

## *M2 Bubbly Flow Analyzer*

Optical probe-based technique for accurate measurements of bubble size, bubble velocity and void fraction in dense flows

*M2* optical probe system suits a wide variety of applications, from fundamental research to industrial R&D and process control

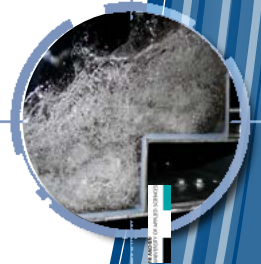
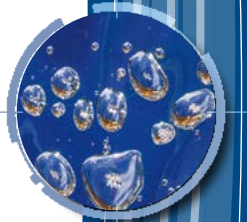
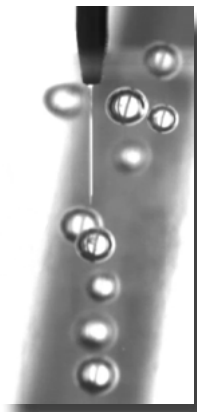
### *Key characteristics*

- The probe can be operated in the heart of dense flows, thanks to a miniaturized sensing part
- No transparency or optical access required
- Efficient optical micro-technology applicable to turbulent flows
- A broad range of sizes and velocities covered all at once enables direct and easy measurement in polydisperse flows
- Eye-safe equipment

### *Some use cases*

- High-pressure chemical reactor
- Hydraulics (wave flume, stepped spillway...)
- Nuclear & automotive cooling systems
- Waste water treatment
- Mixing process
- Fundamental studies
- Oil drilling

*M2* requires only minutes for getting up and running



## Performances & specifications

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- Bubble diameter: from 100  $\mu\text{m}$  to  $\infty$  (one single range)
- Bubble velocity: 0.5 cm/s - 80 m/s (one single range)
- Void fraction: 0 - 100 %
- Void fraction uncertainty: better than 5 %
- Velocity and size uncertainty: better than 10 %
- Measurements independent of bubble shape
- Tolerance between the probe and the flow direction: 30°
- Standard operating temperature: 60°C – option: 150°C or 250°C
- Standard operating pressure: 8 bar – option: 100 bar
- External trigger available
- Laser safety: Class 1 laser product

M2 works also great for sprays or particle-liquid flows

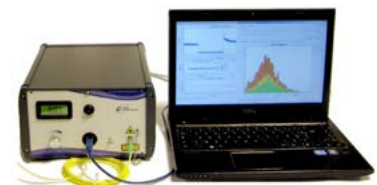
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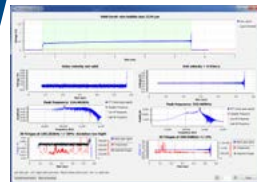


**1** Insert the probe into the port of your column (NPT, BSP, ...), fix it using a proper fitting and fine-tune its position using a moving stage.

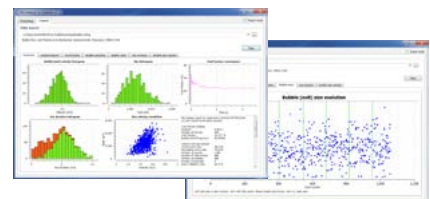
**2** Plug the probe to the optoelectronic module and connect the latter to your computer. The probe and the rest of the system can be several tens of meters away from one another.



**3** Acquire data with a few clicks, then process it using the full automatic mode. If you wish full control on the processing parameters, you can switch to the expert mode that grants access to all settings as well as to the raw data.



**4** Analyze the results using the M2A software, or export the processed data to perform your own analysis.



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