

## *d*-PLUCKER



The *d*-PLUCKER is a small, low cost unit that converts vibrating wire(VW) transducers such as load-cells, stress cells and piezometers, into *d*-Tech compatible instruments. It is available in two 2 different configurations with one (*d*<sup>1</sup>PLUCKER) or four (*d*<sup>4</sup>PLUCKER) VW instruments. D-PLUCKER enables YieldPoint's low cost digital peripheral devices to read (*d*-READER), store(*d*-LOGGER) or transmit (DESTINY) data from VW sensors. The user simply connects the leads of the VW sensor to a terminal block housed inside the unit and then treats the sensor like any other YieldPoint *d*-Tech instrument. The unit outputs the temperature recorded by the thermistor in °C (0.1°C resolution) and the period of vibration of the wire in μS (0.1μS resolution).

### Features:

- ▲ *Inexpensive and versatile solution for VW sensors*
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- ▲ *Allows VW sensors to interface with d-READER, d-LOGGER data-loggers and DESTINY networks*
- ▲ *500-6000Hz (0-5Vdc) square wave sweep. Output in μS or digits.*
- ▲ *Temperature output from thermistor with 0.1C resolution.*
- ▲ *Digital RS485 Output (9600,8,N,1), with Unique Instrument ID, Sensor\_Type, and output data.*

## Technology

The **d-PLUCKER** uses a proprietary algorithm to locate the resonant frequency within the range 500Hz to 6000Hz. An internal switch is used to select 3 different frequency ranges based on the type of instrument used.

Using the **d-READER** it is possible to quickly read the transducer. Using the **d<sup>1</sup>LOGGER** or **d<sup>4</sup>LOGGER** it is possible to log data from 1 or 4 VW sensors over a 100 day duration. Using **DESTINY** it is possible to transmit data over an existing TCP/IP network using either Ethernet or WiFi. A unique ID is assigned to each **d-PLUCKER**.

The output signal from the **d-PLUCKER** is a digital RS485 signal (9600,8,N,1) with ASCII encoded Sensor\_ID, Sensor\_Type, Temp and period.

## Telemetry

### Manual Readout

Readout can be made using YieldPoint's low cost manual interrogation unit (**d-READER**), with a backlit LCD. The Unit displays the Sensor\_Type and Sensor\_ID and outputs the temperature and VW data directly in °C and  $\mu s$ .

The **d-VIEWER** Module provides USB connectivity so that the **d-PLUCKER** can be read with using a Laptop or NetBook PC. If power is available a low cost NetBook computer can be transformed into a data-logger.

### Automated Data Retrieval

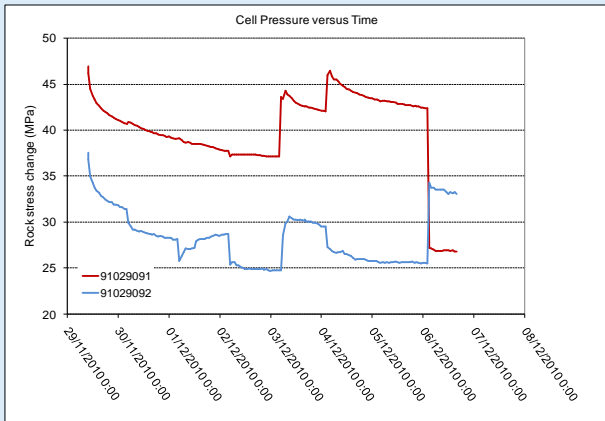
The **d-LOGGER** (32Mb of memory) can collect up to 30000 readings from the **d-PLUCKER** over a period up to 1 year. Download to a PC is with a USB download cable (order separately).

*Plug 'n Play* networks of instruments can be created using YieldPoint's **DESTINY** (digitally Enabled Sensor Transducer and Instrumentation Network from YieldPoint) technology. A low-cost **DESTINY** Slave can connect 4 instruments to a TCP/IP network over Ethernet or WiFi. This solution saves time and money by transmitting data directly to an engineer's desktop computer.

## Applications

- ▲ Monitoring pillar stress changes using vibrating wire BPCs.
- ▲ Monitoring pillar stress changes using vibrating wire stressmeters.
- ▲ Monitoring strain in structural elements using welded vibrating wire strain gauges.
- ▲ Monitoring the loading of structural elements such as posts and pillars
- ▲ Monitoring piezometer arrays.

*Measuring stress changes in a Secondary Rock Pillar .*



*Measured stress changes by two orthogonal Borehole Pressure Cells installed in production hole for a secondary stope pillar. BPCs attached to d'PLUCKERS ( red -longitudinal orientation, blue- transverse). Recorded with d-LOGGER data-logger.*

## Specification

**Range (F.S.):** 166-2000 $\mu$ s period measurement, Temp: -40 to 125 $^{\circ}$ C

**Core Technology:** 20MHz microcontroller providing 0-5V 500-6000Hz sweep

**Output Signal:** RS485 (9600,8,N,1) ASCII encoded signal comprising: Unique Instrument\_ID, Sensor\_Type, Temp ( $^{\circ}$ C) and Period ( $\mu$ S) data

**VW Resolution:** 0.1 $\mu$ s with hand held readout.

**Displ. Accuracy:** - better than +/- 1 $\mu$ s

**Temp. Range** -40 - 125 $^{\circ}$ C

**Temp. Accuracy** +/- 1 $^{\circ}$ C -Digitally trimmed at 0 $^{\circ}$ C and 25 $^{\circ}$ C

**Temp Resolution:** 0.1 $^{\circ}$ C