

# UltraLab ULS Advanced

## Sophisticated Level and Wave Measurements for Labs

UltraLab ULS Advanced  
 • Advanced 4  
 • Advanced 8  
 • Advanced 16  
 • Advanced 32



*The UltraLab ULS Advanced Controller. Here the largest version with 32 channels is shown. A set of typical USS sensors is pictured below.*



The UltraLab ULS Advanced is a high speed, calibration-free, remote sensing measurement system based on General Acoustics' well-known innovative high performance airborne ultrasonic technology. Designed for time-efficient, very reliable and high resolution wave measurements, it is optimized for challenging measurement applications in towing tanks and hydraulic laboratories. It features powerful signal processing for false and lost echo cancelation for outstanding performance at high speed measurements, even at steep, breaking and very fast moving waves with a relative velocity up to 15 m/s

With the fully digitized ULS Advanced system range we have solved problems with lost signals at steep and breaking waves and minimized issues with the proximity between sensors. This is achieved through the synchronized operation of all channels, the sophisticated signal processing and advanced lost-, false- and multi-path echo cancellation processes.

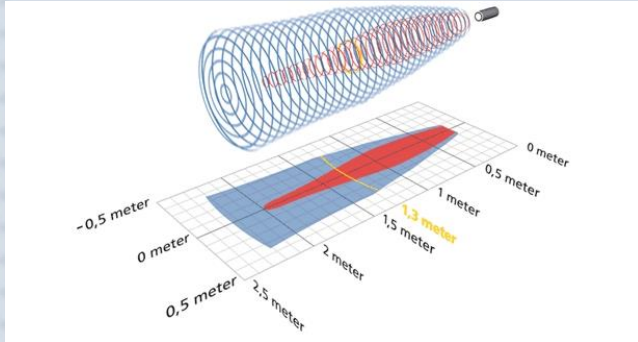
The UltraLab ULS Advanced features 4, 8, 16 or 32 independent, fully-synchronized channels allowing very close spacing between sensors. Each channel can be equipped with up to three sensors for maximum reliability at very high speeds. With measuring/sample rates of 100 Hz or up to 250 Hz (customized), the detection of highly dynamic processes in an impressive resolution of 0.18 mm within the measurement range between 200 and 1.200 mm is enabled. The system is fully calibration free through an integrated speed of sound measurement and thus guarantees an accuracy of 1 mm, even at changing ambient conditions.

## Applications

- Measurements in towing tanks, flood- and surface water models, sloshing tanks:
- fast analysis of waves and wave fields
- fast recording of topographic contours in models
- steep, breaking waves, white water
- very high resolution measurements
- highly dynamic wave processes, very turbulent water surfaces
- relative speeds up to 15 m/s.

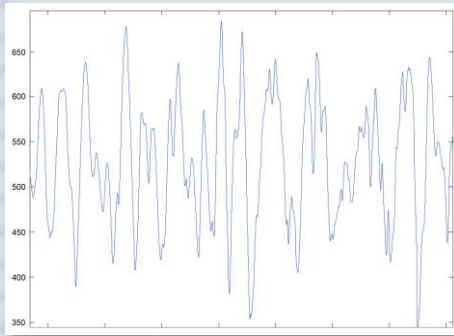
## UltraLab Technology

### Narrow Beam Sensor Technology



The General Acoustics ultrasonic sensors feature exceptionally narrow beams to accomplish a high spatial resolution. Shown here is the beam of the USS 13-HF sensor

### Exemplary Results



An irregular wave field captured from a carrier moving at 6 m/s at the Maritime Inst. of the Netherlands (MARIN):

### Specifications

- Measurement range: 20 cm up to 10 m
- Superior resolution: down to 0.18 mm
- Sample rate: 100 Hz, up to 250 Hz (custom)
- Power supply: 230 V (110 V optional)
- Data format: direct readable ASCII with time stamp, (external TTL signal triggered)
- Remote operation through LAN or RS232
- Windows software for viewing in real-time, logging, remote control and data export
- Standard 10m cables, longer on request
- Optional additional analogue output (0-10V)

### Scope of UltraLab Systems

- up to 96 UltraLab USS sensors (depending on controller model)
- 1 Controller unit with 4, 8, 16 or 32 independent, synchronized channels
- 1 Sensor REF-302 for precise sound velocity compensation

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### Reference Measurement



A dedicated speed of sound measurement cancels all influences of temperature and humidity, enabling a fully calibration-free measurement operation.

### Optional Multiple Sensor Setup



The addition of a second and third (only on UltraLab Advanced) receiver to every channel enables towed measurements and the detection of irregular waves.

### PTP-Synchronization



PTP-Synchronization enables the connection of multiple controllers to perform fully synchronized. PTP-Client and Grandmaster are utilized to connect two UltraLab HF units here.