DATA SHEET
Falcon ADC

PRODUCT NAME

Falcon ADC

TYPE

Air Data Computer

Fig. 1 Falcon ADC

Fig. 2 Falcon ADC – Front view with connectors

DESCRIPTION

The *Falcon ADC* is Vectoflow's air data computer designed for real-time acquisition of pressure and temperature signals. When combined with an air data probe, it delivers precise calculations of engineering values based on wind tunnel calibration data. The *Falcon ADC* is available in 5- and 14-port versions and, for 5-hole probes, can be configured with dual or triple pressure ranges to ensure optimal accuracy across a wide Mach range. In addition to its advanced measurement capabilities, the *Falcon ADC* also supports heated probes.

A full list of outputs and detailed information about the heater system can be found in the corresponding datasheet.

PRESSURE SENSORS

The *Falcon ADC* is equipped with highly accurate, temperature-compensated differential and absolute pressure sensors. The temperature-compensated pressure transducers feature high accuracy and a minimal offset drift. The high proof pressure provides sufficient protection against accidental overloads. The pressure sensors are available in a wide range, from 0.25 kPa all the way up to 1 MPa. Sensors outside these standard ranges are also available upon request. The *Falcon ADC* is available in dual- and triple-range versions for 5-hole probes, allowing the dynamic optimization of accuracy over a wide range of Mach numbers within one device. Please contact Vectoflow to determine the best configuration for your application.

TEMPERATURE MEASUREMENT

The *Falcon ADC* supports temperature measurement in order to compute flow velocities and density. By default, the ADCs support temperature measurement with Type K thermocouples and Pt100 RTDs. Other thermocouple or platinum RTD types may be supported upon request.

COMMUNICATION PROTOCOLS

The *Falcon ADC* provides data transmission over the following protocols: USB 2.0, CAN 2.0, or Ethernet. The data output rate is up to 100 Hz. When connected via USB, the ADC identifies itself to the host PC as a virtual COM port. Thus, any software supporting serial protocols can be used for communication.

When using CAN or Ethernet communication, a 5-36 VDC power supply is required. The CAN-bus protocol is implemented according to the CAN 2.0A or CAN 2.0B specification with Baud rates up to 1 Megabaud.

A DBC file (vector-format) is supplied for easy integration. The TCP/IP output follows the same serial format as the USB mode. The full list of outputs can be found in the Outputs table, and definitions of each along with information about the coordinate systems can be found in the product manual.

HEATER

The *Falcon ADC* can be used to power a heated probe, allowing for measurements at very low temperatures and high altitudes. Heaters up to 150 W are supported, which may be used for de-icing or anti-icing depending on the application. A stable DC voltage (generally 24-36V) must be provided to power the heater.

MECHANICAL INFORMATION [1]

Weight	~ 300 g
Dimensions	Width: 78 mm Length: 120 mm Height: 43 mm
Casing	Extruded aluminum, mounting feet optionally available

[1] *Mechanical specifications may vary based on configuration*

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ENVIRONMENTAL CONDITIONS

Operating temperature	-20 … 85°C
Operating medium	Air and other non-corrosive gases
Humidity	0 … 95%, non-condensing

PRESSURE ACQUISITION

Differential pressure	Up to 14 differential pressure sensors
Accuracy	Typical ± 0.05% FS (max ± 0.2% FS)
Absolute pressure	1 absolute pressure sensor (typically 15 psia or 30 psia)
Accuracy of absolute pressure	Typical ± 0.1% FS (max ± 0.25% FS)

DIGITAL INTERFACES

USB2.0	Communication with host PC for configuration and data acquisition
CAN2.0a/b	Data acquisition and heater control for field use
Ethernet	Data acquisition in serial format over longer distances
Data output rate	Up to 100 Hz
Input Voltage	5V via USB Or 24-36V in CAN or Ethernet mode

Pressure connections	Φ1.6mm steel bulged tubulations
Default cables	1.8m or 5m Lemo to USB2.0 5m Lemo to CAN 5m Ethernet male-male cable 2m power cable Cables to probe heater and thermometer as required

OUTPUTS

Name	Unit
$P_1…P_5$ (differential pressure)	Pa
P_{abs} (absolute pressure)	Pa
T_{tc} (temperature of RTD or TC)	° C
Theta (cone angle)	º
Phi (roll angle)	º
Alpha (angle of attack)	º
Beta (yaw angle)	º
V_{mag} (velocity magnitude)	m/s
u, v, w (velocity components)	m/s
P_d (dynamic pressure)	Pa
P_s (static pressure	Pa
ρ (air density)	kg/m^3
T_{tot} (total temperature)	°C
T_s (static temperature)	°C
M (Mach number)	-
Alt (baro altitude)	m
AltAbs (absolute altitude)	m
Num (counter)	-
Error	-

VECTOFLOW

Name	Unit
Indicated air speed – IAS	m/s
Calibrated air speed – CAS	m/s
Equivalent air speed – EAS	m/s
True air speed – TAS	m/s
Dynamic Pressure derived from TAS	Pa
Mach Number derived from TAS	-
Local speed of sound	m/s
Flight level query nautical elevation	m
Height query field elevation	m
Altitude query nautical height	m
Pressure Altitude	m
Density Altitude	m

SUPPLEMENTARY DOCUMENTS

- Electrical ICD
- Product Manual

PRODUCT DRAWING