



Analog Channels

Channel Number

Number of input channels depends on sensor wiring configuration. Sensor configurations may be mixed:

- Two wire: 1
- Two wire with one shared terminal: 3
- Three wire: 1
- Four wire: 1
- 4-20mA current loop: 1 with internal shunt + 3 using external shunts

Fundamental Input Ranges

The DT51 hardware measures voltage, current, resistance and frequency. From these, all other measurements are derived.

| Full Scale | Resolution | Full Scale | Resolution |
|-------------|----------------|----------------|------------------|
| ±25.00 mVdc | 2.00 μ V | 50 Ω | .25 m Ω |
| ±250.0 mVdc | 20.00 μ V | 500 Ω | 2.50 m Ω |
| ±2.50 Vdc | 200.00 μ V | 5,000 Ω | 25.00 m Ω |
| ±0.25 mA | 0.20 μ A | 100 Hz | 0.01 % |
| ±2.50 mA | 1.00 μ A | 10 kHz | 0.01 % |
| ±25.00 mA | 10.00 μ A | | |

Accuracy

| Measurement at | 25°C | -45°C to 60°C |
|----------------|-------|---------------|
| DC Voltage | 0.15% | 0.25% |
| DC Current | 0.25% | 0.35% |
| DC Resistance | 0.20% | 0.30% |

Sensor Excitation

Each channel: 4.5V (1k Ω source), 250 μ A or 2.5mA switched on when channels is selected

DC Voltage: 5V at 100mA (max.) switched

Multiplexer (Channel Selector)

Type: solid-state \pm 5V input ratings

Input impedance: 1M Ω or >100M Ω , programmable

Common mode range: \pm 3.5V

Internal Channels

Temperature (thermocouple reference junction): 1

Reference voltage channels: 1

Internal battery voltage: 1

Sampling

Sampling for accuracy and noise rejection by integrating over 50/60Hz line period.

Maximum sample speed: 25Hz

Effective resolution: 15 bits

Linearity: 0.01%

Common mode rejection 25mV range: >90dB

Line (50/60Hz) series mode rejection: >35dB

Sensor Support

Supports a wide range of sensors types including, but not limited to the following:

Thermocouples

Types: B, C, D, E, G, J, K, N, R, S, T

Reference junction compensation accuracy:

| Case temperature | 25°C | -20 to +60°C |
|------------------|--------|--------------|
| Accuracy | ±1.0°C | ±1.5°C |

RTDs

Types: Pt, Ni, Cu

Resistance range: 10 Ω to 2k Ω

Measurement accuracy:

4 wire: 0.15% of resistance value

3 wire: 0.25% of resistance value

Thermistors

Types: YSI 400xx Series

Resistance range: <7k Ω ,

<20k Ω with parallel resistor

Monolithic Temperature Sensors

Types supported: LM335, LM34, LM35, AD590

Bridge Sensors

Configurations: 4-wire and 6-wire

Excitation: voltage or current

Bridge completion: external or internal half bridge

4-20mA Current Loops

Shunt value: 100 Ω (standard internal)

Accuracy: 0.25% at 25°C

Sensors - Comments

A wide range of sensor scaling and linearising facilities are provided including polynomials, expressions and functions

Digital Channels

Number of Channels

Bi-directional channels: 4

Dedicated counter channels: 3

Digital Input

Number: 4, shared with bi-directional channels

Input Type: logic level (protected with pull-up)

Counter Channels

Number: 4 low speed (10Hz) shared with bi-directional channels
3 high speed (1kHz, sleep mode) with switchable internal clocking options

Size: 16 bit (65535 counts)

Digital Output

Number: 4, shared with bi-directional channels

Output type: open-collector npn transistor

Rating: +30V, 100mA

Calculation Channels

Any expression involving variables and functions including:

sin(), cos(), tan(), asin(), acos(), atan(), abs(), sqrt(), average, maximum, minimum, time of max., time of min., variance, integral, histogram

Scheduling of Data Acquisition

Number of schedules: 4 acquisition schedules

1 immediate schedule

1 alarm schedule

Scan triggers: time base or digital event

Conditional scanning: while digital input high

Time based scheduling: from seconds to months in increments of 1 second, 1 minute, 1 hour and 1 day

Maximum scheduled rate: 1 second or as fast as possible, typically 25 samples per second

Dynamic scan time base change: yes

Maximum number of channel entries: 110

Alarms

Condition: high, low, within range and outside range

Delay: optional time period for alarm response

Actions: set digital outputs, execute any *dataTaker* commands. Alarms can be combined in a logical fashion

Data Storage

Internal

Type: battery backed SRAM

Capacity: 166,500 data points

Download Data Format

Format: ASCII floating point, fixed point or exponential formats

Compatibility: spreadsheets, word processors, graphing packages, statistical programs and SCADA software

Serial Interface (RS232)

The DT51 is programmed and data extracted via the RS232 serial interface

Speed: 300 to 9600 baud (9600 default)

Handshake: XON and XOFF

Wake from sleep: yes

Isolation: 500V

Compatibility: computers, modems, satellite-modems, radio-modems and printers

System

Processor type: Z180, 18 MHz

Program storage: FLASH

Data storage: SRAM, battery backed

Indicator LED: sampling

Real Time Clock

For time stamping of data, scheduling and timers

Normal resolution: 1 second

Accuracy: 2 seconds per day (25°C)

Power Supply

Voltage range: 11 to 24Vdc or 9 to 18Vac

External battery input: 6V lead acid

Power Consumption

In normal mode: 1W (2W with ext. battery charging)

Sleeping: 2mW (350 μ A from 6V battery)

Typical low power operation: 20mW

External Battery (Recommended)

An external battery can be connected for stand alone data logging. The battery can be re-charged by the DT51 when main supply is restored/applied.

(See power supply above)

Chemistry: lead acid gel cell

Voltage: 6V

Maximum charge current: 200mA

Temperature compensation charging: -10°C to +70°C

Operating time with 1.2Ahr battery:

Normal: approx. 10 hours

Low power: approx. 4 months

Internal Backup Battery

For real time clock and internal data storage backup

Type: 3V 1/2AA Lithium

Physical and Environment

Construction: Powder coated fabricated steel

Dimensions: 260 x 110 x 55mm

Weight: 1.5kg (2.5kg shipping)

Environment temperature range: -45°C to 70°C

Humidity: 85%, non-condensing

Accessories Included

Comms cable: for PC

Software: Software Suite CD which includes DeLogger,

DeTransfer, DePlot applications

Manuals: "Getting Started with *dataTaker*"

"User's Manual"

Optional Accessories

Portable Carrying Case (PE500)

Capacity: 1 DT51 unit + battery

Environmental protection: IP66

Battery

Line adaptor: 110/240Vac, 500mA

Capacity: 1.2Ahr (GC-1.2) or 4Ahr (GC-4) for mounting external to the DT51

DeLogger™ 4 Pro

Graphical programming and supervision software. Supports a large network of DT51, DT500 and DT800 range units connected via modem. Features include comprehensive plotting, reporting, mimics, database, web publishing and other powerful capabilities.

Warranty

The *dataTaker* DT51 is 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 dealer.

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