

HAZARD AND OPERABILITY STUDY (HAZOP) REPORT CONCLUSIONS AND ACTIONS

Subject: **OLED DIVER INTERFACE REV A**
Project: OLED Diver Products.
Site: St.Petersburg Design Centre
Date: 28th May 2008.
Time: 13:00 -18:00
Participants: Deep Life team: Alex Deas, Marat Evtuhov, Sergei Belousov, Sergei Pyko, Vitali.Ivanov
Study leader: Vladimir Komarov .

General summary:

Terms of reference and scope of the study is the Tank Sender in the OLED Diver Product family described by Green Book: **GreenB_OLED_Diverinterface_071220.pdf**.

The meeting was presented with a circuit diagram, pcb layout and mechanical drawing.

One board is being used in three products: the AMOLED Dive computer, the OLED watch style dive computer, a head up display.

Confirmed it has:

1. Ambient light sensor
2. Pressure sensor
3. Solenoid driver for Auto-shut off
4. Hall sensors for buttons/slider
5. Audio driver for voice annunciation and for topside to diver comms, mixed in software.
6. Separate buzzer.
7. Mic input.
8. RF input and output.
9. ARM Processor with verification.
10. 4GB of storage.

There are two pcbs, one for AMOLED, one for OLED, with two schematics. Both need to be presented for review.

Circuit: This has been reviewed by – Sergei Pyko, Igor Abrosimov. **Action:** Also review by Marat Evtukov.

PCB: Both pcbs need to be ready for final review on Friday 6th June, and manufacture with mechanics for AMOLED.

1. Documentation presented to meeting was unsatisfactory.

The keywords combinations:

Primarily keywords:

Pressure; Temperature; Corrode; O2 compatibility,
Absence.

Secondary keywords:

No; Under; Over; Reverse;
Other.

Pressure: the device can accidentally pressurise if the pressure sensor seal fails. The pressure will be up to 400 bar.: the sensor and tank sender is rated to 400 bar. The shell is stainless steel contained, so the failure will be either the window or the USB cap.

The coin slot should be increased such that the cap becomes a weak point that bursts into two, if the unit is pressurized. It should withstand 30 bar reliably but burst with 120 bar.

The tank sender uses a Lithium Mixed Oxide Gel battery. It has been tested in pure helium at 142 bar, with rapid compression and decompression. It operates at 1 ATM in normal use.

SS is not O₂ compatible. Part should be marine bronze, diamond coated. Prototype accepted in SS 321 stainless steel.

For main production, Grilamid 3V plastic will be used, which is UV resistant and tough.

HAZOP Study leader:

V. Komarov