



PROTECT Wireless



PROTECT Wireless is a highly scalable, customizable and cost effective online monitoring and diagnostic system which blends predictive maintenance, energy, operational and process monitoring into one package for a complete picture of facility-wide conditions.

It provides 24/7 monitoring of equipment and processes with immediate alerts via email and text message to changing and deteriorating conditions. In addition, the system enables offsite decision makers and onsite personnel to promptly consult with experts from around the globe. They can remotely analyze and diagnose the data via computer and smartphone for quick, confident and informed decisions.

Our advanced hardware provides an absolute view of your machinery conditions with detailed spectral, phase and cross channel analysis on couplings, bearings and even separate machinery. This and other innovations present remote analysts with instant diagnostic data which, until now, required expert-personnel onsite.

The system's simple image user interface provides machine and sensor hotspots which change colors based on the severity of any detected faults for instant problem recognition.

Provides 24-bit resolution for a crystal clear signal for better analytics

Collects data up to 40 kHz on 1, 2, 4 or 8 simultaneous channels

Can take in hundreds of channels, in banks of eight (8) channels at a time

Accepts any type of input—voltages, 4-20 mA process data and vibration spectral data

Offers real-time data analysis from anywhere around the globe via your computer and smartphone

Allows your team and experts to view the same data, confer and instantly make decisions that, until now, took weeks

Great for permanently monitoring one or more machines, or for moving from one machine to another and screening emerging issues

VSC expert analysts are always available to diagnose your machinery problems remotely



Clicking on the colored hotspot launches a new level revealing additional information details for quickly evaluating the situation.

Each sensor provides extensive analytics with statistics, real-time and historic data, individual and group sensor trends and much more so experts can provide the same advanced diagnostics remotely as they would if onsite.



Best of all, the system's email and text alerts can keep personnel aware of issues 24/7 while providing instant access to the information via PC and smartphone from anywhere around the globe.



PROTECT Wireless is the intelligent industrial platform of the future that is driving the smarter, greener planet initiative. Corporations armed with this technology will prosper, discovering profitable analytics and knowledge for enhanced performance, while those without helplessly wither on the vine.

Contact us about **PROTECT Wireless**: (877) 698-0800 or vsc@vib.com
Or see us on the web at www.vib.com

There are two main hardware parts that make up **PROTECT Wireless**, a coordinator and one or more satellites. The coordinator relays the data to a computer for display, storage, further analysis and reporting. One coordinator may communicate and control multiple satellites as well as have them provide data in real-time to users anywhere around the globe. Satellites are placed on or near the equipment they are monitoring and are directly wired to the sensors. After that – NO WIRES. The data is processed and initially analyzed by the satellite, then wirelessly broadcast at a 2.4 GHz 802.15.4 industrial standard frequency to the coordinator.

The hardware comes with numerous options from single to eight simultaneous channels of data collection. The multiplexer comes standard with eight channels but can accommodate over one hundred, while also accepting virtually any type of sensor.

PROTECT Wireless' versatility offers solutions for nearly every situation and budget. Each system is completely upgradable and can be changed to a full scale system at any time.

Specifications

MULTIPLEXER

Input Voltages: -30 V to +30 V DC, +/-10 V AC Coupling: DC to 100 KHz

Input Types: Voltage or Current (4-20mA) is selectable on each channel. Fully differential readings for 16 channels or pseudo-differential for 32 input channels. Accepts signals from most, if not all, vibration probes (including proximeter) and industrial sensors. A separate tachometer input is also provided. Input impedance is approximately 25K Ohms (Input impedance of tachometer is typically > 10Meg Ohm).

Routing Type: Any of the 32 single-ended or 16 differential input legs may be routed to any of the 8 differential output legs. Due to the simultaneous collection of outputs, relative phase of virtually any input may be correlated to another.

Input Terminations: Input connectors consist of four 2.5mm, 1x16, detachable screw terminal plugs accepting up to 14 gauge wire. ICP™ power typically used for accelerometers is provided for all 32 input channels at 3.5 mA (selectable). This avoids power start-up delays for a maximum switching speed. ICP™¹ and 4-20 inputs are jumper-selectable. In addition, a separate 2-pin terminal is supplied for a separate digital tachometer input (tachometer may also be wired to individual channels).

Switching Characteristics: THD < 0.002% @ 20 kHz. Differential Gain/Phase Error < 0.1%. Low All Hostile Crosstalk of -83 dB. Input voltage noise of 14nv/sqrt (Hz).

Operating Temperature Range: Linear behavior approximately -20°C to +80°C (-4°F to 176°F)

DAQ SYSTEM

Input Channels: Up to 8 simultaneously: true-differential and/or pseudo-differential (user-selectable). Digital resolution: 24 bits or -144 dB. Input impedance is 100K Ohms.

Coupling: DC or AC 0.16 Hz to 40 kHz. Supports ICP™, 4-20 mA as well as most voltage inputs interfacing to almost any industrial parameter transducer. All of this is user-selectable.

Analog Full Scale, S/N Ratio: User selectable in excess of 350 digital steps from 200 V down to 50 mV. S/N ratio for each range supports up to 111 dB for a collective S/N ratio up to 183 dB.

Hardware Auto-scaling: Features channel independent hardware auto-scaling utilizing full scale voltages from 50 mV up to 200 V with more than 350 digital steps. Offers visual overload indicators.

Calibration: Card maintains NIST traceable flash resident constants for digital compensation. Values stored for all signal paths including DC and AC.

Amplitude Resolution: 3.15 nV (0.05 V full scale @ 24 bits resolution theoretical)

Noise Resolution: 141 nV (0.05 V full scale @ -111 dB effective noise resolution)

Auto-Continuity Check: Detects shorts or opens in ICP transducer cabling.

Triggering/Phase: A separate trigger channel is provided which supplies full digital triggering capability. It supports a CMOS compatible pulse on rising or falling edge with Schmitt trigger. Both RPM and phase are provided from the selected F-max down to virtually DC. Timeout capability provided. By supplying 1x amplitude and phase, the system fully supports balancing of up to 8 channels simultaneously. Input impedance (trigger only) typically > 1Meg Ohm.

Tachometer inspection: The tachometer signal may be routed into either channel 4 and/or 8 via user control. Either the pre-buffered (before Schmitt trigger) or post-buffered signal may be selected, providing an excellent debugging tool when interfacing to tachometer signals of various types.

GENERAL PROCESSING

Sampling Rate: 8 channels up to 102.4 kHz (F-max = 40 kHz) simultaneously.

Sample/Spectrum Sizes: 256 points (100 lines) to 128K (51,200 lines).

Anti-Aliasing: Linear phase, multi-stage, low-ripple digital filter supplies in excess of 100 dB in stop band (equivalent to 10 orders). 2-pole out-of-band filter set at 40 kHz.

Frequency Range: 0.16 Hz (10 rpm) to 40 kHz. Steps provided are 50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K and 40K.

Weighting: 11 standard weightings include Hanning, Hamming, Flattop, Force, Exponential...

Averaging: Up to 64K averages with numerous averaging types including summation, peak & exponential.

Units: Universal unit selection for probes and display both English and metric. Supports the majority of required units for conventional sensors.

Vibration units include power spectral density (PSD). Full digital integration/differentiation capabilities provided (hardware integration requirement negated by 24-bit capability) permits seamless vibration unit conversion: Displacement, Velocity and Acceleration.

Power: Typical 400-480 mA @5 V or 2.4 Watts max. With MUX (32 channels), max power up to 1.8 A @ 5 V or 9 Watts. Low Power capabilities include auto or user-selectable shutdown of non-essential subsystems for dramatically improved battery life.

Standard Enclosure: NEMA4, approximate size 10" x 8" x 4" with 1 MUX in addition to 5.5" antenna.

COMMUNICATIONS

Coordinator-to-Satellite(s): 2.4GHz IEEE 802.15.4 up to 4 km range with extended antenna. 20dBm Transmit power, Receiver sensitivity -98dBm, TX current 110 mA, RX current 23 mA

PC to Coordinator: USB 2.0 @ 1MHz Compliant with FCC part 15 rules, IC Canada RSS 210e, ETSI ETS 300-328 and Japan ARIB STD-T66

Satellite Process Features: 32-bit RISC CPU up to 32 MIPs with onboard 128 kB ROM, 128 kB RAM, 4 Mbit serial flash. Also includes watchdog timer, real time clock, 4 power MOSFETs, external 768 Kbit SRAM and 8 Mbit flash, separate USB interface chip, multiple LEDs (both on-board and external), generic MMI interface header supports keyboard and/or display, SD card, headers for optional accelerator processor.

Temperature: -40C to +85°C

Contact us about Protect Wireless: (877) 698-0800 or vs@vib.com or see us on the web at www.vib.com

¹ Trademark PCB Electronics