DT85G Series 4 Data Logger

Geotechnical Logger

Advanced design and technology plus 25 years of geotechnical expertise have produced the dataTaker DT85G GeoLogger – A versatile, powerful – yet low power & cost effective data logger.

It support vibrating wire and other geotechnical sensors such as Slope Indicator, RST Instruments, Geokon, Soil Instruments, Roctest, AGI – Applied Geomechanics Inc.

DT85G is also capable to test sensor integrity through audible frequency

With temperature compensation (thermistor), 16 analog channels are capable to read up to 16 vibrating wire sensors. If temperature compensation is not required this logger can read up to 48 vibrating wire sensors.

Further expansion up to 320 sensors (with temperature compensation) or 960 sensors (without temperature compensation) is possible.

Superior Data Storage & Communications

With the standard unit able to store up to 10 million data points (expandable) you can log as much or as little as you need. Overwrite or stop logging once allocated memory is full, archive data on alarm event, copy to USB memory or transfer via FTP/ Email, the choice is yours.

Communications features include RS232, USB and Ethernet, connect to the DT85G locally, remotely through a modem or over the Internet. The web interface allows users to configure the DT85G, access logged data and see current measurements as mimics or in a list using a web browser.

FTP/ Email provides data to your office over the internet or wireless network, without the need for polling or specific host software.

Applications include:

Land Slide Prevention  Mining Exploration  Concrete Curing
Dam Wall Monitoring  Tunnel Excavation  GPS

Vibrating Wire Support
Carlson, Electro Level & LVDT support
Strain Gauge Support
Dual Channel Isolation Technology
Up to 48 Analog (± 50V) sensor inputs
Expandable to 960 analog inputs
Programmable Analog Output
Modbus for SCADA connection
Web & FTP client / server
USB memory for easy data and program transfer

Warranty: All dataTaker Data Loggers are covered by a 3 year warranty on workmanship and parts. For further information on the dataTaker range, or for useful downloads, visit the dataTaker web site at www.dataTaker.com or contact your nearest dataTaker office or distributor.

Quality Statement: dataTaker operates a Quality Management System complying with ISO9001:2008. It is dataTaker’s policy to supply customers with products which are fit for their intended purpose, safe in use, perform reliably to published specification and are backed by a fast and efficient customer support service.

Trademarks: dataTaker is a registered trademark.

Specifications: dataTaker reserves the right to change product specifications at any time without notice.

Designed and Manufactured in Australia.

*Our ability to provide free software and support is dependent on applicable export control laws (including those of the United States) and the export policy from time to time of Thermo Fisher Scientific Inc.
What is dEX?
dEX is an intuitive graphical interface that allows you to configure your data logger, view real-time data in mimics, trend charts or tables and retrieve your historical data for analysis.
dEX runs directly from your web browser and can be accessed either locally or remotely, anywhere that a TCP/IP connection is available including worldwide over the Internet. You can use any of the logger’s built-in communications ports to view dEX including Ethernet, USB and RS-232.

Easy configuration
The dEX configuration editor allows you to view, edit and save logger configurations in an easy-to-use Windows Explorer style user interface.

Real-time monitoring
dEX displays real-time sensor measurements, calculations and diagnostic information using mimics, tables and trend charts.

Data retrieval
dEX allows you to retrieve your data at the click of a mouse button. Just select either All, Range or New Data Only.

- Built-in software – no application to install
- Runs directly from your web browser
- Accessible by Ethernet or USB¹ connection
- Intuitive graphical interface
- Easy-to-use configuration editor
- Access live and historical data
- View data as charts, mimics and tables

¹ USB port equipped models only.
**Browser-based solution**

dEX comes pre-installed on every logger in the DT80 range\(^2\). The software loads in your web browser so there is no need to install cumbersome applications on your computer. Being browser-based, dEX is cross-platform and will work on all major operating systems including Windows, Mac and Linux. To simplify it even further, dEX starts automatically in your default web browser when you connect to your logger using a USB cable\(^1\).

**Data that is compatible with your applications**

Logged data is ready to import into common spreadsheet and data processing applications such as Excel for further analysis and reporting. Data can be saved to your computer in comma separated (.CSV) format or our proprietary binary (.DBD) format.

**Command window**

The command window provides a terminal interface which allows the built-in command language of the logger to be used. Macro buttons allow common commands to be sent on a button press.

**Configuration editor**

The configuration editor allows you to view, edit and save logger configurations in an easy-to-use Windows Explorer style user interface. Tree view of configuration allows definition of measurement schedules and measurements. Wiring diagrams show available wiring configurations for each sensor type. Configuration can be stored and retrieved on either the logger or a local computer.

**Channel list**

Displays name, value, units, alarm state, time stamp and logging state for each measurement.

**Customisation of the application**

The menu options, mimics panels and mimics can be added or removed to suit novice or advanced users. The color and brand name images within dEX can be customised to match corporate requirements or for personal preference.

Mimics are organised into panels which can be modified to highlight custom alarm conditions or data grouping. Mimics include dials, bar graphs, thermometers etc. Real-time chart recorder mimic allows you to view trends and historical data over a custom time/date range. Up to 16 mimics can be displayed on up to 5 mimic pages (default is 1 page of 6 mimics).

**Minimum system requirements**

- Web Browser (tested with): Internet Explorer V7 and above, Firefox, Safari & Google Chrome
- TCP/IP connection
- Adobe flash player 10 or higher
- Screen resolution of 1024 x 768

**Chart Recorders Mimic**

Real-time trending for sensors, calculations or other data. Supports up-to 5 traces per chart and up-to 2 Y-axes. Backfills with historical data stored in logger.

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\(^2\) dEX operates on all DT80 Series 2, Series 3 and Series 4 except Series 1.
Technical Specifications

Analog Channels
16 analog input channels (expandable to 320*)
Each channel is independent and supports: one isolated 3-wire or 4-wire input, or two isolated 2-wire inputs, or three common referenced 2-wire inputs.
The following maximums apply.
• Three wire with common reference terminal: 48 (expandable to 960*)
• Two wire isolated: 32 (expandable to 640*)
• Three and four wire isolated: 16 (expandable to 320*)
*Expansion requires optional ESM20

Fundamental Input Ranges
The fundamental inputs that the DT85G can measure are voltage, current, resistance and frequency. All other measurements are derived from these.

Sampling
Integrates over 50/60Hz line period for accuracy and noise rejection
Maximum sample speed: 40Hz
Effective resolution: 18 bits
Linearity: 0.01%
Common mode rejection: >90dB

Inputs
Inter-Channel Isolation: 1000V (relay switching)
Analog Section Isolation: 1000V (opto-isolated)
Input impedance: 160KΩ, >100MΩ
Common mode range: ±3.5V or ±5V (attenuator on/off)

Sensor Excitation (Supply)
Analog channels:
• selectable 2µA, 213µA or 2.5mA precision current source
• 4.5V voltage source
• switched external supply
General Purpose: Switchable 12V/5V regulated supply for powering sensors and accessories (max 300mA).

Analog Output
Isolated programmable 16-bit DAC: voltage 0-10V or current 0-24mA

Analog Sensors
Supports a wide range of sensors including, but not limited to, those listed below. A wide range of sensor scaling and linearising facilities including polynomials, expressions and functions.

Thermocouples
Calibration standard: ITS-90

RTDs
Materials supported: Pt, Ni, Cu
Resistance range: 10Ω to 1MΩ

Vibrating Wire
Frequency range: 500 to 5kHz
Col. resistance: 50 to 250Ω
Stimulation method: single pulse pulsed

Thermistors
Types: Y93 400Ω Series, other types*
Resistance range: up to 1MΩ
* Other thermistor types are supported by thermistor scaling and calculated channels.

Monolithic Temperature Sensors
Types supported: LM34 - 85, AD590, 592, TMPx, LM135, 235, 335

Strain Gauge and Bridge Sensors
Configurations: 1/4, 1/2, & full bridge
Excitation: voltage or current
4-20mA Current Loop
Internal 100Ω shunt or external shunt resistor

Digital Channels
Digital Input/Outputs
8 bi-directional channels
Input Type: 8 logic level (max 20/30V)
Output Type: 4 with open drain FET(max 30V, 100mA)
4 with logic output

Relay Output
1 latching relay, contacts (max: 30Vdc, 1A)

Counter Channels
Low Speed Counters
8 counters shared with digital inputs.
Low speed counters do not function in sleep mode.
Size: 32 bit Max Count rate: 10 Hz

Serial Channels
SDI-12
4 SDI-12 inputs, shared with digital channels. Each input can support multiple SDI-12 sensors.

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Generic Serial Sensor
Flexible options to allow data to be logged from a wide range of smart sensors and data streams.
Available ports: Serial Sensor Port (RS232, RS422, RS485)
Host RS232 Port*
Baud rate: 300 to 115,200
*If used as a Serial Sensor channel then the Host Port is not available for other communications.

Calculated Channels
Combines values from analog, digital and serial sensors using expressions involving variables and functions.
Functions: An extensive range of Arithmetic, Trigonometric, Relational, Logical and Statistical functions are available.

Alarms
Condition: high, low, within range and outside range
Delay: optional time period for alarm response
Actions: set digital outputs, transmit message, execute any datataker command.

Scheduling of Data Acquisition
Number of schedules: 11
Schedule rates: 10ms to days

Data Storage
Internal Store
Capacity: 128MB (approx 10,000 data points)
Larger storage available refer to technical support.
Removable USB store device (optional accessory)
Types: compatible with USB 1.1 or USB 2.0 devices,
 então Flash drive.
Capacity: approx. 80,000 data points per megabyte.

Communication Interfaces
Ethernet Port
Interface: 10BaseT (10Mbps)
Protocol: TCP/IP, Modbus (Master & Slave)
USB Port
Interface: USB 1.1 (virtual COM port)
Protocol: ASCII command
Host RS232 Port
Speed: 300 to 115,200 baud (57,600 default)
Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None
Handshake lines: DCD, DSR, DTR, RTS, CTS
Modem support: auto-answer and dial out
Protocols: ASCII Command, TCP/IP (PPP), Modbus (Master & Slave), Serial Sensor

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• Speed: 300 to 57,600 Baud
• Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None
• Protocols: Modbus (Master & Slave), Serial Sensor

Network (TCP/IP) Services
Uses Ethernet and/or Host RS232 (PPP) ports
Command Interface
Access the ASCII command interface of the DT85G via TCP/IP
Web Server
Access current data and status from any web browser.
Custom pages can be defined. Download data in CSV format, Command interface window. Define mimic displays.
Modbus Server (slave)
Access current data and status from any Modbus client
(e.g. SCADA system)

Modbus Client (master)
Read/write data from modbus sensors and devices
including PLC’s, datataker loggers, modbus displays etc.

FTP Server
Access logged data from any FTP client or web browser

FTP Client
Automatically upload logged data direct to an FTP server

System
Display and Keypad
Type: LCD, 2 line by 16 characters, backlit.
Display Functions: channel data, alarms, system status.
Keypad: 6 keys for scrolling and function execution.
Status LEDs: 4 for sample, disk, attention and power.

Firmware Upgrade
Via: RS232, Ethernet, USB or USB disk.

Real Time Clock
Normal resolution: 200 µs
Accuracy: ±1 min/year (0°C to 40°C),
±4 min/year (40°C to 70°C)

Power Supply
External voltage range: 10 to 30Vdc
Peak Power: 12W (12volt: 1A)
Average power Consumption
Using 12Vdc external power source
Sampling Speed Average Power
1 minute 200mW
5 seconds 500mW
30 seconds 1.3W
5 minutes 7W
1 hour 60W

Physical and Environment
Construction: Powder coated zinc and anodized aluminum.
Dimensions: 300 x 137 x 65mm
Weight: 2.5kg (shipping)
Temperature range:–45°C to 70°C*
Humidity: 85% RH, non-condensing
Reduced battery life and LCD operation outside range –15°C to 50°C

Accessories Included
Resource CD: Includes software, video training and user manual.
Comms cable: USB cable
Line adaptor: 110/240Vac to 15Vdc, 800mA

For full technical specifications download the
user’s manual from our website www.datataker.com

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