

Integrated Vehicle Health Management

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The Integrated Vehicle Health Management system aims to monitor the vehicle environment of the Secure Ground Transport (SGT). This system aims to reduce maintenance times and provide readily accessible data for vehicle diagnostics, which will enable preventative care for future models.

Hardware

In order to evaluate the environment of the vehicle, a CompactRIO 9068 is used for real-time, continuous data acquisition and signal processing. The device is equipped with a reconfigurable FPGA chassis which enables code deployment and high speed performance. The GPS module tracks the position of the vehicle and syncs the UTC time with the internal clock of the FPGA.



CompactRIO 9068

Sensors

- Accelerometers – Vibrational fatigue
- Resistance Temperature Detectors – Extreme Temperatures
- Pressure Sensors – Pressurized components and ambient
- Moisture Detector – Corrosion



Accelerometer



Resistance Temperature Detector

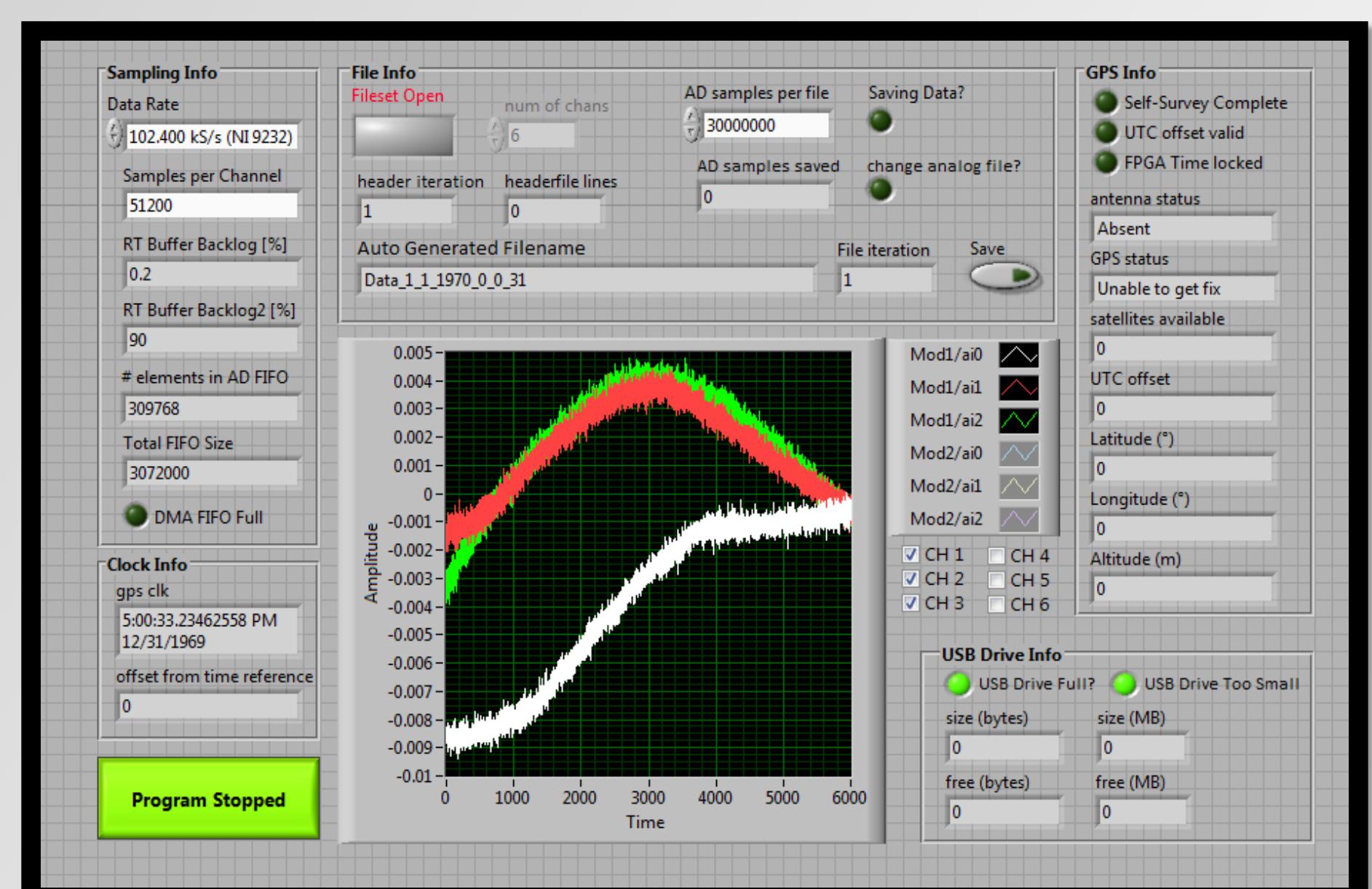
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Testing and Modularity

To test the system, the cRIO will be mounted to a prototype cart in order to collect data during preliminary phases. The current design allows for a mobility of the integrated sensor system to be deployed to a variety of environments. The environmental data can then be characterized and used as a point of comparison for real world applications. Additionally, the modularity of the CompactRIO enables potential expansion and modification of the sensors so that the system can be tailored to specific needs.



Screenshot of front panel interface



Secure Ground Transports (SGT)

