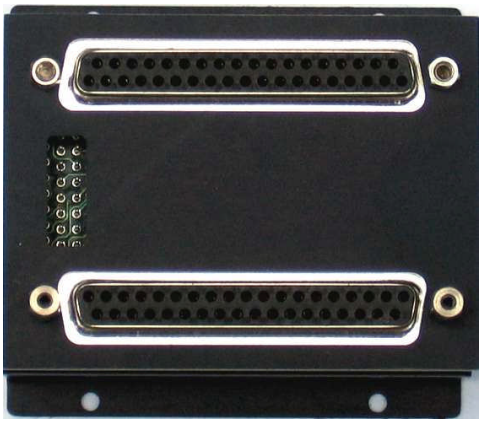
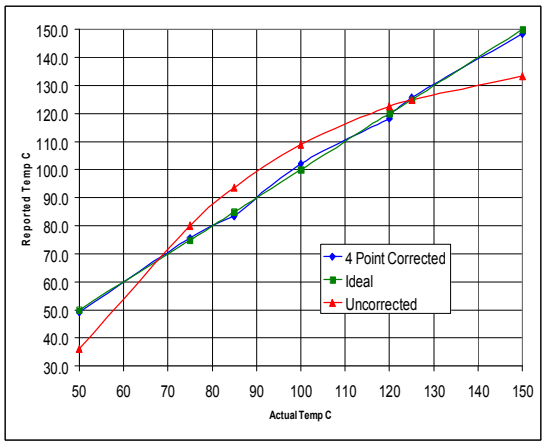
EIS/VFIS FEATURES

Abundant Inputs



Despite its extremely compact size, the SensorNetics EIS/VFIS module family provides one of the largest number of input channels available (up to 74 pins/unit). This represents a substantial increase from previous versions to allow for complete EIS, VFIS, and aircraft system monitoring.

Twenty four general purpose analog input channels are provided with programmable gains to accommodate a wide range of sensors. These inputs have extensive analog and digital noise filtering and input range protection for reliable operation from over 30 Volts down to milli-Volts of resolution.

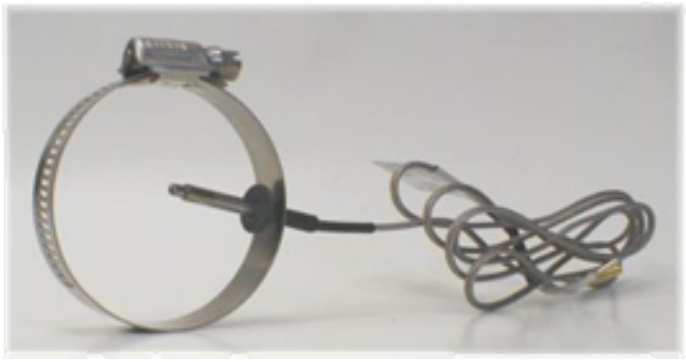


All channels support adjustable offsets and calibration curves, and can correct for inputs such as non linear thermistor temperature senders, irregular fuel tanks, etc. Note that although multi point capacitive fuel probes are supported, they are not required since the unit can correct for multi point calibration independent of the probe type, allowing you to use less expensive single point probes.

18 channels have built in excitation for standard EIS senders to reduce external wiring complexity (excitation can be individually removed if not required). Support is provided for direct connection of low cost precision temperature sensors and switch contacts with no need for external power connections or resistors.

Low cost VFR sensors can be used directly with every base EIS/VFIS module to provide full VFIS capability for any unit.

High Performance EGT/CHT Input Channels

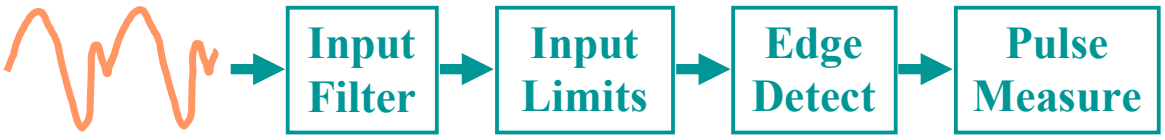


With a generous number of general purpose input channels to provide the majority of measurements, the only decision remaining for EIS applications is how many EGT/CHT channels to add. These special channels provide much higher resolution than general purpose channels to measure the small signals generated by type J, K (or other) thermocouple senders, and provide cold junction temperature compensation for ambient temperature change. These channels can also detect thermocouple opens and shorts (a common problem) through periodic injection of a small calibrated test current.

If not used for thermocouple measurements, these high performance channels can be used for general purpose or high resolution measurements such as strain gauges or sensitive bridge type sensors (see also XP page). They are normally set up as differential pairs, but can be re-configured as single ended for twice the number of general purpose inputs High impedance inputs, extensive digital filtering, and programmable gains allow reliable measurements from 5V (or more) down to fractions of a microvolt resolution.

Dual Tachometer Channels

Two independent tachometer channels are provided to allow for twin engine monitoring, or for redundant inputs such as dual P leads, thus allowing for standard mag checks without losing RPM readings.



In addition to the usual calibration adjustment for number of pulses, tachometer sensitivity is adjustable to accommodate signals levels from less than a volt to 60V without needing external resistors.

Other frequency measurements are supported such as propeller RPM, rotor RPM, Turbine RPM, wheel RPM, alternator frequency, optical tachometer inputs, voltage to frequency outputs, etc.

Pulse width measurement is also supported for fuel injectors to measure both RPM and fuel flow at the same time.

Dual Fuel Flow Channels

Two fuel flow channels can be used to measure twin engine fuel flows or to provide a differential flow rate for circulating fuel systems. Flight time remaining can be estimated based on present fuel flow rate and fuel quantity remaining.

The pulse channels can also be used to measure pulse rates and accumulated pulses for any other desired pulse inputs over time.

Dual RS232 Channels

Two independent RS232 channels provide inputs from a GPS receiver or electronic compass as well as an interface to PCs or PDAs for data outputs.

Data output formats can be configured for CSV spreadsheets like Microsoft Excel, GRT compatible output streams, serial encoder outputs, etc. Channel output streams can be configured for desired channels, channel output order, header outputs, output rate, baud rate, binary or ASCII format, and checksums or CRCs for error checking.

Multiple Timers

Multiple timers are provided to cover a variety of applications. Engine “Hobbs” time is initiated and incremented based on either an RPM or an oil pressure threshold, and is continuously stored in non volatile memory to provide a permanent record of engine time. Periodic maintenance reminders can be entered based on Hobbs times.

Flight time is similarly initiated by either RPM or airspeed thresholds, and in flight periodic reminders can be set e.g. periodic course check, switch tanks, etc.

Sophisticated Alarms

All channels are continuously scanned for out of range conditions even if they are not displayed, so you don't have to worry about missing an alarm condition. Adjustable red and yellow alarm levels warn visually and audibly to quickly alert you to a marginal or out of range condition.

Unlike other systems that limit you to one red and/or yellow alarm level, every parameter can have multiple red or yellow levels such as low or high oil pressure, over or under charged battery, forbidden mid range prop RPMs, etc.

Logical channel combinations can also be used to create custom alarms, such as Airspeed and Flap position, Oil pressure and RPM, or Canopy Open/Closed in combination with an RPM limit (as suggested by Al Wick GlassPanel@yahoogroups.com).

For example if the canopy is securely closed the annunciator bar would indicate a safe color (say blue), while if it is open and RPM is below a taxi threshold, then the bar would indicate yellow, and if open and RPM is above the taxi threshold, then the bar would flash red and an audible alarm would sound.

Alarm states can also be based on change over time, such as shock cooling, or an alarm level being present for longer than a certain time.

Audio Output

A standard audio output is available that can be fed into your headphones for an audible alert to alarm conditions. The output level and frequency patterns are adjustable for distinctive alarm sounds.

The audio output can also be used to provide audio feedback based on individual sensor levels for training or "progressive" audio alarms to reduce the startle factor (and adrenaline levels) when the alarm first sounds.

One example would be progressively increasing volume and/or frequency as the AOA approaches a full stall (useful for judging the flare and ensuring the plane has stopped flying). Other examples would be audible "bugs" for altitude, heading, or airspeed, as well as an audio variometer.

Alarm Output

An open collector transistor alarm output is provided to drive an external indicator light or audible buzzer. It can also drive a relay and comes with a built in protection diode.

Calculated Data Channels

Additional data channels can be created based on other channel data, such as true airspeed, density altitude, Max CHT, EGT spread, etc. These channels are updated at the same time as other channels and can be custom labeled, displayed, output, and can create alarms in the same way as directly measured channels.

Another use for calculated channels would be to provide dual fuel scales for tail wheel attitude in level flight and on the ground, optionally switched by a certain RPM or airspeed threshold (thanks to Eric Witherspoon for the suggestion).

A calculated channel can also be used to adjust calibrations for capacitive fuel senders for different fuel types, either based on a user entered level or a reference probe that is always immersed in the lowest level of fuel.