Overview of UrsaLeo IoT platform

Detailed instructions and screen shots can be accessed at www.ursaleo.com/gettingstarted. This is where the latest information on the cloud platfrom is kept.

Login System
Before connecting equipment to the UrsaLeo, it is necessary to create an account. Navigate to the UrsaLeo login screen at www.UrsaLeo.com and follow the instructions to create an account.

What does this actually do?
It captures user data so you can securely login, allows additional users to be invited to the platform and creates a 'blank' copy of the cloud platform on Google Cloud Platform (GCP). Note - you are not logged into to the Google Cloud itself - our server communicates using a hidden security certificate. This means if someone did get your login details they can't hijack your cloud account for nefarious purposes. Once you enter (or scan) the Unique Identifier and serial number on your development kit, the login server populates the copy of the Google Cloud with your kits details - the other half of the security certificate used for login and the details of the sensors that come with the kit. You are now ready to connect to the UrsaLeo IoT platform.

Billing information
As part of the login process you will need to enter your billing information. This is a necessary step to create an account - but the actual data is held by Google, not UrsaLeo. We do not bill users who transmit 50MB / data / month or less with only one user.

Connecting the development kit
Follow the getting started guide at www.ursaleo.com/gettingstarted. It is recommended you connect a terminal to the debug USB port to help with any network troubleshooting needed. There are also good online resources such as getting started videos for both the NXP and the PI kits. Once the kit is connected to the Google Cloud you can login again to the UrsaLeo server and start viewing and using your data.

UrsaLeo landing page
This is the 'home' page for each user where they can launch the various other cloud applications. The first thing to do is see your sensor data in the cloud - the data 'right now' is displayed in the dashboard.

Dashboard
Clicking the dashboard icon takes you to the pre-configured display for the ten sensors shipped with the kit. You should see the dashboard updating every few seconds, and slight changes in the numbers displayed - typical sensor noise. To create a bigger change, move the sensor board around in space, heat or cool it and watch the changes appearing in the dashboard. The sensors are samples every eight seconds by default and there is some latency between

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the gateway and the cloud, so expect changes to take a few seconds to show up. Once you start adding different sensors to the system, you can associate a dashboard applet with each new sensor, create custom dashboards and save the different layouts for easy retrieval. There is no limit to the number of dashboards or the number of applets / browser window in a dashboard except ease of use considerations.

Events / Alerts engine

The next feature to explore is setting up events and alerts - so when certain criteria are met an email or text alert is generated. This is also accessed from the cloud landing page.
There are some example event / alerts already included in the default platform and it is probably best to use those as a starting point. Enable and modify one to create an alert that sends an email or text to the user of your choice. For example set up a text to be sent when the temperature exceeds a certain value and then heat the senor board with a hairdryer to trigger the alert.

Automatic alerts

Manual alerts are used to trigger email / text when conditions are met - automatic alerts are triggered when conditions are *not* met. For example you may have a sensor reporting 24/7, every 8 seconds. If the sensor does not report for a period of time it can indicate a power failure or an internet outage (or equipment failure). In all cases this might be something you would like to be alerted to. In the sensor management area you can enable / disable automatic alerts and set the time to elapse before an alert is generated in the case of no data being transmitted. In future releases we plan to add automatic alert generation for other use cases - sensors jumping values, or operating outside of long term averages for example.
If equipment is not used 24/7 or you want to disable automatic alerts during maintenance, this can all be done from the sensor management application.

Adding sensors to the code base

It is likely that you will want to use different sensors in your actual application and code needs to be added to the gateway processor to enable this. Sensor data has to be normalized, encrypted and transmitted in a standard format. For the moment, new sensors will be added by UrsaLeo and there is a form at http://ursaleo.com/product to allow you to request adding a sensor. We can do so quickly and will confirm delivery as soon as we receive such a request. Eventually we will provide utilities within the SDK to allow customers to do this themselves.
Once the new sensor is added a new image will need to be downloaded and flashed - detailed instructions on how to do so are included in the developer section of the ursaleo website.

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Adding sensors to UrsaLeo platform
Once a new sensor is transmitting data, information about it needs to be added to the senor data base accessed from the landing screen on UrsaLeo. Navigate there and select 'add sensor'. The sensor unique ID should match the one provided in the new code download and then the rest of the database entries populated. This allows the other applications to 'listen' for data from the sensor, enabling dashboard displays and events / alert setup.

Data over time
We provide access to Google Charts through the landing page and some example charts to help you get started. Charts is typically used to plot data over time - extensive documentation on customization is available on the Google website.

Migrating code to your own design
We provide a comprehensive set of tools to embed our code in your own product using our SDKs. These are available for download in the developer section of the website (note if an SDK is not yet available for the kit we will work with you directly to enable moving the code with our engineering support)

Volume manufacturing
Setting up a line to make connected equipment in volume requires some steps to automatically add new equipment to the cloud platform. We provide test / manufacturing software to facilitate this process. Broadly a database of new devices including a UUID, and serial number of the gateway needs to be recorded at manufacturing. That data is used to create a new gateway entry in the cloud and associate that entry with the 'other half' of the security certificate so the device can securely connect. We also recommend testing device connectivity at manufacturing.

Additional functionality
We are continually working to add functionality to the UrsaLeo - below is a list of features we have planned and we're always looking for suggestions from our customers

Storage management
Choosing how long data is saved and how old data is treated

Mobile apps
To provision new sensors from a tablet and retrieve data using optical recognition

Third part applications
We provide an API to the sensor data to allow third party applications to access the data. These applications maybe your own ERP system or third party business intelligence applications for example.