



*Growth through innovation*

**SISDRON** 

The word "SISDRON" is in a large, bold, grey, sans-serif font. To its right is a stylized icon of a drone, consisting of a central grey body with four blue circular propellers.

**INDUSTRY  
4.0**

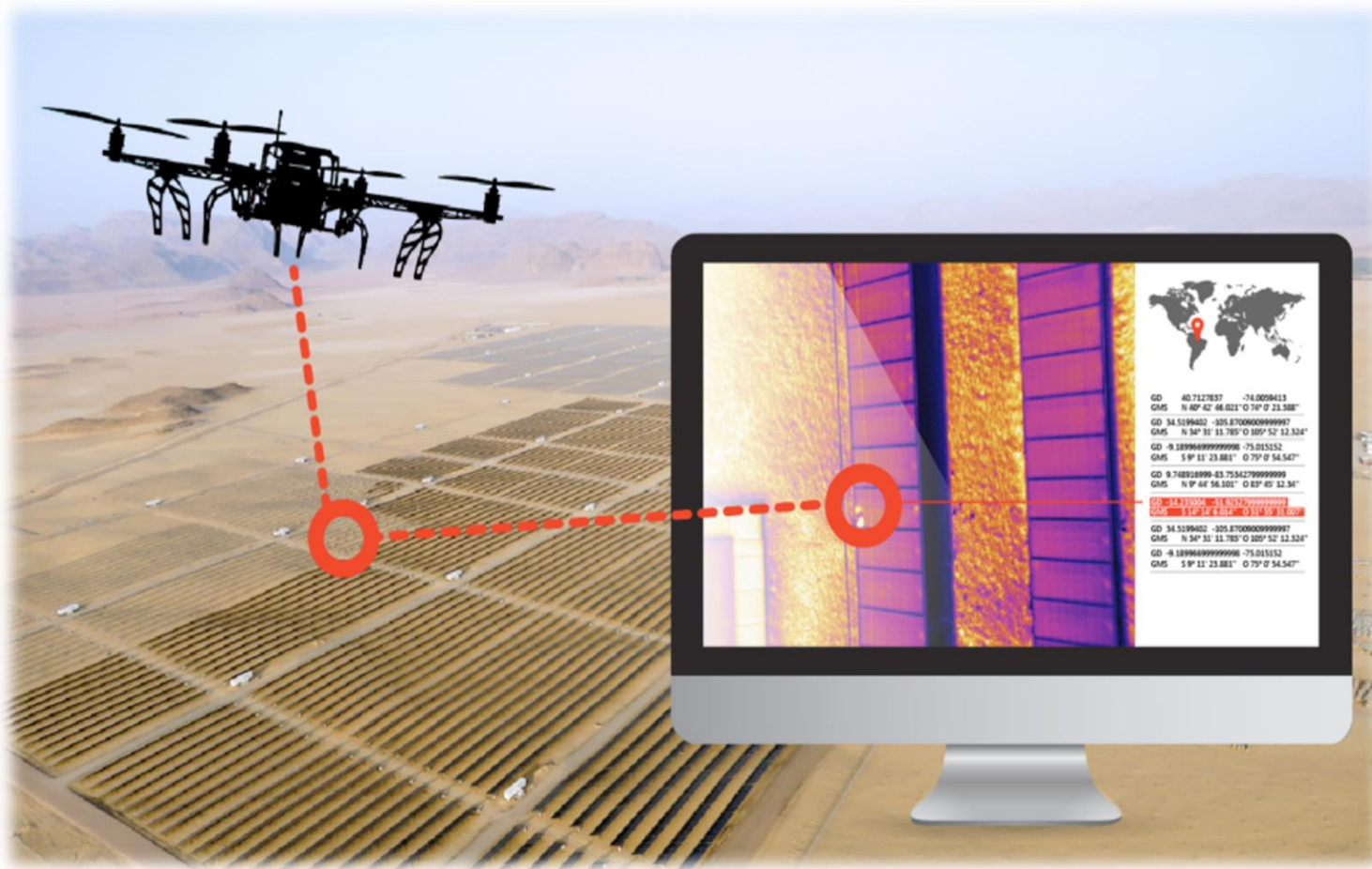
TSK INNOVATION



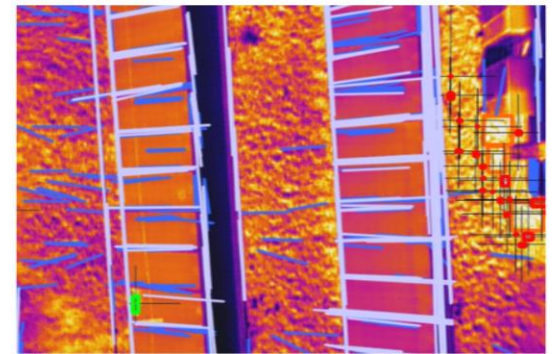
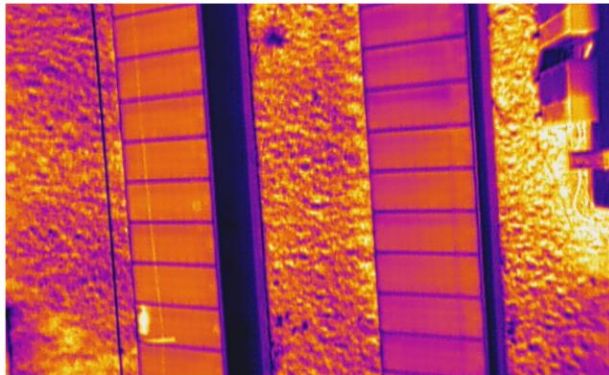
*Thermographic analysis is the standard to obtain the status of photovoltaic panels. Currently the operators carry out this task in a subjective and manual way: panel to panel and with hand-held thermographic cameras*



# SISDRON



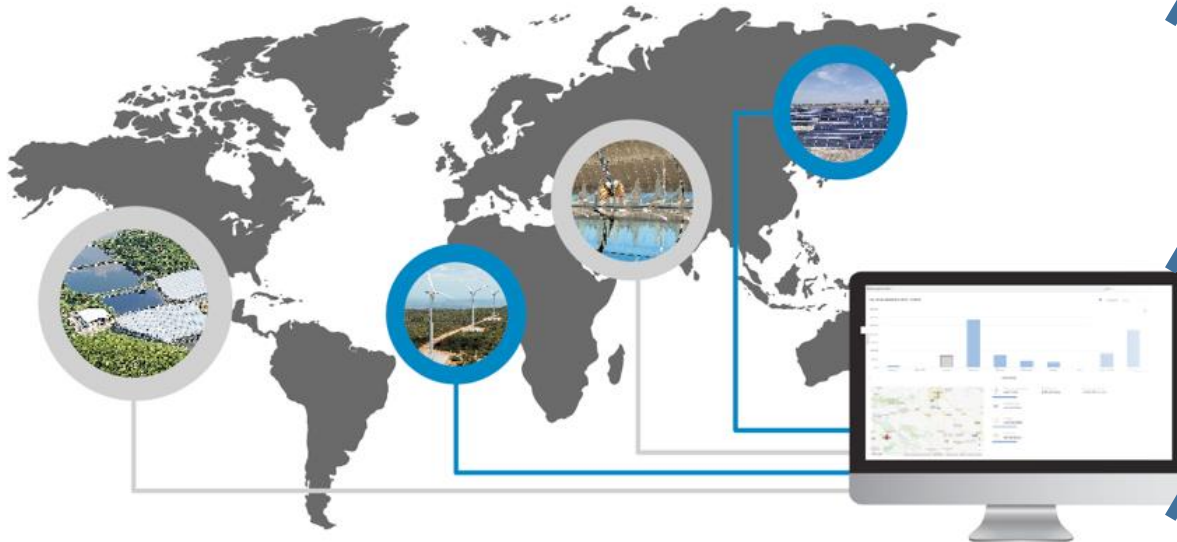




# SISREM

**Sistema autónomo e integral de supervisión de plantas industriales**

GENERACIÓN DE ENERGÍA (CONVENCIONAL, SOLAR, HIDRAÚLICA, EÓLICA, BIOMASA), OIL&GAS, INDUSTRIA Y MEDIO AMBIENTE.



**Automatic  
diagnosis**

**Performance  
analysis**

**Alerts  
management**

**Predictive  
maintenance**





*Growth through innovation*

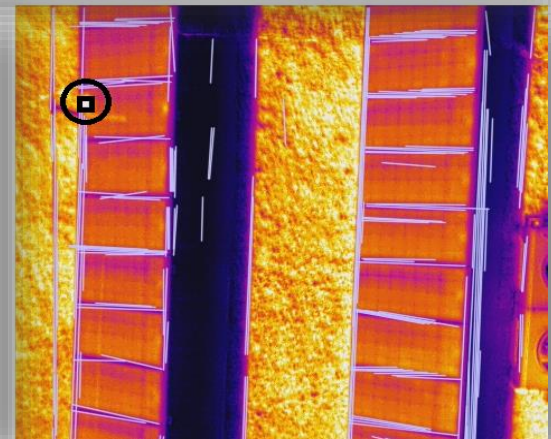
# SISDRON

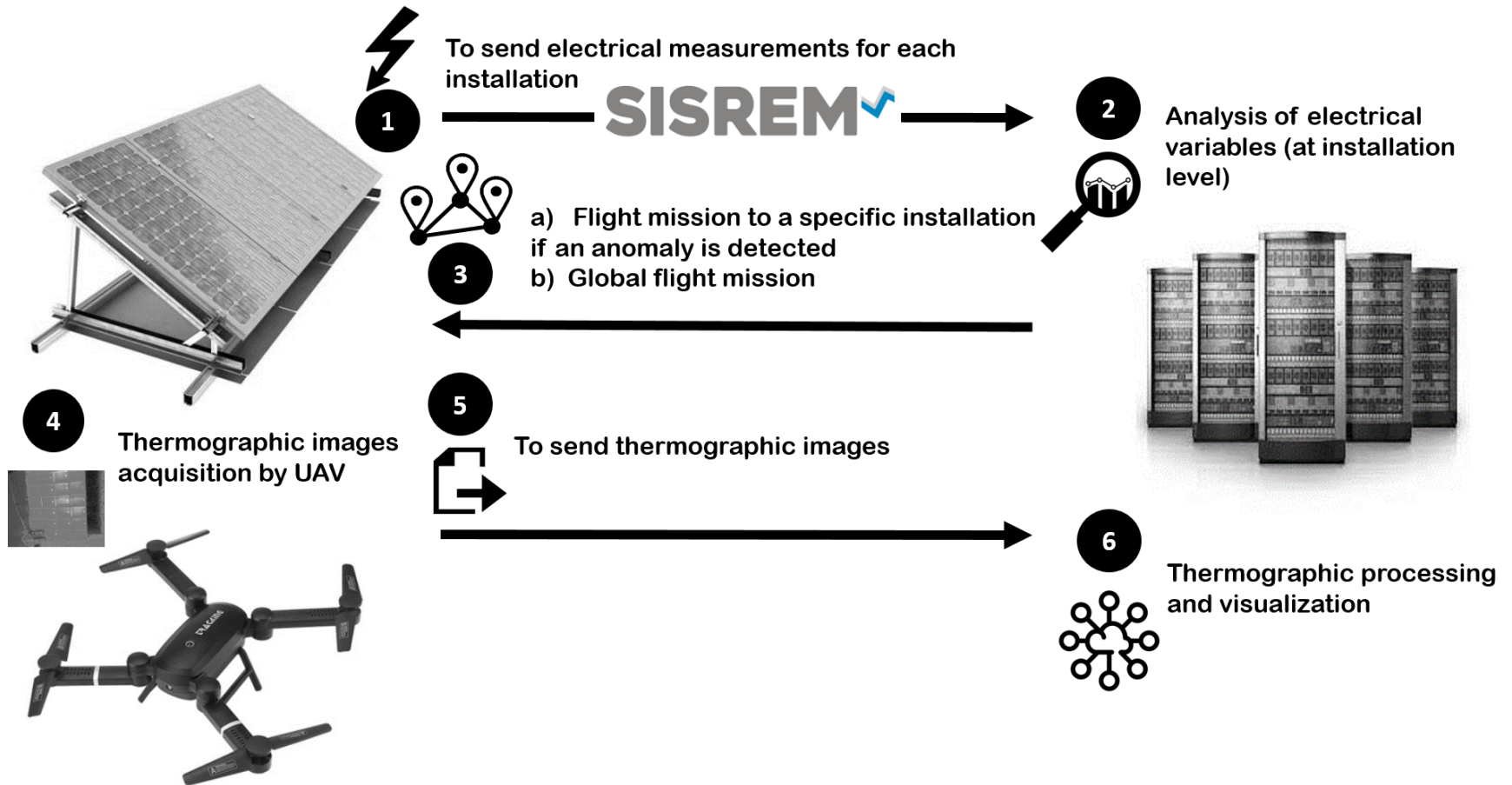
Automatic  
generation of  
aerial missions

IIoT and Big Data  
platform  
integration

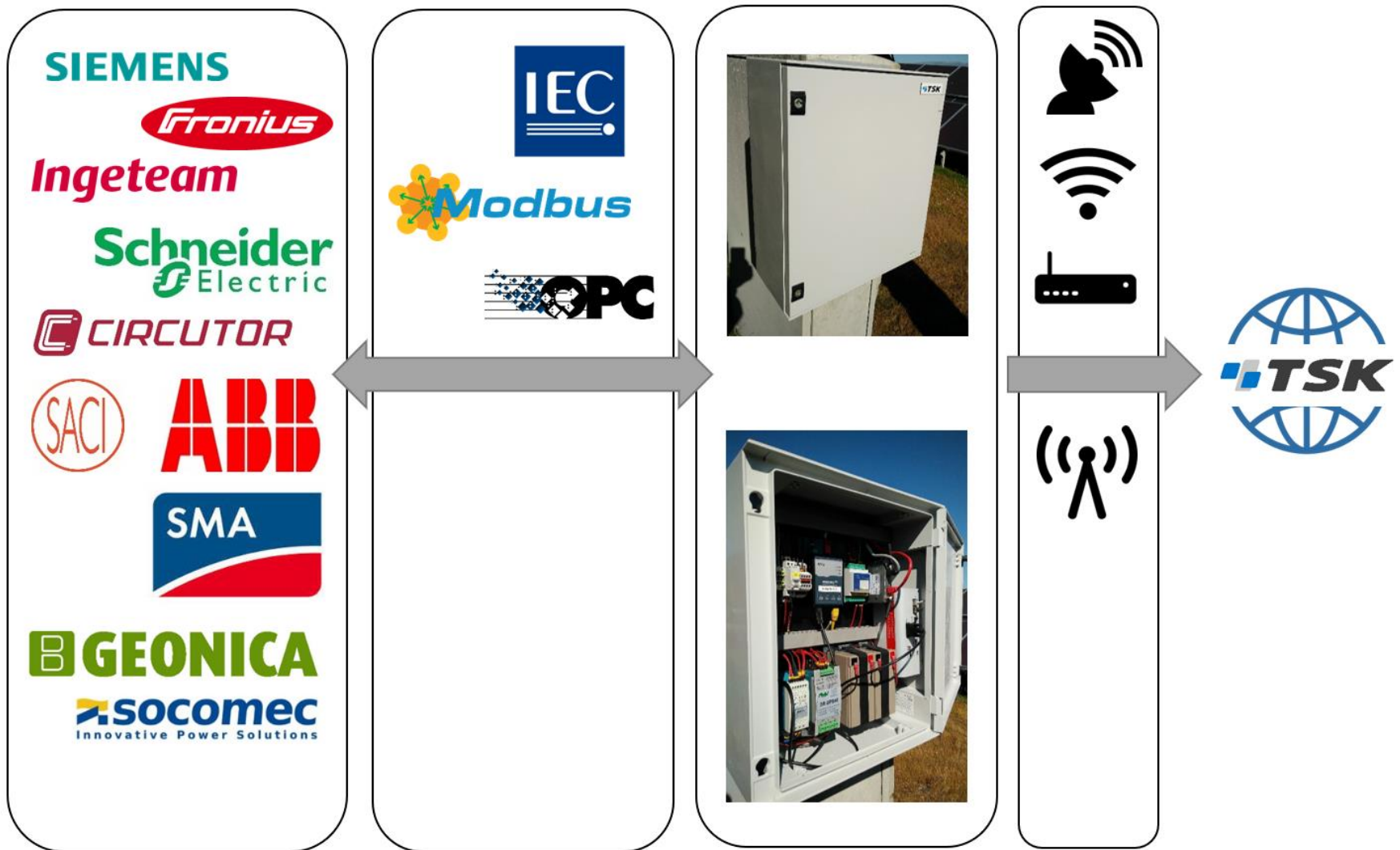
Image automatic  
processing

Alerts and reports  
generation





## 1. Plant data gathering











# SISREM






**IIoT  
architecture**

































**Big Data  
architecture**




Alberto Fernández

### Alarmas

<input type="checkbox"/>	Estado	Tip	Planta	Identificador	Dispositivo	Descripción	Fecha de Activación	Fecha de Desactivación	Severidad	Notas
<input type="checkbox"/>			Rosalejo SISREM	f83333a0-673a-11e9-9bc3-97f213656b66	Rosalejo SISREM	Detección de un problema en comunicación...	25-04-2019 11:15:37	25-04-2019 11:37:22	Muy Alta	
<input type="checkbox"/>			RSSanMiguel	30ae2b90-6731-11e9-9bc3-97f213656b66	RSSanMiguel	Detección de un problema en comunicación...	25-04-2019 10:05:37	25-04-2019 10:17:07	Muy Alta	
<input type="checkbox"/>			Edificio TSK	548b9dd0-66c4-11e9-9bc3-97f213656b66	Edificio TSK	Detección de un problema en comunicación...	24-04-2019 21:06:22	25-04-2019 07:28:22	Muy Alta	
<input type="checkbox"/>			Rosalejo SISREM	c16e9fb0-66bf-11e9-9bc3-97f213656b66	Rosalejo SISREM	Detección de un problema en comunicación...	24-04-2019 20:33:37	24-04-2019 20:55:22	Muy Alta	
<input type="checkbox"/>			Madrigalejo	b438c590-667f-11e9-9bc3-97f213656b66	Madrigalejo	Detección de un problema en comunicación...	24-04-2019 12:55:07	24-04-2019 13:07:22	Muy Alta	
<input type="checkbox"/>			Roces	aafbc2c0-6625-11e9-9bc3-97f213656b66	Roces	Detección de un problema en comunicación...	24-04-2019 02:10:37	24-04-2019 10:20:22	Muy Alta	
<input type="checkbox"/>			Roces	6e5ba0e0-65dc-11e9-9bc3-97f213656b66	Roces	Detección de un problema en comunicación...	23-04-2019 17:26:22	24-04-2019 02:02:52	Muy Alta	
<input type="checkbox"/>			RSReliegos	7467f4b0-655b-11e9-8163-f529bb8126ef	RSReliegos	Detección de un problema en comunicación...	23-04-2019 02:03:52	23-04-2019 04:17:52	Muy Alta	
<input type="checkbox"/>			Rosalejo SISREM	828489c0-64f5-11e9-8163-f529bb8126ef	Rosalejo SISREM	Detección de un problema en comunicación...	22-04-2019 13:53:22	22-04-2019 18:41:07	Muy Alta	
<input type="checkbox"/>			Madrigalejo	a74d95e0-64c7-11e9-8163-f529bb8126ef	Madrigalejo	Detección de un problema en comunicación...	22-04-2019 08:25:07	23-04-2019 04:39:37	Muy Alta	

10
elementos por página

1 - 10 of 57 elementos

☒ Actualización automática
1 min

### ***3. Automatic generation of aerial missions***

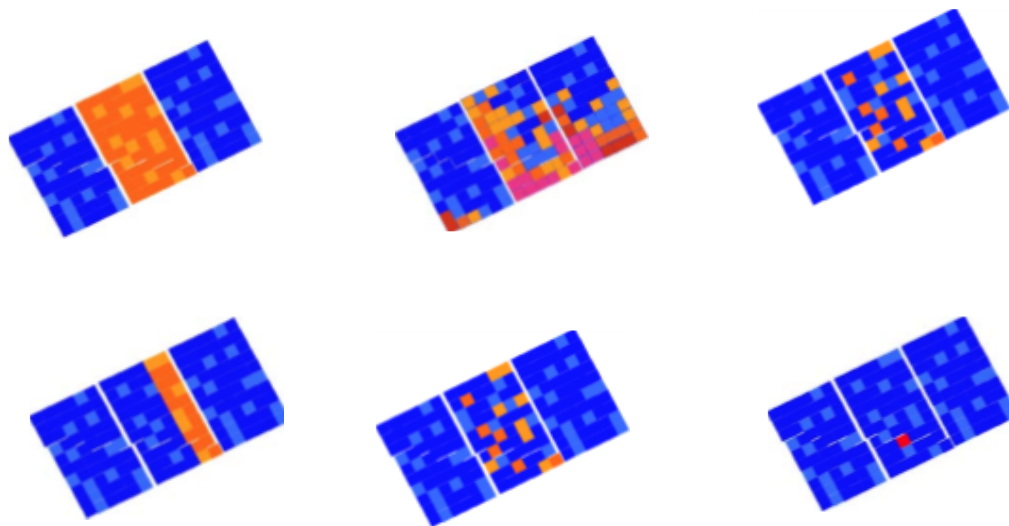
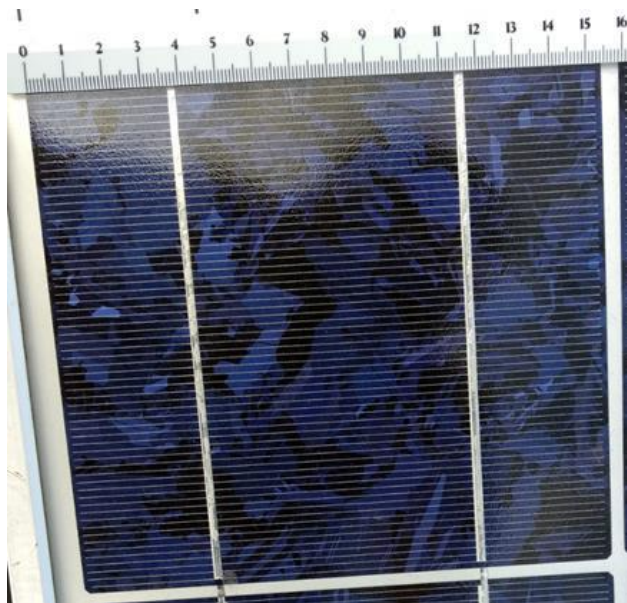


### 3. Automatic sending of aerial missions

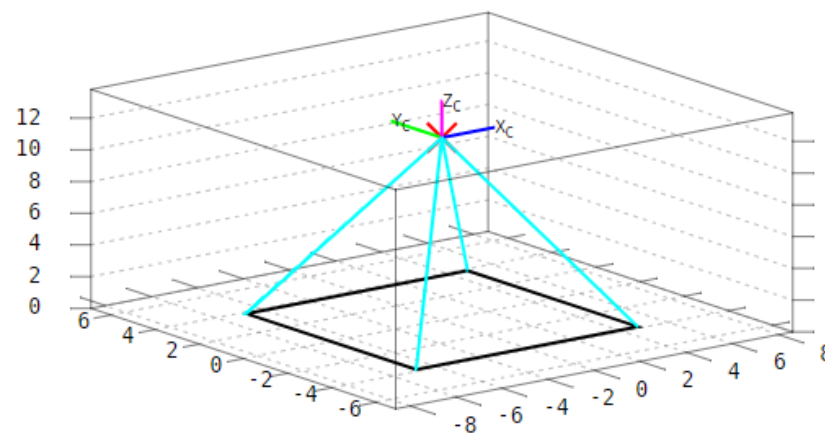
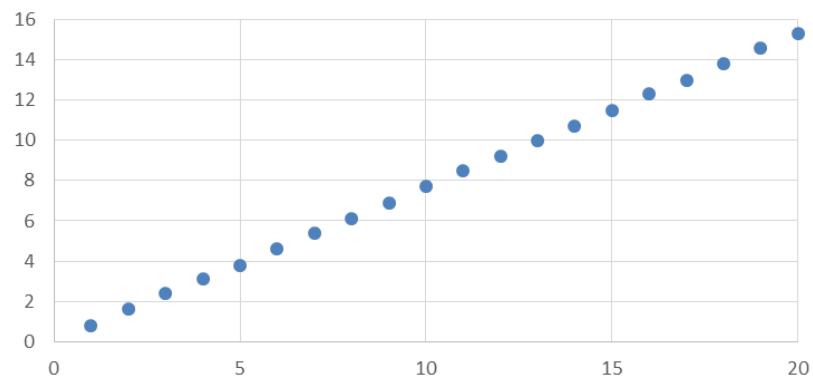




## 4. Images acquisition



Recommended maximum viewing distance for different target sizes







UAV



Acquisition  
device

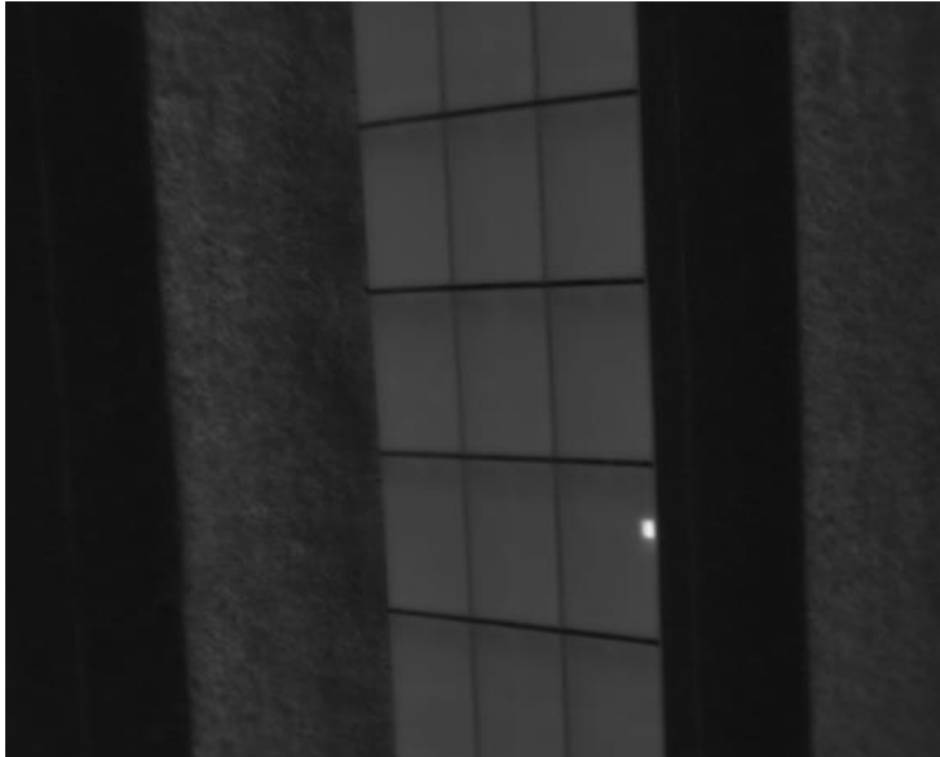


Internet  
connection





## 6. Images processing and visualization



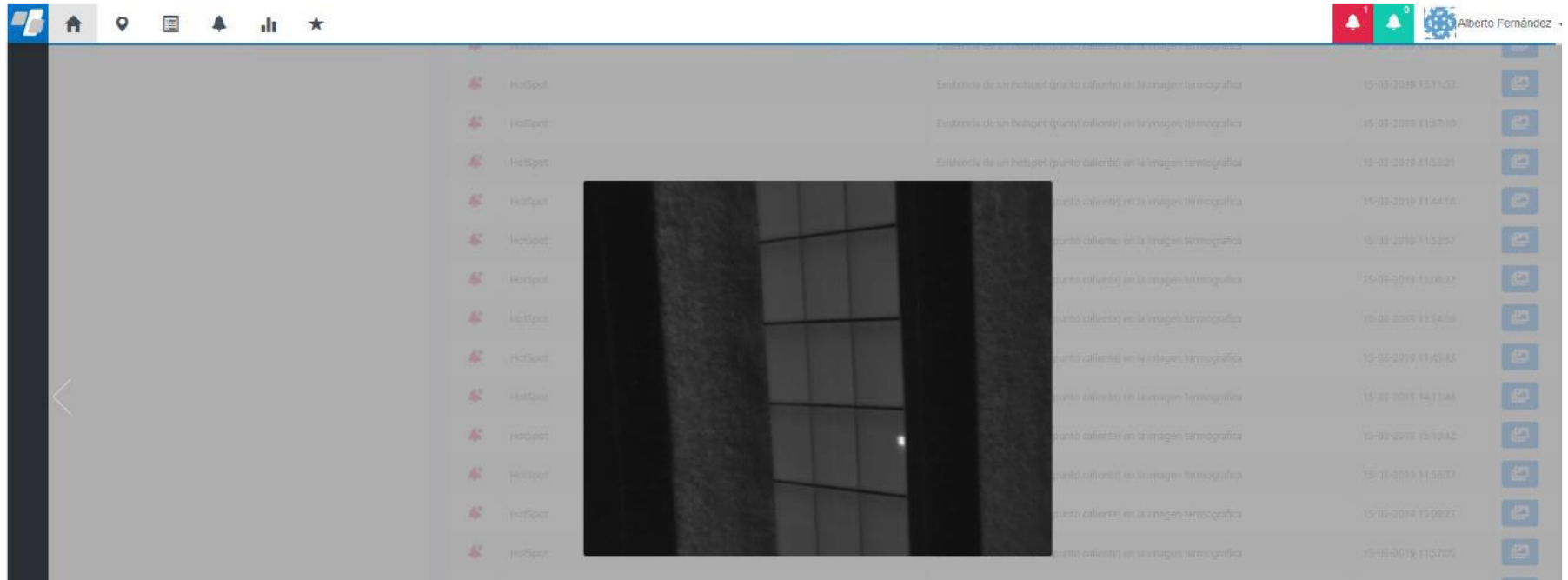
Alarmas

Estado	Tipo	Planta	Identificador	Dispositivo	Descripción	Fecha de Activación	Fecha de Desactivación	Severidad	Notas
		RSReliegos	5a7e0b35-0d9c-4d19-8e3b-c049fb5a42e0	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:11:03	19-03-2019 16:11:32	Alta	
		RSReliegos	f4d49ce8-4773-4d45-875a-4db8cc4d6588	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:51	19-03-2019 16:11:57	Alta	
		RSReliegos	6345b6da-9644-4454-8938-a797f5497274	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:42	19-03-2019 16:10:32	Alta	
		RSReliegos	15a80b82-08b5-4484-9e15-74bead0e6923	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:17	19-03-2019 16:10:28	Alta	
		RSReliegos	c815fb2-e9e9-450c-9246-5da3d671e16	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:12	19-03-2019 16:10:32	Alta	
		RSReliegos	cf347ebc-1f41-4019-a15b-328ee2a15504	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:04	19-03-2019 16:10:32	Alta	
		RSReliegos	9bec702c-4a52-4f5e-9656-58ea73bfe9ce	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:10:01	19-03-2019 16:10:32	Alta	
		RSReliegos	add60f68-557c-4744-926b-a9420079392f	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:09:53	19-03-2019 16:11:40	Alta	
		RSReliegos	cb6dbd22-588b-4bea-9ced-14a51ab711f9	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:09:39	19-03-2019 16:10:28	Alta	
		RSReliegos	843c904e-360e-40e2-b1f3-43cbac7f53ae	RSReliegos	Existencia de un hotspot (punto caliente...)	15-03-2019 15:09:36	19-03-2019 16:10:32	Alta	

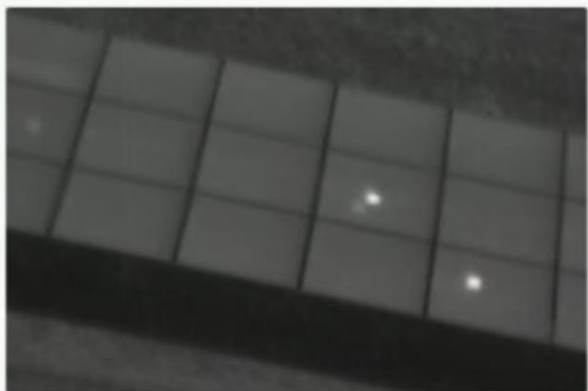
61 - 70 of 252 elementos

Actualización automática: 1 min

## 6. Images processing and visualization








 Camera: FLIR Vue Pro 640 13mm

 Date: Unknown

 Address: LE-6613, Urbanización Campolar,  
Santas Martas, León, C...

 City: Castile and León

 Country: Spain

 Location: 42° 28' 5.80" N, 5° 22' 21.89" W

 View More Info

 Delete Photo



**1. First level: Visual inspection (3 times per day)**

- a. Flying through the whole solar field with a pre-defined rout
- b. During this fly, a solar field operator is looking the screen in the control room with on-line imagine
- c. The operator is checking all collectors for mayor damages, counting broken mirrors, big leakage, etc.
- d. If it is required, the operator could send the drone to an individual collector in order to check their condition

**2. Second Level: Photographic and thermographic inspection (1 per week)**

- a. Flying through the whole solar field with a pre-defined rout
- b. With a IR camera, the temperature of the receiver would be checked in order to detect:
  - i. Receiver (HCE) with vacuum loses
  - ii. Broken receiver (HCE)
  - iii. Thermal insulation integrity
  - iv. Leakage on the ball joints assembly
  - v. Etc.
- c. With a RGB Camera, a photogrammetry on the whole solar field in order to detect:
  - i. Number and location of broken mirrors
  - ii. Number and location of broken HCE supports

**3. Third level: performance check (every two months)**

- a. Tracking accuracy check
- b. Interception factor check**
- c. Module alignment check



*Growth through innovation*



Industrial processes



External sources



Engineering documentation



New devices



Information sources

Cybersecurity



INDUSTRY 4.0

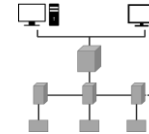
TSK INNOVATION

*A comprehensive Industry 4.0 approach*

SISREM ✓



CMMS



SCADA

SISTER ⚡

SISDRON 🚁



Virtual Simulation

Maintenance services



*Thanks for your attention*