Appendix — *dataTaker DT51*

Introduction

Each model in the ***dataTaker*** data logger range has a number of characteristics that differentiate it from the other models. This Appendix describes these characteristics for the ***dataTaker 51***.

Analog Inputs

- 1 differential or 3 single ended, can be used in any mix.
- Sampling rate 25 samples/sec
- Input impedance 1MΩ, or >100 MΩ selectable
- Common mode range ±3.5 VDC
- Common mode rejection >90 db (110 db typical)
- Series mode line rejection >35 db
- Sensor excitation of 4.5V, 250.0µA or 2.500mA each channel.
- Full, half and quarter bridges, voltage or current excitation.
- Multiplexer type: solid state (CMOS)

For each analog input type, the ***dataTaker 51*** provides three decade ranges which are selected automatically:

Input Type	Channels Diff	Channels SE	Range Units	Resolution
DC Voltage	1	3	±25 mV	1µV
			±250 mV	10µV
			±2500 mV	100µV
DC Current	1	4	±0.25 mA	200nA
			±2.5 mA	1µA
			±25. mA	10µA
Resistance	1	2	10 Ohms	0.5m Ω
			100 Ohms	5mΩ
			500 Ohms	50mΩ
			7000 Ohms	500mΩ
Frequency	1	2	0.1-20,000 Hz	0.01%

Diff refers to differential or double ended channels, and SE refers to single ended channels (see "Glossary" on page 23).

Digital Inputs and Outputs

- 4 TTL/CMOS compatible digital input channels for digital state, digital events, low speed counters (10 Hz, 16 bit, presettable). Digital input terminals are shared with digital output channels.
- 4 Digital open collector outputs rated to 200mA at 30V
- 3 high speed counters, (1KHz or 1MHz, 16 bit, presettable).
- All analog channels may also be used as digital inputs, with a user definable threshold.

Input Type	Channels	Range
Digital Bit	4	0 or 1 State
Digital Nibble	1	0 to 16 State
LS counter	4	65535 Counts
HS counter	3	65535 Counts

Power Supply and Battery also page 15

The ***dataTaker*** 51 can be powered as follows

Source	Range	+ Terminal	– Terminal
AC	9 – 18Vac	AC/DC~	AC/DC~
DC	11 – 24Vdc	AC/DC~	AC/DC~
DC	11 – 24Vdc	AC/DC~	Gnd
9V Alkaline Battery	6.2 – 10Vdc	Alkaline +	Bat. –
6V Gel Cell Battery	5.6 – 8Vdc	Lead +	Bat. –

The external 6 Volt gel cell connection provides temperature compensated charging with voltage (6.90V) and current (1A) limiting for a three cell battery, when an external AC or DC power supply is also connected.
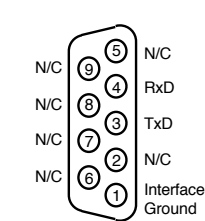
When the ***dataTaker 51*** is powered by a 9V alkaline battery and an external AC or DC source, the 6.9V regulator's (see schematic) output is increased to 10V so that power is drawn from the external source in preference to the battery.

COMMS Port also page 13

The ***dataTaker 51*** RS232 COMMS Port is serial RS232 compatible. The output signal level is approximately ±4 Volts, allowing communications over distances in access 100 meters at 1200 baud. Greater distances are possible at 300 baud. The maximum practical distance is also dependent on the host computer's RS232 characteristics. (Note: the RS232 "standard" specifies 2000pF maximum cable capacitance, and no maximum distance).
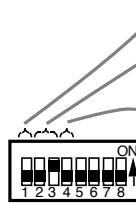
The ***dataTaker 51*** RS232 COMMS Port is electrically isolated to 500V.

RS232 COMMS

N/C	5 – N/C
N/C 9	4 – RxD
N/C 8	3 – TxD
N/C 7	2 – N/C
N/C 6	1 – Interface Ground

Dip Switch

Shown set to the factory defaults

RS232 COMMS Port (Isolated)

½AA Lithium Battery on lower circuit board

1 Analog Input
+5 volts switched
Ground
Digital I/O 1 2 3 4
Ground
1 (out)
Counters 1 2 3
Ground
Wake

Height: 60mm
Weight: 1.5kg

110 mm

75 mm

Convert Lamp

Power AC/DC ~~G

Battery + – +

Display Connector

AC/DC Power Input

Alkaline 9V

Lead Acid 6V

250 mm

270 mm

Caution - To avoid damage use 6 Volt lead acid battery only, ensure correct polarity before connecting the battery

Country Setting

Country	s1
US (60Hz)	on
Other (50Hz)	off

The Country Setting determines the default integration period (16.7mS for US and 20mS for others) for the analog to digital converter, and the default date format (see "Date" on page 6).

Baud Rate and Address

Baud Rate	s2	s3	s5	Add. Range
1200	off	off	x	0 - 15
9600	**off**	**on**	**off**	0 - 7
300	off	on	on	0 - 7
2400	on	off	x	0 - 15
4800	on	on	x	0 - 15

x = don't care

The ***dataTaker 51*** RS232 COMMS port baud rate must match that of the host computer. See "COMMS Port" on page 13. If either 300 or 9600 baud is selected, the logger address range is reduced to 0 -7.

Multiplexer Power

Mux Power	s4
permanent	on
switched	**off**

The power consumption of the ***dataTaker 51*** can be kept to a minimum if the input multiplexer is powered down while the logger is in the sleep state. For the ***dataTaker 51*** this is set using DIP switch s4.

The factory preset is for the multiplexers to power down while the ***dataTaker 51*** ais sleep. The current saving is approximately 150µA, which is current draw of the 4 CMOS multiplexer integrated circuits (CD4052). See "Multiplexer Powering" on page 15.

dataTaker 51 Address

Address	s5	s6	s7	s8
0	**off**	**off**	**off**	**off**
1	off	off	off	on
2	off	off	on	off
3	off	off	on	on
4	off	on	off	off
5	off	on	off	on
6	off	on	on	off
7	off	on	on	on
8	on	off	off	off
9	on	off	off	on
10	on	off	on	off
11	on	off	on	on
12	on	on	off	off
13	on	on	off	on
14	on	on	on	off
15	on	on	on	on

The ***dataTaker 51*** can be given an address, despite the fact that the logger does not support networking.

The address of a ***dataTaker 51*** can be used for
♦ identification in the **STATUS** or **STATUS1** commands (see "STATUS" on page 10)
♦ identification of returned data if /L Address Switch is enabled (see "Swityches - /L" on page11)

If 300 or 9600 baud rate is selected, then the address range is limited to 0 - 7.

Power Consumption

The ***dataTaker 51*** will consume very little power if it is allowed to sleep. Less power is consumed if the ***dataTaker 51*** is powered through the battery terminals, rather than through the AC/DC terminals, because the battery charger circuit draws additional current, especially if it is charging a depleted battery.

Power Source	Condition	Current (typical)
battery	awake	100mA
battery	sleep	0.36mA
AC/DC	awake	105mA
AC/DC	awake & charging	600mA
AC/DC	sleep	5mA
AC/DC	sleep & charging	500mA

6.9V Switch Mode Regulator (−9.2mV/°C)

AC/DC ~ Power ~

6.9V

1000µF

0.22Ω

External Battery Connections

Protection Circuit

Lead +
Bat −
Alkaline +
Gnd

Gnd.

Simplified Power Supply Schematic

Wiring Power

9-18Vac
~ ~ Gnd

External AC Power

11-24Vdc
+ DC −
~ ~ Gnd
or

External DC Power

Wiring Battery

+ Alkaline +
− Bat.
Lead +

6.2–10V

External Alkaline Battery

Alkaline +
− Bat.
+ Lead +

5.6–8V

External Gel Cell Battery