

## iProbe

*Instantaneous flow measurement with a multi-hole probe has never been easier and faster.*





-  Digital multi-hole probe, with onboard data processing and direct output of engineering units: a plug & play flow measurement device
-  Slim design compatible with 3- and 5-hole probe heads
-  Robust design with stainless steel housing and Lemo connector
-  Data acquisition and power via USB



Figure 1: iProbe

### Probe head options

The iProbe, is configurable in different multi-hole probe configurations. This includes 2D probes such as 3-hole probes, as well as 3D probes such as 5-hole probes. The pressure distribution on the probe tip will be correlated to individual wind tunnel calibrations to determine, static pressure, total pressure, and the velocity components/flow angles.

The probe can be equipped with freely customized probe shapes, due to the design freedom in additive manufacturing. Shape and size can hence be adapted to any installation or access to flow path situation.



Figure 2: Shape examples (top to bottom: cobra probe, straight probe, L-shaped probe)

The iProbe is also available with optical tracker and compatible to Streamwise ProCap System.

[\(https://www.streamwise.ch/procap/\)](https://www.streamwise.ch/procap/)

iProbe	
General	
<b>Weight probe shaft</b>	190 g
<b>Weight probe head</b>	Typical head 60 g
<b>Dimensions probe shaft</b>	Ø20 mm x 255 mm (5-hole probe version)
<b>Dimension probe head</b>	Typical head 100 mm x 20 mm
<b>Probe options</b>	3- and 5-hole probe heads
<b>Temperature measurement</b>	PT100
Environmental Conditions	
<b>Operating temperature</b>	-20 ... 70 °C (-4 ... 158 °F)
<b>Operating medium</b>	Air and other non-corrosive gases
<b>Humidity</b>	0 ... 95 %, non-condensing

### General

The iProbe is a compact plug & play solution for flow and pressure measurements. The setup can be used with any laptop, in field or laboratory environment. The setup comes with VectoVis Pro, which allows to monitor and record engineering data in real time.

### Pressure Acquisition

<b>Pressure acquisition</b>	up to 5 differential pressure sensors with variable pressure ranges
<b>Pressure sensor accuracy</b>	Max. +/- 0.25 % full scale (typical +/- 0.1 %)
<b>Absolute pressure acquisition</b>	Barometric pressure sensor

### Sensor Options

Differential pressure range (kPa)	Max. Mach number
0.25	0.06
0.50	0.09
1.25	0.13
2.50	0.19
7.50	0.32

### Measurement Errors

<b>Flow angles</b>	< 1°
<b>Velocities</b>	< 0.5 m/s or < 0.5%,
<b>Temperature</b>	< 1 K

### Interfaces

<b>Communication</b>	USB for communication with host PC (setup and data acquisition)
<b>Power</b>	5 V via USB
<b>Pressure reference port</b>	Metal tube for reference pressure D=1.0 mm
<b>Cable (included)</b>	1.8m Lemo cable (FGG.0B.307.CLAD52) to USB
<b>Sampling rate</b>	up to 50 Hz

### Probe Configuration

<b>Geometry</b>	Straight, L-shaped, Cobra
<b>Number of holes</b>	3 and 5
<b>Max. probe head length</b>	Up to 280 mm (one part) >280 mm (multipart designs)
<b>tip diameter</b>	Typ. 3 mm ... 5 mm
<b>Tip geometry</b>	Conical, spherical
<b>Material</b>	Stainless steel, Titanium, Inconel
<b>Fastening</b>	Hexagonal, one-sided flattened cylinder
<b>Reference</b>	Reference surface normal to Z axis
<b>Temperature range</b>	-20 ... 70 °C

### Sensors and Electronics

The iProbe is equipped with up to 5 differential pressure sensors for the probe tip, and one barometric pressure sensor which is used as a reference pressure for the differential pressure sensors. All differential pressure sensors can be selected by pressure range. The temperature-compensated pressure transducers feature high accuracy and a minimal offset drift. The high proof pressure provides sufficient protection against accidental overloads.

### PC communication

The data can be transmitted via USB. The transmission rate can be set up to 50 Hz. A 5V power supply can be provided simply via USB.

When connected via USB the pressure scanner identifies itself to the host PC as virtual COM port. Thus, any software supporting serial protocols can be used for communication.

The data acquisition can be done with VectoVis, where e.g., a live view of all data and data recording function in readable file formats such as csv is available.

### Outputs

The following output values are available:

<b>Outputs</b>	
<b>Name</b>	<b>Unit</b>
<b>P<sub>1...P<sub>5</sub></sub></b> (differential pressure)	[Pa]
<b>P<sub>abs</sub></b> (absolute pressure)	[Pa]
<b>T<sub>tc</sub></b> (temperature of RTD)	[°C]
<b>Theta</b> (cone angle)	[°]
<b>Phi</b> (roll angle)	[°]
<b>Alpha</b> (angle of attack)	[°]
<b>Beta</b> (yaw angle)	[°]
<b>V<sub>mag</sub></b> (velocity magnitude)	[m/s]
<b>u</b> (x-component of velocity)	[m/s]
<b>v</b> (y-component of velocity)	[m/s]
<b>w</b> (z-component of velocity)	[m/s]
<b>P<sub>d</sub></b> (dynamic pressure)	[Pa]
<b>P<sub>s</sub></b> (static pressure)	[Pa]
<b>ρ</b> (air density)	[kg/m <sup>3</sup> ]
<b>T<sub>tot</sub></b> (total temperature)	[°C]
<b>T<sub>s</sub></b> (static temperature)	[°C]
<b>M</b> (Mach number)	[-]
<b>Alt</b> (baro altitude)	[m]
<b>AltAbs</b> (absolute altitude)	[m]
<b>Num</b> (counter)	[-]
<b>Error</b>	[-]

## Contact

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