

4CTA

Hot-Wire Measurement System and Data Acquisition

- Connection of up to 4 hot-wire probes
- High-dynamic measurements of flow velocities
- Velocity range: 0.1 – 50 m/s in air, higher velocities and other gases possible
- Data transfer via USB
- Software included
- Free analogue and digital in- and outputs on custom connectors
- Acoustic analysis via headphones



General Description

The 4CTA measurement system is a hot-wire anemometer for simultaneous operation of up to four hot-wire probes. The hot-wire bridges are used for dynamic measurements of flow velocities in air (eCTA).

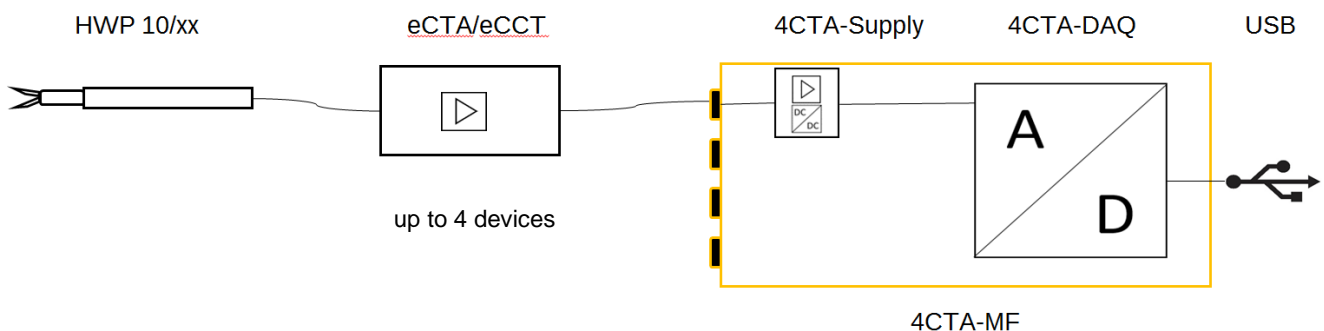
Due to its measurement principle the hot-wire anemometer is especially qualified for small flow velocities and transient or more specifically dynamic processes.

The system is delivered ready for use on, as the included probes are already adjusted and calibrated. The signals of the hot-wire probes are directly recorded by the internal USB-data acquisition and converted into velocities or temperatures.

By decoupling the fluctuations to the headphones, an intuitive sensation of the flow conditions is created. As the ear is a good frequency analyser, this is one of the most effective methods for investigating aero-acoustic problems.

In addition, a barometrical pressure sensor and a PT100 signal transducer are incorporated. The free analogue and digital in- and outputs of the data acquisition module can be adapted to customer-specific connectors in order to plug in other sensors.

Assembly of the Hot-Wire Measurement System



The measurement chain consists of four components:

Hot-wire probe → Hot-wire bridge → Supply and signal conditioning unit → A/D-converter.

Probe and bridge form a unit, which has to be calibrated as such. It has to be considered that probe and bridge are matched to each other and hence an elongation of the sensor cable is not possible. The connecting cable of the eCTA-bridge can be customized.

Technical Specifications

Hot-wire measurement system	
Refer to the data sheets of eCTA hot-wire bridge and HWP10/xx hot-wire probes	
Data acquisition card (option 4CTA-DAQ)	
National Instruments USB-6211 (different data acquisition card optional on request)	
Analogue inputs	16 channels, 16bit, 250kHz total sampling rate 1 ... 4 channels for hot-wire bridges 1 barometric pressure sensor 1 PT100 signal transducer
Analogue outputs	2 channels, 16bit
Digital in- and outputs	4+4 channels, including 1 counter
Further intern components	
PT100 amplifier	0...300°C
Barometric pressure sensor	800...1100 hPa
CTA-Mainboard	Supply and signal conditioning eCTA/eCCT, per hot-wire probe
Power supply	
AC	110...264 V, 47-63 Hz, 100 W
DC	11...18 V, min 4 A, 40 W (Binder 712 2 pin)
Configuration of signal in- and outputs – connectors on the front face	
PT100 temperature sensor, 1x	Binder 712, 2 pin
Hot-wire bridges, up to 4	Binder 712, 7 pin
Audio volume and channel selection switch	
Headphones	3.5 mm audio jack
Analogue inputs, up to 10	BNC or customized
Analogue outputs, up to 2	BNC or customized

Digital in- and outputs	D-Sub 9 pin or customized
Ambient conditions for electronics	
Temperature	5...40°C
Humidity	Non-condensing
Dimensions	
case (H x W x D)	134 mm x 234 mm x 333 mm (19" 3HE 42TE)

Ordering Options

4CTA-MF	4CTA basic device
4CTA-DAQ	Data acquisition card
4CTA-Supply	Supply and amplifier for eCTA/eCCT necessary for each hot-wire probe
eCCT	Hot-wire bridge for temperature measurement
eCTA	Hot-wire bridge for velocity measurement
HWP10/xx	Hot-wire probes