

Standalone Calibrator

Velocity and directional calibration of generic hotwire probes



Introduction

Calibration of probes is a crucial step in thermal anemometry in general. In particular, velocity and directional calibration of hotwire probes used for Constant Temperature Anemometry measurements is a must for the required accuracy during, for example, turbulence investigations.

Dantec Dynamics has offered the legacy StreamLine Flow Unit and the current StreamLine Pro Automatic Calibrators for few decades as part of the StreamLine and StreamLine Pro system families. This meant that this high-accuracy calibration solution with a traceable velocity calibration certificate was only available for customers purchasing the legacy StreamLine or the current StreamLine Pro systems.

Due to its overall performance and specifications, the StreamLine Flow Unit and StreamLine Pro calibrators achieved a certain popularity in the market, which led to inquiries about the possibility to calibrate third party hotwire / hotfilm probes, or even other generic anemometry probes / sensors.

Key benefits

- Automatic velocity calibration up to 120m/s using 3 nozzles
- Automatic directional calibration with Automatic Directional Calibrator (ADC) option
- Calibration of non-Dantec hotwire & hotfilm probes
- Calibration of generic anemometry probes & sensors
- Customizable calibration file generation

Standalone calibration solution

The standalone velocity calibration functionality is achieved using the StreamLine Pro Automatic Calibrator, the Standalone Calibration Software module, and a system controller (Desktop PC or Laptop).

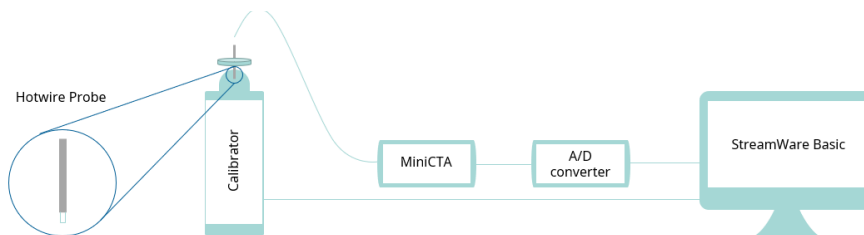
For the directional calibration of multiple-sensor probes, either the Automatic Directional Calibrator (ADC) or the manual pitch/yaw/roll manipulator should be purchased. The A/D converter board must be in the list of supported devices in the Standalone Calibration Software, and National Instruments DAQmx device support is included as standard.

The solution in brief

The schematic diagram below shows the components in the Standalone Calibration Solution. The StreamLine Pro Automatic Calibrator and the A/D converter is connected to the system controller via USB / LAN connection. The system controller is equipped with a supported A/D board, for example a National Instruments DAQmx type A/D board, running the Standalone Calibration Software.

The A/D converter board reads the voltages from a generic thermal anemometer (CTA) equipped with generic hotwire / hotfilm probes, and records them during velocity and directional calibration events.

The StreamLine Pro Automatic Calibrator provides the accurate velocity reference, and the ADC provides the accurate angular reference. Please refer to the relevant solution / data-sheets for the individual component specifications.



The complete CTA calibration setup. The hotwire probe, CTA and the A/D converter are not included.



The pitch-yaw manipulator used for directional calibration of multi-wire probes.



The Automatic Directional Calibrator performs directional calibration of multi-wire probes.

Technical specifications - Directional calibration

Specifications	
Pitch positioning accuracy	0.1 deg (1745 μ rad)
Roll positioning accuracy	0.1 deg (1745 μ rad)
Resolution	0.0002 deg (3.5 μ rad)
Weight	0.99 kg
Dimensions	208 mm x 158 mm x 122 mm
Data connection	USB, 4.5m
Emergency stop button	External, red, 0.9m cable
Probe alignment tools	Triple sensor parallel flow probes only
Mains connection	100 - 240 VAC

Technical specifications - Velocity calibration

Specifications	
Velocity range	0.02 m/s to 120 m/s using 3 nozzles
Accuracy (2σ)	±1% ±0.02 m/s (0.05-120 m/s)
Repeatability	<±0.2% or ±0.02 m/s
Turbulence intensity	<0.3% in entire range, typically <0.2%
Test section	Free jet
Nozzle diameter & velocity range	42 mm, 0.02 to 0.5 m/s 12.4 mm, 0.5 to 60 m/s 8.8 mm, 5 to 120 m/s
Air supply	Compressed air at 0.7 to 0.9 MPa
Air consumption	0.2 to 26 m ³ /h
Operating temperature	0 to 45 ° C
Dimensions	13.5 cm (w) x 33 cm (h) x 25 cm (d)

Ordering information

Model	Item no
Standalone Calibrator Software Calibration of generic single-, dual- and triple-sensor hot-wire / hotfilm probes.	91S01
StreamLine Pro Automatic Calibrator Velocity range: 0.05-120 m/s using 3 nozzles. Traceable calibration certificate for 2-50 m/s. USB & LAN interface, supports standalone operation. Compatible with StreamWare v4.10 or newer. Directional calibration with 90H03 Pitch/Yaw/Roll manipulator. Incl. 90H04 Air Purifier Unit with 10-meter air hose.	91H01
Option Automatic Directional Calibrator Motorized directional calibration of multiple- sensor, parallel-flow hotwire probes. Please quote "91H11 Probe alignment kit for cross-flow probes" if the configuration includes cross- flow probes.	90H10
Option StreamLine Pitch/Yaw/Roll Manipulator Air/Water Directional calibration of multiple- sensor, parallel-flow hotwire probes. Please quote "91H11 Probe alignment kit for cross-flow probes" if the configuration includes cross-flow probes.	91H03
Option Probe Alignment kit for cross flow probes Probe alignment kit for cross flow probes. Suitable for the calibration of 55R52, 55R62, 55P63, 55R53, 55R63, 55P64, 55R54, 55R64 and the triple sensor probe 55R97.	91H11

