

**Name**

ViewDat

**Version**

1.04

**Synopsis****Viewdat [Port] [Baud] [-bN] [-x]****Description**

VIEWDAT is a simple bench test program for the DIGITISER digitiser. It receives DIGITISER output data over an RS-232 serial port, provides a real-time text display of seismic data, GPS status and instrument state-of-health, and a real-time graphical display of seismic data.

**Usage and Options**

VIEWDAT may be run under DOS or in a DOS window under OS/2 using the command-line syntax given above. If you wish to use the graphical display mode of VIEWDAT you must run the program as a DOS full-screen session. The data port of the DIGITISER should be connected to one of the serial ports (com1 or com2). To avoid missing any data, the program should be started before the DIGITISER is powered up. However, the program may be started at any time; it will start displaying and recording data after receiving the next data sync (at the start of the next data packet).

VIEWDAT recognizes the following command-line options:

<i>Com Port</i>	Specify com1 or com2 to specify to which serial port the DIGITISER is connected. Default is com2.
<i>Baud Rate</i>	Specify the baud rate for communication with the DIGITISER. Accepted values are 12(00), 24, 48, 96, 192 and 384. The default is 38400. This MUST be set to the same value as that being used for transmission by the DIGITISER.
<i>Data Bundles per Packet (-bN)</i>	Specify the number of data bundles per compressed data packet. This must be an odd number in the range of 1 to 59. This MUST be set to the same value as that being used for transmission by the DIGITISER. The default is 59.
<i>Transmission Mode (-x)</i>	Data transmission may be optimized for wire (default) or radio mode (-x). In radio mode the data is scrambled and the data is augmented by filler in order to maintain the full transmission baud rate. In wire mode the data is unscrambled. This parameter MUST be set to the same value as that being used for transmission by the DIGITISER.
<i>Help (-h)</i>	Type VIEWDAT -h to display a usage summary.

**Commands**

VIEWDAT recognizes the following keyboard commands:

V	Toggles between the two display modes (text and graphics).
P	Pauses the display (stops displaying incoming data).
R	Resumes updating the display.
ESC	Exit the program.

In graphics mode VIEWDAT also provides the following commands:

D	Toggle the DC removal option. DC removal Off - the raw data is displayed DC removal On - the packet mean is subtracted from the data before plotting.
+/-	Changes the vertical scale factor for the trace plots.

**Text Mode Display**

The VIEWDAT text display is divided into 4 parts:

1. The top section of the screen shows current signal statistics from each data channel,
2. the next section shows the current GPS status,
3. the third section shows the most recent state-of-health readings and
4. the bottom section logs incoming messages and communication diagnostics.

**Data Display**

The VIEWDAT display is packet-based. The DIGITISER outputs data in packets which contain a timestamp, followed by 4N to 16N data samples in a compressed format, where N is the number of data bundles per packet (see above). For example, if N = 59, each packet contains 236 to 944 samples, which corresponds to 1.2 to 4.7 seconds of data at 200 sps. VIEWDAT computes signal statistics based on the data contained within a single packet and displays the following information:

<i>Channel Number</i>	The digitiser channel number (0 to 5).
<i>Sequence Number</i>	The sequence number of this packet. Packets are numbered sequentially for each channel. Sequence number is reset to zero when the DIGITISER is restarted. Only the last 4 digits of the sequence number are shown.
<i>Time</i>	The time of the first sample in the packet in the format MM:SS.FRAC.
<i>Number of Samples</i>	The number of samples in the packet. This is also the number of samples over which the displayed values are calculated.
<i>Maximum</i>	The maximum sample value in the packet.
<i>Minimum</i>	The minimum sample value in the packet.
<i>Mean</i>	The arithmetic mean of all sample values in the packet.
<i>RMS</i>	The root mean square (standard deviation) of the sample values in the packet.
<i>Trend</i>	The rate of change of the mean value per second. This is determined through a linear regression of the sample value vs. time.
<i>ZC - zero crossings</i>	The number of zero crossings in the packet.
<i>Frequency</i>	Estimated signal frequency is based on the number of zero crossings. This is meaningful only for sinusoidal input signals.

**GPS Display**

The GPS status display shows the GPS status and activity as determined from the most recent message received.

**Status**

Unlocked	The GPS is off or unlocked (not providing accurate time information).
Coarse Lock	The GPS is locked and the instrument time is in fast-lock mode.
Fine Lock	The GPS is locked and the instrument time is in fine-lock mode.

**Mode**

NAV 3D	The GPS has a full 3D time and position solution.
NAV 2D	The GPS has a 2D time and position solution.
ACQ	The GPS is searching for satellites and does not have accurate time and position.
ACQ COLD:	The GPS is searching for satellites in cold start mode.

**Num Satellites**

This shows the number of satellites used for the current GPS time and position solution.

**Figure of Merit**

An indicator of the horizontal position accuracy: 1 = best; 9 = unlocked.

### Date, Time and Position

The middle column of the GPS display shows the time and position returned by the GPS clock. Note that the time may not be completely up to date since the GPS information messages may be buffered for some time before being transmitted to VIEWDAT.

### Channel Status

The right hand column of the GPS display shows the current activity of the 5 GPS channels. Each channel may be searching for a satellite, tracking a satellite, or idle. The display also shows the PRN number of the satellite being searched for or tracked and the signal to noise ratio of the incoming GPS signal. The signal to noise ratio must usually be over 30 in order to track a satellite; over 40 is better. Poor signal to noise ratios often indicate that the GPS antenna is obstructed.

### State of Health Display

<i>SSOH and FSOH</i>	These fields show the most recent readings from the slow and fast state-of-health channels respectively. Readings are shown as counts from a 10-bit A/D and are always between 0 and 1023.
<i>Comm Rx</i>	This shows the number of bytes received from the DIGITISER by VIEWDAT.
<i>Comm Ovr</i>	This shows the number of bytes lost due to com port overruns (should be zero).
<i>Bytes Lost</i>	This shows the number of bytes lost due to sync or CRC errors. This should be zero for a good communication link. Any change in this value indicates that one or more messages has been lost, usually due to noise or fading on the serial data link.

### Graphical Display

In graphical display mode VIEWDAT plots the contents of each data packet as it is received. The vertical scale may be adjusted by pressing + or -; the current scale factor is shown in the status line at the top of the screen. The horizontal scale is adjusted automatically to the number of samples in the data packet. To the left of each trace VIEWDAT displays the maximum, minimum, mean and RMS for the current packet. The sequence number and number of samples for the displayed packet is shown in the upper left corner of the trace box; the time of the first sample is shown in the lower left corner. Definitions of all displayed fields are given above.

*Note that VIEWDAT plots packets; since packets on different channels may be generated at different times the traces shown are not, in general, aligned with each other along the time axis.*

### Environment

Viewdat will run under DOS (DOS 6.2 or higher), in DOS full-screen mode under OS/2, Windows95 or WindowsNT.

### This document information

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