

# G5-Data logger <sup>TM</sup>

Delta-Sigma Technology

## Quick start

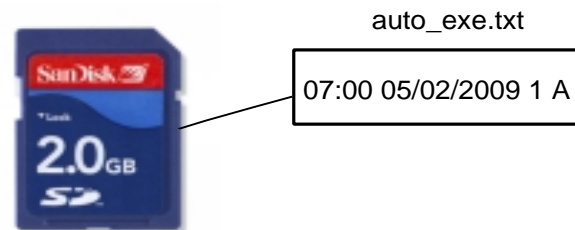


- Easy use and setup
- Designed for scientific experiment
- LAB-grade data converter (20 Bits ADC)
- Up to 2GB storage capacity
- CSV data file for spreadsheet software
- Internal clock for time stamping
- Battery powered for site logging

G5 Data Logger is a device used for recording the analog signal produced from the sensors to a cheap memory card with time stamping. The device provides up to 8-channel DC input signal. The DC signal is converted to digital data with the LAB grade data converter. The data is recorded as the Comma Separate Value (CSV) file to the SD/MMC memory card. The interval between sample is programmable from 10 secs to 60 mins. The optional digital input signal, pulse, and frequency measurement are also provided.

### A. Memory Card Preparation

The memory card can be SD or MMC standard size with storage capacity up to 2GB. The card must be formatted using FAT file type. The new memory cards that used in digital camera usually are preformatted with FAT.



### B. Setup File

To set the internal clock, interval and station name, the setup file must be prepared. The setup file is a simple text file. It can be created using any text editor program. The file name must be "auto\_exe.txt".

The text content is as follows.

```
HH:MM DD/MM/YY I N
```

```
07:00 05/02/2009 1 A
```

The example sets internal clock to 7:00, date to 5 Feb 2009, interval (I) to 1 minute and station name (N) to A. Each field must be separated by one space.

### C. Operating procedures

1. Insert the memory card. Switch on the device.
2. The LED shows RED blinking.
3. The device is detecting the memory card.
4. GREEN LED shows the memory card found and the data file will be created with a given station name e.g. ADATA000.CSV.
5. GREEN LED blinks every 4 secs scanning the input signals.
6. Within the preset interval, the RED LED blip once showing the record is writing to the memory card.
7. To remove the card, switch off, push the card to unlock it..
8. The data file can be transferred to the PC easily using the memory card reader.
9. When insert the same memory card, the next data file will be created sequentially as ADATA001.CSV.

**Note** For next experiment. No need to make the setup file again. However if need to change the clock, interval or station name, user can create the new setup file. The new settings will be updated automatically.

### D. Interval Settings

The interval between reading can be set with number 0-6.

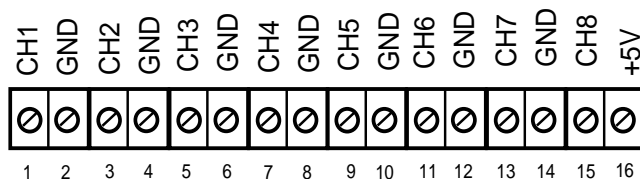
Number	Interval	
0	10 secs	
1	1 mins	07:00 05/02/2009 1 A
2	3 mins	
3	5 mins	
4	10 mins	
5	30 mins	
6	60 mins	

### E. Low Battery

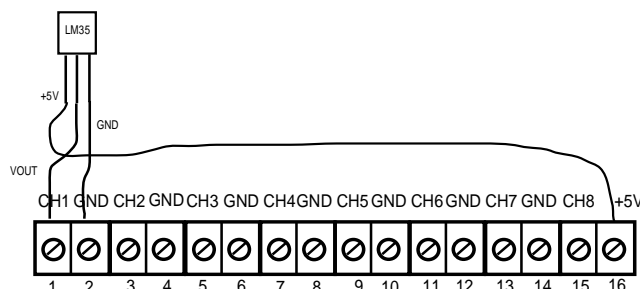
When the battery voltage is low, the RED LED blip-blips indicating low battery. Recharge it with the charger.

## F. Analog Input Terminal

The analog input terminal (CH1 to CH8) accepts 0-1VDC single end input. Pin 16 provides +5V for the sensors that need power supply.



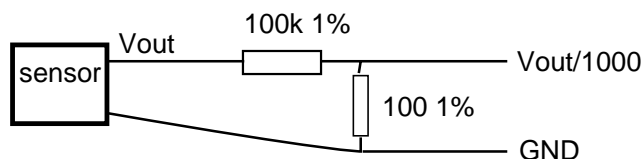
Example for LM35 temperature sensor connected to CH1.



The reading resolution for CH1 to CH8 is 1 microVolt. The maximum source resistance is 1 kOhm.

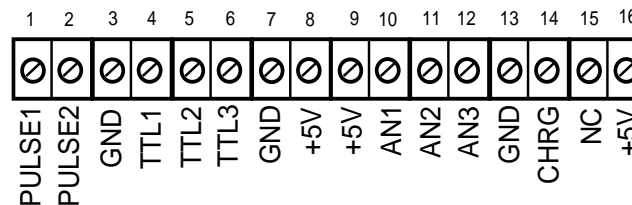
## G. +10VDC Analog Input Signal

For larger amplitude DC signal, e.g. the sensors that produce +10V full scale, we can make 1000 times voltage divider using 100k Ohms and 100 Ohms 1/8W resistors. The circuit is shown below. The reading appeared in the record will be 1/1000 of the input signal.



## H. Digital Input Terminal

The bottom terminal provides optional digital input signals.



Pulse counter=TTL1 (CH16)  
 Frequency counter=PULSE2 (CH17)  
 Logic input=TTL1 (CH13)  
 Logic input=TTL2 (CH14)  
 Logic input=TTL3 (CH15)

TTL1, TTL2 and TTL3 can be used to monitor the contact status between 0V or +12V input. The value "1" shown in the record means +12V input and value "0" for 0V input.

For pulse signal, TTL1(pin4) accepts the TTL pulse. The counter for CH16 is 32-bit totalizer.

For frequency measurement, PULSE2 (pin2) accepts TTL signal with frequency from DC to 15kHz. The reading is +/-1Hz.

The digital terminals also provide optional 10-bit resolution ADC for 0-3VDC input at AN1(CH9), AN2(CH10), and AN3(CH11).

CH12 is battery voltage monitored by internal firmware.

## I. Battery Charging

Pin 14, CHRG (\*V) and pin 13, GND accepts +7 to +9VDC 100mA for battery charging. Any small AC adapter using transformer can be used to charge the battery.



+9V AC Adapter

## J. Specifications

Number of analog input: 8-channel 0-1VDC  
 Digital input: 3-channel TTL, 1-ch pulse, 1-ch frequency  
 Controller: nonowatt CMOS microcontroller  
 Clock: super capacitor backed up RTC chip  
 Reading interval: programmable 10s to 1Hr  
 ADC: 20-bit Delta-sigma technology  
 Storage capacity: up to 2GB  
 File format: FAT  
 Record type: CSV, spreadsheet compatible  
 Power supply: +6V 2.8AHr dry cell battery (approx. 10 days logging)  
 Dimension: 145x145x80mm (WxLxH)

## Contact Information

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