Wave Logger Prototype Notes

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Preface:

This document outlines the basic do's and don't when operating the unit. It assumes that all necessary care will be taken with the electronics. It must be noted that the system has been designed to be as simple and cost effective as possible and for this reason some of the user error protections that may be found on other devices don't exist here.

1. The Pressure Sensor:

The pressure sensor outputs 0.5 to 4.5 volts (full scale 0-50 PSI). At the moment the microcontroller uses a reference voltage of 3.3v. It is therefore not possible to submerge the unit past 15m water depth (on the safe side).

The pressure sensor has been soldered directly to the controller board. If for any reason, the logger is taken apart, make note of the pin outs, reversing the voltage to the sensor will destroy it!

The sensor has a stainless steel membrane which is exposed to the water. This hole should be kept clean and no tools should be used remove debris as this will damage the membrane.

2. The SD Card:

All SD cards used should be formatted FAT16.
Some SD cards may not work due to speeds and or capacity.

3. Data Logging:

The unit will log data to a file called "datalog.txt". This file is created by the unit if it doe not exist. If a file is present, it will be appended to. If you would like to deploy the instrument, it is recommended that you remove the existing datalog.txt from the SD card, so that only new data will be written.

The data is only saved to the file when the SD card is closed by the microcontroller at the end of each burst period. Therefore if the green LED is still flashing and power is removed the last burst will NOT be written to the card.

The device is setup to log once per hour, when the minute variable is 0. The user may only change the number of samples to be recorded (done in the menu).

The following file format is used to store data....

Data File Structure

$S (header) , Num (burst number) , Time , Temp , Date
This is followed by the data at a rate of 4 Hz.
$D (header) , Num (burst number) , Raw ADC Reading
.....
.....
.....
.....
$E (header), Num (burst number), End Time

4. Indictor LED's:

On startup for 10 seconds:

Green:	ON
Orange:	ON
Red:	ON

In sleep mode between bursts:

Green:	OFF
Orange:	Blink every 4 seconds
Red:	OFF

Recording measurements (Burst):

Green:	Blinking rapidly
Orange:	OFF
Red:	OFF

ERROR SD Card:

Green:	OFF
Orange:	OFF

Red: ON

6. USB Cable:

The supplied USB cable has a built in FTDI chip, a driver may need to be installed and can be found here: http://www.ftdichip.com/FTDrivers.htm

The cable is energized with 5V from the computer USB port, it is therefore necessary to connect the cable to the logger in the correct orientation or damage will result.
The colour of the corresponding wire has been written next to the FTDI pins on the logger.

7. Configuring the Unit:

The device may be configured via the supplied USB cable. Any terminal program may be used to communicate with the device (Hyper Terminal is recommended). The date and time of the unit can be checked and changed and the sampling duration may be changed.

Method:
>Remove power to the unit.
>Plug in the USB cable to the computer.
>Start Hyper Terminal or some other terminal program.
>Select to COM port that corresponds with the FDTI USB cable.

Com port settings:
    Baud Rate: 9600.
    Data Bits: 8
    Parity: None
    Stop Bits: 1
    Flow Control: None

>Open the port.
>Connect the USB FTDI cable to the device (take note of orientation).
>Connect power to the unit.
>All three LED should be lit.
>In the terminal window, text should appear, prompting the user to enter the "M" (capital M) key to enter the setup.
>Follow the instructions on screen to complete the setup.

8. The Housing:

The housing is made from rigid PVC pipe. The fittings have been thermo welded to each other. There is a single o-ring seal for the unit. This o-ring should be kept clean and silicon applied after each deployment. The seal is compressed with the screw on the end cap.

9. Batteries:

The unit needs to be supplied 6v to 9v power.
4 X AA batteries can be used when working in the lab.
2 X D Cell 3.6v Lithium Ion 16500AHr are required for longer deployments.