Margay: a practical, minimalistic, ultra-low power, and open-source environmental data logger

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- Specialization breeds isolation
- The fewer the better
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Open Source at Heart



- All software and hardware is open source and easily accessible
- Designed to support parallel and subsequent development







A Link in the Chain

- A generic option in a data management minefield
- Generates a simple CSV file, easily made compatible with any management system





A Unique Set of Skills

- Key features all included on a single board
- Supports commonly used interfaces (analog and digital)
- Simple USB user interface





Flexible Software to Meet Unique Needs

- Designed for modularity
- Not "all or nothing" solution



Downhole_BME280 §
//MargayDemo.ino #include "Margay.h" #include <tp_downhole.h> #include <eme.h></eme.h></tp_downhole.h>
// fdefine MARGAY_1v0 TP_Downhole DH; //Initalize TP-Downhole sensor EME RH; //Initialzie EME280
<pre>float HighWaterMark = 2500; //High stage of river [mBar] unsigned long FastLogRate = 60; //Period of high speed logging [s] unsigned long NormalLogRate = 60*15; //Period of normal frequency logging [s]</pre>
<pre>String Header = ""; //Information header uint0_t I2CVals[3] = {0x6A, 0x77, 0x76]; // int Count = 0; unsigned long UpdateRate = 60; //Number of seconds between readings</pre>
Margay Logger(Model_1v0);
<pre>void setup() { Header = Header + DH.GetHeader() + RH.GetHeader(); Logger.begin(I2CVals, sizeof(I2CVals), Header); //Pass header info to logger Init(); }</pre>
<pre>void loop() { Logger.Run(Update, UpdateRate);</pre>
<pre>if(DH.getPressure() > HighWaterMark) { UpdateRate = FastLogRate; } else { UpdateRate = NormalLogRate; } }</pre>
<pre>String Update() { Init(); return DH.GetString() + RH.GetString(); }</pre>
<pre>} void Init() { DH.begin(TP2A2); RH.begin(0x77); }</pre>

Downhole BME280 | Arduino 1.8.5



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Agile Development

v0.0



Initial Development -February 2018

#Deployed: ~12

v0.1



<u>Bug Fixes</u> -April 2018 -Fixed general errors

- -Improved SD interface
- -Added I2C robustness
- -Fixed USB issues

#Deployed: >100

v0.2



Feature Improvements -(Expected) April 2019 -Improved USB power -Increased output power -Added lockup protection -Added additional on board sensors



#Deployed: TBD

Specifications

- I2C Interface
- UART Interface (Added on v0.2)
- Single 18 bit Analog Interface
- Input Voltage 3.3v ~ 5v (Designed for 3 alkaline batteries)
- Sleep current ~ 2.5 uA
- Reverse polarity input protection
- Designed around powerful ATMEGA644P processor
- SD Card for onboard storage
- RGB Status Indication LEDs



Up and Running!









Questions?

