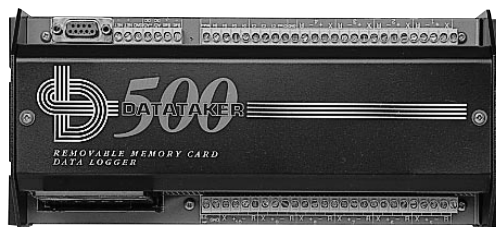# Datataker 500

DATA LOGGER

The Datataker 500 is a microprocessor-based battery-powered data logger which measures inputs from most sensor types.

Data manipulation includes statistical functions, calculations and sensor calibration. Data is stored in battery-backed RAM and removable memory cards. Alarms can be set for all channels.

Suitable for scientific, industrial and public utility applications.

Analog Inputs
- 10 differential or 30 single-ended, can be used in any mix
- Expansion by external modules of 10/30 analog channels
- Autocalibrating and autoranging, 3 decades
- Resolution 15-bit plus sign, 1µV
- Sampling rate 25 samples/second
- Accuracy better than 0.15% of full scale
- Linearity better than 0.05%
- Input impedance 1MΩ, or >100MΩ selectable
- Common mode range ±3.5VDC
- Common mode rejection >90db, 110db typical
- Series mode line rejection >35db
- 4-, 3- and 2-wire resistance, RTD and thermistor measurement
- Sensor excitation of 5V, 250.0mA or 2.500mA each channel
- Full, half and quarter bridges, voltage or current excitation
- CMOS multiplexer

Digital Inputs
- 4 TTL/CMOS-compatible digital input channels for digital state, byte, events and low speed counters: 10Hz, 16-bit, presettable
- Digital inputs share with digital output channels
- Expansion by external modules of 10 digital I/0 channels
- 3 high speed counters, 1kHz or 1MHz, 16-bit, presettable
- Analog channels also read digital states, definable threshold

Temperature
- Thermocouple types B, C, D, E, G, J, K, N, R, S and T with cold junction compensation and linearization
- Platinum RTDs: α=0.00385 & 0.003916Ω/Ω/°C, any resistance
- Nickel RTDs: α=0.005001Ω/Ω/°C, any resistance
- Thermistors: Yellow Springs YSI 400xx series
- Semiconductors: AD590, LM335, LM34 and LM35

Digital Outputs
- 4 TTL/CMOS-compatible digital output channels for general purpose switched outputs, relay control, alarm annunciation and sensor support. Bit and byte (4-bit) management.
- Open collector lines, rated to +30VDC @ 200mA
- Digital outputs share with the digital input channels
- 3 LEDs, display backlight and a beeper on the optional panel mount display

Ranges
3 decade for analog channels

Input Type	Range	Units	Resolution
DC Voltage	±25.000	mV	1µV
	±250.00	mV	10µV
	±2500.0	mV	100µV
Attenuated DC Voltage	Any Range	mV	
DC Current	±0.2500	mA	200nA
Internal Shunts	±2.500	mA	1µA
	±25.00	mA	10µA
External Shunts	Any range	mA	
4-20mA Loop	0 to 100	%	0.01%
Resistance	10.000	ohms	1mΩ
	100.00	ohms	1mΩ
	500.0	ohms	5mΩ
	7000.0	ohms	50mΩ
Frequency	0.1 to 300,000.0	Hz	0.01Hz
Period	30,000 to 3	µSec	1µS
Temperature	−250.0 to 1800.0	°C	0.01%
	−420.0 to 3200.0	°F	0.01%
Strain Gauges and Bridges			
	-10^4 to 10^4	ppm	1ppm
	-10^5 to 10^5	ppm	10ppm
	-10^6 to 10^6	ppm	100ppm
Digital Bit	0 or 1	state	1
Digital Byte (4 bits)	0 to 15	state	1
Digital Average	0.00 to 1.00	state	0.01
Counter	0 to 65535	counts	1
Up Down Counter	−32768 to 32767	counts	1
Analog State	0 or 1	state	1
Polynomials	$±9.9e^{-18}$ to $±9.9e^{18}$	user	0.0001
Linear Spans	$±9.9e^{-18}$ to $±9.9e^{18}$	user	0.0001
Calculations	$±9.9e^{-18}$ to $±9.9e^{18}$	user	0.0001

Time and Date
- Resolution 1 second
- Accuracy 2 seconds/day
- Date in DD/MM/YYYY, MM/DD/YYYY, day number DDDDD, and decimal day DDDDD.DDD
- Time in HH:MM:SS, seconds SSSSS and decimal hour HH.HHHH
- 4 auto-incrementing internal timers (second, minute, hour and day of week) for use in sequencing, alarms, calculations, etc.
- Real-time clock for use in scan scheduling, date and time stamping of data, alarm timing and calculations

Scanning Input Channels
- 1 immediate scan schedule, can include one ore more channels
- 4 repetitive scan schedules, can include one or more channels
- Time-based scanning from 1 second to months, in increments of 1 second, 1 minute, 1 hour or 1 day
- Event-based scanning on digital or counter channel events
- Poll-based scanning initiated by host requests
- Conditional scanning while any digital input is high
- Alarm-based scanning and scan modification

Data Manipulation
- Statistical data including average, standard deviation, minimum and maximum with optional date and time of minimum and maximum, and integral for each channel

- Delta, rate of delta (differential) and integral between scans
- Histogram, with user-definable number of classes
- Expression evaluation using channel data and constants, with arithmetic, logical and relational operators, logarithmic, trigonometric, and other intrinsic functions
- 20 user-definable polynomials (5th order) and linear spans, for linearizing most sensor types

Alarms
- Alarms for monitoring input channels for high and low alarm, inside and outside of range alarm, with definable setpoints
- Alarms can be combined by AND, OR and XOR operators
- Optional delay period before an out-of-range condition is considered a true alarm, or recovery considered a true recovery
- Alarm action can switch digital outputs, return definable text to the host, and execute Datataker commands

Data Storage
- Battery-backed internal RAM, stores up to 13,650 readings
- Removable memory cards, store up to 340,000 readings
- Stack and circular buffer (overwrite) data storage modes
- No data loss when memory cards are exchanged
- Stored data can be returned for individual scanning schedules, and for selectable date and time periods

Data Format
- All data is returned in ASCII floating point, fixed point or exponential formats
- Data format is user-configurable for channel identification, data resolution, units text and delimiters
- Selectable host computer format with error detection protocol
- Compatible with spreadsheets, graphics packages, statistical packages, text editors, etc.
- Compatible with most communications methods including direct connect, modems, radio, and satellite

Programming
- All programming by simple descriptive commands, which are entered from a host computer via the serial interface
- Commands can be pre-recorded into a memory card, and are automatically executed whenever a memory card is inserted (useful for field programming).

Host Communications
- RS-232, full duplex; also supports RS-423
- 300, 1200, 2400 and 4800 baud, switch selectable
- Bi-directionable XON/XOFF protocol
- Compatible with computers, terminals, modems, radio modems, satellite ground terminals, serial printers, etc.

Network Communications
- RS-485, with inbuilt error correcting protocol
- Connected via twisted pair cable, maximum 1000 metres
- Up to 32 loggers can be in a Datataker network, with one host

Power Supply
- Voltage 9–18VAC or 11–24VDC external power
- Mains-powered from 12VAC/DC mains adaptor
- Automatically selects low power standby (sleep) mode
- Current draw: 120mA normal power mode, 400mA when charging internal battery, <450mA low power (sleep) mode
- Internal 1.2Ah gel cell battery, recharged by external power

Battery Life
- Approximate battery life for different scanning schedules and battery sizes:

Sampling 10 channels every	1.2Ah Gel Cell battery	17Ah Alkaline battery
Continuously	10 hours	6 days
1 minute	15 days	200 days
15 minutes	60 days	800 days
1 hour	90 days	900 days

Mechanical Specification
- Robust modular construction using powder-coated steel
- Can be used directly, or housed in fixed or portable enclosures
- Length 270mm (10.5"), width 110mm (4.3")
- Height 85mm (3.3") with no memory card inserted Height 105mm (4.2") with a memory card inserted
- Weight 2.2kg
- Signal I/0 connection by screw terminals
- Operating temperature –20 to 70°C, humidity 95%

Accessories Included
- 110/240VAC mains/line power adaptor
- 1.2Ah gel cell internal battery
- RS-232 communications cable for IBM® and compatibles, 9- and 25-pin adapting connector
- Getting Started Manual and User's Manual
- DeTerminal software package for IBM® and compatibles

Options
- Channel Expansion Module: 10 differential/30 single-ended analog inputs, 20 digital inputs, and 10 digital outputs
- Relay multiplexer, replaces CMOS multiplexer
- Panel-mount display / keypad module
- Portable carry case: clamshell design, waterproof
- Industrial quality steel enclosures (IP65, NEMA5)
- 4Ah gel cell rechargeable battery
- 17Ah alkaline battery
- 64K Datataker memory card, stores 16,000 readings
- 256K Datataker memory card, stores 81,000 readings
- 512K PCMCIA memory card, stores 170,000 readings
- 1M PCMCIA memory card, stores 340,000 readings
- PCMCIA memory card adaptor
- Memory card readers
- Communications cable for Apple® Macintosh®
- DeCipher Plus software package for IBM® and compatibles

Ordering
Datataker 500, CMOS multiplexer	DT500
Datataker 500, relay multiplexer	DT505
Channel Expansion Module	CEM
Panel-mount display	PMD
Portable carry case	PE
Small industrial enclosure	SIE
Large industrial enclosure	LIE
Small industrial cabinet	SIC
64K Datataker memory card	MC-64
256K Datataker memory card	MC-256
512K PCMCIA memory card	MC-512P
1M PCMCIA memory card	MC-1024P
PCMCIA memory card adaptor	MC-ADP
Memory Card Reader – RS-232 Interface	MC-RS
Memory Card Reader – Centronics Interface	MC-RP