

Appendix – dataTaker DT 51

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 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

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.

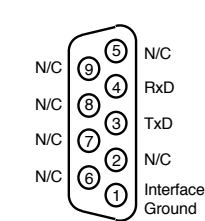
When the **dataTaker 51** is powered by a 9V alkaline battery and an external AC or DC source, the 6.9V regulator's (see schematic) output is increased to 10V so that power is drawn from the external source in preference to the battery.

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 excess 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).

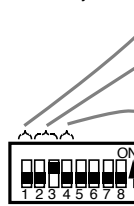
The **dataTaker 51** RS232 COMMS Port is electrically isolated to 500V.

RS232 COMMS



Dip Switch

Shown set to the factory defaults



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

| 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

Baud Rate and Address

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

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** is in 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.

| Address | s5 | s6 | s7 | s8 |
|---------|-----|-----|-----|-----|
| 0 | off | off | off | off |
| 1 | off | off | off | on |
| 2 | off | off | on | on |
| 3 | off | off | on | off |
| 4 | off | on | off | on |
| 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 |

See text to right

dataTaker 51 Address

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 "Switches - /L" on page 11)
 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 |

