dataTaker

DT82EM Series 3 Data Logger

Designed especially for environmental monitoring

Applications include:

Environmental Monitoring
Research & Development
Weather Stations
Thermistor Arrays
Wind Power Generation
Agricultural Research
Total Energy Monitoring
Temperature Profiling
Aquaculture

***FREE** Software & Technical Support*

- » Ultra low-power design
- » Integrated cellular modem
- » Automatic data transfer to email or FTP
- » Support for up to 10 SDI-12 sensors
- » Up to 6 Analog (± 30V) sensor inputs
- » Flexible digital channels & counters
- » Modbus for SCADA connection
- » Switchable 12V & 5V supplies for powering sensors

Designed For Remote Applications

The dataTaker DT82EM intelligent data logger is a low-powered logging platform with an integrated cellular modem, making it perfect for remote applications. The rugged design and wide operating temperature range of the DT82EM provides reliable operation in virtually any environment. The DT82EM's perfect balance of performance with low-power also allows you to use a smaller solar panel without compromising on functionality.

Automatic Data Delivery

Forget travelling long distances to get your data. Utilise the DT82EM's automatic data delivery features to schedule your data to be automatically emailed to your inbox every day, week, month or other time interval. More sophisticated systems can make use of the automatic data delivery features to send logged data to an FTP server. Alarm conditions can also trigger data delivery in addition to sending alarm messages to multiple email addresses or mobile phones.

Easy To Configure

The DT82EM is configured directly in your web browser using dataTaker's *dEX* graphical interface. *dEX* takes you through the configuration of your logger, showing you wiring diagrams and allowing you to decide – in as much or as little detail – how you want to the system to work, suiting both novice or advanced users. Using the internal modem you can even re-configure your system remotely over the internet if required.

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.*

dEX Logger Software

» Built-in software - no application to install

» Runs directly from your web browser

» Accessible by Ethernet or integrated modem

» Intuitive graphical interface

» Easy-to-use configuration editor

» Access live and historical data

» View data as charts, mimics and tables

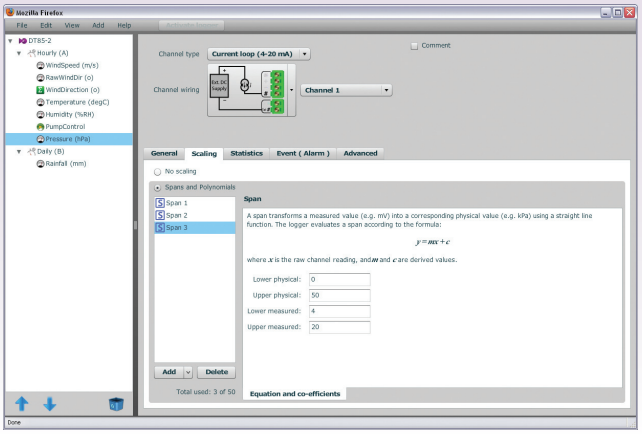
What is dEX?

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.

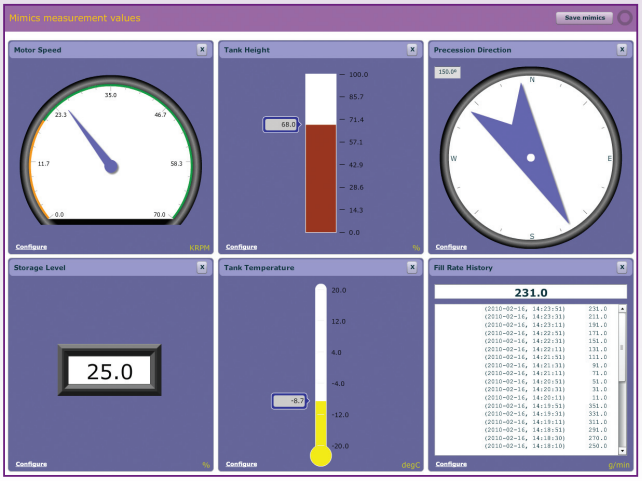
Easy configuration

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



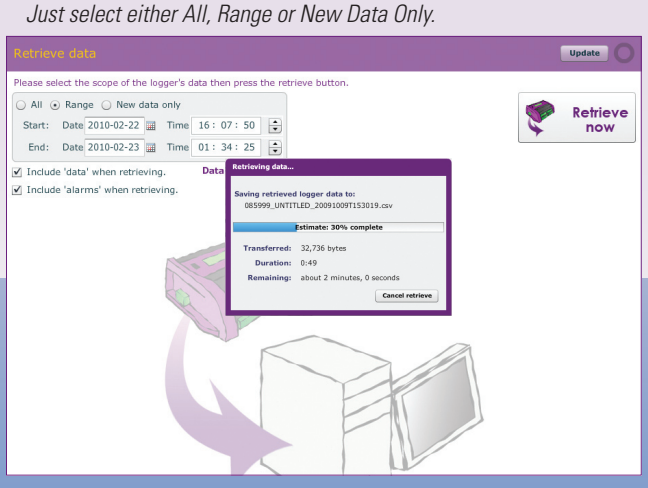
Real-time monitoring

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.



dEX Logger Software

Browser-based solution

dEX comes pre-installed on every logger in the DT80 range.
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.

Data that is compatible with your applicatons

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.

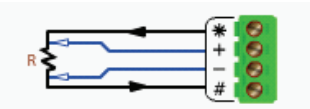
Command window

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.

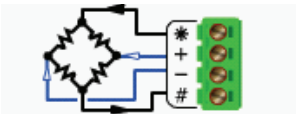
Configuration editor

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.



Platinum RTD (4 wire)



Voltage bridge (+ / #)

Channel list

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

Run ▲	Name	Value	Units	Alarm	Time stamp	Log
✓	1hr_Humidity	51	%RH		2010-02-02, 12:00:00	✓
✓	1hr_Mean Win	0	m/s		2010-02-02, 12:00:00	✓
✓	1hr_Mean Win	7			2010-02-02, 12:00:00	✓
✓	1hr_Pressure	1006	hPa		2010-02-02, 12:00:00	✓
✓	1hr_Temperati	23.6	Deg C		2010-02-02, 12:00:00	✓
✓	1min_Humidit	48	%RH		2010-02-02, 12:32:00	✓
✓	1min_Mean Wi	0	m/s		2010-02-02, 12:32:00	✓

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.

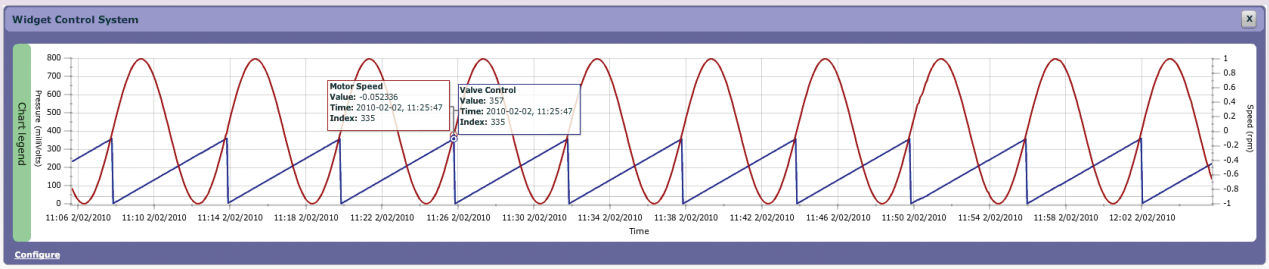
Mimics are organised into panels which can be modified to highlight custom alarm conditions or data grouping. Mimics include dials, bar graphs, thermometers etc. Real-time chart recorder mimic allows you to view trends and historical data over a custom time/date range. Up to 16 mimics can be displayed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

Minimum system requirements

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

Chart recorder 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.



*The difference is **dEX!***

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Technical Specifications

Analog Channels

2 analog input channels
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.
Two wire with common reference terminal: 6
Two wire isolated: 4
Three and four wire isolated: 2

Fundamental Input Ranges

The fundamental inputs that the DT82EM can measure are voltage, current, resistance and frequency. All other measurements are derived from these.

Full Scale	Res olution	Full Scale	Resolution
±30 mVdc	0.25 µV	100 Ω	1.5 mΩ
±300 mVdc	2.5 µV	1000 Ω	15 mΩ
±3 Vdc	25 µV	10,000 Ω	150.00 mΩ
±30 Vdc	250 µV	100 Hz	0.0002 %
±0.3 mA	2.5 nA	10 kHz	0.0002 %
±3 mA	25 nA		
±30 mA	250 nA		

Auto-ranging is supported over 3 ranges.

Accuracy

Measurement at ...	5°C to 40°C	– 45°C to 70°C
DC Voltage	0.1%	0.35%
DC Current	0.15%	0.45%
DC Resistance	0.1%	0.35%
Frequency	0.1%	0.25%

Accuracy table above is % of reading ±0.01% of full scale.

Sampling
Integrates over 50/60Hz line period for accuracy and noise rejection
Maximum sample speed: 25Hz
Effective resolution: 18 bits
Linearity: 0.01%
Common mode rejection: >90dB
Line series mode rejection: >35dB

Inputs
Inter-Channel Isolation: 100V (relay switching)
Analog Section Isolation: 100V (opto-isolated)
Input impedance: >100MΩ, 100KΩ (30v range)
Common mode range: ±3.5V or ±30V on 30V range

Sensor Excitation (Supply)
Analog channels: selectable 250µA or 2.5mA precision current source, 4.5V voltage source, or switched external supply.
General Purpose: Switchable 12V regulated supply for powering sensors & accessories (max 150mA). Switchable 5V regulated supply for powering analog sensors (max 25mA).

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
Types: B, C, D, E, G, J, K, N, R, S, T
Calibration standard: ITS-90

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

Thermistors
Types: YSI 400xx Series, other types*
Resistance range: <10kΩ**

* Other thermistor types are supported by thermistor scaling and calculated channels.

**Resistance range can be increased with the use of a parallel resistor.

Monolithic Temperature Sensors
Types supported: LM34 - 60, AD590, 592, TMPxx, LM135, 235, 335

Strain Gauge and Bridge Sensors
Configurations: ¼ , ½ & full bridge
Excitation: voltage or current

4-20mA Current Loop
Internal 100Ω shunt or external shunt resistor

Digital Channels

Digital Input/Outputs
4 bi-directional channels
Input Type: 4 logic level (max 20/30V)
Output Type: 3 with open drain FET(max: 30V, 100mA), 1 with logic output.

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

Counter Channels

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

Dedicated Counter Inputs
4 high speed inputs
Size: 32 bit
Max count rate: 100 kHz
Input type: 2 logic level inputs (max ±30V), and 2 programmable inputs as either logic level inputs or sensitive inputs (10mV) for magnetic pick-ups (max ±10V)

Serial Channels

SDI-12
1 SDI-12 input shared with a digital channel
Supports up to 10 SDI-12 sensors.

Calculated Channels

Combine 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 via SMS or email, execute any dataTaker command.

Scheduling of Data Acquisition

Number of schedules: 11
Schedule rates: 10ms to days

Data Storage

Internal Store
Capacity: 128MB = approx 10,000,000 data points

Removable USB store device(optional accessory)
Types: compatible with USB 1.1 or USB 2.0 drives, e.g. Flash drive.
Capacity: approx. 90,000 data points per megabyte

Communication Interfaces

Ethernet Port
Interface: 10BaseT (10Mbps)
Protocol: TCP/IP

Network (TCP/IP) Services

Uses Ethernet port or integrated modem

Command Interface
Access the ASCII command interface of the DT82EM via TCP/IP

Web Server
Access *dEX* to view data or configure the logger.
Define custom dynamic web pages.
Download data in CSV or DBD format.
Command interface window.
Define mimic displays.

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

FTP Client
Automatically upload logged data direct to an FTP server.

Modbus Server (Slave)
Access current data and status from any Modbus client (e.g. SCADA system)

Email Client
Email data or alarms directly from the logger.

DDNS Client
Browse directly to the logger over the Internet using Dynamic DNS.

System

Display and Keypad
Type: LCD, 2 line by 16 characters, backlight.
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: Ethernet, USB disk.

Real Time Clock
Normal resolution: 200µs
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

Average Power Consumption (typical)
Using 12Vdc external power source
Values within brackets represent the additional power required by the modem to push data daily to an FTP server.

Schedule Rate	1 analog sample Average Power (mW)	6 analog samples Average Power (mW)
1 sec	540 (9)	840 (27)
5 sec	250 (3)	330 (7)
30 sec	50 (2)	65 (2)
1 min	30 (2)	40 (2)
5 min	15 (2)	15 (2)
30 min	10 (2)	10 (2)
1 hrs	10 (2)	10 (2)

Inbuilt Modem

Features
Alarms: Send email or SMS messages
Data: Send data to an email address or FTP server
Remote access: Connect to dEX or Command interface
SIM interface: SIM Socket (1.8V/3V)

Networks and Frequencies

USA Only:
Interfaces: EDGE, GPRS, GSM, CSD

All other places:
Interfaces: EDGE, GPRS, GSM, WCDMA, HSUPA, HSDPA

Frequencies:
EDGE/GPRS/GSM: 850/900/1800/1900 MHz
WCDMA/HSUPA/HSDPA: 850/1900/2100 MHz

Physical and Environment

Construction: Powder coated steel and anodized aluminum.
Dimensions: 180 x 137 x 65mm
Weight: 900 gram (3kg shipping)
Temperature range: -30°C to 70°C *
Humidity: 85% RH, non-condensing
*reduced LCD operation outside range -15°C to 50°C

Accessories Included

Resource CD: includes software, video training and user manual.
Comms cable: Ethernet crossover cable
Line adaptor: 110/240Vac to 15Vdc, 800mA
Antenna with 2m cable

Optional Accessories

A range of accessories are available.

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