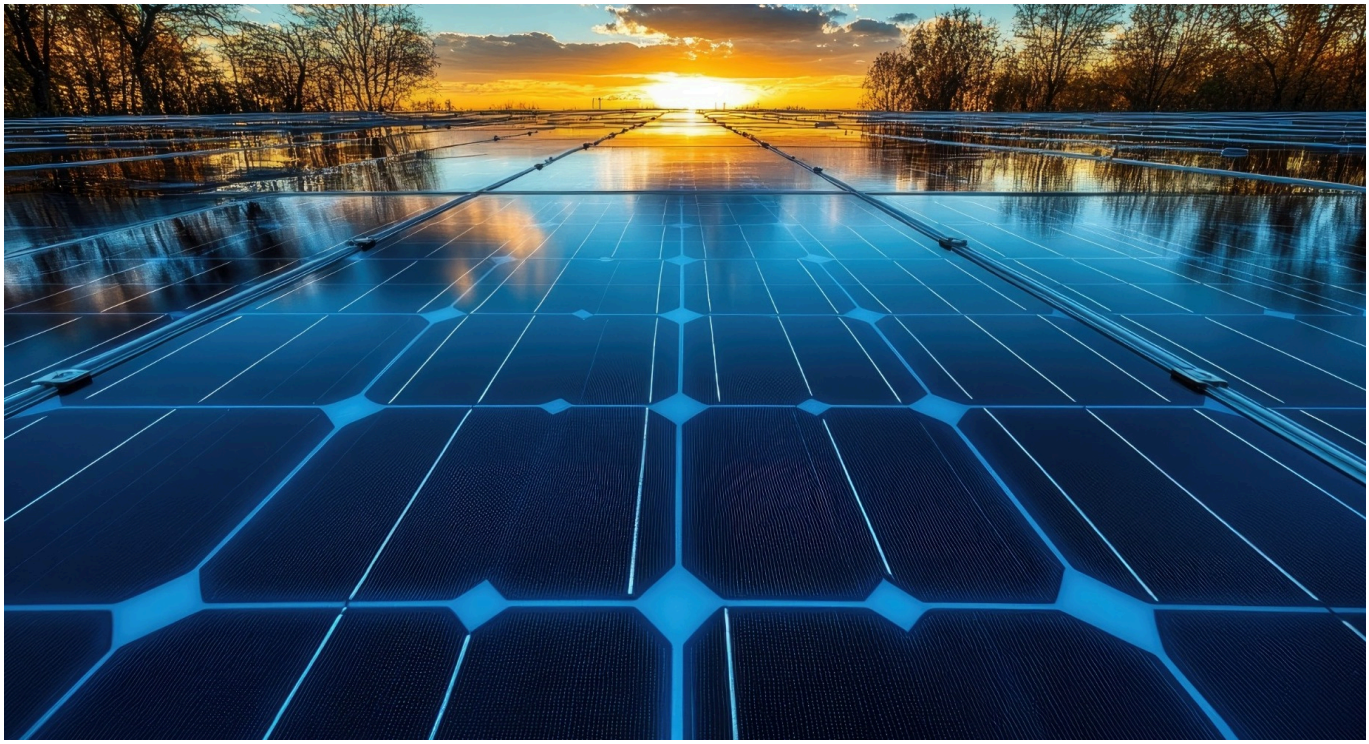
TECH OFFER

Digital Solar Asset Management and Optimization Platform



KEY INFORMATION

TECHNOLOGY CATEGORY:
Sustainability - Low Carbon Economy
Energy - Solar

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: SOUTH KOREA
ID NUMBER: TO175415

OVERVIEW

Conventional solar monitoring at the inverter level is reactive and labour-intensive, with issues like shading, soiling, mismatch, or degrdation often detected only after energy losses occur. Troubleshooting requires manual checks, slowing response times and driving up costs.

This technonlogy provides a digital O&M control plane that delivers real-time, module-level visibility and control. Coupling module-level power electronics with advanced software, it captures second-by-second data on voltage, current, temperature, and faults from each module. The platform integrates with existing inverter and SCADA systems, is inverter- agnostic, and can be retrofitted selectively where risks or losses are the highest.

By detecting anomalies early, quantifying avoided losses, and prioritizing interventions by ROI, the technology turns monitoring into proactive operations. Operators can execute remote module-level actions, such as isolating or restoring modules - before sending crews, reducing downtime and cost. Built-in safety features also meet rapid shutdown requirements and generate

auditable compliance records.

By closing the loop from sensing to analytics to remote action, this technology maximizes energy yield, accelerates response, and lowers the total cost of solarplant operations. In real-world deployments, the system has achieved up to a 50% reduction in management and O&M costs, and a 4–15% increase in overall power generation efficiency, while significantly strengthening fire-safety assurance through rapid isolation of faulty panels or hotspots.

The technology owner is seeking collaborations with asset owners, O&M service providers, and EPCs/developers for test-bedding and licensing.

TECHNOLOGY FEATURES & SPECIFICATIONS

- **Smart Module devices:** Real-time module data capture, per-module optimization, and rapid shutdown for safety and efficiency.
- **Connected edge network:** Low-power mesh links modules to an on-site gateway, which securely aggregates and normalizes data. The gateway supports Ethernet/LTE backhaul for reliable connectivity, enables remote diagnostics, and delivers over-the-air firmware updates.
- **Digital O&M platform:** Module-level visualization, anomaly detection, automated workflows, remote control, and audit-ready logs—transforming monitoring into proactive operations.

POTENTIAL APPLICATIONS

- **Solar EPCs & Developers:** Improve system bankability at shade-affected or complex sites and reduce post-commissioning performance risk.
- **O&M Service Providers:** Enable ROI-based task prioritization, remote interventions, and verifiable reporting while reducing on-site maintenance visits.
- **Insurers:** Leverage verified performance and fault data to support cleaner claims, lower loss severity, and enable risk-based premiums.
- **Asset Owners & Investors:** Strengthen yield reliability, reduce operational risk, and enhance long-term asset value and investor confidence.

UNIQUE VALUE PROPOSITION

- **Closed-Loop Digital O&M:** Transforms intelligent electronics—whether proprietary or third-party—into a unified control plane to sense, analyse, act, and verify in real time.

- **Automated, ROI-Driven Operations:** Executes predefined O&M workflows (thresholds, triage, remote actions, dispatch, escalation) and prioritizes tasks by avoided energy loss or financial impact.

- **Remote Optimization & Control**: Enables operators to isolate or restore affected zones, apply targeted performance tuning, and verify fixes remotely, minimizing site visits and downtime.

- **Continuous Learning & Improvement**: Built-in measurement and verification (M&V) tools learn across sites and auto-refine O&M rules for sustained yield enhancement.

- **Hardware-Agnostic & Scalable:** Integrates with existing inverters and SCADA systems, supporting selective retrofit deployment where justified.

- **Quantified Impact:** Proven to achieve 4–15% higher power generation, up to 50% reduction in O&M costs, and enhanced fire safety through rapid fault isolation and compliance-ready shutdowns.