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ENTRACK

ADAPT SOLUTIONS

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HOME

Solar Photo Voltaic (SPV) based power sources are recognized as one of the high potential clean energy sources. Consequently, across the world and specially in developing countries, one sees special drives / incentive schemes undertaken by the Governments and Private-Public sectors to bring this technology to consumers. Over time SPV power units are becoming part of main stream alternate energy power sources. Further, one of the key attractive factors of SPV is its long life – researches predict a life of 25+ years.

Considering the fact that SPV power units are ‘costly’ while having a long life, it is perhaps prudent to simultaneously implement a solution to monitor generation as per specification and the trends as it ages.

ENTRACK : THE SOLUTION

enTrack is a solution in this space offering:

- **Energy Tracking 24x7**
Measurement and tracking of the generated units of energy and compare the same against its design/installation specifications. The trends of the generation are web enabled.
- **Alert Generation**
The measured units (like voltage, current, battery status) are benchmarked against a baseline and deviations are visually augmented to alert a user on any malfunctioning. System has provisions to send email alerts to selected users as well to installers of the system, thus aiding in proactive AMC setups.
- **Performance Tracking**
System produces trend reports on generated energy to estimate deviations with respect to original system design considerations and aids in proactive maintenance to SPV unit’s components.
- **Data Visualization & Report Generation**
Data and trends are made available to users via intuitive visual metaphors to aid ease of understanding and decision making.

➤ **Trouble Ticket and Alert tracking**

Any alert raised in the system is converted to a trouble ticket for the installer or for the vendor providing AMC for the installed SPV unit. This helps in tracking all malfunctions and establishes a SLA framework for AMC.

➤ **Secured Access**

System provides for an inbuilt security module to allow registered users to access.

➤ **Data Mining**

Provision is present to archive records for data mining, in future. This module is effective only after 2-3 years of operational data has been generated.

TECHNOLOGY SPECIFICATIONS FOR ENTRACK

Hardware

- Data acquisition module based on microcomputer MCS51
- GSM transmitter

Database

- MySql server

Application Server

- Programming Technology: java(JDK 1.6)
- MVC implementation: SpringMVC
- ORM tool: Hibernate3.1
- UI technology: JSP , jQuery
- Application server: tomcat6
- SMS handler: shell process to receive GSM data

BI Visualization Components

- Flash Gauges
- Highcharts API

MEASURING CONTRIBUTION TO SOCIETY

Environmental Impact

- ✓ Every kW of PV solar energy produced contributes to one ton CO2 offset.
- ✓ Over a life time a 500kW solar station provides 5000 ton offset of CO2.
- ✓ To highlight commitment to environment based on operational data points, this offset needs to be monitored and shared with regulators and climate evangelists.
- ✓ Important that the environmental contributions of developing countries like India contributions are measured and showcased.
- ✓ A near real time online application like enTrack aids in such a process which is transparent and can be validated for the claims made.

Consumer Economic Impact

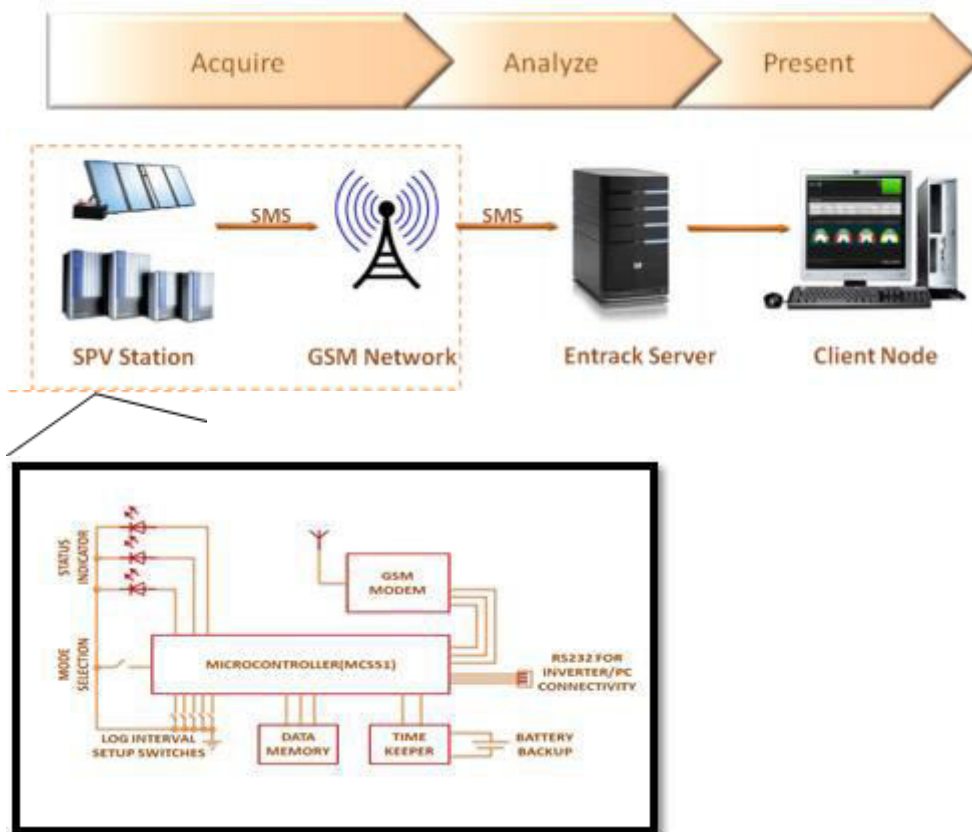
- ✓ Most of the PV power plants are built with Government subsidy.
- ✓ The energy reports of enTrack applications are available in Government eGovernance websites.

USEFULNESS OF ENTRACK

enTrack is a useful tool in the hands of

- Owners of the installation as they can measure the generated clean power and do capacity planning for near future
- Installers to provide proactive maintenance and support of the installation, as well as produce SLA compliance MIS reporting as part of their AMC
- Regulatory bodies like REDA who provides subsidies for installation of renewable energy producing units and are custodians on clean energy produced across regions / country.

ENTRACK : HOW IT WORKS



Acquire

Data is acquired at the location, digitized and transmitted over GSM network. Current version support equipments manufactured by Agni Power & Electronics and the data acquisition board is part of the PCU assembly. The GSM modem is part of this data acquisition card. Current transformers have been used as primary transducers to capture data related to voltage and current. At installation, the datacard is configured to transmit SMS to a specific number associated with the GSM receiver at the server end. Frequency of transmission can also be customized. By default data is transmitted once every 30min.

It is technically possible to deploy this data card on any PCU from outside. In such cases there could be a limitation of the data elements captured.

Analyze

Essentially a software module built using Java and uses MySQL for database. Primary function of this module is to parse the SMS containing the data string and store the various data elements in the database. Data is organized per data card, location and owner. A rule engine filters the acquired data to trigger alerts for any possible malfunction or mismatch against a benchmark data. Baselines to generate the alerts are customizable. For every alert generated, a 'trouble-ticket' is generated to help tracking the alert condition. The module has a built in security database to restrict access to the system.

Visualize

This is a key component of enTrack and uses HTML, CSS and FusionChart Flash components to deliver web enabled visualization of the generated data. Heart beat of the system is visualized thru an instrument panel metaphor. Alerts zone colours are customizable. Trend charts and data viewers have filters to provide date ranges.

ENTRACK – EVOLUTION CONTINUES

- ✓ Aggregated trends over geographical regions
- ✓ PCU independence
- ✓ non-GSM technologies to transmit data
- ✓ Integration with Modbus based data acquisition system
- ✓ Feasibility to use in grid connected large PV power stations
- ✓ enTrack dashboard on cloud