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AN-1005

Anemometry System

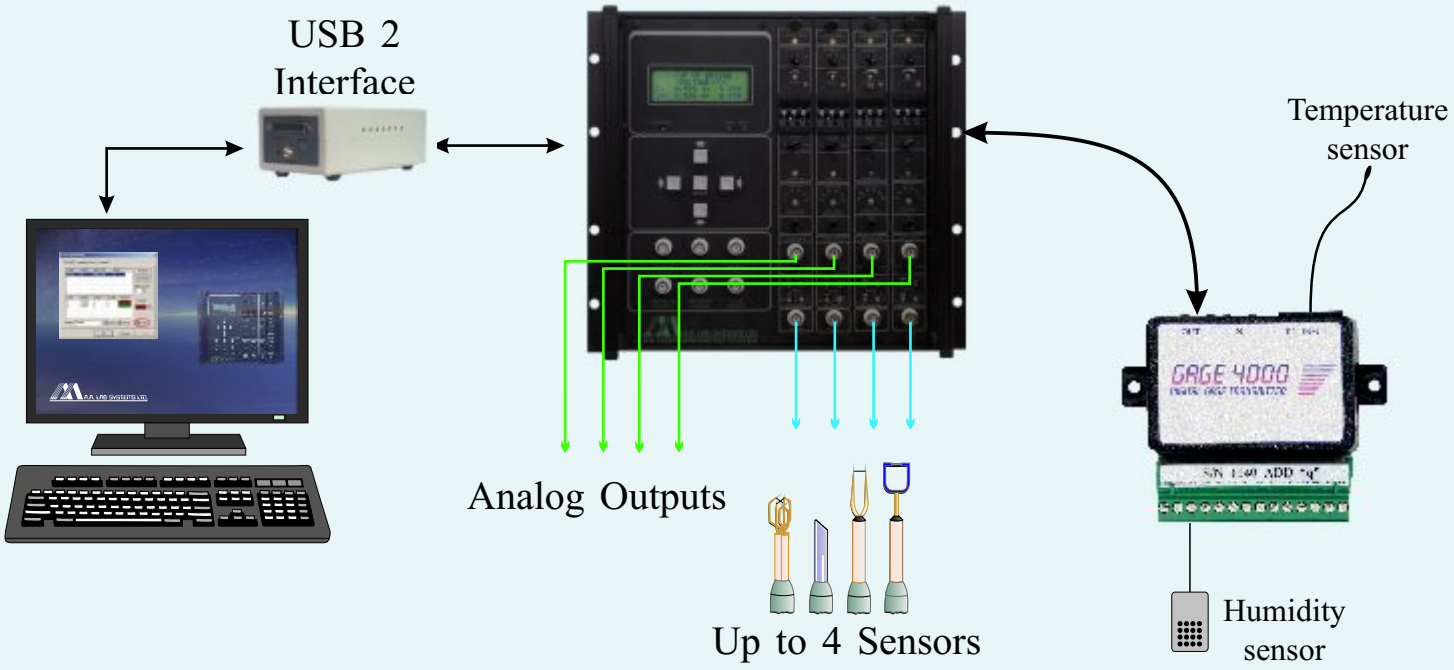


A.A. LAB SYSTEMS LTD.

AN-1005 ANEMOMETRY SYSTEM

The AN-1005 is a portable compact anemometry system, based on the AN-1003 system channels. The system has a built-in microprocessor with parallel interface and data acquisition capabilities.

The mainframe has a built-in display for monitoring 2 channels simultaneously, using a 5 digit voltmeter. A friendly built-in menu guides the user through th operating procedure. All analog signals may be measured on external BNC's. However, a high accuracy optional data acquisition system is built inside the mainframe, for high-speed sampling at up to 1 MHz @ 16 bit resolution. The data acquisition is done directly to High Speed USB2 interface or to any bidirectional parallel port (EPP), eliminating the need for an expensive A/D card or other interfaces.
All Analog Signals are Optically isolated from the PC or the digital interface, for noise immunity.

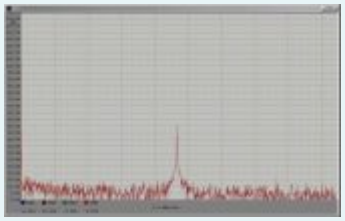
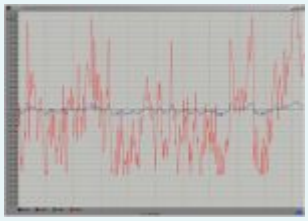


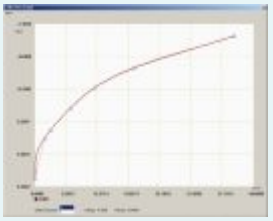
FEATURES:

- Portable system - up to 4 channels
- Microprocessor controlled
- Built-in data acquisition
- Optically isolated - No computer noise on your signals!
- Ideal for research and education
- Using the high performance AN-1003 channels
- Digital data output - directly to a PC parallel port.
- Easy operation - friendly Software and hardware interface- Can work on any Laptop or Desktop PC
- Built-in thermocouple + RH sensor for on-line compensation

PC Software:

Friendly, Easy to use PC software with Probe Calibration, Data Acquisition, and real-Time Pulse response, Oscilloscope, FFT etc. All data acquisition files and calibration files can be exported to other programs or ASCII.



TECHNICAL DATA

CHANNEL SPECIFICATIONS

A BRIDGE T.C.

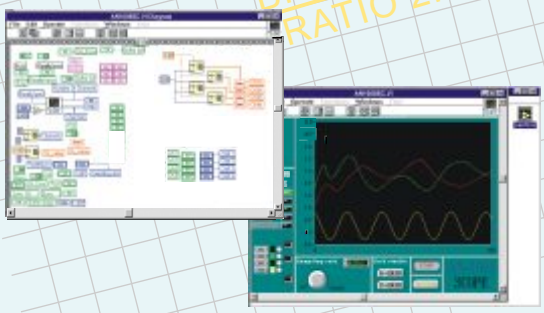
Non-linear, constant-temperature type
Bridge ratio.....1:10 and 1:1
High power mode.....1:20 and 1:2
Sensor resistance range:
1:1 Bridge.....0.5-9.99 Ohm
1:10 Bridge.....1.0-99.9 Ohm
Cable resistance compensation.....0.2-1.2 Ohm
Maximum closed loop bandwidth:
1:1 Bridge.....DC-120 kHz
1:10 Bridge.....DC-100 kHz
With option 04.....DC-500 kHz
Maximum probe current
x1 Drive .....300 mA max.
x2 Drive .....600 mA max.
Equivalent input noise
1:1 Bridge.....1.6 nV/√Hz
1:10 Bridge.....2.2 nV/√Hz
With option 01.....400 Picovolts/√Hz
Typical hum induced in input.....0.03 µVrms
Typical output noise
5um Tungsten probe
OHR=1.5 ; U=0 ; B.W.=10kHz.....135 µVrms
The same with option 01.....60 µVrms
Stability: Typical input drift
1:1 Bridge.....0.5 µV/°C
1:10 Bridge.....0.3 µV/°C
Less than 0.1µV/°C with option 01.
Probe cable.....5m of RG174 or RG58A
Output.....Top of bridge or amplifier output

A BRIDGE C.C.
(11 Option, Constant Current Anemometer)

Fixed currents and any.....1,2,5,10,20 mA
combination of these currents
Variable current source.....0.3-30 mA
Module-selected current is displayed on Main module

POWER SUPPLY

Output voltages.....±15V,±5V
Maximum current (@+15V).....±2.5A
Noise & Hum.....100 µVrms



SIGNAL CONDITIONER

Output voltage range.....±12V
Amplifier gain.....1-20
Presettable to any gain in range.
(can be ordered with 1-50 or 1-100 ranges)
Gain accuracy.....0.5%
DC offset.....0-10V
Output impendence.....100 Ohm
Input impendence.....10k Ohm
Typical input with noise.....30nv/√Hz
Frequency range.....DC-100 kHz
Typical equivalent input drift.....160uV/°C

PASS FILTER-LOW

Triple pole butteworth type
12 Cut-off frequencies in 2 bands:
Lower band.....300Hz-5kHz (6 frequencies)
Upper band.....7kHz-16kHz (6 frequencies)
(Other frequency bands may be ordered)

MAIN MODULE

PULSE GENERATOR

Frequency.....2kHz
Duty cycle.....0.1% - 99.9%
Rise time.....50nSec
DC REFERENCE:
Output voltages.....0.1V
Accuracy.....50ppm/°C, 0.1%

GENERAL

The unit interfaces to USB2 high speed interface, or EPP parallel port (bi-directional).
Data transfer rate: up to 1MB/sec
Built-in A/D: 500KHz, 16bit (1 MHZ.Optional)
Sampling: Quasi-simulataneous
(full simultaneous is optional).
Isolation: Optical isolation of analog channels and A/D from PC bus signals, up to 1500V.
Sampling rate:
1 channel - 400 kHz
2 channels - 150 kHz
Pulse Response - 800 KHz.
Triggering: Int/Ext. trigger

* All specifications might change without a prior notice

PC Software and
LabView drivers available

ORDERING INFORMATION

The AN-1005 Hot-Wire & Film Anemometry System includes:
One mainframe (with low-noise power supply and CPU module)
Up to 4 CTA/CCA channel modules (with built-in signal conditioner)
The AN-1005 Interfaces to any PC compatible computer with USB2 interface or EPP parallel port.
No data acquisition cards or other interface cards are required for operation of the anemometer.

The AN-1005 is optically isolated from the host PC and the noises that are generated by the PC's power supply and peripherals. This feature allows high signal to noise ratio with full 16 bits of data, without any interferences or "ground-loop" effects. The data is transferred via High-Speed USB2 interface to your computer. The built-in A/D Converter is used for high accuracy sampling (@ 16 bit resolution) of the conditioned output signals. An A/D with quasi simultaneous sampling is standard. Using option 19, the A/D may sample simultaneously. This option is mainly used in dynamic applications, where accurate phase information is important (for example: in multi-sensor probes at high speed/High bandwidth flows).

OPTIONS:

The AN-1005 system may be purchased with various options.

Channel options:
01 - Ultra low noise input amplifier - 400 PicoVolts/ Hz (less than 0.1 mVrms output noise on 20 kHz. bandwidth).
04 - High frequency compensation - a tunable circuit for improving the frequency responce up to 500 kHz, or usage with long probe cables. This option may be configured for probe cable length of up to 20m (Optional).
06 - Filter bands - other than specified values. Please specify upper and lower frequency in each band.
07 - Gain option - other than 1-20. Please specify maximum gain requested.
11 - CCA mode in addition to CTA mode. Modes are switchable on board. 31 fixed current values + variable.
12 - Enhanced signal conditioner - gain of 1-100 in 2 gain stages (1-10 and 1,2,5,10 gain multiplier).
High accuracy DC offset (2ppm/C accuracy) with fine control of 0-2V and fixed steps of 0,2,4,6,8V. DC off function. Use for low velocity and low turbulence levels.
14 - Auto zero DC offset - for automatic reduction of DC offset (used for automated velocity profiles or near wall). Simple control by TTL signals (zero offset + DC read).
15 - Five meter high quality RG-58 sensor cable.
* Probe protection and soft starts circuits are standard for all channel modules.

MAINFRAME OPTIONS:

13 - Power supply removal kit - removal of the power supply into external box, for ultra high noise and hum immunity (recommended for CCA (option 11) users).
18 - 1 MHZ A/D converter (instead of standard 500 kHz.)
Quasi-simultaneous sampling.
19 - Sample & Hold (S&H). True simultaneous sampling of all channels (for dynamic applications/ multi-sensor probes).
20 - AN-1005 software for Windows + LabView drivers.
22 - Gage 4000 unit for Temperature and %RH compensation. Records ambient temperature and Humidity to Data Acquisition file header.

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