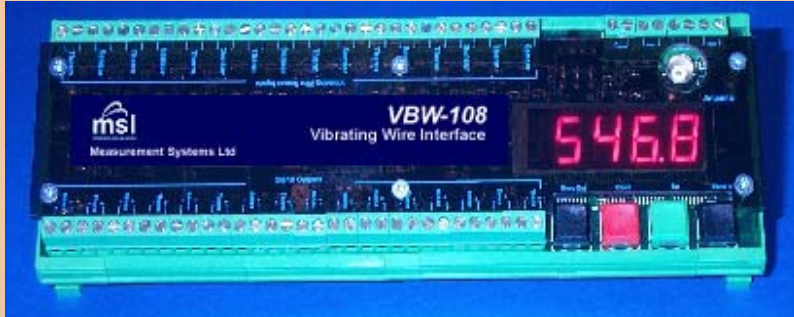




VBW-108

Vibrating Wire Sensor Interface



General Description

The VBW-108 is a general purpose vibrating wire sensor interface which has been designed to operate with most types of vibrating wire sensors.

The interface contains all the necessary signal conditioning to connect Vibrating wire sensors such as strain gauges, extensimeters, crack meters, pressure and temperature sensors into a single unit.

The VBW-108 also contains signal conditioning completion electronics for sensors with built in temperature sensors.

Although it will connect to any Data Acquisition system, it is fully integrated with our DataWeb products. For remote monitoring of multiple interface units, we recommend using our Orchestrator DataWeb Control Centre software. For optimum stability we would also like to recommend our 650-001 12Vdc power supply, which has proved to be exceptionally stable during testing.

Operating Principle

The VBW-108 signal conditioning unit consists of 4 main elements:-

- 1 Signal conditioning for integrated thermistor temperature sensors.
- 2 With the RS485 version, Digital Communication to a PC is available which will allow the VBW-108 to be deployed on a network away from the logger and to enable simple large channel solutions to be easily assembled. This can be achieved using simple ASCII commands.
- 3 Analogue outputs using a low noise 16 bit DAC enabling the output signals representing Frequency to be connected to any data acquisition or logger unit.
- 4 Soon to be available is a version offering FM Wireless connection. This utilises a 2.4GHz spread spectrum transceiver, which is capable of transmitting securely over a range of upto 1km.

Main Features

- ◆ 8x 4-wire Vibrating Wire Inputs
- ◆ Lightning Protected Inputs
- ◆ 9-18Vdc Power Supply
- ◆ Intelligent Power Management System
- ◆ Full 4-wire sensor support
- ◆ Temperature sensor inputs
- ◆ Continuous Phase Locked Sensor Excitation
- ◆ 5 User Preset Frequencies 100Hz- 10kHz
- ◆ User-defined frequency selection – low point & range
- ◆ Connection to any Data Acquisition System
- ◆ RS485 port (for distributed solutions)
- ◆ Optional wireless transmitter (for cable free solutions) **COMING SOON**
- ◆ Integrated Speaker Unit (with channel selector switch)
- ◆ DIN-Rail mounted enclosure
- ◆ Analogue Output 0 – 2.5Vdc representing period
- ◆ 5x7 Segment User Display/Frequency Meter
- ◆ Supports Strain, Vibration, Temperature sensors etc.

Sensor Excitation

The VBW-108 utilises a continuous phase locked continuous excitation pulse to activate any vibrating wire sensors that are used to ensure the maximum signal return from the sensor is always achieved.

The excitation signal changes automatically with the varying operation of the sensor. The VBW-108 is supplied as standard with 5 preset operating frequencies that cover the operating frequency of many common sensors and a User defined frequency range allowing for the setting of the lower frequency and operating span for any vibrating wire sensor.

User Display

A 5 digit 7 segment display is provided to aid in the configuration and to show the real-time frequency of a specified sensor. The display allows for the configuration of the inputs and the local display of results.

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Technical Specifications

The following table summarises the operating specifications for the VBW-108 signal conditioning

Basic System

Physical Dimensions	233 x 82 x 41 mm
Power Supply	9 - 18V DC @ 2 mA Average in Transmission mode.
Operating Temp Range	-40 to +85 Deg C
Lightning Protection	All sensor inputs protected (gas discharge tube)
Update Rates (User Selected)	Continuous, 1min, 10min, 15min, 30min, 1Hr, 6Hr, 12Hr, 24Hr.
Environmental Protection	Protected against the ingress of moisture, dust and high humidity
User Display	5 digit x 7 Segment display Frequency Meter :- accurate to 1 Hz
User Menu	Using the on board keyboard to define Individual Channel configuration such as operating frequency and unit update rate

Communication Ports

Serial Port (Optional)	RS-485 Multi-drop network - supports 256 Vibrating Wire & 256 Temp sensors 1200 M network length with 32 VBW-108
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Vibrating Wire Interface

Number of Channels	8 x 4 Wire Sensor Inputs/module
Operating Frequencies	Range 1: 500Hz - 1.2 KHz Range 2: 800Hz - 2.0 KHz Range 3: 1.4 - 3.5 KHz Range 4: 2.3 - 6.0 KHz
User Defined Frequency	100 Hz - 10 Hz 100 Hz Steps
Frequency Span Increment	10 & 100 Hz steps
Sensor Excitation	Phased Locked Excitation
Analogue Output Level	0 - 2.5V using 16 Bit DAC
Analogue Output Parameter	Frequency
Temperature Compensation	
Thermistor Completion Resistor	10 K Ohm
Analogue Output	0 - 100 mV
Temperature Signal	Requires thermistor linearisation

Intelligent Power Management

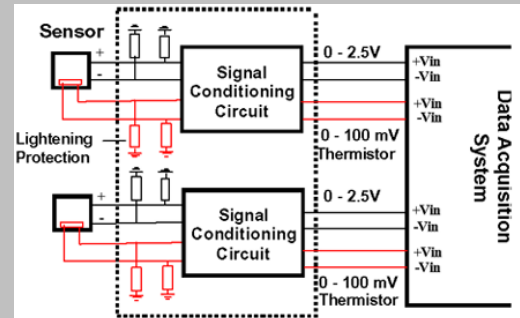
The VBW-108 uses the latest low power technology within its construction to maintain the minimum power for operations and switches off any unnecessary components in between samples. When re-activated the VBW-108 makes repeated readings for each sensor before sending the results at the specified update rate to the data recorder.

Lightning Protection

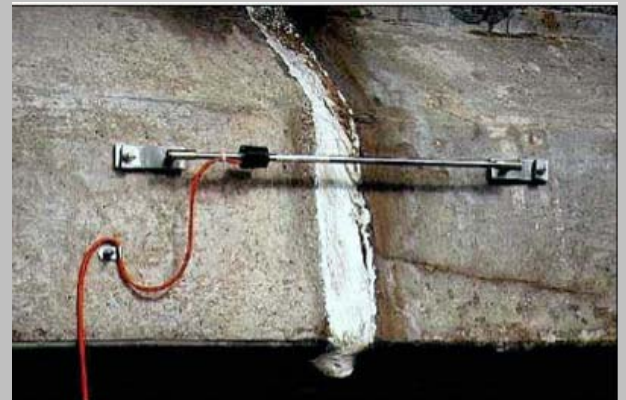
The VBW-108 utilises gas discharge tube protection on all sensor inputs to protect the sensor inputs from lightning strikes making the unit safe for remote field applications.

Direct Analogue Output Connection

Using the analogue output channels available on the VBW-108 module the unit can be connected to any Data Acquisition system or logger unit capable of measuring 0-2.5V inputs & 0-100mV and requires thermistor linearisation software when temperature compensation is required.



Vibrating Wire extensometer mounted across a repaired joint



Data Reporting

The VBW-108 systems are all fully integrated with the DataWeb series of data-logging modules.

Part Numbers

VBW-108/NET Unit with RS485 network support