

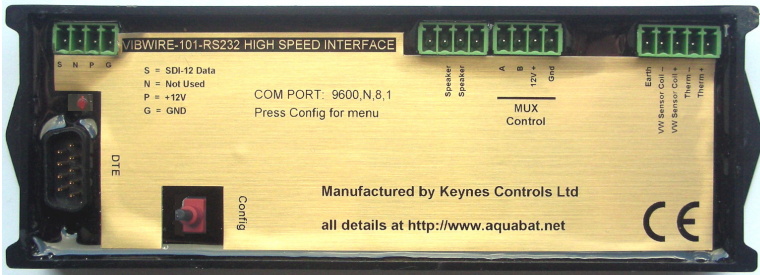


VibWire-101-HS High Speed Vibrating Wire Sensor Interface

Single Channel Instrument
Dynamic & Static Measurements



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Dynamic Measurements with Standard Single-Coil Sensors

Dynamic Vibrating-Wire Interface Using Auto-resonance

Part No. VibWire-101-HS

Contact details

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Overview

The VibWire-101-HS module is designed to interface with standard single-coil circuit vibrating wire sensors such as strain gauges, load cells, pressure transducers, crackmeters, and peizometers.

The VibWire-101-HS provides dynamic measurements at rates at 20 to 50 Hz for sensors operating frequencies 500 - 6 K Hz.

The VibWire-101 connects to a PC for local high speed measurements, to a local area network for remote distributed applications and to the RS-485 network for SCADA applications.

The module uses a auto-resonance excitation mechanism that maintains the vibrating-wire sensor in a continuously vibrating state as-well as minimising the amount of energy required to excite the sensor in order to optimise sensor life.

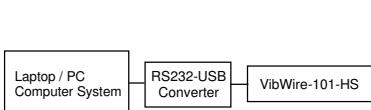
The module measures the resonant frequency of the wire between excitations using an advanced algorithm to determine the sensor frequency. The VibWire-101-HS provides a true result and not an interpolated answer from complex spectral peaks.

The auto-resonance approach and advanced algorithm provides very fine measurements, and the use of 32 bit conversion provides very stable, reliable and high resolution measurements.

Features

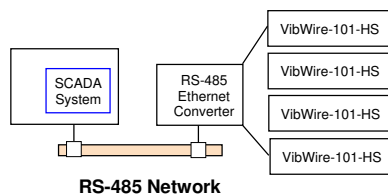
- Interfaces to standard single-coil vibrating wire sensors
- Unlimited Channel Expansion
- Synchronised across multiple modules
- High Speed Dynamic Measurement rates.
- Dynamic measurements at 20 - 50 Hz made simultaneously on all inputs
- Auto-resonance calculations provides superior noise immunity and measurement resolution compared to interpolated spectral approach
- Auto-resonance method mains the optimum sensor excitation to maintain resonance with the minimum energy.
- Thermistor input for each vibrating wire channel is sampled at the dynamic data rate.
- Data communication options via USB, Ethernet LAN or RS-485.
- User configurable, onboard post-processing of the data including frequency output conversion, temperature conversion and rainfall histogram collection

Network Options



Single Channel Measurements

Single channel high speed recording with unlimited data recording capacity.

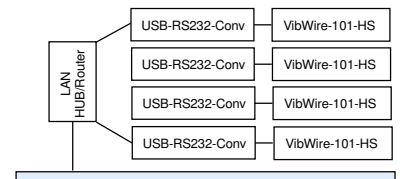


Simple SCADA Integration

Un-limited Channel Expansion

Freq Data: Hz, Digits Hz² Temp: Deg C or mV

Third party network systems support



Local Area Network

Un-limited Channel Expansion

On-demand Sample Rate Adjustment

Connects to any local area network

Integrated Temperature Results

Dynamic Vibrating Wire measurements using Auto-resonance UK & European Patent Pending

Technical Details

The VibWire-101 also a thermistor input channel that is sampled at the same same time as the frequency input. The thermistor data is converted to temperature using the Steinhart-Hart conversion equation which can be configured inside the instrument and all data values supplied as engineering units.

The temperature data can be further used with the sensor calibration equations to correct directly for temperature effects, should this be necessary.

Data is presented to the User in CSV (Comma, Separated, variable) format. It is a simple calculation to determine the static sensor value from the measured signal using a spreadsheet.

There is no driver software required to operate the VibWire-101 as all operations are configured using the in-built terminal menu system.

The VibWire-101-HS can be reconfigured to operate as a standard intelligent vibrating wire interface and can be expanded using the MUX-16/32 unit.

The VibWire-101-HS is the standard building block for high speed VW sensor applications. The method of communication is modular so you only use what is absolutely required.

The instrument is supplied in immersion proof enclosure making it safe to operate in harsh environments. Even though not rated for continuous submerged operation it is safe from the ingress of sand, dust and moisture.

The data rates specified can be sent directly across a local area network



Technical Specifications

Number of channels	1 x 4 Wire VW Input - standard
VW sensor coil resistance	to 2 K Ohm (standard):- other ranges on request
Distance of VW sensor to interface	0 .. 10 Km depending on cabling.
Frequency range	400 - 6 KHz (standard) Other ranges on request
Frequency Resolution Accuracy	32 bit resolution 0.001 Hz
Long term stability	± 0.05 % FS max. Per year
Temperature range	- 50 to 70 Deg C
Temperature resolution	0.1 °C +/- 0.2 Deg Thermistor 10 K Ohm standard 3.3 K Ohm on request
Temperature accuracy	± 0.2 °C / 0.2 °F SDI-12/RS-485
Thermistor measurement	A half bridge ratio-metric measurement . Value returned in mV. Is used for temperature compensation on VW measurements.
Thermistor excitation	2.5 V DC 50 ppm /Deg C
Input resistance	10 K Ohm 0.1 % Completion resistor (Standard) 3.3 K Ohm on request
Units - Frequency	Freq (Hz), Digits (Hz ²), SI Units - Quadratic expansion
Temperature	Temperature Deg C, mV - Raw

Electrical Data

Voltage supply	10.5 to 16 V DC
Current compensation SDI-12 Option only	Typical values are @ 12 V DC Excitation
Idle mode	1.2 mA typical
Active / measurement	20 mA data transmission These values may change slightly between sensors. Use figures as a guide only.
Measuring time	
Warm up	250 ms
Response	50 ms

High Speed VW Results via RS232 Port

20 Readings/Sec (50 milli-Sec) to 40 Readings/Sec (25 milli-Sec) depending on sensor.

RS-485 Address mode Supports enhanced addressing 0 .. 9 A .. Z

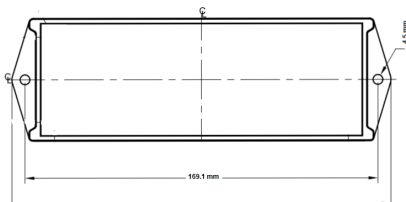
General Data

Dimensions (mm)	L =260 W = 127 D = 38
Material	Plastic with epoxy encapsulation waterproofing.
SDI-12 Digital Port	SDI-12, 1200 Baud, 7 bit, N stop bit, Even Parity - other speeds on request
CE Conformity	CE conformity according to EN 61000-6
Weight	400 g

Communications

Terminal Port 9 Way Male - 9600 Baud 8 data, No Parity, 1 stop bit, No Flow control - DTE

RS-485 Network Settings 110 kB Baud, 7 data bit, N stop bit, even parity



For advice on systems design, layout and quotation requests, and data transmission rates then contact Keynes Controls directly at sales@keynes-controls.com or via the contact for on the website