



SparkVIEW

Substation Hot-Spot
Monitoring System

www.tempsens.com

SparkVIEW

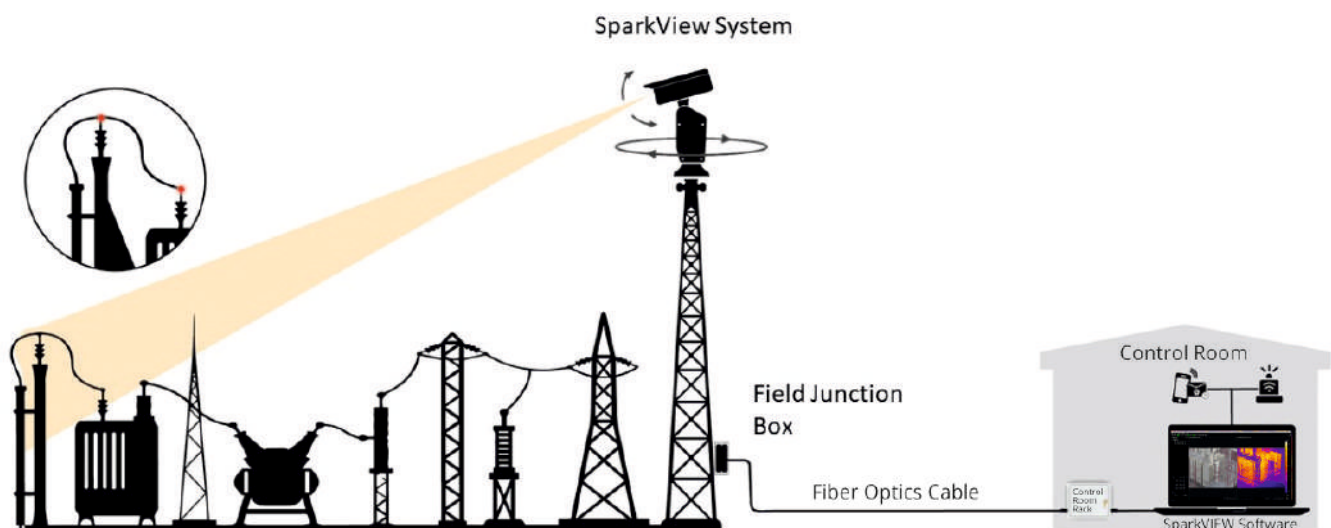
Tempsens's SparkVIEW: Substation Hot Spot Monitoring System is a high-resolution thermal imaging based automated hot-spot monitoring and reporting system for predictive maintenance. It detects hot-spots in switchyard or substation's several electrical equipment such as CT (Current Transformer), PT (Power Transformer), CB (Circuit Breakers), Surge or Lightning etc.

Key components of SparkVIEW

- PT-Drive with Enclosure
- Visual Camera with optical zoom
- Thermal Camera
- SparkVIEW Software



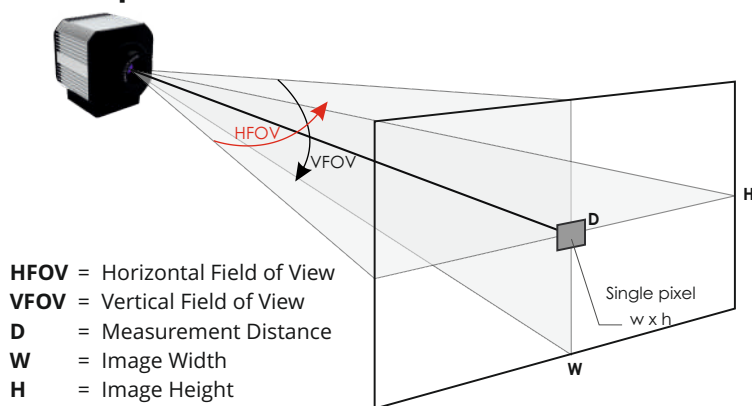
Camera Installation



1. The system will be installed on an approx. height of 2-3m above the highest component with proper electrical grounding.
2. This system works on Ethernet communication. The camera unit is connected to a gigabit switch with fiber optic output options.
3. The fiber optic cable is extended up to the control room and then to another gigabit switch with FO input and Ethernet output.
4. The output will be connected to PC/Server installed with SparkVIEW software.
5. Identify set points and create a scanning/Thermal reading schedule.

SparkVIEW

Lens Options in Thermal Camera



Measurement Field & Spot Size for ThermCAM-384

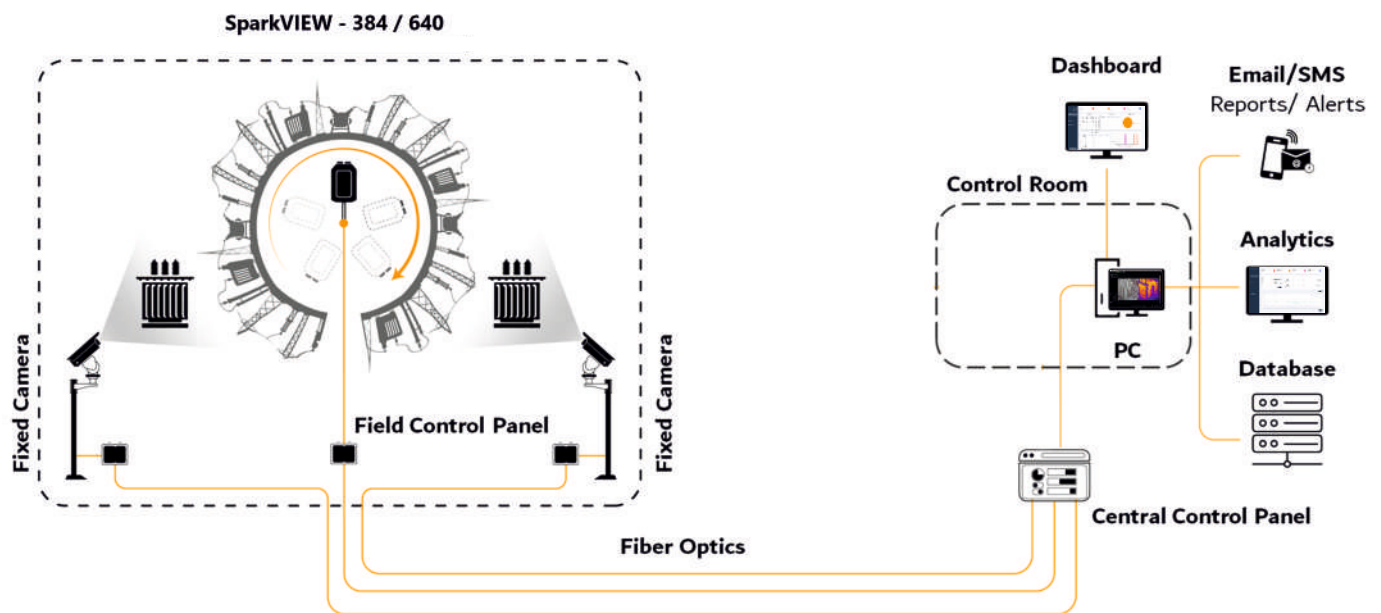
Distance of Object	Measurement Field (W x H)			
	50 mm lens (7.5° x 5.6°)	35 mm lens (10.6° x 8.6°)	25 mm lens (14.8° x 11.2°)	13 mm lens (28.1° x 21.3°)
5 m	0.6 m x 0.5 m (Spot size: 1.7 mm)	0.9 m x 0.7 m (Spot size: 2.5 mm)	1.3 m x 0.9 m (Spot size: 3.4 mm)	2.5 m x 1.8 m (Spot size: 6.5 mm)
10 m	1.3 m x 0.9 m (Spot size: 3.4 mm)	1.8 m x 1.5 m (Spot size: 5.0 mm)	2.6 m x 1.9 m (Spot size: 6.8 mm)	5.0 m x 3.7 m (Spot size: 13.0 mm)
30 m	3.9 m x 2.9 m (Spot size: 10.2 mm)	5.6 m x 4.5 m (Spot size: 15.0 mm)	7.8 m x 5.9 m (Spot size: 20.3 mm)	15.0 m x 11.2 m (Spot size: 39.1 mm)
50 m	6.5 m x 4.9 m (Spot size: 17.0 mm)	9.3 m x 7.5 m (Spot size: 25.1 mm)	12.9 m x 9.8 m (Spot size: 33.9mm)	25.0 m x 18.8 m (Spot size: 65.2 mm)

Measurement Field & Spot Size for ThermCAM-640

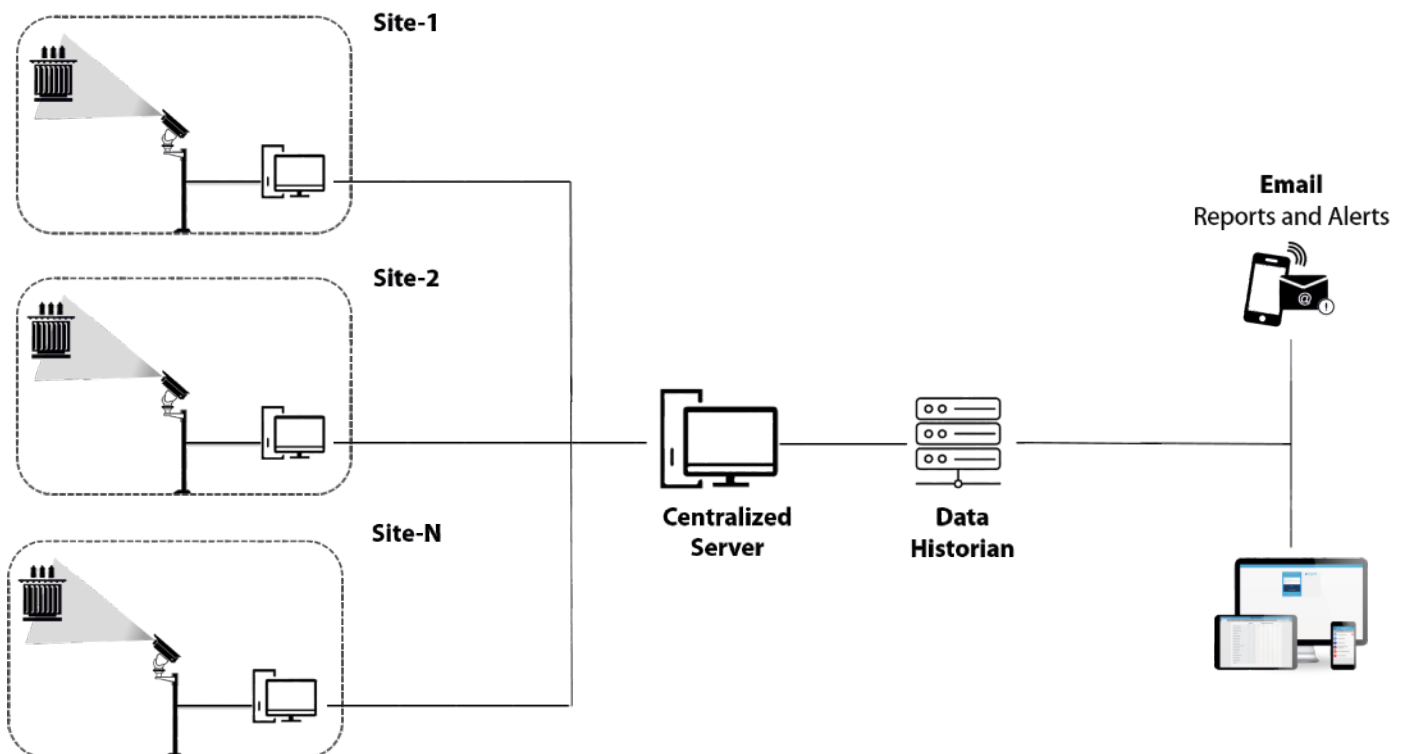
Distance of Object	Measurement Field (W x H)			
	75 mm lens (5.8° x 4.4°)	50 mm lens (8.8° x 6.6°)	35 mm lens (12.5° x 9.4°)	25 mm lens (17.3° x 13.1°)
10 m	1.01 m x 0.77 m (Spot size: 1.59 mm)	1.54 m x 1.15 m (Spot size: 2.40 mm)	2.19 m x 1.64 m (Spot size: 3.42 mm)	3.04 m x 2.29 m (Spot size: 4.77 mm)
30 m	3.04 m x 2.30 m (Spot size: 4.78 mm)	4.62 m x 3.46 m (Spot size: 7.21 mm)	6.57 m x 4.93 m (Spot size: 10.27 mm)	9.12 m x 6.88 m (Spot size: 14.31 mm)
50 m	5.07 m x 3.84 m (Spot size: 7.96 mm)	7.69 m x 5.76 m (Spot size: 12.02 mm)	10.95 m x 8.22 m (Spot size: 17.12 mm)	15.21 m x 11.48 m (Spot size: 23.85 mm)
70 m	7.092 m x 5.38 m (Spot size: 11.14 mm)	10.77 m x 8.07 m (Spot size: 16.82 mm)	15.33 m x 11.51 m (Spot size: 23.97 mm)	21.30 m x 16.07 m (Spot size: 33.38 mm)

SparkVIEW

Automated and Remote Monitoring System



Centralized Server for Multiple Site Locations



SparkVIEW

Features for Local Client Workstation/PCs:

- Flexible, user friendly and easy to use.
- Capabilities to create/modify/delete users & assign password to each user and set access rights to the various client applications and its functions selectively.
- Remote interface features for configuration, display & control of cameras remotely over the network.
- View access log, alarm log & system log for events.
- Pan-Tilt controls for both automatic and manual positioning remotely.
- User defined region of interest and different alarm configuration for each preset position.
- Configure different colour palates and temperature scale.
- Configure alarms based on temperature or rate of change of temperature.
- Simultaneous view of the thermal and visual image.
- Built-in map function to provide an intuitive overview of the system.
- Set focus of Infra-Red & Visual Cameras
- Define preset (PTZ position)
- Creation and deletion of area of interest for corresponding preset position
- Defining preset position on substation single-line diagram /Map.
- Creating threshold for warning & alarm for every area of interest
- Define parameters for trend analysis, data storage and system health.
- Data analysis & report generation.
- Selection of Infra-Red, Visual, IR+VIS cameras for monitoring the substation in Automatic mode.
- Acknowledge alarms & Act
- Access Trend Charts with Infrared Data
- Live video of thermal and visual camera
- Status of IR and visual cameras
- Viewing of trend for all the area of interest which is predefined by the administrator.
- Viewing current alarm with location beings highlighted along with installation name.
- Viewing warning & alarm history of the station.
- The levels of alarm shall be customized and prioritized as per user
- Emergency Mode (In case of high priority alarm (User defined), the camera will focus on designated hotspot for the duration specified by user)

Features for Remote Client Workstation/PCs:

- View Live Video and Recorded video/thermal images/snapshots
- Full PTZ and camera control
- Captured images Search and Play back
- See Audit and system log
- The operator shall be capable of seeing the record of the alarm.
- Configure alarms / prioritization of alarms
- Set different colour palettes
- Get an alarm/notification along with a snapshot automatically if violation of temperature limit is observed (Observed Temperature Minus Ambient Temperature) in any of the area of interest as per temperature setting provided.
- Set different temperature setting for each area of interest and shall automatically get an alarm whenever there is a violation. The nomenclature of each area of interest is user defined.
- View side by side view of the thermo-graphic image as well as normal camera image.
- Shall be able to detect the ambient temperature and show the difference between the hot spot temperature and ambient temperature at any point.
- Mouseover temperature (see the temperature measured at any pixel, when user scrolls the mouse).
- Detect hot spot, if any through alarm notification/GUI
- Monitor temperature of the objects.
- See thermal trending of object temperatures. User defined Maximum, minimum and/ or average value of any pre- defined area of interest and the duration for which it wants to see the trending.

Technical Specifications

Thermal Camera	
Resolution	384 x 288, 640x480 Pixels
Detector	Un-cooled FPA detector
Pixel Pitch	17µm, 12µm
Digital Zoom	at least upto 8x
Focus	Remote focus and tour-based auto focus
Wavelength	8-14 µm
Temperature Range	0-250°C/100-1000°C (Switchable via Software)
Emissivity Correction	0.01 to 1.0
Sensitivity/NETD	<50mK f1.0, 30Hz 300 K
Accuracy	±2°C or ±2% (whichever is greater)
Lens Options	25mm, 35mm, 50mm, 75mm

Technical Specifications

Visual Camera

Resolution	1920 x 1080 Pixels (2MP), 2688 x 1520 Pixels (4MP), 3840 x 2160 (8MP)
Image Sensor	1/1.8"CMOS, 1/2.8"CMOS
Zoom	20X, 40X optical zoom
Frame Rate	30
Minimum Illumination	0.05 lux 2 F 1.2
Day C night capability	Yes
Lens	Varifocal IR corrected megapixel resolution
Video Compression	On board H .264 compression of video
Dynamic Range	Wide
Image Settings	Compression ratio, Brightness, Sharpness, White balance, Exposure control, Dynamic contrast, Low light behaviour adjustment
Supported Protocols	IEC61850, 104, OPC, IPv6 and MODBUS
Power	Separate power should be used (POE will not be used)
Compatibility	ONVIF

Pan and Tilt Enclosure

Number of Presets	Up to 128
Rotation Range (Pan & Tilt)	PAN 360° continuous rotation. Tilt 125°(-85°~+40°) / 128°(-88°~+40°)
Rotation Speed (Pan & Tilt)	PAN 0.2°~80° per sec. / 0.06°~30° per sec. Tilt 0.2°~40° per sec. / 0.06°~ 20° per sec.
Preset Speed	PAN 80° per sec. / 30° per sec. Tilt 20° per sec. / 40° per sec.
Communication	Ethernet
Repeatability (Preset Accuracy)	≤ 0.05°
Duty Cycle	100%
Jitter	Close to Zero
Backlash	Zero

Output/Interface

For Video	Ethernet
For PTZ system	RS-485
Protocol	PELCO-D, IEC 61850

Power

Power consumption (Typical-Maximum)	Neutral product consumption ≤ 50W; With extra freezing-proof consumption ≤ 100W
Input Voltage/Frequency	24V AC/50 Hz (220VAC to 24 VAC conversion is done in the Junction Box)

Environmental / Mechanical Specifications

Ambient Temperature	-30°C~+60°C
Storage Temperature	-30°C~+60°C
Operating /Storage Humidity	0~95% non-condensation
EMI/EMC Compliance	IEC 61000-4-4, IEC 61000-4-2, IEC 61000-4-8
Protection Class	IP67
Weight	<25kg (including Thermal+Visual camera & cable)
Enclosure Material	Aluminum



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