App Note: Viewing ORB Data on Google Earth Pro™.

Data measured by the ORB can be viewed can be forwarded to the Senquip Portal or directly to a user platform. In some instances, users may want to import ORB data into geographic information system (GIS) applications. A common way in which to import data is through the use of a text file such as a comma separated values (CSV) file. The Senquip Portal allows users to download selectable ranges of data in CSV file format for easy upload into GIS applications. This application note describes how to upload ORB data from the Senquip Portal to Google Earth Pro™.

Collecting the Data

The ORB-X1 can measure data from most industrial sensors and can send that data to the Senquip Portal via Wi-Fi of GSM. Of particular importance in GIS applications is the collection of position data. The ORB-X1 has a built in GPS that allows position, height, speed and other data to be collected. To enable the GPS, specify the measurement interval in the GPS settings panel on the Senquip Portal or on the ORB webserver.

GPS	
Name	GPS
Interval	1
Max Time	180 — Seconds
Position	
Position Alert	☐ Enabled
Radius	20 — Meters
Hysteresis	10 — Meters
Expected Latitude	-32.93197 — Degrees
Expected Longitude	151.77882 — Degrees
Speed	
Speed Alert	☑ Enabled
Threshold	110 — km/h
Hysteresis	1 — km/h

In the example above, since the interval is specified as 1, the GPS will be samples on every measurement cycle of the ORB. The *Max Time* parameter sets how long the GPS will attempt to acquire a satellite fix before returning to sleep. In this case, the GPS will attempt to acquire satellites for 180 seconds before returning to sleep. The *Max Time* parameter is provided to save power in cases where the ORB is battery or solar powered and the ORB is mounted in a position where satellites are not visible.

Note that position and speed alerts can be enabled. In this example, a speed alert has been enabled when the ORB travels faster than 110km/h.

Once enabled, the ORB will produce GPS data and will display it on the Senquip Portal and store it in the Senquip cloud.

Creating the CSV File

Data stored by the Senquip Portal can be downloaded as a CSV file.

Firstly, go to then *Raw Data* tab on the Senquip Portal, enter a date rage for the data of interest and press *Load Data*.

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Measured data for the time period selected will be shown in a table and the ability to choose the next, previous or a specific page is provided. Press the Export to CSV button to save your data to a CSV file on your local computer. The file will be saved with file name "RawData-ORB-xxxxxxxxx.csv" where the xxx represents the ORB device id. The file is typically saved in your downloads folder.

Device Timestamp	Device Date/Time	Server Timestamp	Speed	GPS Latitude	GPS Longitude	Analog 1	Analog 2	Ambient	Humidity	Atmospheric Pressure	Supply Voltage	Battery Voltage	System Voltage
1568869412.9	19/09/2019, 3:03:32 pm AEST	1568869412	4.7	-27.3691	153.17761	0	0	32.39	36.38	102.16	12.17	0	4.3
1568869432.9	19/09/2019, 3:03:52 pm AEST	1568869432	6.8	-27.36912	153.17773	0	0	32.39	36.36	102.15	12.17	0	4.3
1568869452.9	19/09/2019, 3:04:12 pm AEST	1568869452	3.3	-27.36918	153.1774	0	0	32.38	36.39	102.16	12.19	0	4.3

The CSV file can be opened, viewed and manipulated in any spreadsheet program and in many GIS applications.

Uploading to Google Earth Pro

Open Google Earth Pro™ and select *File > Import* and choose your downloaded CSV file.
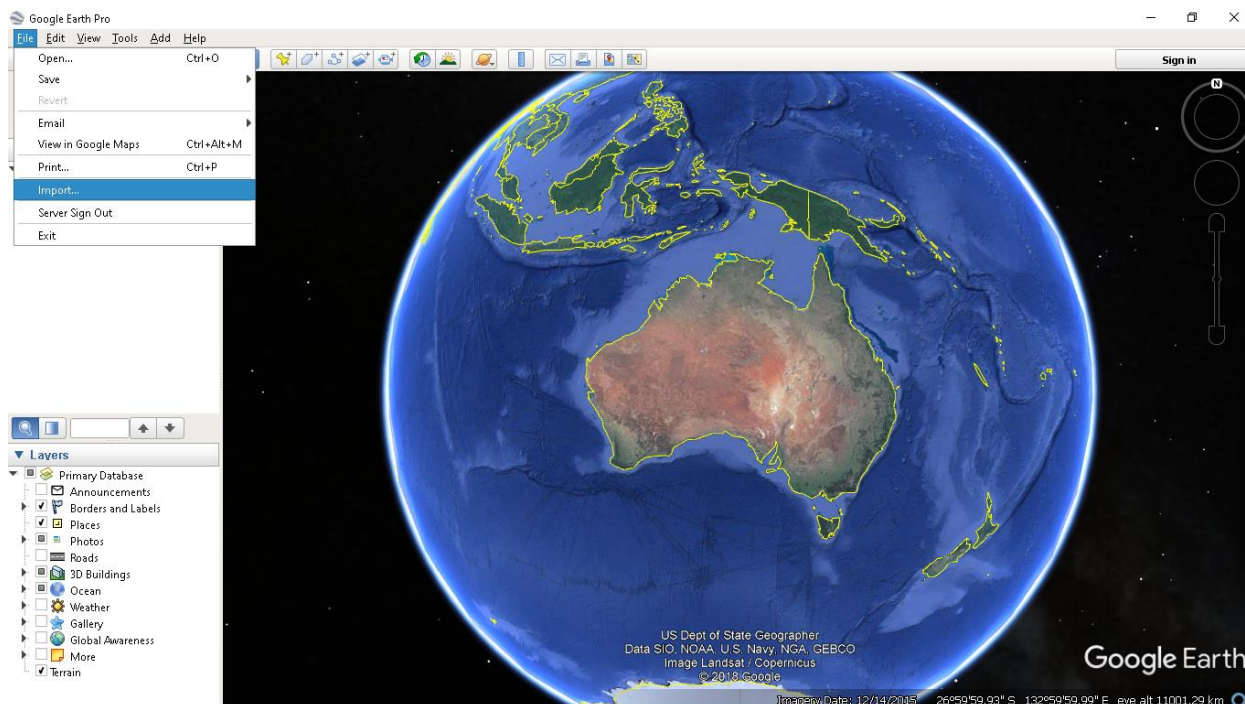
The Google Earth Pro™ Data import Wizard will open and you will see the ORB data at the bottom of the page. The settings on the first page are correct by default and can be left unchanged. Press *Next*.

In the Latitude field, choose GPS Latitude and in the Longitude field, choose GPS Longitude. Press *Next*.

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This page allows you to change the format of data other than Latitude and Longitude. We will not change anything. Press *Finish*.

Depending on the size of the CSV file as determined by the range of dates chosen and the update rate of the GPS peripheral on the ORB, you may get a warning advising that the file size is large. We are going to choose "Import All" but you may choose to go back and restrict the data range of your import file, only import a sample of the data or restrict the uploaded data to points that are on the map area currently shown.
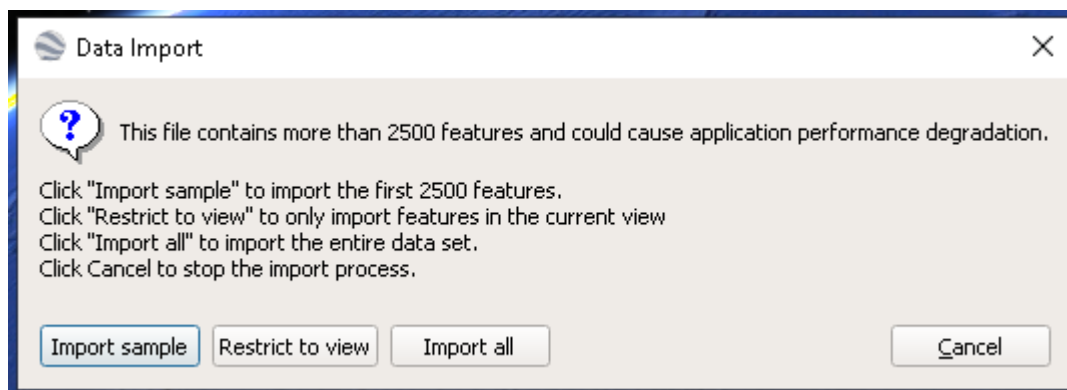
You may get asked if you want to apply a style template. Style templates allow mapping of specific fields in your imported data to display features such as icons and colours. We are going to select *Yes* and are going to map speed to a colour range. As you become more advanced in the use of Google Earth Pro, you may want to save template files to allow quick import and meaningful display of data.
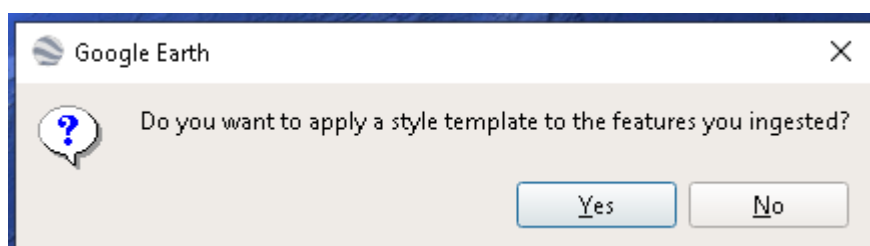
To map the speed against a colour range, select speed in the *Set name field*.

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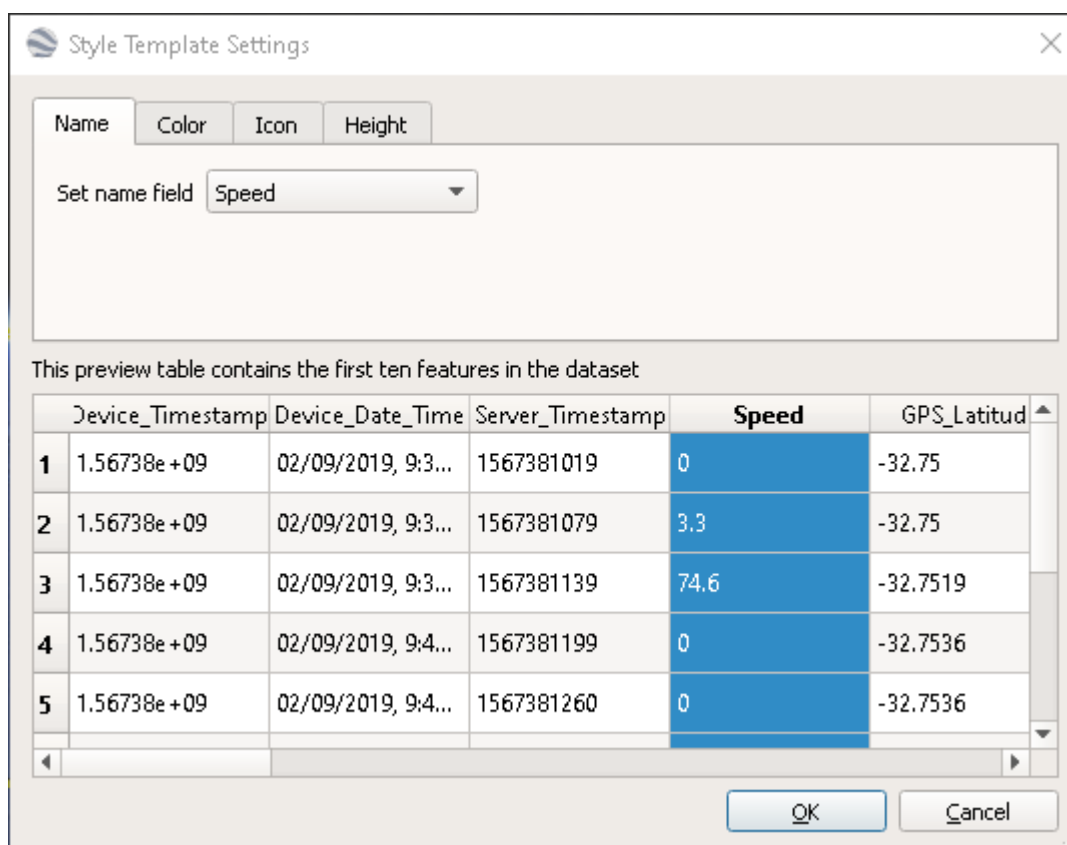
In the *Color* tab, select the *Set color from field* option and select speed as the *Select color field*. We are going to choose green as the *Palette start color* and red as the *end color*. There are other options that allow further formatting but we will select *OK* to continue. Save your template file. The Data Import Wizard will close and you will see an image of the earth. You have completed the data import process.

Viewing the Data

Your data has now been imported into Google Earth Pro™ and will be showing as an option under *Temporary Places* on the left hand side of your page under the name of your dataset, in this case "RawData-ORB-WB39S3HF1". To enable the data to be shown on the map, tick the box next to your dataset. Use the zoom, orientation and other tools on the top right of your screen to browse the data.
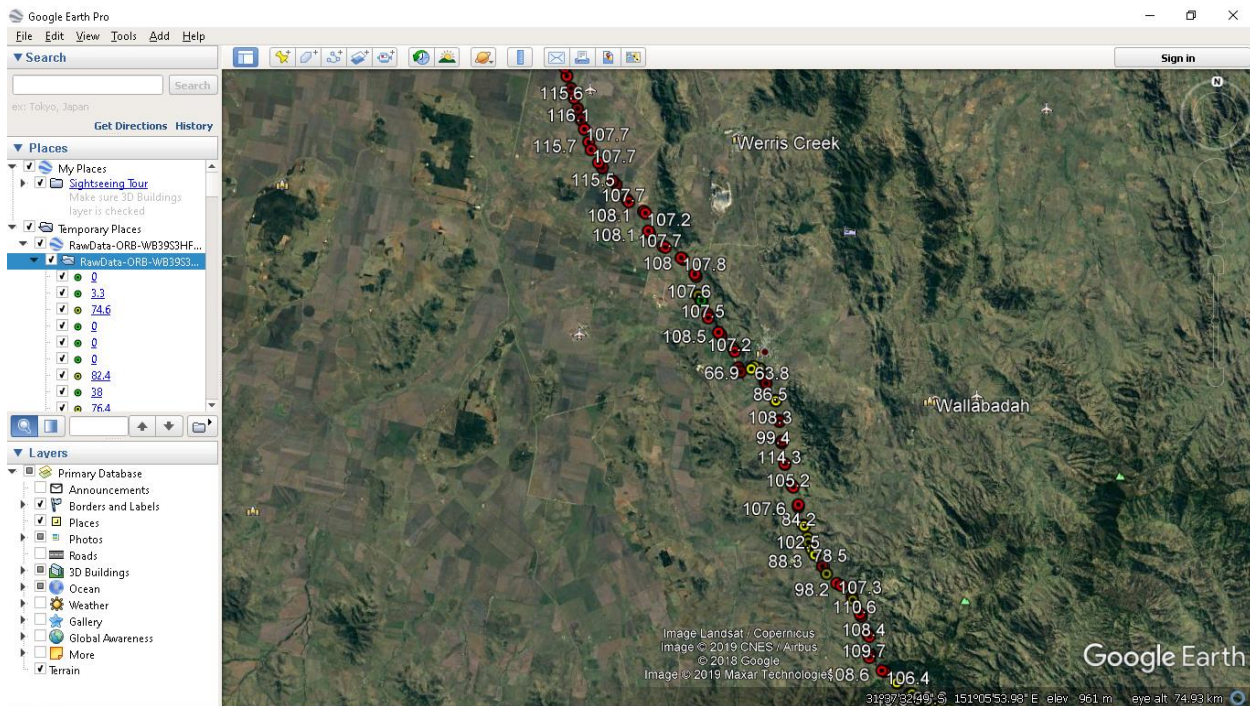
By clicking on an individual icon on the map, all the data associated with that point in time is shown.

Conclusion

The Senquip Portal allows for data measured by the ORB to be downloaded as a CSV file and imported into Google Earth Pro™. Similarly, CSV files can be loaded into other common GIS applications, meaning that it is simple to integrate ORB data into your favourite application for further processing and visualisation.