DT80 Series 3 Data Logger

Intelligent Data Logging Products

» Dual Channel Isolation Technology
» 2 Serial ‘Smart Sensor’ ports
» FTP for automatic data transfer
» Up to 15 Analog (± 30V) sensor inputs
» Expandable to 300 analog inputs
» Modbus for SCADA connection
» SDI-12 (multiple networks)
» USB memory for easy data and program transfer

Applications include:

- Research & Development
- Agricultural Research
- Weather Stations
- Total Energy Monitoring
- Environmental Monitoring
- Temperature Profiling
- Thermistor Arrays
- Aquaculture
- Structural Monitoring
- Strain Gauges
- Process Monitoring
- Fault Identification
- Machine Down Time
- Pressure
- Load Cells
- Flow
- Vehicle Testing
- GPS
- CANgate (optional)
- – CAN bus
- – J1939
- – OBDII

The Smarter Solution

The dataTaker DT80 smart data logger provides an extensive array of features that allow it to be used across a wide variety of applications. The DT80 is a robust, stand alone, low power data logger featuring USB memory stick support, 18 bit resolution, extensive communications capabilities and built-in display. The dataTaker DT80’s Dual Channel concept allows up to 10 isolated or 15 common referenced analog inputs to be used in many combinations. With support for multiple SDI-12 sensor networks, Modbus for SCADA systems, FTP and Web interface, 12V regulated output to power sensors, the DT80 is a totally self contained solution.

Versatile Measurement

Connect an array of sensors through the versatile Analog and digital channels, high-speed counter inputs, phase encoder inputs, programmable serial sensor channels and the optional CANgate interface available for CAN bus applications. Temperature, voltage, current, 4-20mA loops, resistance, bridges, strain gauges, frequency, digital, serial and calculated measurements can all be scaled, logged and returned in engineering units or within statistical reporting. Set up sampling, logging, alarm and control tasks to suit your own requirements while interfaces for smart sensors, GPS and other intelligent devices expand the DT80 flexibility.

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, the choice is yours. Communications features include RS232, USB and Ethernet, connect to the DT80 locally, remotely through a modem or over the Internet. The web interface allows users to configure the DT80, access logged data and see current measurements as mimics or in a list using a web browser. FTP provides data to your office over the internet or mobile phone network, without the need for polling or specific host software.

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 in 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.

www.datataker.com

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dEX Logger Software

» 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

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, USB¹ 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.
**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

1. USB port equipped models only.
2. dEX operates on all DT80 range Series 2 & Series 3 models (DT80, DT81, DT82E, DT85, DT80G, DT85G). The latest firmware which includes dEX is available for download from the dataTaker website. DT80 range Series 1 models do not support dEX.

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**The difference is dEX!**

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Technical Specifications

Analog Channels
5 analog input channels (expandable to 100*)
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 maximum applies.
Two wire with common reference terminal: 15 (expandable to 300*)
Two wire isolated: 10 (expandable to 200*)
Three and four wire isolated: 5 (expandable to 100*)
*Expansion requires optional CEM20

Fundamental Input Ranges
The fundamental inputs that the DT80 can measure are voltage, current, resistance, and frequency. All other measurements are derived from these.

<table>
<thead>
<tr>
<th>Full Scale</th>
<th>Resolution</th>
<th>Full Scale</th>
<th>Resolution</th>
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</thead>
<tbody>
<tr>
<td>±0.25 μV</td>
<td>100 μV</td>
<td>100 μV</td>
<td>±5 mV</td>
</tr>
<tr>
<td>±0.25 mVdc</td>
<td>1000 μV</td>
<td>1000 μV</td>
<td>±15 mV</td>
</tr>
<tr>
<td>±3 μV</td>
<td>14.0 μV</td>
<td>14.0 μV</td>
<td>±30 mV</td>
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<tr>
<td>±30 mV</td>
<td>1.40 mV</td>
<td>1.40 mV</td>
<td>±150 mV</td>
</tr>
<tr>
<td>±30 mΩ</td>
<td>1.4 mΩ</td>
<td>1.4 mΩ</td>
<td>±2000 mΩ</td>
</tr>
<tr>
<td>±300 mΩ</td>
<td>14 mΩ</td>
<td>14 mΩ</td>
<td>±15 kΩ</td>
</tr>
</tbody>
</table>

Accuracy
Measurement accuracy:
5°C to 40°C ~ -40°C to 70°C
DC Voltage
0.1% ± 0.15%
DC Current
0.1% ± 0.15%
DC Resistance
0.1% ± 0.15%
Frequency
0.1% ± 0.25%
Accuracy table above is 1% of reading ± 0.01% of full scale.

Sampling
Integrates over 50/60Hz line period for accuracy and noise reduction.

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: 10kΩ
Common mode range: ±5V or ±35V 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, J, K, N, R, S, T
Calibration standard: ITS-90
RTDs
Materials supported: Pt, Ni, Cu
Resistance range: 100 to 10KΩ

Thermistors
Types: YSI 4000xx 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: LM334 - 60, AD590, 592, TMPxx, LM135, 235, 335
Strain Gauge and Bridge Sensors
Configurations: 3/4, 3/16 full bridge
Excitation: voltage or current
4-20mA Current Loop
Input 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 counter do not function in sleep mode.
Size: 32 bit
Max Count Rate: 10 Hz

Dedicated Counter Inputs
4 high speed or 2 phase encoder (quadrature) inputs
Size: 32 bit
Max Count Rate: 100 kHz
Input Type: 2 logic level inputs (max ±30V), 2 sensitive inputs (10mV) for magnetic pick-ups (max ±10V)

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

Generic Serial Sensor
Flexible option to allow data to be logged from a wide range of smart sensors and data streams.
Available ports: Serial Sensor Port (RS232, RS422, RS485) or Host RS232 Port*
Baud rate: 300 to 115200

*If used as a Serial Sensor channel then the Host Port is not available for other communications.

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: set time period for alarm response
Actions: set digital outputs, transmit message, execute any data logger 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
Larger storage available refer to technical support.

External Store
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)
Protocols: TCP/IP, Modbus (Master & Slave)
USB Port
Interface: USB 1.1 (virtual COM port)
Protocols: ASCII command
Host RS232 Port
Speed: 300 to 115200 baud (57.6kHz default)
Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None

Modbus (Master & Slave), Serial Sensor
Serial Port
Interface: RS232, RS422, RS485
Speed: 300 to 57600 baud
Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None

Application: Modbus (Master & Slave), Serial Sensor

Network (TCP/IP) Services
Uses Ethernet and/or Host RS232 (PPF) ports

Command Interface
Access the ASCII command interface of the DT80 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 display 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, backlight.
Display Functions: channel data, alarms, system status.
Keypad: 6 keys for scrolling and function execution.
Steady LEDs: 4 for sample, disk, attention and power

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

Real Time Clock
Normal resolution: 200ps
Accuracy: ±1min/year (0°C to 40°C), ±6 min/year (-40°C to 70°C)

Power Supply
External voltage range: 10 to 30Vdc
Internal battery: 6Vdc, 1.2Ah lead acid
Peak Power: 12W (12Vdc 1A)

Average power Consumption
Using 12Vdc external power source

Sampling Speed
Average Power
1 second
1500 mW
5 second
500 mW
30 second
135 mW
5 minutes
70 mW
1 hour
60 mW

Typical Operating Time
From internal 6Vdc, 1.2Ahr battery

Sampling Speed
Operating Time
1 second
6 hours
5 second
1 day
1 minute
10 days
1 hour
3.5 months

Physical and Environment
Construction: Powder coated zinc and anodized aluminum.
Dimensions: 180 x 137 x 65mm
Weight: 1.5kg (4kg shipping)

Temperature range: ±45°C to 70°C + Humidity: 85% RH, non-condensing

* Reduced battery life if the DT80 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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