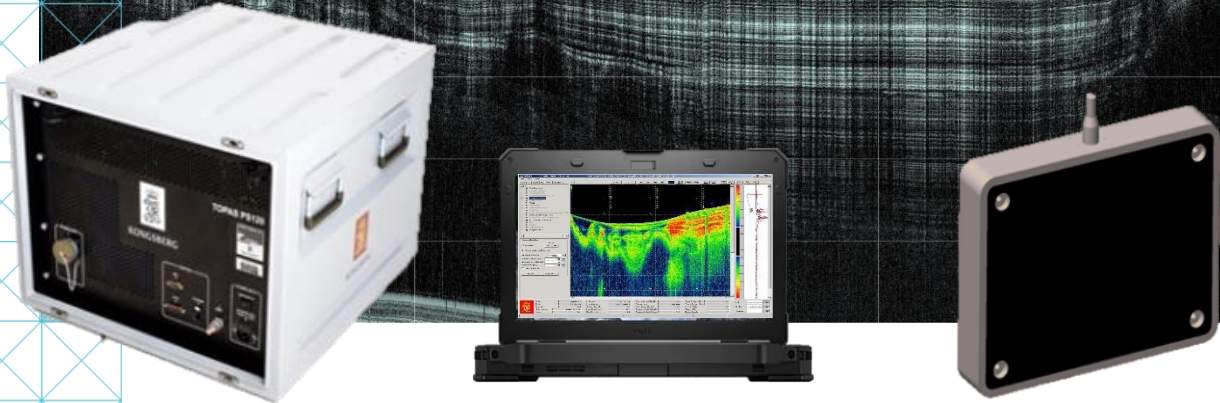


TOPAS PS120



APPLICATION NOTE

TOPAS PS120

- Operating depths: 2-500 m
- Penetration: >50 m
- Range resolution: 0.5-4 cm
- Sediment layer resolution: <5 cm
- Frequencies
 - Primary: 70-100 kHz
 - Parametric: 2-30 kHz
- Beam width: $\pm(1.5^\circ \times 2^\circ)$
- Source level
 - 4 kHz: 186 dB
 - 20 kHz: 208 dB
- Pulse types
 - CW
 - Linear FM
 - Hyperbolic FM
 - Ricker
 - User defined
- Max ping rate: 40 Hz
- Dimensions (DxWxH)
 - TRU: 50x70x40 cm
 - Transducer: 34x40x7 cm
- Weight:
 - TRU: 45 kg
 - Transducer: 13 kg

TOPAS PS120 – best practice

The TOPAS PS120 Parametric Sub-Bottom Profiler is a narrow beam, high resolution sub-bottom profiler. The system is operated by the TOPAS software, which balances the unique property of being highly powerful in its applications and functionality with being a user-friendly solution for inexperienced users.

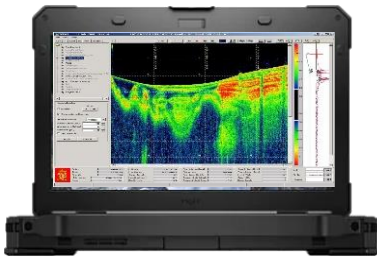
This application notes targets users that are not that experienced with using TOPAS PS120, and recommendations and best practice guidance to get started are provided. It should however be clearly understood that this guidance does not cover all operational and data quality aspects that the physical nature of sub-bottom profiling may cause.

SEDIMENT IMAGING

The primary application of TOPAS PS120 sub-bottom profiler system is to make images of sediment layers underneath the sea bottom. As the vessel moves, the sub-bottom image is built up as a vertical slice showing the sediment layer structure. How deep and detailed imaging of the seabed can be done is influenced by:

- The system's ability to distinguish object and features separated in angle and/or range. The spatial resolution is given by the **beamwidth** and the **bandwidth**. Narrow beams and high bandwidth give better resolution.
- The **ping rate** relative to the vessel speed. Dense probing gives smoother pictures.
- The **angle of incident** of the transmit beam. The echoes received are primarily caused by specular reflections at interfaces between layers of different acoustic impedance. These echoes are only strong close to normal incidence.

The best **transmit waveform** to use will depend on operational depths, and whether high-resolution or high penetration is the primary requirement.



The powerful TOPAS MMI software for realtime acquisition, as well as offline replay and processing. TOPAS PS120 operator station is a ruggedized laptop

Transmitter	
Transmit mode	Normal
Trigger mode	Internal
Trig interval	Manual
Ping interval [ms]	125
Pulse form	CW pulse
Frequency [kHz]	12.0
Number of cycles [#]	1
Output level [dB]	0
Output level [%]	100.0
<input checked="" type="checkbox"/> HRP Stabilization	
Beam control	Manual
Beam offset pitch [deg]	0.0
Beam offset roll [deg]	0.0
Transducer sound speed [m/s]	1500.0
<input type="checkbox"/> Whale warning	
<input type="checkbox"/> External control	
Apply	Cancel

Configuration of transmit parameters for shallow waters

Receiver 1	
Delay control	Manual
Master trig delay [ms]	0.0
Delay offset [ms]	0.0
Actual trig delay [ms]	0.0
Sample rate [kHz]	96
Trace length [ms]	100.0
HP-filter [kHz]	2
<input type="checkbox"/> Audio	
Apply	Cancel

Configuration of receive parameters for shallow water recommendations. Note that the Apply button must be pressed to make the change effective



Getting started

Ensure that you have installed the equipment, and that installation parameters such as external sensor input, offset, etc., have been set. We must refer you to the user manuals for proper installation and configuration. When ready to start data acquisition, the following operational parameters can be used as a start:

RECOMMENDED SETTINGS

Transmitter	Shallow waters / high resolution	Deep waters / high penetration
Ping interval	125 ms	250 ms
Pulse form	CW	LFM
Start/stop frequency	N/A	6000 / 18000
Chirp length	N/A	4 ms
Output level	0 dB (max)	0 dB (max)
Receiver:		
Trace length	<p>This is the critical settings to ensure that the full trace length is recorded.</p> <p>Automatic control may be used when you have a reliable external depth sensor, or when you trust the bottom detection algorithm.</p> <p>We recommend using Manual control and adjust the trace length as the depths change.</p>	
Realtime processing – Appearance and data logging		
Data plotter 1	Enabled	
Filters	Automatic, bandpass Low/High stop: 7200/21000 High/Low pass: 9600/15000	
Bottom tracker	Enabled	
Processed data logger	Suggested logging position	
Time variable gain	Enable	
Attribute processing	Instantaneous amplitude	
Gain	Manual	
Data plotter 2	Enable	
Start/stop pinging and logging		
	FIX	Survey
	Start/stop pinging	
	Start/stop logging raw data for replay	
	Start/stop logging processed data (.PRO or .SEGY)	

Tricks of the trade

- PC IP address: 192.168.70.1
- To avoid return signal from next ping in the trace, the ping interval must be set to a value larger than the trace length
- Water column data can be removed from the trace by adding a Master trig delay close to the water depths in ms (water depths in metres/0.75)
- Make sure logging of raw data is started to allow for replay and post processing
- Define a max raw data file size to avoid too large or too many files
- Changing the line number or name will start a new raw data file
- Observe the bottom detection indicator in the rightmost window, and right click if an incorrect search window is being used

