / ~ 3.5 kW	> 247 dB / ~ 5.5 kW	> 239 dB / ~ 3 kW
	± 2°	± 1°	± 2°
	4 – 15 kHz / 2 – 22 kHz	4 – 15 kHz / 2 – 22 kHz	5 – 15 kHz / 4 – 22 kHz
	• / • / •	• / • / •	• / • / •
	0.07 – 1.5 ms	0.07 – 3.5 ms	0.07 – 1.5 ms
	up to 40 Hz	up to 40 Hz	up to 40 Hz
	• / • / – | • / – / •	• / • / – | • / – / •	• / • / – | • / – / •
	70 kHz @ 24bit	70 kHz @ 24bit	70 kHz @ 24bit
	[45 × 36 × 18] cm^3 / 16 kg (19 inch / 4 U)	[45 × 36 × 31] cm^3 / 24 kg (19 inch / 7 U)	[Ø 28 × 75] cm^3 / 58 kg titanium housing
	[34 × 26 × 8] cm^3 / 12 kg	[50 × 50 × 12] cm^3 / 40 kg	[Ø 47 × 6] cm^3 / 32 kg
	surface	surface	2,000 m
	external / Ethernet	external / Ethernet	external / Ethernet
	20 – 30 V DC / < 200 W	20 – 30 V DC / < 300 W	100 – 240 V AC | 115 – 370 V DC / < 250 W
	• / • / optional	• / • / optional	• / • / optional
	2020	2020	2003 / 2017

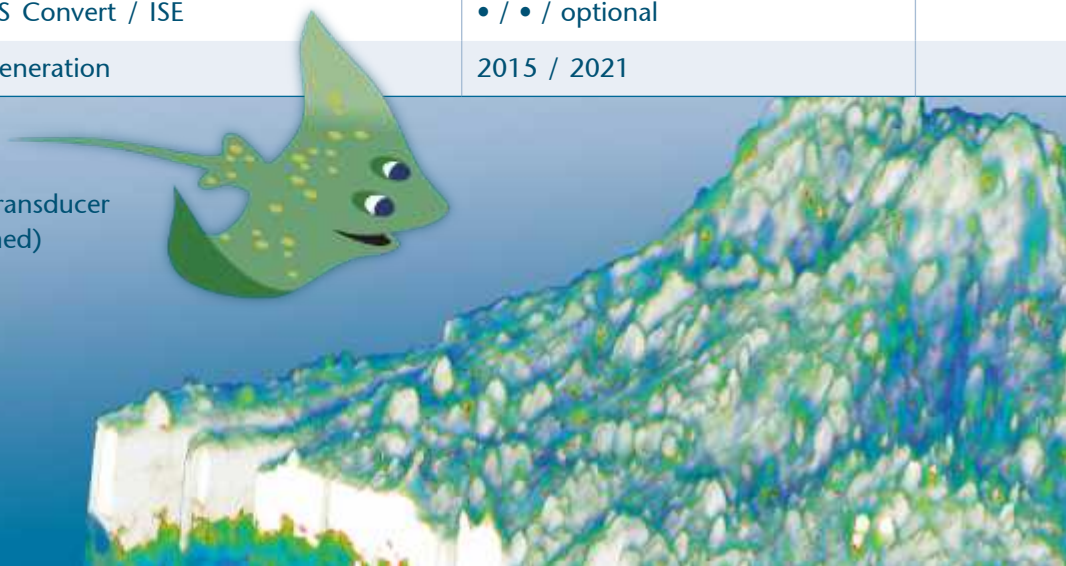


Multi-Transducer Solutions

- when 3D sub-seabed data can give additional answers
- for buried structures, archaeology, pipeline, cable and boulder detection

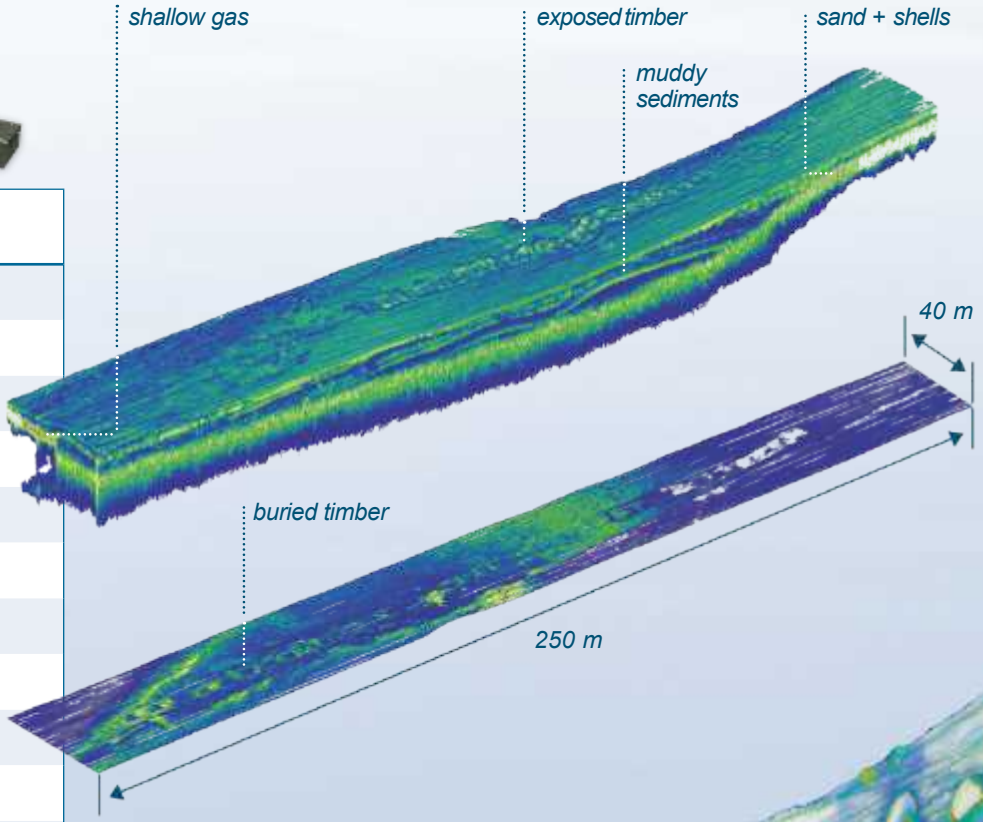
	quattro	
Depth Below Transducer	0.5 – 100 m (1 – 1,000)*	
Seabed Penetration	up to 20 m (50)*	
Resolution: Sample / Range	< 1 cm / up to 5 cm	
Primary Frequencies	~ 100 (85 – 115) kHz	
Primary Source Level / Power	> 235 dB (245)*	
Transmit Beam Width	± 2.5° (1.5)*	
SBP Centre Frequencies / Band	4 – 15 kHz / 2 – 22 kHz	
Pulse Type: CW / Ricker / Chirp	• / • / –	
Pulse Width	0.07 – 1 ms	
Pulse Rate	up to 15 Hz (60)*	
Heave / Roll / Pitch Comp.	• / – / –	
Data Sample Rate	96 kHz @ 24bit	
Transceiver Size /Weight	[52 × 40 × 34] cm^3 / 32 kg (19 inch / 7 U)	
Transducer Size / Weight (excl. cable)	4 × [21 × 21 × 6] cm^3 / 5 kg	
Depth Rating	surface	
Control PC	internal	
Power Supply / Consumption	100 – 240 V AC / < 300 W	
Software: SESWIN / SES Convert / ISE	• / • / optional	
First / Latest Product Generation	2015 / 2021	

* value given as: single transducer (all transducers combined)



	sixpack
	0.5 – 100 m (2 – 1,500)*
	up to 20 m (70)*
	< 1 cm / up to 5 cm
	~ 100 (85 – 115) kHz
	> 235 dB (248)*
	± 2.5° (1.5)*
	4 – 15 kHz / 2 – 22 kHz
	• / • / –
	0.07 – 1 ms
	up to 15 Hz (60)*
	• / – / –
	96 kHz @ 24bit
	[52 × 40 × 34] cm^3 / 34 kg (19 inch / 7 U)
	6 × [21 × 21 × 6] cm^3 / 5 kg
	surface
	internal
	100 – 240 V AC / < 350 W
	• / • / optional
	2017 / 2021

Buried wood structure from the Viking era

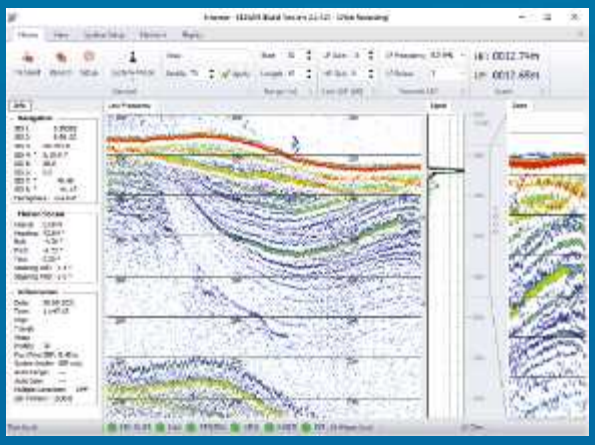


Innomar SESWIN

data acquisition software

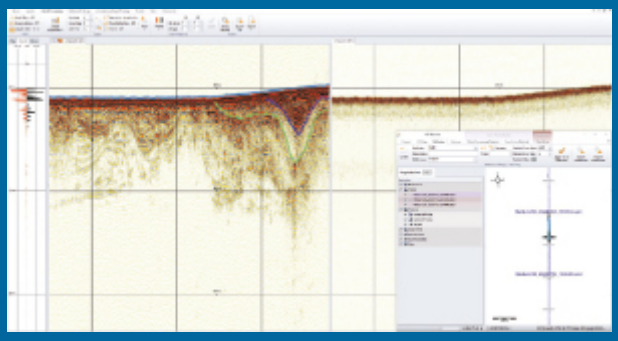
The Innomar online acquisition software SESWIN provides a straightforward interface to configure and control the system parameters during survey. Online echo plots are used for quality assurance. For autonomous solutions a remote and network interface is available.

All Innomar SBP models support a wide range of external navigation and motion sensors. Raw full waveform signals and sensor data are stored within the Innomar data files for post-processing. Data can be processed with Innomar ISE as well as various third-party software.



Innomar ISE

post-processing software



Innomar ISE is the user-friendly post-processing software for all data acquired by Innomar's parametric sub-bottom profilers.
A project-based workflow allows intuitive handling of 2D seismic sections together with a GIS map window. The processing includes signal filtering, noise reduction, tide and vertical corrections, cleaning of external sensor data, picking of seabed and sub-seabed reflectors and targets and the overlay of external probe and core data to assist interpretation.
Raw, processed and interpreted data can be exported to various industry-standard formats, such as SEG-Y, XTF and ASCII.

Innomar Technologie GmbH

Schutower Ringstr. 4
D-18069 Rostock / Germany
+49 381 440 790
info@innomar.com

www.innomar.com

2023-01