DT80W Series 4 Data Logger

Intelligent Data Logging Products

**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

**Versatile Measurement**

Connect an array of sensors through the versatile analog and digital channels, high-speed counter inputs, phase encoder inputs and programmable serial sensor channels.

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 DT80W flexibility.

**Local Wireless Access**

With wireless access, no need to have physical connection to the logger. Send the program, view and download the data or even modify your setting on nearby PC or Tablet wirelessly either as a Master (Access Point mode) or Slave (Client).

**Automatic Data Delivery**

On Client mode dataTaker can have access to local router and if the router has internet access it can utilise the DT80W’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.

**Easy To Configure**

The DT80W 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 the system to work, suiting both novice or advanced users.

- Dual Channel Isolation Technology
- Up to 15 Analog (± 50V) sensor inputs
- Expandable to 300 analog inputs
- 12 flexible digital terminals
- 2 Serial ‘Smart Sensor’ ports
- SDI-12 (multiple networks)
- Programmable Analog Output
- Integrated WiFi
- Automatic data transfer via email or FTP
- Sending alarm via SMS or email
- Modbus for SCADA connection
- USB memory for easy data and program transfer
- Web & FTP client / server

**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 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, 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.

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

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\(^2\) dEX operates on all DT80 Series 2, Series 3 and Series 4 except Series 1.
**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 referred 2-wire inputs.
- The following maximums apply:
  - 2-wire with common reference terminal: 15 (expandable to 300*)
  - 2-wire isolated: 10 (expandable to 200*)
  - 3- and 4-wire isolated: 5 (expandable to 100*)
- Expansion requires optional OEM20

**Fundamental Input Ranges**
- The fundamental inputs that the DT80W can measure are voltage, current, resistivity, 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%
- Communication mode rejection: >90dB
- Line series mode rejection: >35dB

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

**Sensor Excitation (Supply)**
- Analog channels:
  - selectable 2.5V, 213mA or 2.5mA precision current source
  - 4.5V voltage source
  - switched external supply
- General Purpose: Switchable 12V/24V regulated supply for powering sensors and accessories (maximums 150mA).

**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 linearisation facilities including polynomials, expressions and functions.

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

**Thermistors**
- Types: YSI 400xx 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 - 60, AD530, 592, TMP0x, LM135, 235, 335

**Strain Gauge and Bridge Sensors**
- Configurations: ½, ¼, & full bridge
- Excitation: voltage or current
- 4–20mA Current Loop
- Internal 1000 Ohm shunt or external shunt resistor

**Digital Channels**
- Digital Input/Outputs: 8 b–directional channels
- Input Type: 8 logic level (max ±20V/30V)
- Output Type: 4 with open drain FET (max ±20V/30V)
- 4 with logic output

**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
- Dedicated Counter Inputs
  - 4 high speed or 2 phase encoder (quadrature) inputs
  - Size: 32 bit Max Count rate: 150 kHz
  - Input type:
    - 2 logic level inputs (max ±30V)
    - 2 sensitive inputs (1000Ω) for magnetic pickups (max ±10V)

**Serial Channels**
- SDI-12
  - 4 SDI-12 inputs, shared with digital channels. Each input can support multiple SDI-12 sensors.
- General Serial Sensor
  - Flexible options to allow data to be logged from a wide range of smart sensors and data streams.

**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.

**Calculations**
- Condition: high, low, within range and outside range
- Delay: optional 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 Storage
  - Capacity: 128MB (approx. 10,000,000 data points)
  - Larger storage available refer to technical support.
  - Removable USB storage device (optional accessory).
- Types: compatible with USB 1.1 or USB 2.0 drives, e.g. Flash drive.
- Approx. capacity: 90,000 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
  - Modern support: auto-answer and dial out
  - Protocols: ASCII Command, TCP/IP (PPP), Modbus (Master & Slave), Serial Sensor

**Serial Sensor Port**
- Interface: RS232, RS422, RS485
- Speed: 300 to 115,200 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 and/or integrated WiFi

**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, data logger, modbus displays etc.

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

**System**
- Automatically upload logged data direct to an FTP server

**Display and Keypad**
- Types: 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: 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
- Internal battery: 6Vdc: 1.2Ah lead acid
- Peak Power: 12W (12Vdc 1A)

**Average power Consumption**
- Using 12Vdc external power source

<table>
<thead>
<tr>
<th>Sampling Speed</th>
<th>Average Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 second</td>
<td>1.2W</td>
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<tr>
<td>5 seconds</td>
<td>5W</td>
</tr>
<tr>
<td>30 seconds</td>
<td>15W</td>
</tr>
<tr>
<td>1 minute</td>
<td>75W</td>
</tr>
<tr>
<td>1 hour</td>
<td>600W</td>
</tr>
</tbody>
</table>

**Typical Operating Time**
- From internal 6Vdc: 1.2Ah battery

<table>
<thead>
<tr>
<th>Sampling Speed</th>
<th>Operating Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 second</td>
<td>65 minutes</td>
</tr>
<tr>
<td>5 seconds</td>
<td>1 day</td>
</tr>
<tr>
<td>1 minute</td>
<td>10 days</td>
</tr>
<tr>
<td>1 hour</td>
<td>3.5 months</td>
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</tbody>
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**Integrated WiFi**
- Model: Customer or Access Point
- Security: OPEN, PSK, WEP, PSK_WPA, PSK_WPA2
- Consumption: 150 mW (AP model), 726 mW (full throughput)

**Physical and Environment**
- Construction: Powder coated zinc and anodized aluminum.
- Dimensions: 180 x 137 x 65mm
- Weight: 1.5kg (4kg shipping)
- Temperature range: –30°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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