SENQUIP Quarterly Update

Welcome to the Senquip quarterly update. If you would like to be added to the distribution list, please contact us at support@senquip.com.

Welcome to IPU

Senquip is pleased to welcome IPU Group as Senquip distributor in the UK and Ireland.

IPU Group designs and manufactures high quality engine starting, fuel polishing, emissions solutions and components for critical diesel and gas engine applications. Their engineered solutions provide reliability and confidence where you need it most – for power generation, the oil and gas industry, offshore and marine, industrial, and off highway applications. With the addition of Senquip telemetry, those solutions can be remotely monitored and controlled.

"I'm delighted that IPU is now the exclusive UK and Ireland Senquip distributor. These highly innovative products can be used in various industrial applications to monitor, measure, and provide remote data capture and analysis from multiple sensors. This new distributorship is an exciting opportunity to expand our offerings to our existing markets and customers, giving more visibility of their assets and sites than ever before." said David Caddick, IPU Group Sales and Technical Director.

Senquip over satellite

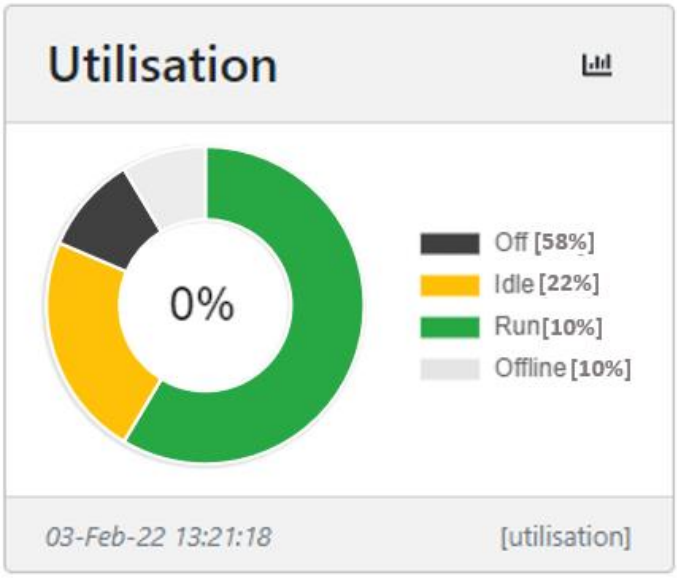
For extremely remote locations where 4G LTE is not an option, Senquip telemetry devices can be connected to a satellite modem such as the Iridium Edge which operates on the Iridium network.

The Senquip scripting engine gives you complete control over when satellite communication is used, and what data is sent, allowing you to manage data costs.

Data, whether transmitted by satellite, 4G LTE, or Wi-Fi is delivered to the Senquip Portal or a server of your choice.

For further information, see the Application Note on connecting a Senquip device to an Iridium modem on the Senquip website.

Utilisation and state variables



We noticed the large number of applications where users are measuring machine utilisation using Senquip devices. To make this simpler, we have added *state* variables to the scripting language.

State variables are persistent variables that store how much time a device has spent in each state. States can be named to suite the application with typical names being “Run”, “Stop”, “Idle”, “Fault”.

The current state can be set in a script, so for instance, when ignition is on but there is no GPS speed, the state could be set to Idle. Being able to set the state in a script allows different machines to produce comparable utilisation results.

For further information on states, please see the Scripting Guide.

Serial data received interrupt

You can write JavaScript functions for Senquip devices that will run when serial data is received. This can be handy when interfacing to serial devices that are completely under script control.

The function that is triggered when serial data arrives will typically check the serial buffer to see if a full message has been received and will then act based on the contents of the message.

Functions in Senquip scripts that are triggered based on serial data received and timers run asynchronously to the routine measurement and transmit functions on the device, meaning that they can run faster than a measurement cycle.

Data is passed between asynchronous functions and the main data handler using global data structures.

For more information, please see the Scripting Guide

Demo ORB running of AA Batteries

A while back, we setup a Senquip ORB running off Energiser AA Lithium batteries as a demo of battery capability. The device is measuring pressure, temperature, a thermocouple, and pitch + roll hourly; GPS position every 6 hours; and is transmitting all the information over 4G LTE daily. A script that converts temperature to Fahrenheit is also running.

According to the online battery calculator, the device will run for 490 days. So far it has been running 133 days and the battery voltage has gone from 6.9 to 6.75V.

Interestingly, the Senquip ORB ran off the internal LiPo battery for 128 days before accessing the AA batteries for a recharge.

The GPS is the largest consumer of energy and if turned off, it is estimated that the setup will run for 4 years on the AA batteries.

Senquip device IP testing

The apparatus on the right is a pressure chamber that we use to expose Senquip devices to high pressures such as those experienced when a device is submerged in water.

The Senquip ORB is rated to IP67. We have always known it could do better and so decided to test it. Currently we are achieving IP68 (submerged in 4m of water for 4 days) but have decided to keep going. We now have a Senquip ORB operating at a depth of 10m with no sign of water ingress. I must admit, we are a little proud.

To achieve the extended ratings, we have replaced the standard Senquip cable gland to one that does not have a pressure equalising vent (Senquip devices all ship with a vent on the cable gland). The vent is used to allow air to enter and leave the device whilst blocking moisture. This is useful in applications like where a very hot machine is washed with cold water. The hot air in Senquip device compresses as it cools, causing a suction. Without the vent, the suction may cause water to be drawn up attached cables resulting in cable corrosion and water entering the Senquip device. We will publish data on suitable glands once the experiments are complete.

Latest scripting features

```
load('senquip.js');
load('api_config.js');
load('api_endpoint.js');

SQ.set_data_handler(function(data) {
  let obj = JSON.parse(data);

  // Base 64 decode example:
  let b64 = "VGhpcyB0ZXh0IHdhcyBiYXNlNjQgZW5jb2
  let decoded = SQ.atob(b64);

  let DevModel = Cfg.get('device.model');
  let DevId = Cfg.get('device.id');
  let DevName = Cfg.get('device.name');

  // Publish data to MQTT connection
```

Senquip will continue to develop scripting, adding new functions to add capability.

- Files – a user can now create a file within a script and add arbitrary data to that file. Files can also be read by a device or can be downloaded via the webserver.
- Connectivity – functions have been added to allow a user to determine of a device is connected to Wi-Fi or 4G LTE from within a script.
- States – the state of the device can be set from within a script. State variables are persistent.
- Functions have been added to allow custom control of when a device transmits. Applications include time of day transmission.

For the latest firmware, see the Firmware Release Guide and for details on scripting, see the Scripting Guide.

Interesting sensors – Bluetooth sensors

ELA Innovation have added additional sensing capabilities to their range of Bluetooth puck sensors. This is just a selection of what is now on offer:

MAG: Magnet detection to detect opening and closing of doors
MOV: Movement detection through vibration measurement
RHT: Temperature and humidity monitoring
AI: Analog voltage measurement
PIR: Infrared detection of presence and movement
PROXIR: Distance measurement with Infra-Red
T-PROBE: Temperature measurement with an external probe

All these sensors can be read by Senquip devices. For more information on connecting to BLE sensors, please see the App Note on making sense of Bluetooth Beacon Data.