AERIAL INFRARED THERMOGRAPHY · IEC/TS 62446-3

Photovoltaic Thermographic Inspection Report

Drone-based radiometric IR survey of PV modules and systems for fault detection, severity classification, and O&M prioritisation.

CLIENT *[Client / O&M operator]*	PLANT *[Plant name · MWp]*	INSPECTION DATE *[YYYY-MM-DD]*
REPORT REF. / REV. *[REF-001 / r0]*	OPERATOR **Nadir — Alexandro Priftuli**	CAA OPERATOR REG. *[SI reg. no.]*

Screening survey per IEC/TS 62446-3. Results reflect thermally detectable conditions at the irradiance and time stated in §1. Not a substitute for electrical commissioning tests (IEC 62446-1). Nadir · Alexandro Priftuli · alexandro.priftuli@gmail.com

1. Environmental & Survey Conditions

IEC 62446-3 validity gate: plane-of-array irradiance **≥600 W/m²** (target >700), stable and clear, low wind. Data captured outside these bounds is flagged invalid.

Parameter	Value	Requirement	Pass
Irradiance (plane of array)	*[W/m²]*	≥600	*[Y/N]*
Ambient temperature	*[°C]*	record	—
Wind speed	*[m/s]*	<8 typ.	*[Y/N]*
Sky / cloud cover	*[clear / scattered]*	stable, clear	*[Y/N]*
Soiling state	*[clean / dusty]*	record	—

2. Equipment & Method

Item	Detail
Aircraft / sensor	DJI Mavic 3 Thermal (M3T) — 640×512 radiometric IR · 48 MP wide RGB · zoom
Flight altitude / GSD	*[m AGL] / [thermal GSD cm/px]*
Emissivity / reflected temp.	*[0.85 glass] / [°C]*
Scan pattern / overlap	*[grid, nadir, overlap %]*
Processing	DJI Thermal Analysis Tool (radiometric ΔT) + geotag / layout overlay
Standards applied	IEC/TS 62446-3; IEC 62446-1 (commissioning reference)

DETECTION LIMIT

The 640×512 sensor reliably resolves cell- and substring-level anomalies at the stated GSD. Sub-cell microcracks are confirmed only on the zoom pass and are not exhaustively screened. Findings are limited to thermally detectable defects under the conditions in §1.

3. Defect Classification & Severity

Thermal delta (ΔT) is measured against representative healthy modules within the same string. IEC 62446-3 classifies anomalies by type/pattern; the ΔT tiers below are an operator triage convention for O&M prioritisation, not an IEC-mandated threshold.

ΔT	Priority	Action
< 10 °C	Monitor	No immediate action; re-check next cycle
10–20 °C	Schedule	Plan repair / cleaning within maintenance window
> 20 °C	Urgent	Inspect promptly — fire / safety / production risk

Defect classes (anomaly types catalogued under IEC 62446-3): hot spot (single cell) · bypass-diode / substring activation · PID · soiling / shading · full-module open · string offline · junction-box / connector fault.

4. Summary of Findings

Defect class	Count	Affected MWp	Est. production loss
Hot spot (cell)	*[n]*	*[—]*	*[—]*
Substring / bypass diode	*[n]*	*[—]*	*[—]*
Full module / string offline	*[n]*	*[—]*	*[—]*
PID	*[n]*	*[—]*	*[—]*
Soiling / shading	*[n]*	*[—]*	*[—]*
Junction-box / connector	*[n]*	*[—]*	*[—]*
Total	***[N]***	***[MWp]***	***[%]***

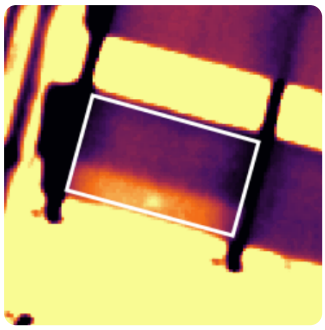
5. Anomaly Inventory

One row per defect. Full machine-readable list delivered as accompanying **anomalies.csv** / GeoJSON for direct O&M / CMMS import.

ID	GPS / string / module	Class	ΔT (°C)	Priority	Image ref.
A-001	*[lat,lon · S## · M##]*	*[class]*	*[ΔT]*	*[tier]*	*[IR / RGB]*
A-002	*…*	*…*	*…*	*…*	*…*

PER-ANOMALY DETAIL (REPEAT PER FLAGGED DEFECT)

Anomaly *A-001* — *[class]* *[tier]*



Thermal IR — elevated ΔT at lower module edge (boxed)

RGB — same array for module identification

Location: *[GPS · inverter · string · module]*
ΔT: *[°C]* · **Pattern:** *[single cell / substring / full module]*
Probable cause: *[…]*
Recommendation: *[…]*

6. Site Thermal Map

[Plant layout / orthomosaic with anomalies pinned and colour-coded by priority]

7. Limitations & Declaration

Screening survey under IEC/TS 62446-3. Results reflect thermally detectable conditions at the time and irradiance stated in §1. This report is not a substitute for electrical commissioning tests (IEC 62446-1). Recommendations are advisory; electrical verification before any intervention is the client's responsibility.

DELIVERABLES ACCOMPANYING THIS REPORT

Branded PDF (this document) · **anomalies.csv / GeoJSON** for CMMS import · geotagged thermal + RGB image pairs per anomaly · annotated site map.

Alexandro Priftuli · Nadir · alexandro.priftuli@gmail.com · *[date / signature]*