



d-Tech - Primer

YieldPoint Inc.

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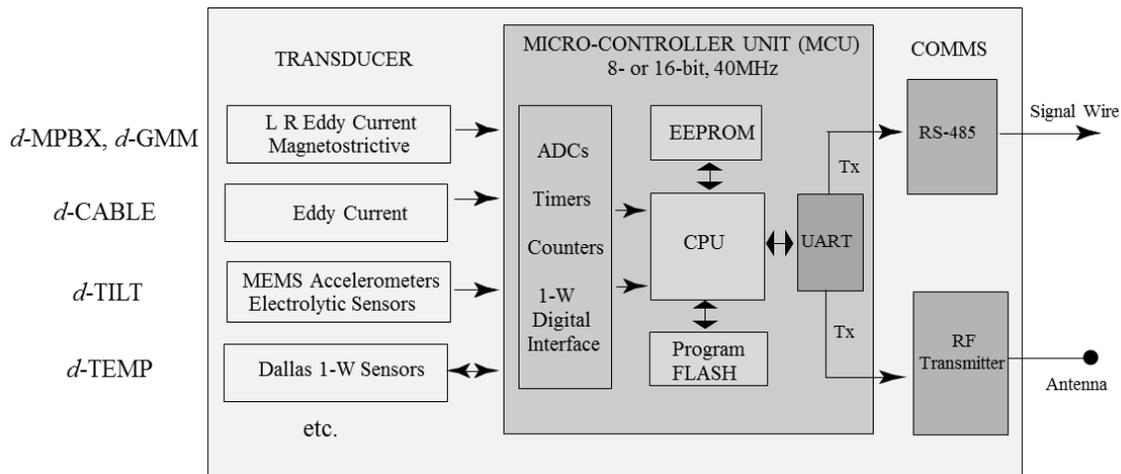
What is *d*-Tech?

***d*-Tech** is digital instrumentation platform developed by YieldPoint Inc. that embeds a microcomputer in every instrument so creating truly SMART geotechnical and structural instruments. The microcomputer performs tasks such as:

1. Sensor excitation
2. Sensor multiplexing
3. A-D data conversions
4. Temperature compensation
5. Digital signal transmission (RS485).
6. Provides a unique instrument ID for every instrument.

***d*-Tech** represents the modern approach to instrumentation that enables clusters of instruments to be easily networked together using technologies such as WiFi and Ethernet. With simplicity comes lower cost especially with respect implementation and maintenance. The advantages permeate to all aspects of data monitoring and management.

Instrument Architecture



***d*-Tech** Instrument architecture involves interfacing a myriad transducer technologies (some SMART digital, some analog) with an embedded microcontroller running at 40MHz, and an output transceiver, usually RS485 or Zigbee wireless.

RS485 Output signal/Lead-wire

The interested reader can discover the intricacies of RS485 in the papers provided on this website. The key points are:

1. The digital signals can be sent using RS485 long distances, theoretically up to 1200m but YieldPoint recommends over 500m. Also, if severed lead-wires can be twisted back together.
2. Signals are transmitted on a balanced twisted pair of wires designated RS485-A and RS485-B.

All YieldPoint instruments, regardless of the number of channels have 4 conductor lead-wire. Two of these conductors carry +Pwr (red) and GND(black), the other two are RS485-A(white) and RS485-B(green).

The output signal is a standard serial (9600,8,N,1) string of the form:

Manufacturer

The first entry represents the sensor manufacturer , in this case YP standing for YieldPoint.

Unique Serial Number

The second csv field is the unique SensorID which is constructed:

1103 21 009

YY/MM TYPE ID

The first 4 digits are the year and month of manufacture, the next 2 represent the Sensor_Type with the 5th digit representing the number of data channels. The final 3 channels are factory assigned sequential IDs.

Sensor_Type

The next CSV represents the Sensor_Type: e.g. d4CABLE, dGMM

Sensor_Type (Numeric)

The first character of Sensor type numeric represents the Number of channels and the second represents the type of channel (1-displacement, 5-load).

Data, Units

The remaining data represents the data from the instrument with alternating values and unit. The values relate directly to the units.

Reading the d-Tech Instruments.

d-READER

d-READER is rugged hand held readout device with a back-lit LCD display.



The **d-READER** with a **d-GMM(DETECT)**.

d-VIEWER

Sensor View is a technology that allows the output from a **d-Tech** instruments to be displayed on a PC over the USB port. This can be useful when conducting laboratory tests. The **d-Viewer** is powered with a 9V battery.

d-LOGGER

d-LOGGER is a very simple data-logger available in 1 instrument (**d¹LOGGER**) or 4 instrument configurations (**d⁴LOGGER**). The data-loggers require minimal configuration and can log data from any type of **d-Tech** instrument. Up to 30,000 readings can be stored in 32Mb of Flash memory. The data is downloaded to individual .txt files corresponding to each instrument ID e.g. 110321001.txt. If different instruments are plugged into the d-Logger during the same session the download process will write these to different files.



The d¹LOGGER and d⁴LOGGER

DESTINY

DESTINY is an interface between 4 **d-Tech** instruments and Ethernet running TCP/IP. The technology is based on the Lantronix Matchport device server. The technology is also available in a WiFi version (RHS).



The *d*-Tech Advanatage

In summary ***d*-Tech** sensor architecture provides the following advantages over legacy analog geotechnical instrumentation systems:

1. Improved Accuracy (i.e. Linearity, Temperature Compensation)
2. Improved Reliability (e.g. non-contact technology, MEMS sensors)
3. Output in Real World Units. All digital sensors have standard readout signal.
4. Output signal includes unique SensorID+ SensorType
5. MUX many channels on a single leadwire pair.
6. Simplified Low-cost Peripherals (e.g.Dataloggers)
7. Simplified Data Transmission(Ethernet running TCP/IP,WiFi)
8. Simpler Data Management