

Product Document | Smart Temperature Monitoring

Application

The product is a curated set of offerings that can enable smart & centralised operational management of temperature controlled assets. The key idea is to lay down smart IoT infrastructure to enable remote monitoring of temperature levels. Such operational system will enable the operators/managers to monitor, analyse & manage their assets kept in temperature controlled places in order to mitigate the operational losses. It can be used in cold storage, cold-fleet, panel monitoring, compressor monitoring, server room monitoring etc.

Product Architecture

The product is an end-to-end offerings that consist of an IoT hardware and a software platform. The IoT hardware enables data acquisition using temperature sensors and wireless communication with the cloud. The software is a web platform running on cloud (remote servers). It can be accessed using laptop, tablet or mobile from anywhere by typing the URL: <https://iosense.io> on the web browser and entering the login credentials. The platform enables several key features to monitor the asset in near real-time across all the storage locations and generate alerts whenever the temperature reaches unwanted regimes.

IoT Device

Following are the key components of the IoT device that will be installed at the warehouses or cold storages.



Components	Description
Temperature Sensors	The device is compatible with multiple sensors such as IR temperature sensors, DHT 22 (digital), DS18B20 (digital) & PT-100 (analog: <i>requires calibrated data logger with Modbus RS-485 output</i>)
Power Supply	The IoT device comes with a 230V AC to 12V DC adapter
Data Rate	The data is sent to the cloud using MQTT in JSON format. The data rate is typically 1 sec per batch (4 data points)
Connectivity	The data is communicated wirelessly using GPRS
Local Storage	In case of poor connectivity, the data is locally stored at the device in SD Card along with the time stamp (using RTC). Once the connectivity is achieved again the data is pushed to

	the cloud.
Battery Backup (Optional)	This part is to provide suitable battery back up in case the power outage is a very common in the area and is affecting the assets.
Led Indicator	Blue: Power, Red: Data Transmission, Green: Connectivity

Temperature Sensors | IR Probes

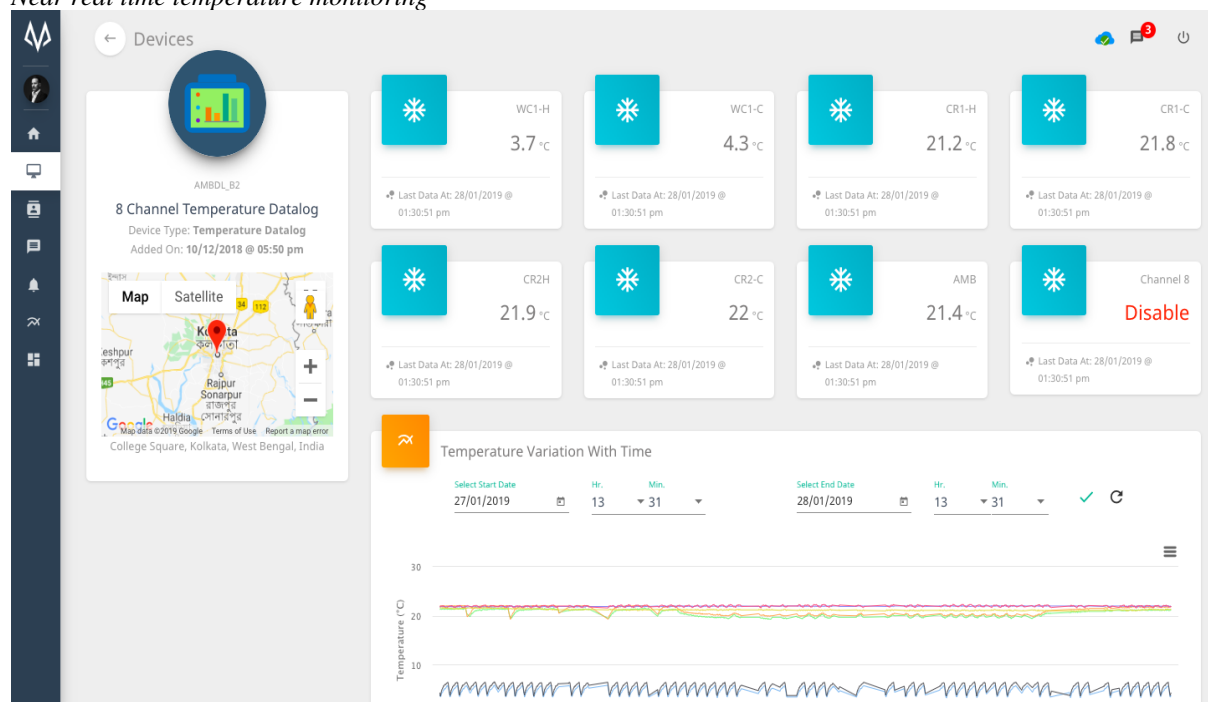


Web Platform

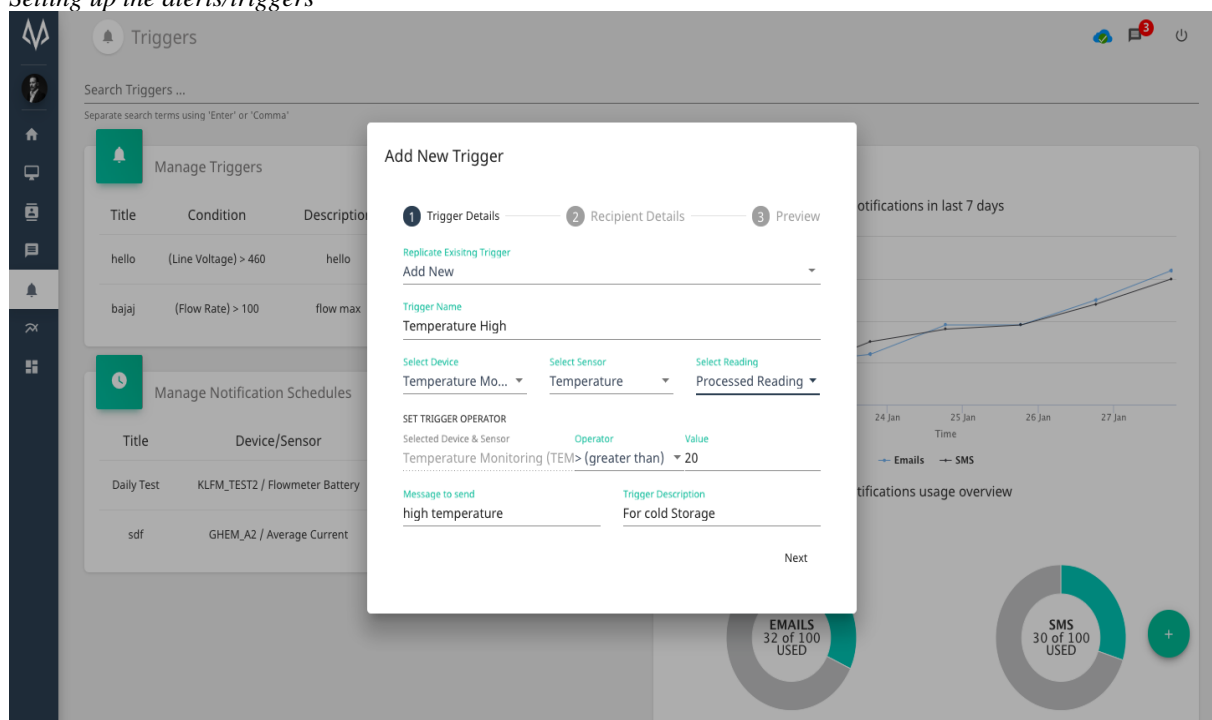
Below are the key features of the platform. The software is built using latest technologies available to ensure the security and create an architecture designed to enable curated customization in order fit a particular business case. Below are key feature set for smart temperature monitoring.

Features	Description
Visualization	Near real-time view of temperature levels of all the connected IoT devices/storages from a single interface. User can also view the locations(fixed) of each IoT devices on maps and tag(cluster) the devices for easy search & management
Reporting	Curated & custom reports to monitor the performance assets. Data Reports, Alert Log, User Sessions are provided as default reports.
Analytics	User can see and compare the trends of data of any IoT devices for any selected duration.
Triggers	Condition based triggers to send SMS, emails to alert the concerned operators. The operator can set-up/manage the required conditions using this feature.
Tracing (Optional)	The assets health can be traced by mapping its storage timelines with the temperature data of that storage location.
Admin Panel / Hierarchical Structure	To manage the devices and user-accounts. The admin can create several user accounts and allocate devices & access to setup a hierarchical and transparent structure that can efficiently be used by the manager and operators.

Near real time temperature monitoring



Setting up the alerts/triggers



Mobile view: Reports, map view, real-time data/controls

