IAS 4Xight Monitoring Solution

Document Approval

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Examiner's signature	Your signature specifies that you have reviewed this document which briefly explained about the IAS 4Xight monitoring solution.
Examiner name	
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Signature	
Date	
Sponsor's Signature	Your signature verifies that to the best of your knowledge this document fulfils all the requirements as detailed specification to develop the monitoring solution for IAS 4Xight.
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Document Classification

Title	Specification for Monitoring Solution
Version	3.1

Document Revision History

Revision History	This Revision History keeps a record of the dates when changes were made to previous documents. Any differences between this version and previous ones are resolved in favour of the current document.				
	The following table describes all revisions to this document.				
	Version	**Date**	**Initials**	**Updated Section**	**Description**
	3.0	12th January 2021	HT	All	First Version

Aim of the project:

Measurement of crude palm oil and palm kernel volume in Silo storage tanks on a Real time base.

Description of project:

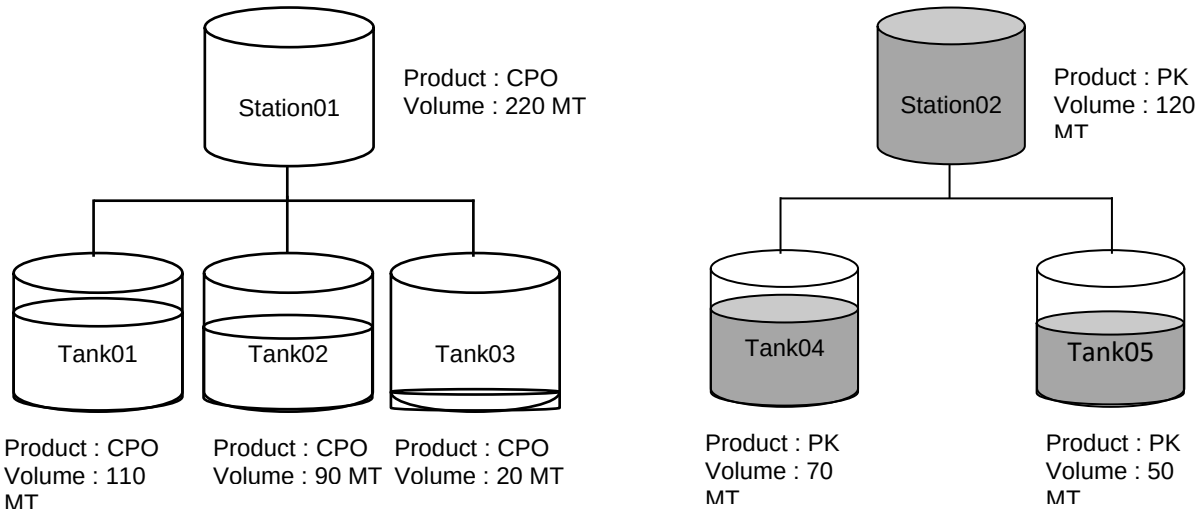
Station

The station consists of sensors / analyzer, converter, data logger and DTU. The site from where the data has to be collected for monitoring purpose is called as a station. Capturing data can be done by connecting the sensor output to a converter as per the requirement. The sensor output must be captured for calculating actual value obtained during any event and transmitting the captured parameter value to the server at HQ over a chosen communication link. In this case, 4G is chosen as the communication medium to transmit the data from the station to the server.

The very basic step is to capture the output from the **Vegaplus C21 RADAR level** sensor to measure the crude palm oil and palm kernel height inside the silo storage tank in the industry. The output from the Vegaplus C21 RADAR level sensor is in **4 to 20mA analog format**. A converter is required to convert the analog value to digital value coming from the sensor. The converter output has to be connected to the data logger. The digital value received in data logger must be converted to information using a specific formula. This information about the parameter value can be saved in a data logger as raw data (if raw data is required) for future reference. Hence, the data logger must be programmed to receive the digital value from the converter and convert the received data to an actual value (height) using a formula. The height obtained from the calculation, has to be converted to the volume of crude palm oil and palm kernel inside the silo storage tank using a formula. Since the tank size is not fixed in all locations, the tank size can be entered by a configuration page. Either the value (height) needs to be sent to the front end for calculation for obtaining the volume or the volume can be calculated in data logger as per the settings of tank size entered by the user in front end. In case of volume calculation in data logger, the volume has to be saved in data logger. If the raw data is not required, the final value such as volume of palm kernel can be saved in data logger. This data can be extracted locally in xls / csv format by a pen drive if required. After saving the data in data logger, it can be forwarded to the server using a client program as per the REST API mentioned in the server. The data can be forwarded to the server through a DTU (a customized 4G MODEM to send data using HTTP / HTTPS service) attached to the data logger. The REST client program has to be developed in data logger.

The REST Client need to encrypt the data using AES Base 64 encryption logic and the header must be encrypted using RSA encryption. Hence the encrypted data can be secured and sent to server using HTTP service over a 4G link.

Diagram:



Web Application

1. Master Files
2. UI – Setup & Configuration
3. UI – Alert & Triggering
4. Reporting

a. Dashboard
b. Graphs
c. Reports
d. Data Connectivity

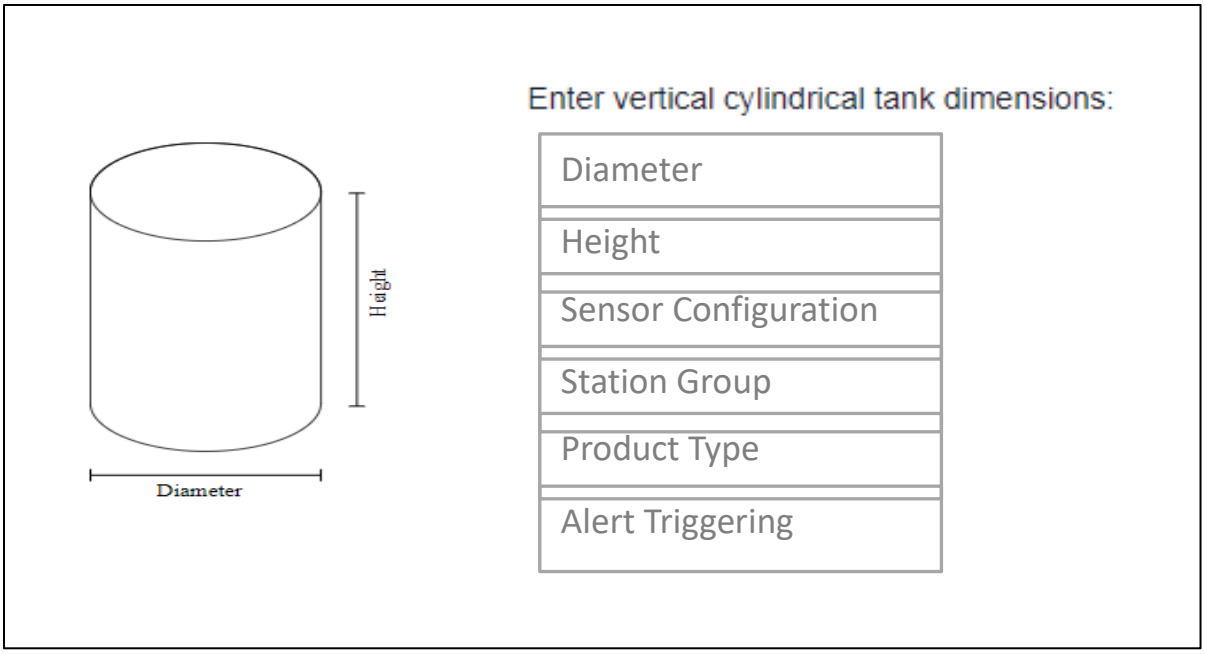
1. Master Files

a. Plant Master
b. Station Master
c. Tank Master
d. Sensor Master
   i. Signal – Min, Max, UOM
   ii. Representation – Min, Max, UOM
   iii. Actual – Min, Max, UOM
e. Product Master
f. UOM Master

g. User Master

h. Security Master

2. UI – Setup & Configuration



3. UI – Alert & Triggering

a. To have 5 Alerts Triggering via email & SMS

b. Alert Triggering

i. Triggering Volume

ii. Description

iii. Email Address

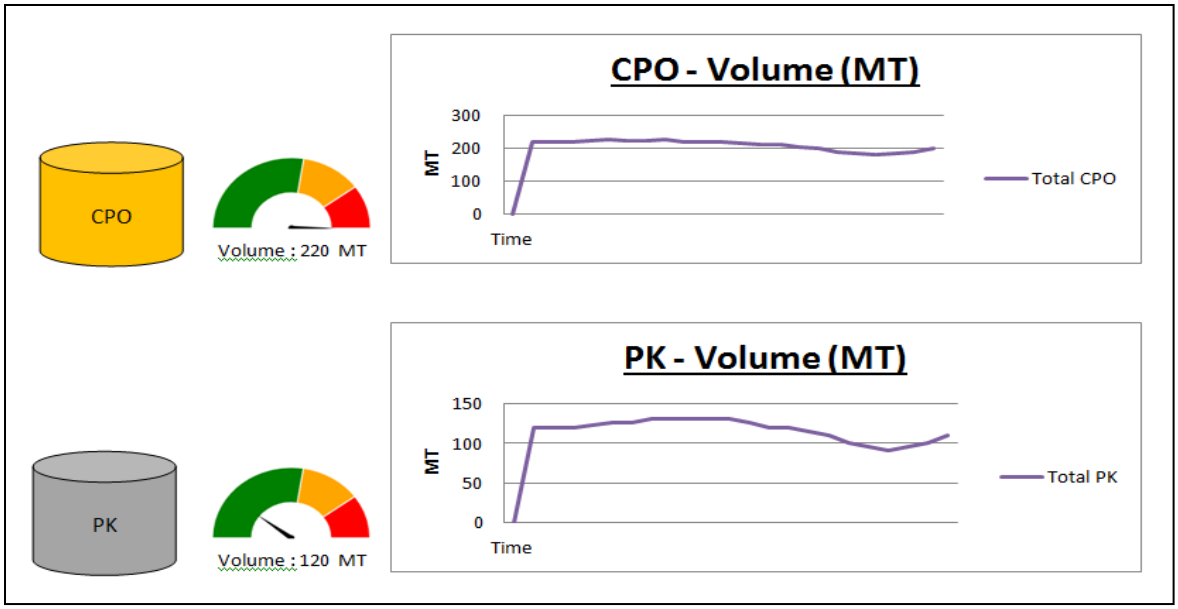
iv. HP No

4. Reporting

a. Dashboard Main

i. Product by Stations diagram

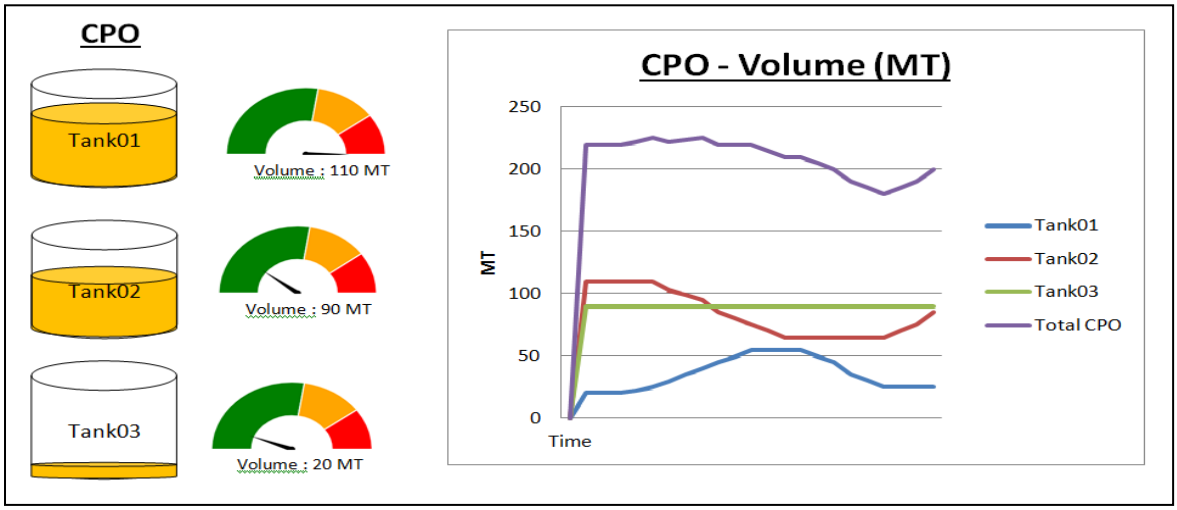
ii. Product by Stations graph

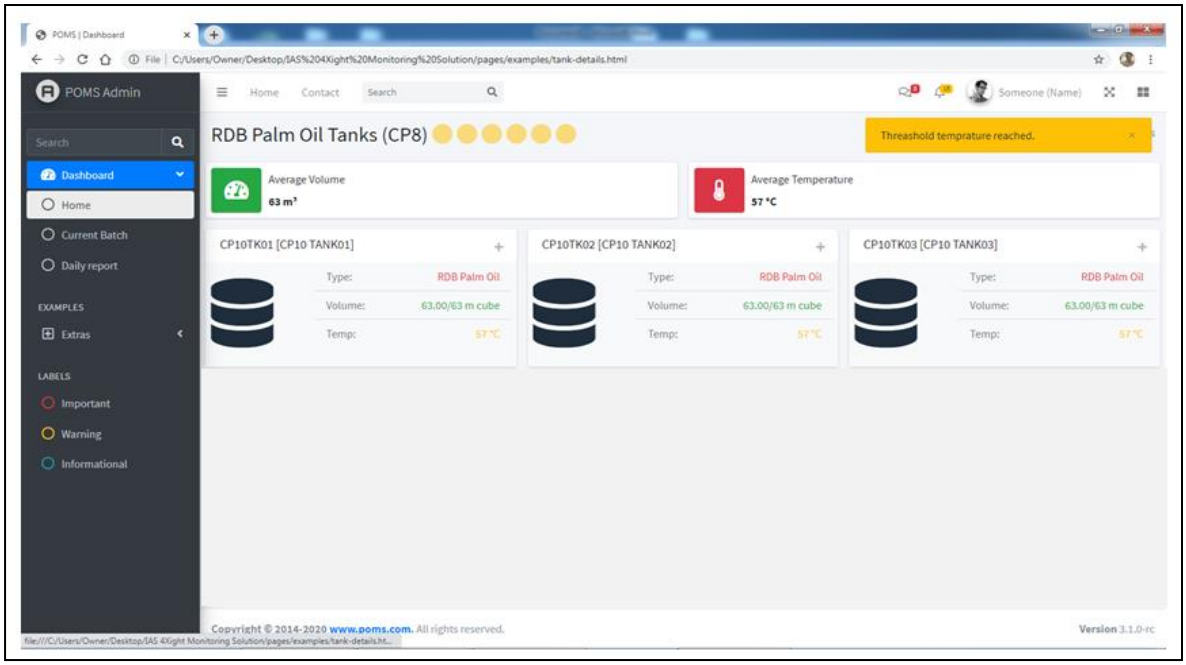


b. Second Page

i. Product by All Tanks diagram

ii. Product by All Tanks graph



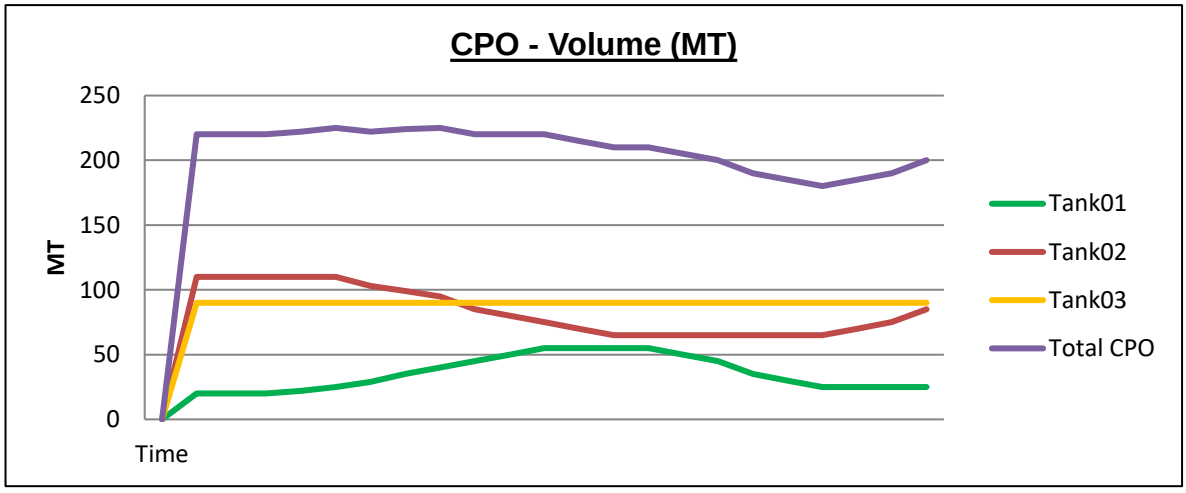


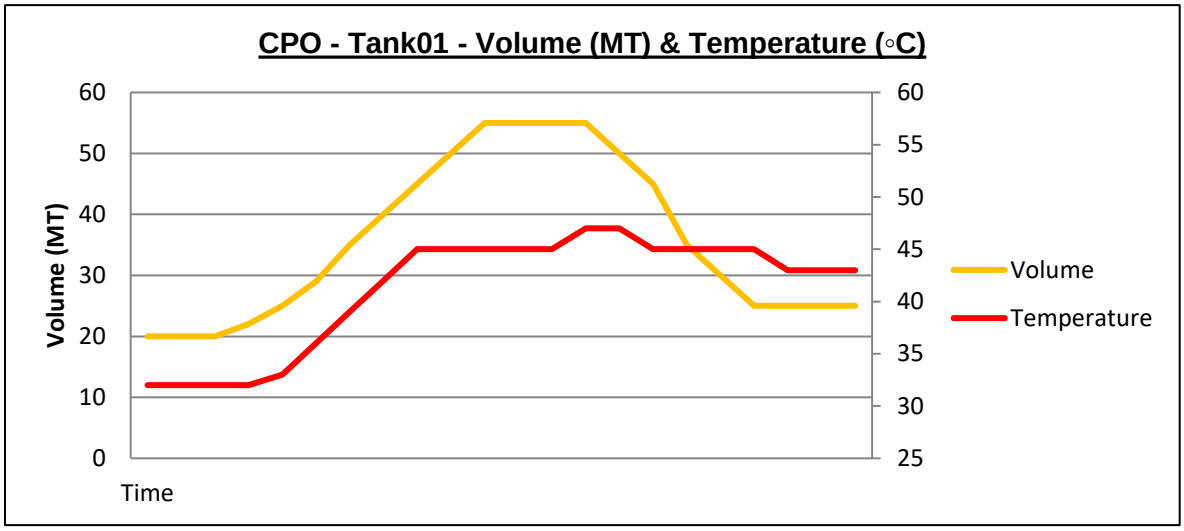
c. Third Page

i. Product by Individual Tank diagram

ii. Product by Individual Tank graph

d. Graphs





a. Reports

i. Product by Station

ii. Product by Tank

iii. Product

iv. Product by Production (+ve values)

v. Product by Issuance (-ve values)

vi. Alert & Triggering

vii. Audit Trail – on modification of Setup & Configuration

viii. Data connectivity

b. Data Connectivity status page