



SOVEREIGNTY

SYSTEMS

Catalogue 2024



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ENGINEERING

Our Engineering division, based in Centurion, is focused on development and integration of hardware, software, embedded software, and firmware applications and solutions. Our work is primarily tailored to the Aerospace and Defense Sector.

MANUFACTURING

Our manufacturing division, based in Durban, specializes in PCB assembly, product integration and testing of advanced secure military communication systems for Airborne, Naval and Land based applications. These systems are manufactured to strict military standards, Class 3 IPC standards and in accordance with ISO9001:2015 quality standards.

R & D

Sovereignty Systems keeps up to date with the latest technology and incorporates R&D as part of its strategic goals by developing new, and improving on existing products.



MIL-STD-1553 Analyzer

The 1553 Analyzer product is a unit that behaves as a Remote Terminal on the 1553 bus. It captures navigation information from the bus. The information is analyzed and displayed on a user interface. The 1553 Analyzer consist of a neatly packaged standard 1U unit ready to be rack-mounted, and software running on a laptop.



MIL-STD-1553 Analyzer Software

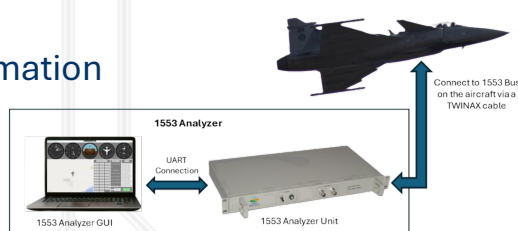


The Analyzer software provides the following navigation parameter information:

- Latitude and longitude
- Roll, Pitch and Yaw
- Heading
- Altitude
- Air Speed
- Time and Date

The software also provides:

- Raw data information
- Specific Remote Terminal information
- Map display
- Navigation gauges



Our Products

Control PCB

This PCB contains a SOC chip. The firmware and software was developed for the SOC, which forms part of the core functionality of the Control PCB. This PCB interfaces with different components and controls them by feeding specific digital signals each component.

System Diagnostic Software

This software runs on a PC/Laptop and allows the user to make certain selections on the Control PCB and monitor feedback signals through the GUI.



The activities involved with the development of the Control PCB comprises:

- Hardware Design (schematics and PCB)
- Embedded Software
- Firmware running on a Xilinx System on Chip (SoC).

The Control PCB interfaces to several devices which includes the following standards:

- RS232
- SPI
- I2C
- 1-Wire
- TTL Outputs
- TTL Inputs

The System Diagnostics Software runs on a PC/Laptop and allows the user to make certain selections on the Control PCB and monitor feedback signals through the GUI.



The Pilot Control Unit (PCU)



The PCU System is a wireless control and communication system designed to provide the pilot with remote control & monitoring of various equipment that is otherwise external to the aircraft.

It comprises two units, Unit 1 is a handheld, battery operated device that provides command and monitoring through a RF command link. Whereas Unit 2 is mounted to the aircraft's external equipment. It therefore decodes and executes the message from the command link & in turn provide status report via a RF response link to unit 1.

The PCU is designed with the following specification:

- User-friendly to allow the pilot/operator to easily monitor and take the necessary course of action from the cockpit of the aircraft.
- Having a quick low frequency communication update rate between Unit 1 & Unit 2 such that the pilot can take quick action when required.
- To make provision for the following low-level interfaces via a mil-spec circular connector:
 - Standard RS232
 - SPI
 - I2C
 - Electromechanical switching with 2 feed and 2 return lines
- Battery compartment with ease of access.
- Mil-spec LED indicators and switches for control & monitoring
- RF antenna bracket to keep it in place during flight
- Adjustable RF output power ranging from 21dBm to 30 dBm

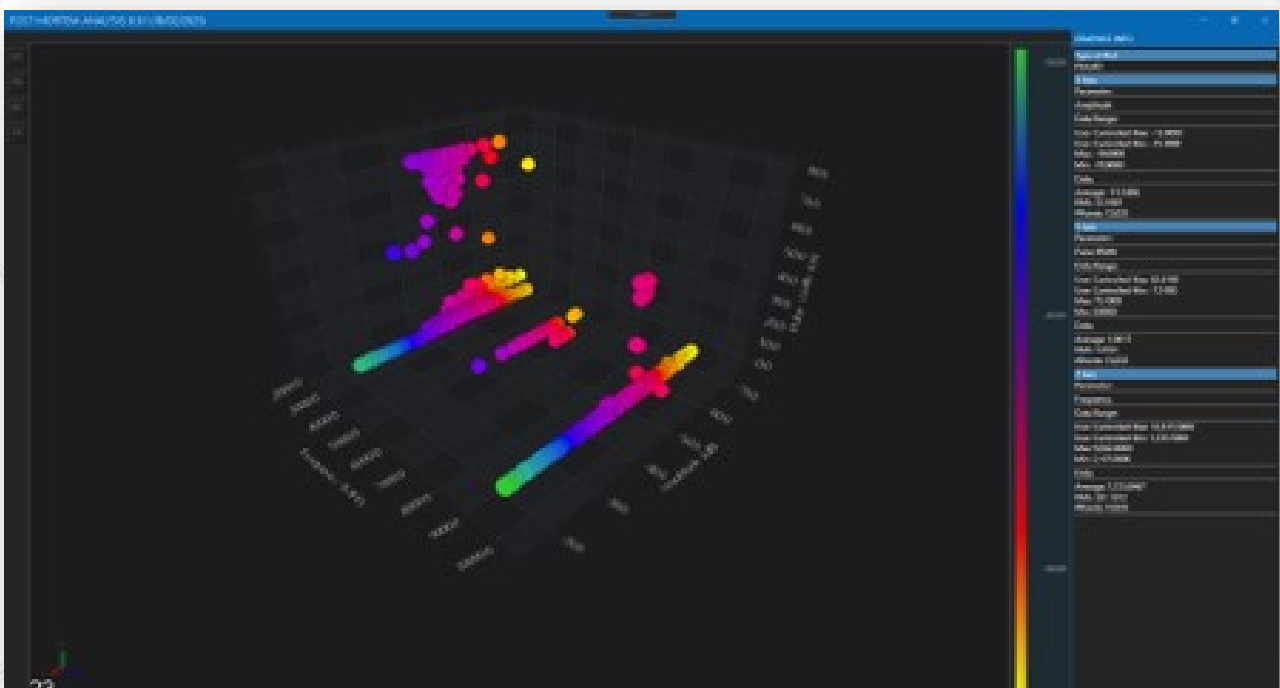


Our Products

SciChart Application Software

This application reads specific CSV files and plots the information using different types of graphs. SciChart also provides various data analyses tools such as:

- Selecting a specific number of points on the plot
- Providing different parameter values for each point on the plot
- Data Filtering
- Plot point size variation
- Customize and save plot configuration
- Change number of decimal values



Information can be displayed in different types of plots:

- 2D
- 3D
- 3D Coloured
- Histogram

SDR Based Interception System

The SDR-based Interception System (SBIS) is drone-mounted payload used to intercept target transmissions from a height advantage. This system comprises the hardware that communicates with a ground station laptop over a Wi-Fi link. The ground station laptop runs a SDR application software that controls the SDR as well monitors signals as and when intercepted.



Hardware

- Single-tuner wideband full featured 14-bit SDR
 - Covers the entire spectrum from 1kHz to 2GHz
 - Contains 3 antenna ports, two which are SMA connectors and operate across the full 1 kHz to 2 GHz range and the third uses BNC connector which operates up to 200MHz.
- Intercepts common signal types such as AM, FM, SSB, etc.
- 2.4 GHz/ 5 GHz Comms link
- On-board Rechargeable power source

Base Station/ Application features

- Multiple Virtual Receiver (VRX) with basic radio controls
- Target signal demodulation and results display (waterfall and spectrum displays)
- Remote server with two streaming modes across both LAN and WAN (internet):
 - a) Full IQ and
 - b) Audio – a streaming mode which provides a very efficient way of displaying a large spectral bandwidth across a network with a limited data throughput
- Band Framing
- HDR mode support
- Headless server command line options
- SNR Measurement
- Notch filters in the Aux spectrum



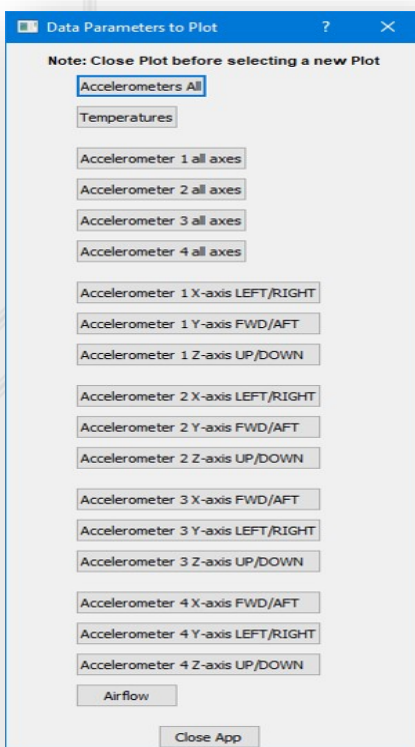
Our Products



Data Logger

The Data Logger Unit runs from a standard +9V battery which makes it flexible for any remote data recording application.

Sovereignty Systems can adapt the Data Logger Unit firmware to record different parameters according to customer requirements.



The standard Data Logger Unit records the following time-stamped data on a FAT32 Micro SD Card for post-processing on a PC/Laptop:

- Temperature (1x Internal, 3x External).
- Airflow.
- Acceleration Data (4x 3-axis Accelerometers).

All sampled data is stored every 4ms (250 samples in a second).

The battery voltage (+9V) is constantly monitored, and the SD Card will be closed & unmounted, and the device halted if the battery level falls below +6.4V.

A logfile is created and it is given a filename with the current date e.g. SEPT5_23.TXT.

Data is appended to the file when the recording is stopped

in between on the same day.

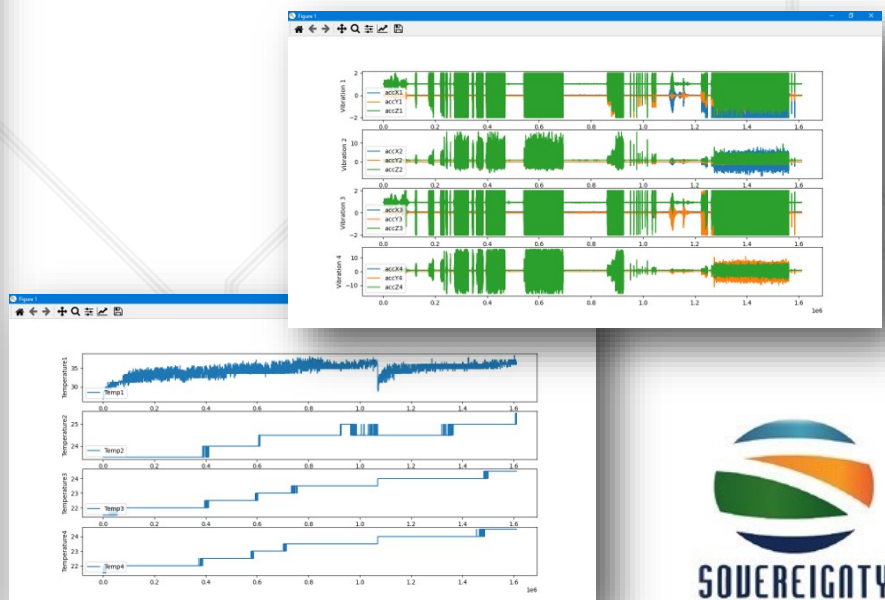
Two external signals (Power On/Off & Record On/Off) control the Data Logger Unit Power and Modes.


The SD Card is automatically Mounted and Unmounted by the software based on the Record On/Off switch input i.e. "On" causes Mount and "Off" causes Unmount.

The SD Card is removed, inserted into a PC/Laptop with a Card Slot and the data plotted using Analysis Software.

The Analysis Software was developed as a Python script to allow the user to run it on any Operating System platform i.e. Windows or Linux.

Due to the limitations of the FAT32 file system, the logfile size cannot exceed 4GB.





RF Antenna Tuning Units

RF Tuned Antennas

Intelligent Battery Packs

Power Supplies

Radio Mounting Frames



Our Products

Turnkey

Intelligent Battery Packs

Batteries are integrated with PCBs that are pre-programmed to client specification and are used with military VHF/UHF radios MCR3005, MCR2005 and PCR4000.

Sovereignty Systems (Pty) Ltd manufactures according to processes and procedures to achieve a complete product which meets military environmental standards.



PBR0406
BATTERY PACK



MBR1412
MAN PORTABLE TRANSCEIVER

RF Antenna Tuning Unit (ATU)

Sovereignty systems (Pty) Ltd manufactures and repairs the following ATU's with the aid of defined processes to accompany Reutech Communications sub-system(s) specifications:

- VCM1100W / AT2220V HF ATU VEHICLE 125W
- AT2229 HF ATU VEHICLE 125W
- AT2223 100W LOW COST CAN PERIPHERAL
- AT2223N ATU 100W
- VCM2050 VHF ANTENNA TUNING UNIT
- AT2222 125W HF LOOP ANTENNA TUNING UNIT



Field repairs/customer repairs are offered for all ATUs that are in the field, inclusive of the Projects that have been discontinued or not in order books:

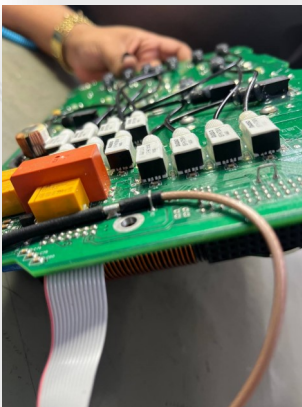
- AT2220 ATU VEHICLE 125W BLK GENERIC
- AT2221 HF ATU VEHICLE 400W BLK
- AT2820 HF LOOP ATU 100W BLK GNRL
- AT2821 ATU HF AIRBORNE 100W BLK GNRL
- AT2822 ATU HF AIRBORNE 400W BLK GNRL
- VCM1100W / AT2220V HF ATU VEHICLE 125W
- AT2229 HF ATU VEHICLE 125W
- AT2223 100W LOW COST CAN PERIPHERAL
- AT2223N ATU 100W
- VCM2050 VHF ANTENNA TUNING UNIT
- AT2222 125W HF LOOP ANTENNA TUNING UNIT



Our **manufacturing division**, based in Durban, specializes in PCB assembly, product integration and testing of advanced secure military communication systems for Airborne, Naval and Land based applications. These systems are manufactured to strict military standards, Class 3 IPC standards and in accordance with ISO9001:2015 quality standards.

We specialize in the following services:

- Printed Circuit Board Assembly (PCBA)
- Mechanical Assembly
- Conformal Coating
- Potting and Mechanical Packaging
- Test and Integration
- Product Industrialization
- Wiring, Looming and Harnessing



Our Services



Sovereignty Systems aims to exceed customer expectations and industry standards to create a unique quality system that ensures customer satisfaction and product reliability.

At Sovereignty Systems we take pride in having the highest possible standard of production, which is maintained through our strict quality control procedures.

These quality controls through multiple stages of our production process ensure constant testing and monitoring of our operation.

Sovereignty Systems continuously improves its client service and procedures to maintain or improve efficiency and quality.

We also offer a certification of the completed and tested product where required.

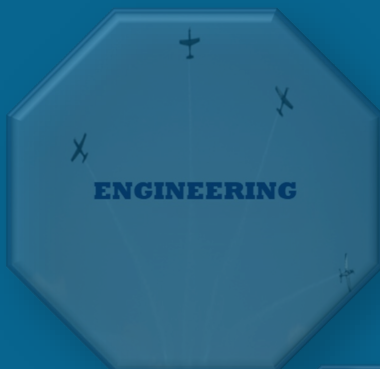
Work instructions are followed meticulously, ensuring that the quality of the product we produce, from beginning to end, is of the highest standard.





Sovereignty Systems (Pty) Ltd was established with a view to be an innovative product developer and services provider in the Aerospace and Defense Sector. We are a South African based engineering company, comprising several specialists aiming to be recognized competitors in the industry. We have positioned ourselves to address technology-based product design and development for its complete life cycle. We therefore develop, industrialize, and commercialize technology products in the Aerospace and Defense Sector.

Sovereignty Systems (Pty) Ltd was formerly appointed to the Defense Industry Development Programme, championed by the Minister of Defense, and has worked with well-recognized companies in the defense space such as Reutech, CSIR, Sysdel, GEW (Hensoldt) and Eduprep.



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