



Smart Connected Solar Panels - Shedding Light on an IoT Remote Monitoring Solution

The technology landscape is rapidly evolving, and with the introduction of the 4IR, businesses need to progressively and digitally transform to ensure operational processes are optimally enhanced to gain multiple advantages, as well as a competitive edge.

The Solution for All

With the introduction of IoT this has become a possibility. One such IoT solution creating the necessary buzz for many industries as it is enabling substantial business optimization, is remote monitoring. By utilizing IoT and implementing a remote monitoring solution, companies in varying sectors can now optimally operate outside of their existing work hours and locations, receive immediate notifications on any alerts, and ensure their systems and processes are functioning as they should.

Having an IoT solution integrated into business operations has become one of the best practices for operation enhancement and equipment monitoring performance, in today's advanced digital era.

A Shining Example

With the Solar industry growing to sprawling heights, solar companies are hard pressed to find innovative solutions to not only integrate various business processes, but also combine maintenance monitoring and management systems, into one. An IoT solution can facilitate a complete digital transformation and optimize operational efficiencies by ensuring that forecasting and energy output are correctly predicted and managed.

For a solar farm to be successful, it needs to produce the correct quota of energy, as an over production results in wasted revenue and an under-production results in loss of revenue and customers. As such, each Solar PV and its end-points need to work optimally. Previously, solar farms relied heavily upon manual processes to monitor any changes with regards to maintenance and possible issues, but due to the sector's scale and spread, this is fast becoming uncommon.

With more and more consumers viably interested in clean energy as a source of renewable power, solar has become the leading source of renewable energy. Companies, globally, have recognised that an investment into this renewable power source is guaranteed to be substantially lucrative.

The IEA (International Energy Agency) stated that according to their research it is estimated that:

Solar Power will grow extensively in the next 6 years, with 575 GW of new capacity expected to become operational over that period

[\(source: IEA\)](#)

Equally noteworthy, the South African Government announced its commitment to expanding the availability of renewable power to enhance the country's energy mix.

With a cabinet meeting held in February of 2019, it was decided that the South African government would:

Ensure a responsible and just transition to a cleaner future

[\(source: The South African\)](#)

Due to this, creating a smart connected solar farm using unique IoT technologies has consequently become a top priority for Solar companies, aiming to stay ahead of this demand.

Putting things into perspective

To establish and sustain a solar farm can be quite costly, and to effectively run it, one would need to consider certain potential risks. Without proper precautions and optimal planning in place, these risks could drastically affect not just the ROI but the overall wellbeing and sustainability of the farm. Potential risks include:

- Insufficient power output due to weather conditions

- Machinery or equipment breakdown or failure
- Business and connectivity interruption due to unplanned maintenance

One such risk to pay significant attention to, is business down time, due to inefficient inspection procedures conducted, unreported faults, repair and maintenance.

To provide further insight to the scale of a solar farm, customarily, a 10MW solar plant has in the area of 40 000 solar modules. If a technician spends 1 minute per panel to inspect it, it will take him 3 to 4 months to inspect the full plant.

These challenges can be addressed by an IoT solution. Utilizing an extensive IoT framework, provides varied benefits such as continuous remote monitoring and asset management tracking. By capitalizing on the power of IoT as the foundation of a digital business, and by instituting an intelligent IoT solution, interdepartmental business teams can marry their operational disciplines, collectively communicate with one another and optimize operations, across the board.

Equally, thanks to wireless monitoring and smart connectivity, solar farm operators can now resolve ubiquitous challenges commonly associated with involute energy grids. They can positively elevate overall efficiency as they can track, manage and monitor data, view and attend to any warnings or alarms signalled, as they occur, and intuitively schedule the required down time for maintenance, with little disruption to business operation.

It is therefore vital to have an accessible, simple and fully-integrated digital system such as IoT in place, that can empower the plant's operational personnel to effectively communicate with one another better, as well as remotely monitor and manage outputs and performance.

IoT for the Win

The Hellothing IoT solution that Fastcomm provides, has the potential to enhance existing operations within a solar farm.

By installing IoT sensors on each solar panel, this ensures that any subsequent abnormalities in behaviour occurring on the panels or its' end-points will be detected, whereby an alert will instantly be communicated. With this constant monitoring in place, preventative maintenance is enabled, and down-time is invariably reduced.

All data collected from the solar panels is aggregated by a device on the solar platform, which in turn forms part of the collective mesh network that will communicate the data to the base station. The base station forms part of the collective mesh network that will upload the solar parameters to the Hellothing cloud platform. Upon receipt, an in-depth

analysis is performed by the Hellothing platform and real-time alerts are raised and notifications sent to the correct department according to fault classification.

The real-time overall system health is reported on the client interface and can be drilled down to individual solar platform and panel performance. Operators are then able to review and monitor all historical data and trends, and subsequently provide insights into plant and device performance. Asset life cycle tracking is done on the panels and statistics are recorded and built up over time. Data is prepared and saved to be available immediately to the Hellothing portal used. The performance and efficiency of the solar plant is available in real-time and, at any given moment, the total power output of the plant is visible. By having the powerful tools of a modern IoT platform at hand, opens new possibilities, such as predictive analytics, proactive detection of malfunctions, degradations and failures.

Other impressive IOT components such as Machine Learning, Artificial Intelligence, Big Data and Cloud Computing can provide accurate real-time analytics, as well as, provide future predictions for efficiency, based on the historical solar plant data recorded.

With the help of an informative and responsive IoT solution, professionals invested in, or working at solar farms, are adaptably more capable of ensuring that demands are met, and plants are run more effectively, efficiently and profitably.

The Fastcomm Advantage

Fastcomm's business is to build technology platforms that empower its clients to digitally transform their businesses and therefore to understand and address the growing needs of their customers. Our mission is to build long-term technology partnerships that help transform companies, allowing them to concentrate on their core business.

We have a proven track record of understanding disruptive technologies and the effect that they have on businesses. We have built platforms in the IoT and OTT technology domains that allow us to connect people, places and things successfully.

The Fastcomm group of companies have been providing solutions to its partners, since 2002. We have offices in the USA, Europe and South Africa, allowing us to produce innovative solutions, utilizing know-how and skills acquired worldwide. Our skilled engineering teams have, over many years, created platforms and building blocks that allow for rapid development and deployment of solutions.

References

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