



OBSERVE

for Aerial Thermography

A leading solar EPC uses OBSERVE, the AI-powered defect detection, tracking, and remediation feature of the SenseHawk Solar Digitization Platform, to accurately identify, classify, and schedule remediation for thermal defects at the end of each stage of a project's construction.

Solar Digitization Platform or SDP

VISUALIZE, MANAGE, TRACK, COLLABORATE & REMEDIATE with a single asset-centric platform that mirrors the reality of your project.

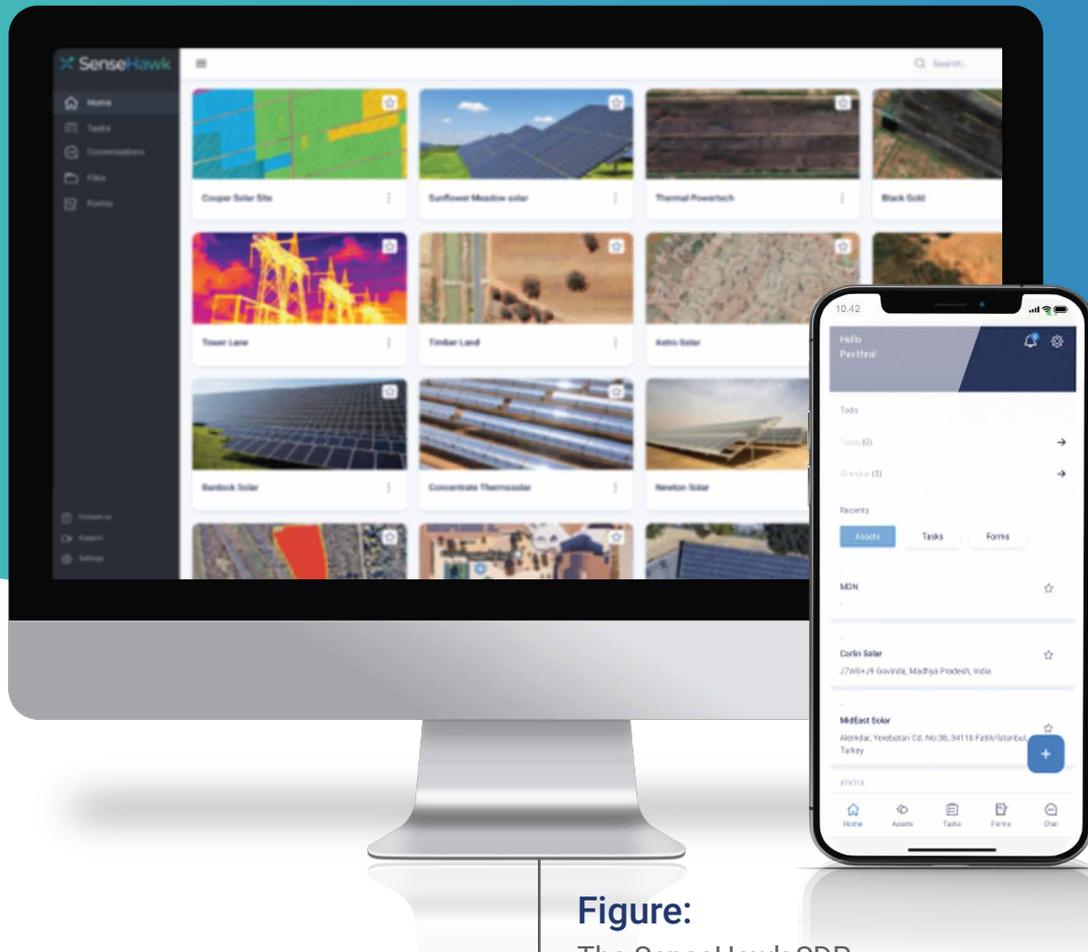


Figure:
The SenseHawk SDP,
accessible on web
and mobile

SenseHawk SDP Features

Custom-built for Solar, the SenseHawk SDP offers powerful features for every stage of your asset lifecycle. Built around an intelligent system model, the SenseHawk SDP keeps you in the KNOW, helps you BUILD, moves WORK forward, lets your teams COLLAB, and allows you to OBSERVE and remediate asset issues.

100+
GIGAWATTS

600+
SITES

20+
COUNTRIES

100+
CUSTOMERS

KNOW

Actionable insights for planning your site

Actionable insights into site planning. Location-specific views & data on in-built GIS that integrates layered inputs from SRTM, ALTA, & other surveys.

OBSERVE

Drive remediation and never miss a defect

Get alerted to hotspots, see classified hotspot types, view defect locations, & schedule remediation tasks. Evaluate energy loss & track defects over time.



BUILD

Full-featured solar construction management

Construction management suite to schedule projects, assign jobs, build workflows, configure quality controls, digitize documentation, & unify onsite & stakeholder reporting.



AIM

Asset Information Model

System model of your asset's digital twin



COLLAB

All you need to keep your teams in the know

Real-time coordination with job sites on desktop & mobile app to enable timely access to information, contextual communication, & notifications.



GO

The map-powered app that works offline

Mobile app to navigate to a task or location of a defect. Attach observations, photos, videos, or forms and chat with the team. Work offline & sync when connected.

WORK

Map-based, end-to-end site work management

Tracking & scheduling of work using forms, tasks, & workflows. Field-friendly mobile app for onsite teams with built-in map views overlaid on asset data from AIM.

User Interface for the SDP OBSERVE feature



FILTERS

Filter thermal defects to view by priority, remediation status, assignee, due date, and temperature range, as shareable lists.



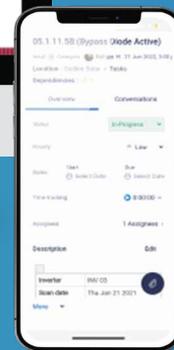
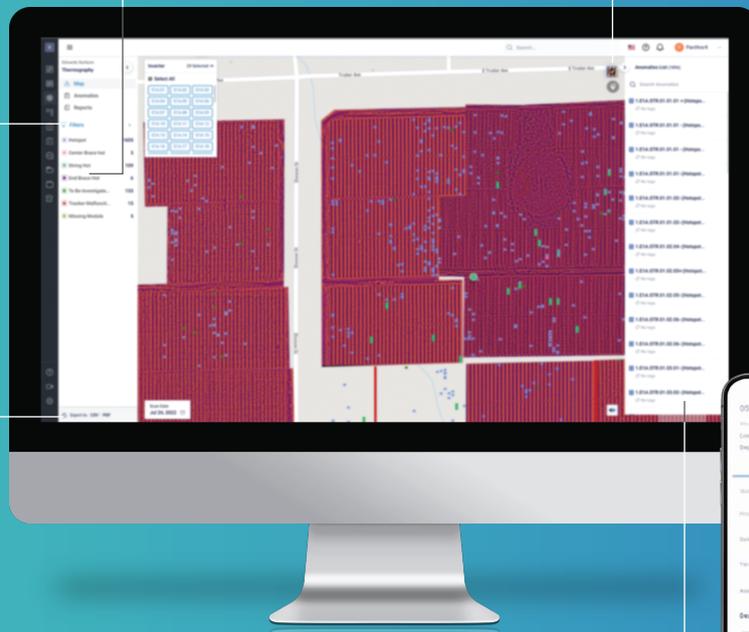
DEFECT CLASSIFICATION

View defect types, classified automatically based on thermal signatures, and represented using color-coded vectors on the site map.



MAP VIEW

Switch between visual and thermal map views of the site that integrate all identified defects along with associated tasks, forms, and other information.



REPORTS

Track, download and share filtered defects or task reports with all associated details.



DEFECT-RELATED TASKS

Access tasks, linked to each identified defect, with all relevant details, including defect type, location, and temperature delta.



MOBILE APP

Fieldworker-friendly mobile app to view defect lists, access assigned tasks, navigate to defects, update reports, attach images, and more.

Case Study

The OBSERVE feature of the SDP helps resolve solar installation issues faster with integrated defect detection and task assignment. Read on for a specific use case where a leading solar EPC uses OBSERVE to quickly and accurately identify and remediate defects for each completed phase of an under-construction utility-scale project.

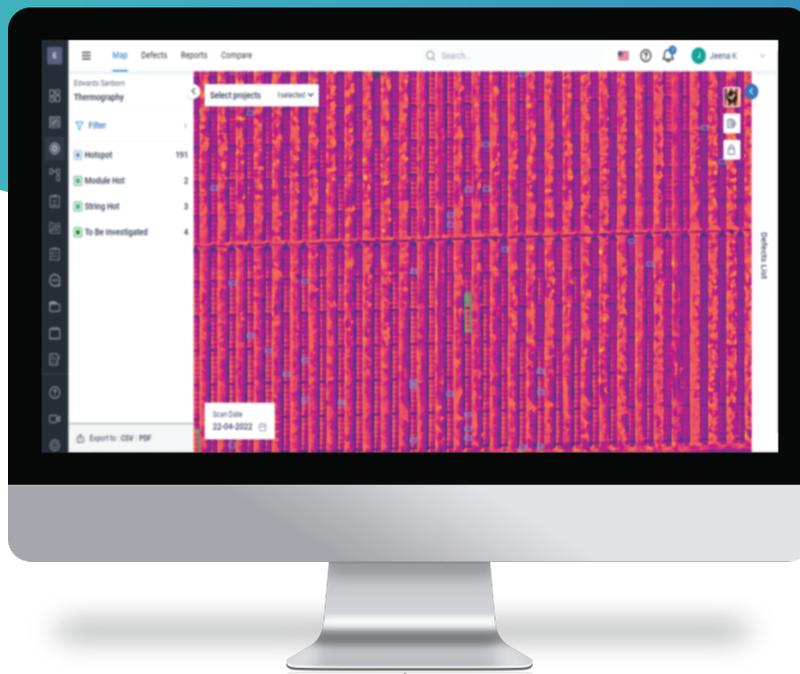


Figure:

Interactive thermographic map view with color-coded defects. Drill down to view all associated information

- ✘ A leading EPC approaches SenseHawk to conduct a thermal study of the completed phase of its under-construction utility-scale solar project and identify defects in the installed solar modules.
- ✘ SenseHawk proposes using the OBSERVE feature of its SDP to swiftly identify, classify, and prioritize defects for effective remediation.
- ✘ OBSERVE significantly reduces the time taken to identify thermal defects per inverter. The integrated task management feature on the SDP speeds up remediation and helps the EPC enhance the expected energy yield.

At a Glance

The Client Requirement

A leading EPC is constructing a large integrated solar and energy storage project in multiple phases. It wants to identify, classify, and fix defects in the installed solar modules at the end of each phase of construction. Spread across 6000 acres, the completed project will have nearly 2.5 million photovoltaic (PV) modules.

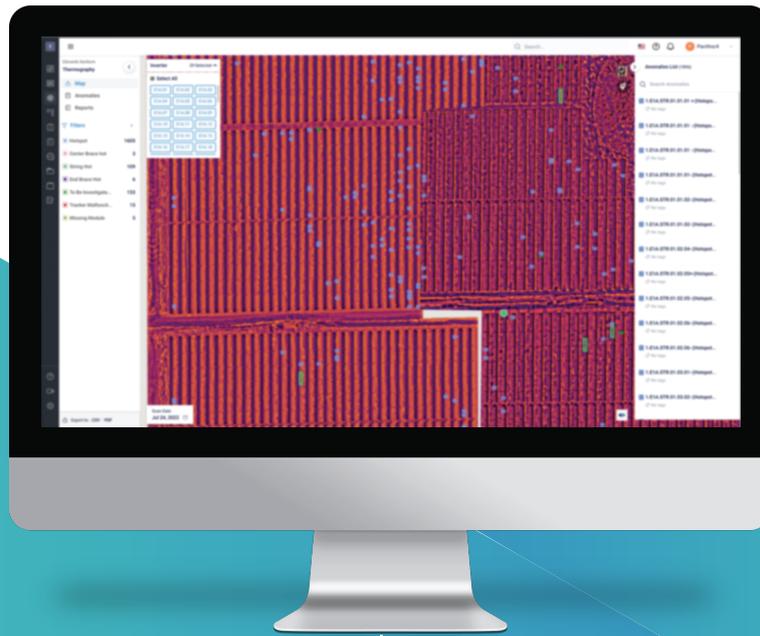


Figure:
Interactive map-based
defect and remediation
tracking

Timely detection of mechanical and electrical defects in the solar modules will ensure optimal power generation capacity during commissioning. Defects due to module manufacturing issues can be flagged for the asset owner to investigate for warranty claims.

The EPC wants the thermal study of each completed phase of project construction to be done quickly, accurately, and in lockstep with the construction schedule. However, conventional handheld thermography methods take time and a large crew to locate, investigate, report, and address defects. Even when the final reports are given, field engineers often struggle to use them to locate the table or string number on the vast solar sites. Poor network connectivity can also make onsite recording of investigation results difficult.

SenseHawk's Proposal

SenseHawk proposes using OBSERVE, the drone-scan based defect detection and remediation feature of the SDP to address the EPC's requirement.

Infrared (IR) camera-equipped drones are used to rapidly scan the site. Proprietary algorithms are applied to analyze the imagery to identify defects, classify them based on probable cause and issue severity, and create a thermal map of the defects that is layered on the digital model of the site on the SDP.

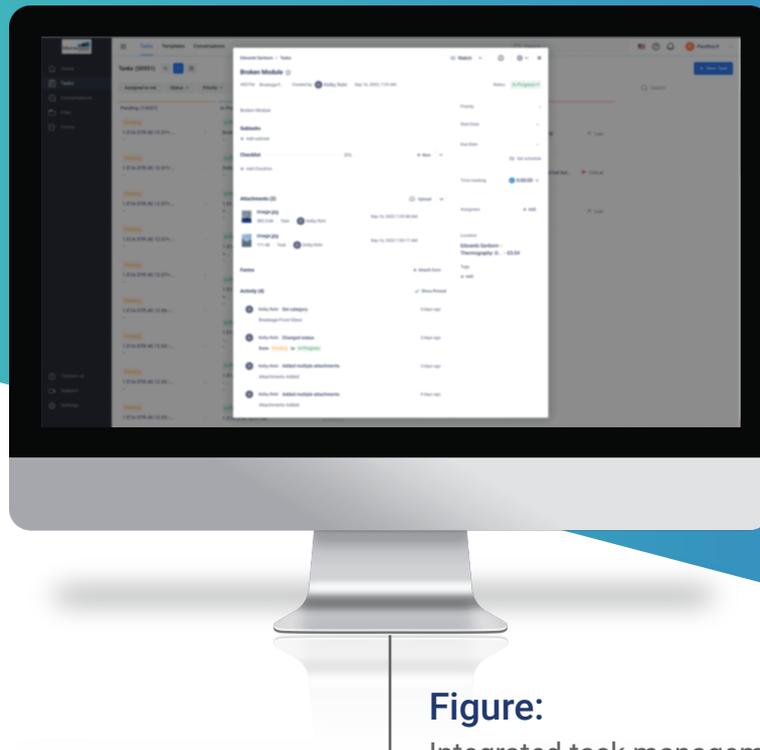


Figure:
Integrated task management
to support remediation after
defect detection

Each identified defect triggers the automatic creation of a related task. The tasks can now be easily assigned to the EPC's onsite teams for investigation, remediation, and status updates. Custom lists can be generated using various filters, including defect type, priority, temperature range, task assignee, due date, and more. Viewable on the SenseHawk desktop and mobile apps, these reports incorporate hotspot locations, string numbers, temperature deltas, and defect classification, among other useful details to aid field teams in remediation.

Based on the defect types and probable causes, the EPC team can filter out and remediate the mechanical and electrical issues, such as string heat, string short circuits, tracker malfunctions, and cracked modules. However, the defects caused by faults in the module can be reassigned to the owner's team for field investigation and possible warranty claims.

The Impact

Based on the thermal study of the first completed phase of the project, a large number of "cell failure" hotspots are flagged on OBSERVE. Cell failure indicates a catastrophic failure of the module, making it eligible for warranty replacement. However, field investigations reveal that over 60% of these defects are, in fact, benign "light visible through scribes" that do not affect module performance. The EPC now has significantly fewer defects to address.

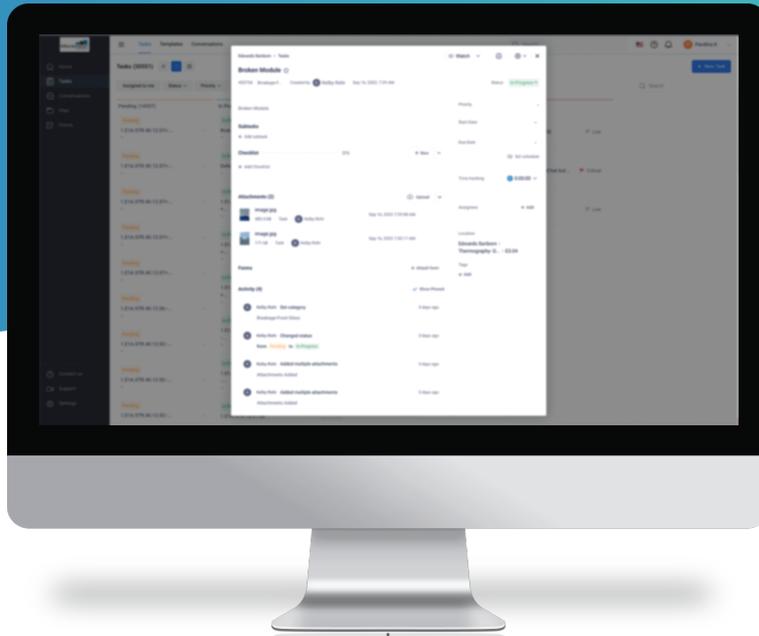


Figure:
Resolve tasks faster with
in-time and up-to-date
information

With OBSERVE, the EPC can significantly reduce the effort and time required to identify and remediate defects. Addressing the defects results in an increase of over 4% in the forecast yield.

Depending on the number of defects, OBSERVE can increase defect identification speed to up to 20 MW per day or 2 hours per inverter.

Driving Remediation with OBSERVE

The EPC constructing the multi-phase energy storage project is among the top five in the region and was chosen by the project owner for its cutting-edge approach to quality and delivery. The EPC wants to conduct a thermal analysis of each completed stage of construction and address defects in a timely manner to stay on track with the construction schedule.

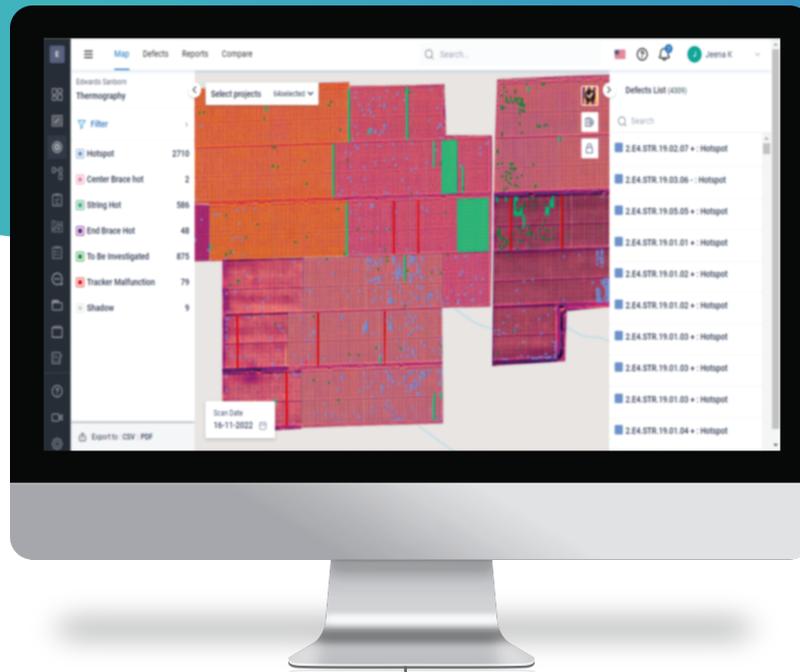


Figure:

Zero-miss defect detection and proper classification for efficient remediation and optimal asset health

SenseHawk's OBSERVE feature, with its integrated defect detection and task assignment capabilities, provides a fast and efficient way to address defects. Various filters can be applied to the collated defect data to create custom lists that can be downloaded or shared. The reports contain all relevant defect details, including defect type, string number, and temperature delta.

The tasks that are automatically created for each defect can be assigned to field teams for action. Managers can attach checklists and forms to manage the processes. Using the interactive map views on the fieldworker-friendly mobile app, GO, onsite crews can locate, navigate to, investigate, remediate, and create status updates for each defect.

Using OBSERVE, the EPC can detect mechanical or electrical defects such as string heat, string short circuits, tracker malfunctions, or cracked modules, and address them immediately. It is also able to reassign thermal defects caused by issues in the manufacturing to the asset owner's team for investigation and possible warranty claims from the module manufacturer.

About OBSERVE

OBSERVE, on the SenseHawk SDP, helps users detect hotspots, evaluate energy loss, schedule maintenance, track defects over time, and more. Thermal defects are identified from sensor-driven reports, including drone scans. Mitigating tasks are then automatically created and assigned to field teams with workflows to resolve and close them efficiently.

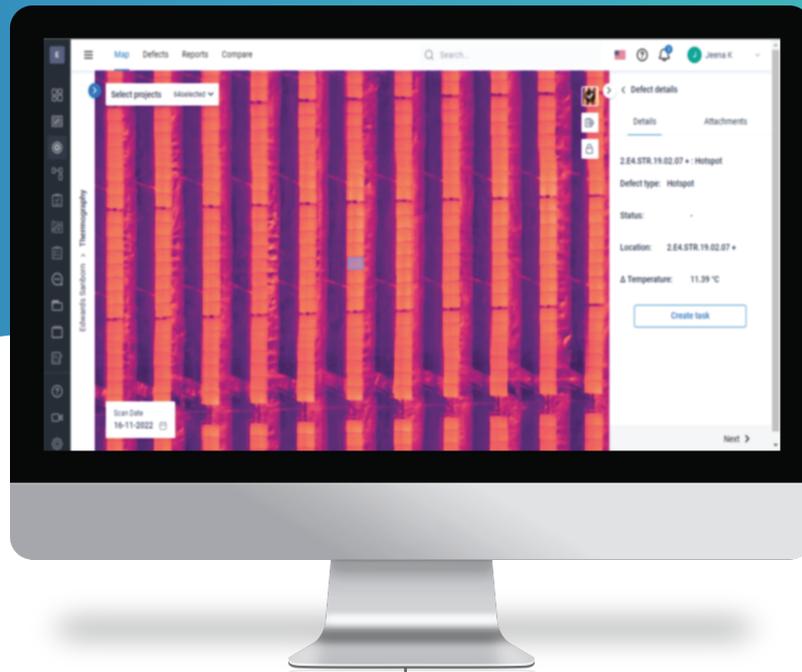


Figure:

Thermal defects viewed on the map-based app, along with string or module numbers and other data useful for remediation

The identified hotspots are differentiated by type and assigned their respective string or module numbers on OBSERVE, and resolution is much faster. Data collection, access to installation files, and warranty data is simplified with AIM. The user can access the integrated barcode scans to identify batches for timely warranty claims and replacements.

On-site, field teams can use the map-based mobile application, GO, to view assigned tickets, navigate to the problem, access checklists and related documents, including warranty information, flash test data, and work history, fill out reports, attach supporting photographs, and record component replacement to help track serial numbers.



About SenseHawk

SenseHawk is an early-stage California-based developer of software-based management tools for the solar energy generation industry with operations in the United States, the UAE, and India. SenseHawk's Solar Digitization Platform SaaS helps with process optimization, automation, and asset information management. The SDP enables yield improvement, defect identification, progress monitoring, productivity enhancement, cost reduction, collaboration, and data management throughout the solar lifecycle. From development and construction, through operations and maintenance, SenseHawk software has been deployed on 600+ solar sites worldwide.



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 www.sensehawk.com