

# SBP29



## Multibeam sub-bottom profiler

# SBP29 – Sub-bottom profiler

The SBP29 is primarily used for sub-bottom imaging and detecting buried objects. It operates within a frequency range of 2 to 9 kHz. The system is available in configurations with 3-, 6-, and 12-degree transmit beam widths. The SBP29 features an adjustable source level, reaching up to 228 dB at 4 kHz for the 3-degree version, offering exceptional sub-bottom profiling capabilities.

The SBP29 shares the same array geometry as the EM multibeam echo sounders and utilizes the wideband receive antenna of the EM system for reception. Due to its Mills cross TX/RX geometry, the SBP29 can be considered a multibeam sediment profiler.

The SBP29 beams are electronically stabilized for roll and pitch, and the data are heave compensated. The system offers several advantages when dealing with sloping sediments:

- Each ping can produce a swath of beams that cover the across-track footprint of the transmitter, enhancing tolerance to across-track slopes.
- It is possible to operate with wider beams, allowing the benefits of wide beams such as search for buried objects.
- The transmit beam can be cyclically tilted from ping to ping, scanning for specular reflections in the along-track direction as well.

The composite solution generates an additional echogram by selecting the strongest reflections from various look directions. This allows you to perform both traditional vertical and narrow beam sub-bottom profiling while simultaneously scanning across and along for extra information.

## SPECIFICATIONS

- Operating frequency: 2-9 kHz
- Range resolution: 0.2 ms
- Source level: Up to 228 dB
- Max ping rate: 20 Hz
  - Burst mode: 5 Hz
- Beam width @ 4 kHz:
  - Transmit: 3/6/12 x 35°
  - Receive EM124: 80 x 3/6/12°
  - Receive EM304: 120 x 7/14/28°
- Number of beams per ping: 21
- Beam spacing:  $\leq 15^\circ$
- Fan width (RX):  $\leq 30^\circ$
- Pulse type: FM (linear or hyperbolic), Ricker, CW
- Pulse length: (FM and CW): 2-100 ms
- Range sampling rate: 21008.4 Hz
- Roll and pitch stabilization
- Heave compensation
- Volume scanning:  $\pm 15^\circ$
  
- Penetration capabilities:
  - More than 300 ms (image above)
  - Depending on sediment conditions, noise and system configuration



### The SBP29 transducer array:

- 3° configuration, 96 transducer elements
- Before mounting of baffle
- Image courtesy of SHOM

### External inputs:

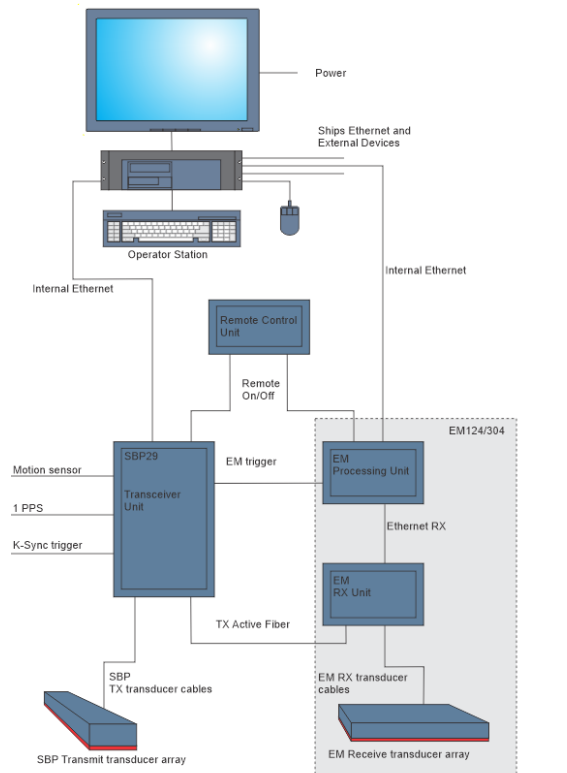
- Position
- Heading
- Motion (pitch, roll, heave)
- External clock
- Depth, bottom slope angles and sound velocity information (from any EM multibeam echo sounder)

### Operating / storage temperature:

- Transceiver unit: 0 to +45°C / -30°C to +70°C
- HWS: -25°C to +70°C

### SBP29 system components:

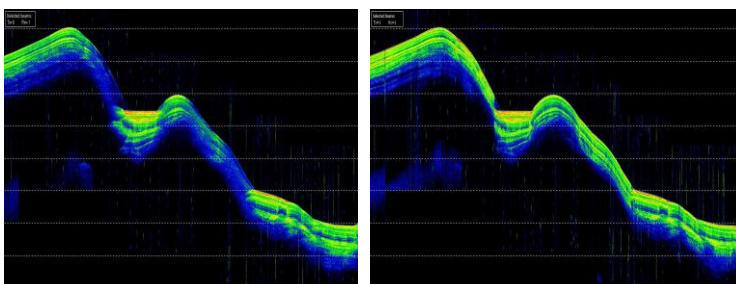
- Transceiver unit (867x545x758 mm, 123 kg (3°))
- Transmit transducer array:
  - 3°: 7450x800x353 mm
  - 6°: 3834x800x353 mm
  - 12°: 2026x800x353 mm
- Cable Connection Unit (CCU)
  - 1 CCU per 24 transducer elements
- Total weight elements, frame and CCU (3°): 2530 kg
- Hydrographic Work Station (HWS)
  - SBP29 Operator software



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### Power requirements – operational voltage and frequency:

- Transceiver unit: 220-240 VAC (3-phase Δ, 1-phase) or 385 to 415 VAC (3-phase Y)
- At maximum power level and maximum duty cycle, the average power consumption is 700 to 1900 Watts depending on system size
- 47-63 Hz
- Peak power requirements: 3°: ~15 kW, 6°: ~8 kW, 12°: ~4 kW



### The composite echogram

Left: The vertical echogram, 3x3° beam

Right: The composite echogram

- Made from 25 beams
- The high SNR and low backscatter of a 3x3° beam
- The slope tolerance of a 12° beam