

# HID Cell Logger

SERIAL DATA LOGGER FOR DIGITAL HI CELLS

## PRODUCT USER MANUAL



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# Introduction

The HID logger is designed to power Digital HI Cells, display the data on a terminal, and store the HID data to a Flash Drive.

Up to four HID's can be connected at one time. Connections to the HI Cells are via easy-to-use front panel connectors. Power is supplied to the HID via an internal SLA battery, allowing complete standalone operation. An external DC charger supply can also be used to power the HID's and charge the internal battery (see External Power section)

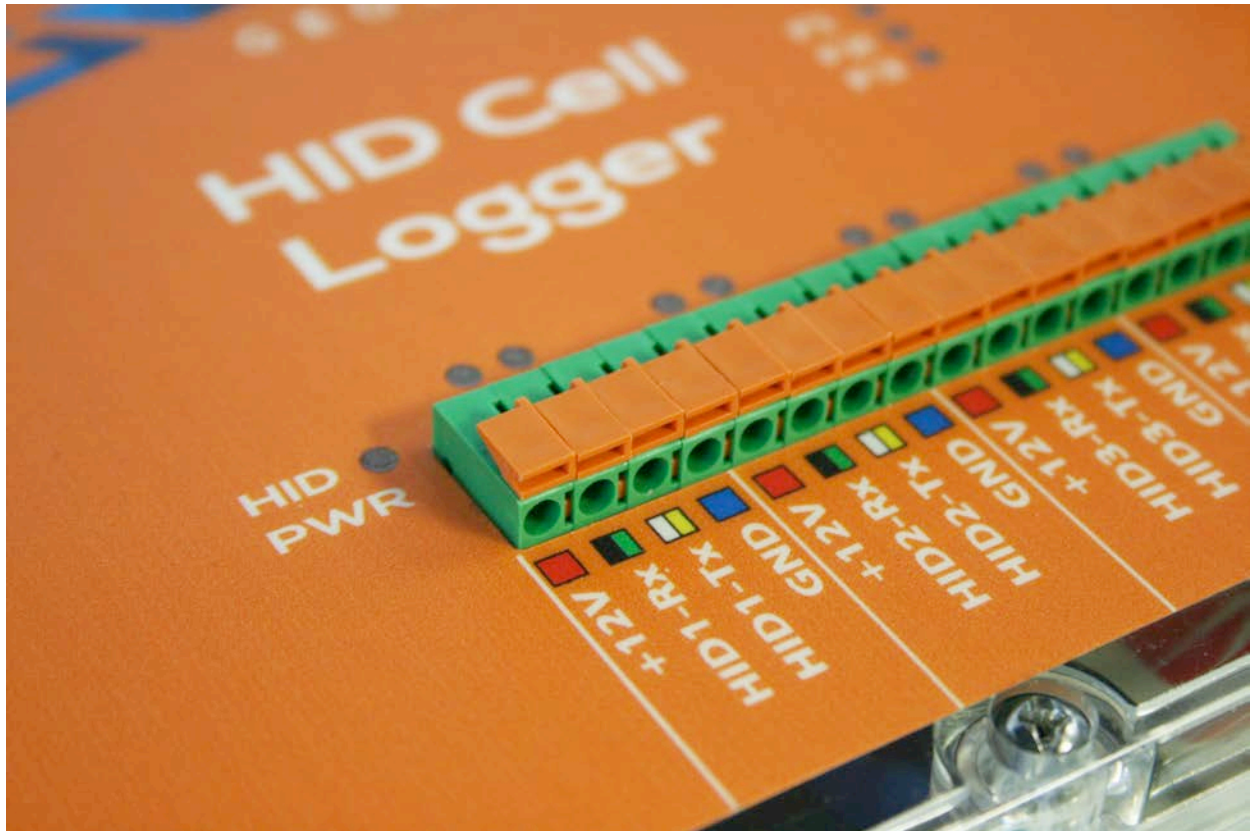
A standard terminal can be connected to allow user to monitor data collection, and set operation parameters.

A front panel USB connection accepts an industry standard Flash Drive. If the USB switch is toggled set to USB WRITE ENABLED, data is written to the USB drive. The LED on the USB socket flashes to indicate data is being written. The data is stored in a standard "CSV" format, which can be opened in Excel.

Operation is simple: Once the HID's are connected, the user simply inserts the USB Flash Drive, and toggles the front panel switch to "USB WRITE ENABLED". All data received from the HID's is then automatically written to the USB. The operation can be monitored on a Terminal.

# Connections

Front Panel	Connection	Notes
HID connectors	+12V	Power supply to HID's. 100mA max
	HID Rx	Connects to <b>HID Rx</b> RS232 data out from HID Cell Logger
	HID Tx	Connects to <b>HID Tx</b> RS232 data in to HID Cell Logger
	GND	Ground
Power switch		Activates power.
Flash drive	USB connector	Accepts industry standard Flash Drives. 8GB typical
Terminal	DB9	Connects to external terminal. 9600,8,N,1 See Terminal section
USB switch		When set to USB WRITE DISABLED, no data is written to the drive. When set to USB WRITE ENABLED, data is written to the USB. <b>Switch to USB WRITE DISABLED when removing USB drive.</b>
Power connector	2 pin, screw secured	External Charger. Connect a battery charger, not a standard power supply. See External Power section



When power is switched on to the HID Cells, the LED labeled "HID PWR" will glow.

The LEDs above each Rx/Tx terminal flash to show activity on the Receive/Transmit lines of the serial link to each digital HI Cell.

# Data Formats

When data is read from the HID Cell, it has the following formats:

Time-stamp on:

```
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:17:58,21/03/2015
```

```
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:18:23,21/03/2015
```

Time-stamp off:

```
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28
```

```
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28
```

The default operation is to have time-stamping on. Time-stamping can be turned off by using the `T0` command.

The fields are as follows:

Field	Contents	Notes
1	\$SPHCn	NMEA id
2-13	HI Cell values	Strain gauge measurements
14	60, or Temperature	60 if the internal trip wire is intact. Cell temperature if the internal trip wire is broken.
15	Seconds count	Counts seconds since the HID was started
16	Checksum	Binary XOR of all values between \$ and *
17	16:18:23	Time (when time-stamping is on)
18	21/03/2015	Date (when time-stamping is on)

# HID Cell Logger Operation

## Terminal

An external computer or laptop running a terminal program can be connected here to monitor operation. A standard DB9m-DB9f extension cable is required. Any Terminal program can be used (e.g. *Hyperterminal* or *TerraTerm*)

As data is received from the HID sensors, it is written to the terminal. The terminal displays data in the same way that data is written to the Flash Drive. In other words, the terminal output is the same as the above data format written to Flash Drive.

Hitting CR (Carriage Return) will test the serial communications link by responding with a startup message and the version number.

```
15:50:50,23/03/15 HID LOGGER H124 ? for help S/W: V217
```

If the USB switch is set to the USB WRITE ENABLED position, the data will be written to the USB drive. In this case, a `D:>/` will appear after each write to the drive, as shown below:

```
1SPHC1,-226,79,-34,-91,-36,-112,-156,101,-162,81,-31,-21,60,59021*22
```

```
D:>/
```

```
1SPHC1,-226,77,-35,-90,-39,-112,-155,103,-162,78,-32,-21,60,59081*2D
```

```
D:>/
```

```
1SPHC1,-226,81,-34,-87,-38,-110,-155,103,-161,81,-31,-20,60,59141*2A
```

```
D:>/
```

```
1SPHC1,-225,80,-34,-89,-38,-109,-156,104,-161,81,-32,-20,60,59201*2E
```

If the USB switch is in the USB WRITE DISABLED position, the `D:>/` does not appear. The `D:>/` indicates that data is written to the Flash Drive.

Note that the terminal does not have to be connected for data to be written to the USB.

The Terminal also allows the user to send commands to the HID sensors, and also to interrogate the Flash Drive. Functions for the HID sensor start with "H", and functions for the Flash drive start with "F". Simply type in the command and hit carriage return.

Terminal commands are listed below (use "?" to display on terminal): Note that the "n" designates different port numbers.

# Functions

HnT	Cycles through the interval options of the selected HID HnV	Get Version of the selected HID
Hn*	Forces 1min time interval of the selected HID	
HnD	Enters debug mode for the selected HID. <i>Note this will produce a significant amount of output.</i>	
HnN	Nulls the offsets of the selected HID	
FDIR	Directory of files on Flash drive	
FFS	Returns free space of the Flash drive. Note – this may take a long time for large drives	
FIDD	Provides information of the Flash drive	
FDLF	Delete selected Flash drive Files	
ST	Set time using format hh:mm dd/mm/yy (see <b>Setting the Time</b> section)	
T1/T0	Timestamp on/off (defaults to ON after power up)	
V0/V1	Flash drive power off/on	
D0/D1	HID power off/HID on. Controls the power to the HID's.	
RR	Reset CPU	
RV	Reset Flash drive (same as V0 – 1sec – V1)	
TST	Sends tests strings to the RS232 outputs (see <b>Test Mode</b> section)	

Using separate commands for each port allows different HID's to be set to different time intervals. It also allows different interrogations to be made, e.g. checking the version numbers of separate loggers. For example, to toggle the HID connected to HID-1, send the following console command:

```
>H1T
```

The logger will respond with the time interval which has been set.

It is recommended to turn off writing to the USB drive (using the USB switch) while using the above commands, since the output of from the HID's will be mixed with the responses from the commands.

# Real Time Clock

The HID Logger has an internal Real Time Clock (RTC). This is powered by a separate Lithium battery. Note that the link J3 (marked "RTC Battery") should be connected to enable the battery to power the RTC. If the HID Logger is kept in storage for long periods of time, this link should be disconnected.

## Setting the time

To set the time of the internal real time clock, use the command

```
ST hh:mm dd/mm/yy
```

For example, to set the time at 9:14am on 8th March 2014, use the command:

```
ST 09:14 08/03/14
```

Hit the Return key exactly as the time changes from 23:13:59 to 23:14:00, and the seconds will automatically be set to 00.

## Flash Drive operation

When HID sensors are connected to the HID Cell Logger, and the USB switch is set to "USB WRITE ENABLED", data is written to the file *HIDnDATA.CSV* where "n" is the HID number (1-4).

When data is stored on the Flash drive, the "\$" at the start of each line is replaced with the channel number to identify which input channel was the source of the data.

A typical *HIDnDATA.CSV* written when a HID sensor is connected to the HID Cell Logger is shown below:

HID1DATA.CSV

```
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:17:58,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:18:23,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:18:27,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:18:32,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:19:01,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:19:06,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:19:10,21/03/2015
1SPHC1,-291,15,-99,-162,-108,-213,-226,25,-245,45,-210,-118,60,25241*28,16:19:15,21/03/2015
```

Note: The file creation date of all *HIDnDATA.CSV* files is always 2004-12-04 00:00:00

**Note: Do not remove the Flash drive while data is being written. Always switch the USB switch to USB WRITE DISABLED before removing the Flash drive.**



## Test Mode

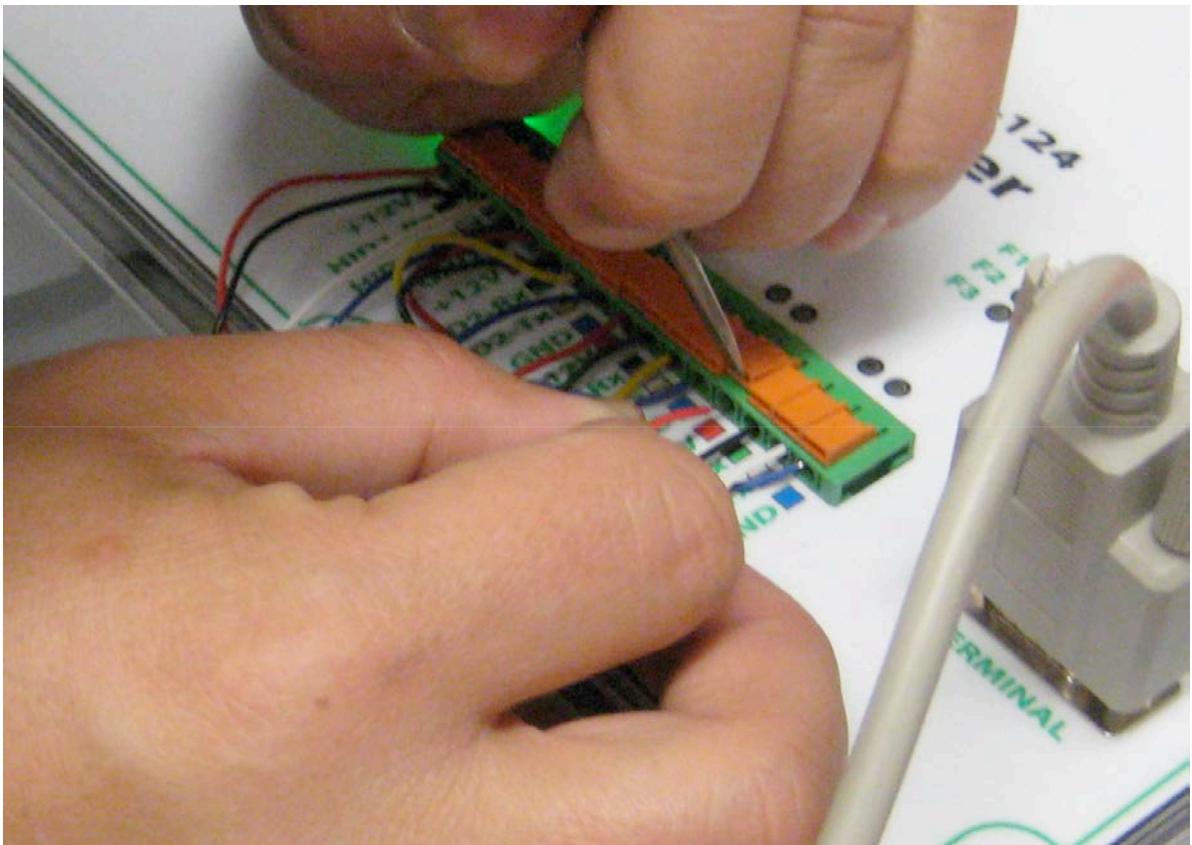
A built-in test mode allows the input and output channels to be tested without use of external equipment.

At the terminal, enter the TST command. This will cause a test string to be written to all four RS232 outputs (Rx terminals). The LEDs should flash indicating data being sent from that port.

Connecting any one of these to any of the inputs (Tx terminals) with a short section of wire will result in the data being received in that port and sent to the terminal and the USB drive (if the USB switch is set to the USB WRITE ENABLED position).

This can be used to test the operation of the serial ports without using an external sensor. The Test Mode will exit after a carriage return is entered at the terminal.

## Connecting HID wires



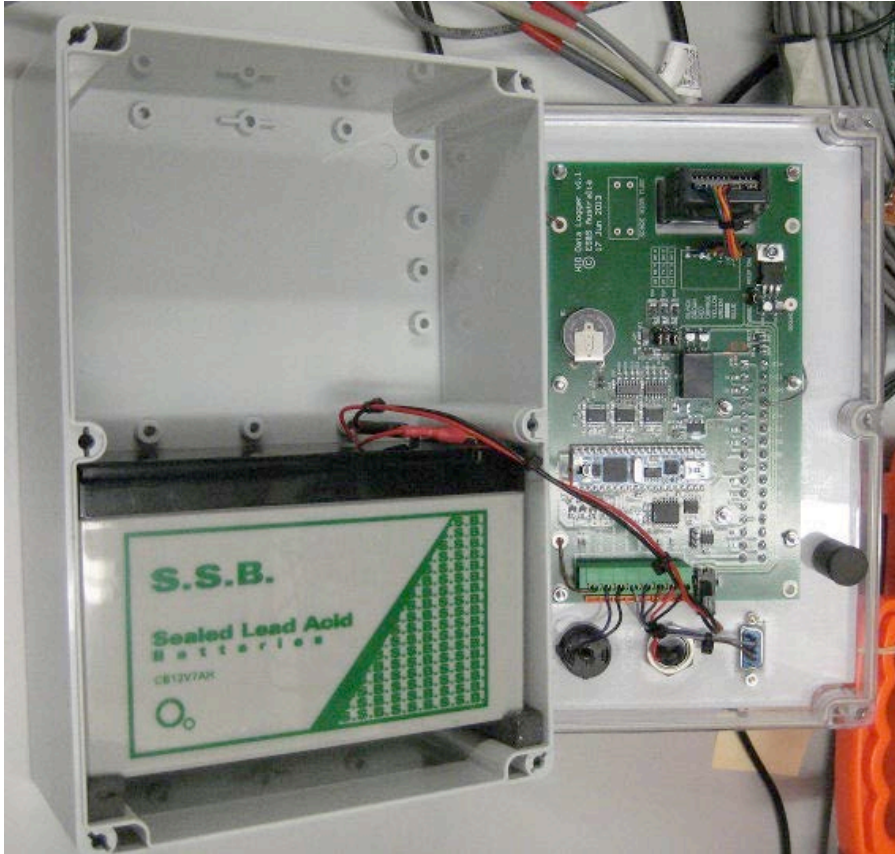
The connectors are designed for use in the field to allow quick and reliable connections. Use a small screwdriver to open the connector while inserting the cable as shown above.

The colour labels below the connection points should be used as a guide to indicate where the wires should be inserted

**Note: It is recommended to connect the GND wire first.**

# Internal Maintenance

To gain access to the battery and internal PCB, switch off, and unscrew the 6 retaining screws. Carefully lift off the front panel. Note there is a single 2-way cable connecting the battery to the main PCB. To remove the battery, remove the terminal connectors and then remove the retaining bracket.



# External Power

The front panel connector allows the HID Cell Logger to be powered by an external power source. A battery charger should be used.

**Note: Do not connect this to a standard DC supply. Use the charger supplied.**