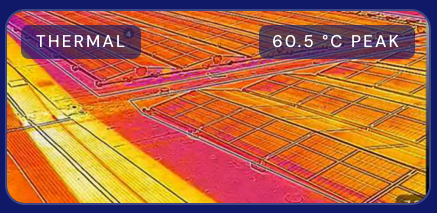
MultiSensor AI

USE CASE DATASHEET

Solar Performance Monitoring

Identify early electrical and thermal degradation across panels, inverters, combiner boxes, and terminations before declining performance becomes lost revenue.

Surface thermal anomalies as they develop: panel degradation, hotspots, resistance buildup, and array imbalance—the failure modes that rarely trigger a system-level alert. Solar Reflection Analysis is built in, so reflection is handled instead of ignored.



24/7
Continuous fixed-mount IR, not inspection-day snapshots

Days, not months
Faults caught between inspections, not after them

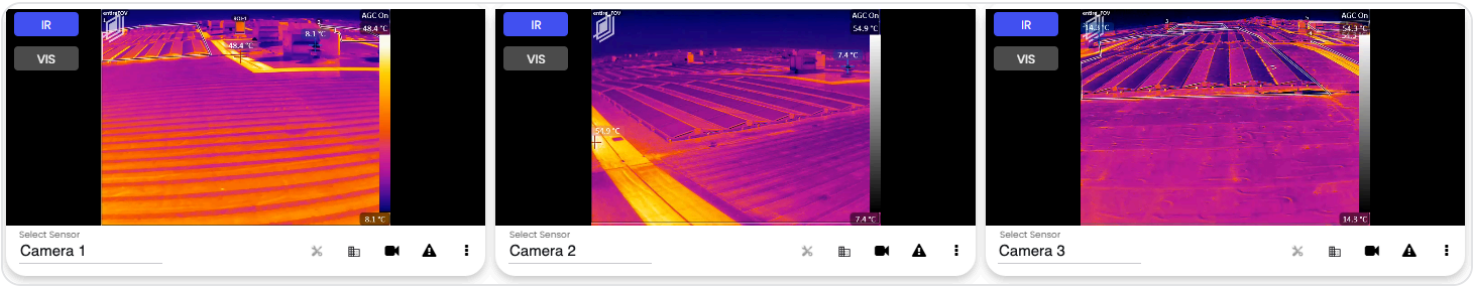
1 connector
One loose DC connection, found and fixed before it could arc. (See case study, page 2.)

WHAT IT CATCHES

FAILURE MODE	WHAT IT COSTS YOU
Panel degradation	Reduced output from cell damage or contamination. Lost generation that cannot be recovered retroactively.
Hotspots and thermal anomalies	Localized overheating at modules, terminations and DC connections. Arc and fire exposure, accelerated degradation.
Inverter and combiner faults	Resistance buildup and thermal drift in power conversion and combiner boxes before derates or shutdowns.
Array imbalance	Uneven performance across strings, racks or blocks, pinpointed to the underperforming zone.

INSIDE THE PLATFORM

MSAI Connect · Solar thermal monitoring



Continuous fixed-mount IR

Quantitative temperature on defined regions of interest, 24/7. Radiometric, not colorized.

NEW Solar reflection analysis

Reflection is identified, not filtered. Alerts carry a “possible reflection” advisory and the visual frame.

Works above SCADA and inverters

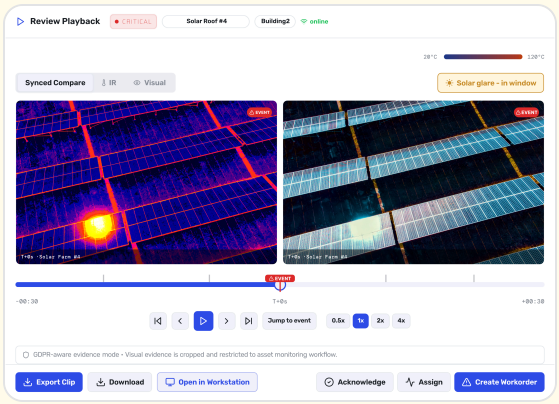
Condition trending, string and block comparison, and asset-level alert routing alongside production data.

SOLAR REFLECTION ANALYSIS NEW

Panel glass has an emissivity of roughly 0.85 to 0.90 in the 8 to 14 micron band, and its reflections are specular, so nearby warm objects can appear in the thermal image as apparent hot spots on the panel. Raising thresholds to suppress those events also raises the threshold for genuine ones, which is why the interpretation layer matters more than the threshold setting.

MSAI Connect does not filter reflection away. It identifies when reflection is possible and surfaces the alert with the evidence attached. Confirmed reflection is logged and closed; confirmed faults and uncertain events go straight to your team. Closed events are not deleted: every alert, whether resolved or escalated, stays logged and reviewable in your history.

A handheld or drone inspection can re-shoot the same area from another angle to test whether a hot spot moves, a fixed camera cannot, so MSAI Connect resolves it from alert context instead.



- **Possible reflection**, checked against time of day, sun position, alert persistence.
- **Seasonal auto-tuning**, same field of view compared against prior days.
- **Evidence with the alert**, thermal and visual frames, operator decides.

CASE STUDY

A DC connector at a combiner box had begun to work loose. Continuous IR caught it while it was still a maintenance ticket.

Visibility came from inverter and SCADA data and a drone inspection once or twice a year: one reports after the fact, the other covers one morning. Left alone, the connector would have kept heating for weeks, with arc and fire potential, before dropping enough production to register on SCADA.

> *"Heat is the early language of a fire. For years I had no way to hear it day to day."*

FACILITIES & ENERGY OPERATIONS LEAD

BEFORE · INVESTIGATION

Walk the array and hope to spot it. Faults unnoticed until the next flight, months later.

AFTER · REPAIR

A tech is dispatched to a specified location. Service calls are fixes, not investigations.

SPECIFICATIONS

SENSING

Fixed-mount radiometric thermal (IR) and visual across panels, combiner boxes, disconnects, terminations, and inverters. Radiometric, not colorized.

MEASUREMENT

Continuous quantitative temperature on asset-specific regions of interest, live and historical trending. Delta T assessed against adjacent cells under the same irradiance and load, per IEC TS 62446-3. Readings taken at different irradiance levels are not directly comparable.

REFLECTION ANALYSIS

Checks every possible reflection alert against time of day and sun position, then escalates only confirmed or uncertain events to your team.

ANALYTICS

AI baseline modeling and deviation detection, failure progression tracking, string and block comparison.

EDGE & HOSTING

The MSAI Hub processes on site and transmits encrypted. MSAI cloud or on-premises over LAN, Wi-Fi or cellular. Multi-site architecture.

ALERTING & BOUNDARIES

Asset-level alerts routed by email, SMS and phone; work orders into CMMS or EAM. Runs alongside SCADA: it reports condition, not output.

We close the visibility gap. That means earlier detection of degradation, and time to get ahead of unexpected, high-cost failures.

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