

TCAM2500 VISUAL PLUS THERMAL MONITORING SYSTEM

FEATURES

- Dual visual plus thermal monitoring in a single camera
- Engineered for operation in Electric Power substations
- Automated temperature monitoring of critical assets
- Monitor multiple temperature points /assets
- Notification through SCADA or email
- Storage of temperature readings in system database

KEY BENEFITS

- Thermal temperature readings with visual confirmation
- Reliable operation in harsh environments with high levels of EMI, ESD, voltage surges and interrupts
- More reliable continuous temperature readings under all system load conditions
- Reduced downtime due to unplanned outages by detection of potential problems before failures occur
- Reduced monitoring requirements for operations personnel
- Temperature trending analysis allows input into condition based maintenance program

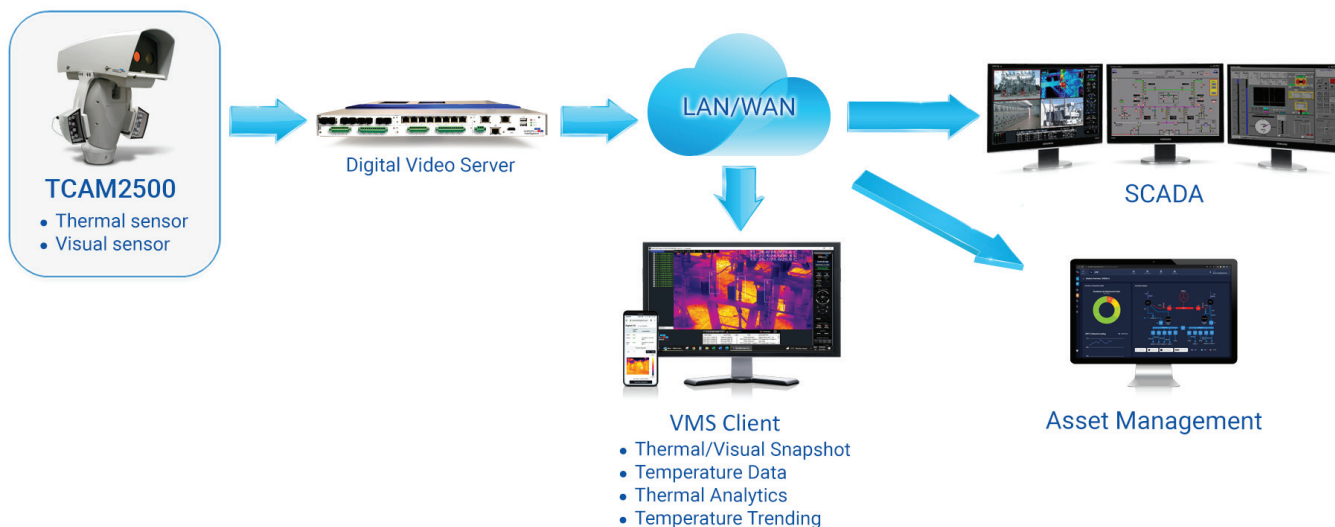
The risk of outages is increasing on the electric power grid due to its aging infrastructure and lack of automation systems that monitor the condition of critical equipment at substations and along the grid. Transformer fluid leaks or insulation breakdown cause overheating that is a warning of potential failures, but many utilities don't have automated thermal detection systems that can help reveal these problems.

Continuous thermal monitoring systems are able to anticipate, detect, and respond rapidly to problems, thereby reducing the chance of failures, outages and lost productivity. Detection of temperature increases in substation equipment with thermal monitoring cameras allows preventative maintenance operations before an unplanned outage occurs due to asset failure.

The Systems With Intelligence thermal monitoring solution includes a substation hardened digital video server (DVS) that digitally records video from multiple cameras and incorporates a suite of sophisticated video and thermal analytic algorithms for detection of anomalies. The DVS includes software tools for video monitoring and analysis, features flexible networking capabilities and provides automated alarm and event notification.



SUBSTATION MONITORING ARCHITECTURE



APPLICATIONS

The Systems With Intelligence thermal monitoring solution can be used to monitor and analyze the thermal signatures of the following substation components. Abnormal thermal signatures are precursors to potential equipment failures.

- Power transformers (oil levels, radiators and pump operation)
- Load tap changers
- Insulator bushings
- Standoff insulators
- Lightning arrestors
- Circuit breakers
- Mechanical disconnects
- Control cabinets
- Batteries

TECHNICAL SPECIFICATIONS

SPECIFICATIONS	
IMAGING PERFORMANCE	
Field of View, focal length	PL08 / PS08 NARROW 55MM 8° 640 x 512 Pixels (30Hz / 7.5Hz) PL18 / PS18 WIDE 24.4MM 18° 640 x 512 Pixels (30Hz / 7.5Hz) PL24 / PS24 WIDE 18MM 24° 640 x 512 Pixels (30Hz / 7.5Hz) PL32 / PS32 WIDE 14MM 32° 640 x 512 Pixels (30Hz / 7.5Hz) PL50 / PS50 WIDE 9.2MM 50° 640 x 512 Pixels (30Hz / 7.5Hz) PL95 / PS95 WIDE 4.9MM 95° 640 x 512 Pixels (30Hz / 7.5Hz)
Resolution	336 x 256 or 640 x 512 pixels
Detector Type	Uncooled VOx Microbolometer
Pixel Pitch	17µmqwhitr
Scene Range (High Gain)	-25 °C to 135 °C
Scene Range (Low Gain)	-40 °C to 550 °C
Time to Image	<4.0secs
Video Compression	H.264

NETWORK	
Interface	Pan/Tilt Housing: 10/100TX, RJ45
Security	Password Protected
Protocols	IPv4/v6, DHCP, HTTP, UDP, RTP/RTSP, UPnP, NTP, ICMP
Software Interface	Web Server
THERMAL	
Spectral band	7.5 to 13.5 um
Sensitivity	0.1° C
Frame rate	PL = 30 Hz, PS = 7.5Hz
ENVIRONMENTAL WITH PAN/TILT HOUSING	
Operating Temperature Range	-40 °C (-40 °F)/+85 °C (185 °F)
Encapsulation	IP66 (IEC 60529)
Wind Resistance	Operational: up to 160km/h Stationary: up to 210 km/h
Resistance to Salty Fog	EN50130-5, EN60068-2-52
Certifications	IEC61850-3, IEEE1613, EN60950-1, EN6095-22, EN61000-6-4, EN55022 Class A, EN50130-4
* The specification for this product may change without prior notice for product improvement.	



SPECIFICATIONS: DAY/NIGHT CAMERA	
CAMERA	
Sensor:	1/2.8" CMOS Progressive Scan (2MP)
Lens:	Compatible with CS Mount or C Mount with adaptor DC Auto Iris Support
Day/Night:	IR cut filter removal (ICR) Off/Dusk/Dark/Custom
Iris:	DC-Auto/Manual
Min. illumination:	0.2 lux @ F1.2 (Colour) 0.01 lux @ F1.2 (BW)
VIDEO	
Video Compression:	H.264 (MPEG-4 Part 10) MJPEG
Resolution:	1920 x 1080 (1080p) 1280 x 720 (720p) 720 x 480 (D1) 704 x 480 (4CIF) 704 x 240 (2CIF) 352 x 240 (CIF) 176 x 120 (QCIF)
Frame Rate:	30 fps for all resolutions (except 1080p & 720p-15fps)
Video Streaming:	Triple Stream: 2ch H.264, 1ch MJPEG Stream-profile: resolution /compression / framerate / video quality
Analog Video Out:	BNC port, NTSC
Image Setting:	Brightness, Contrast, AWB, Sharpness, Saturation, Gain, White Balance, Auto Exposure
Image Mirroring:	Horizontal/Vertical/Both
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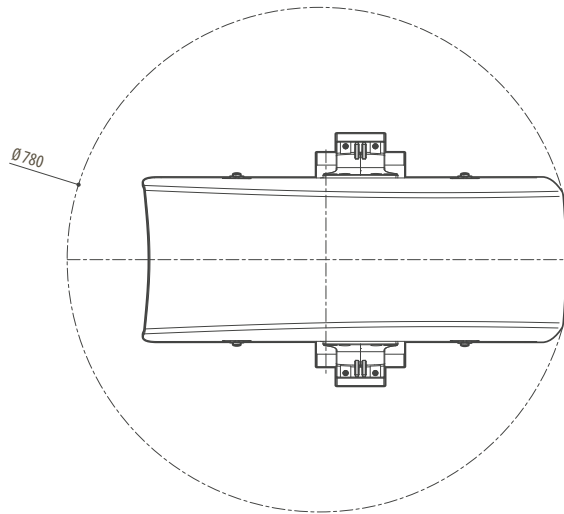
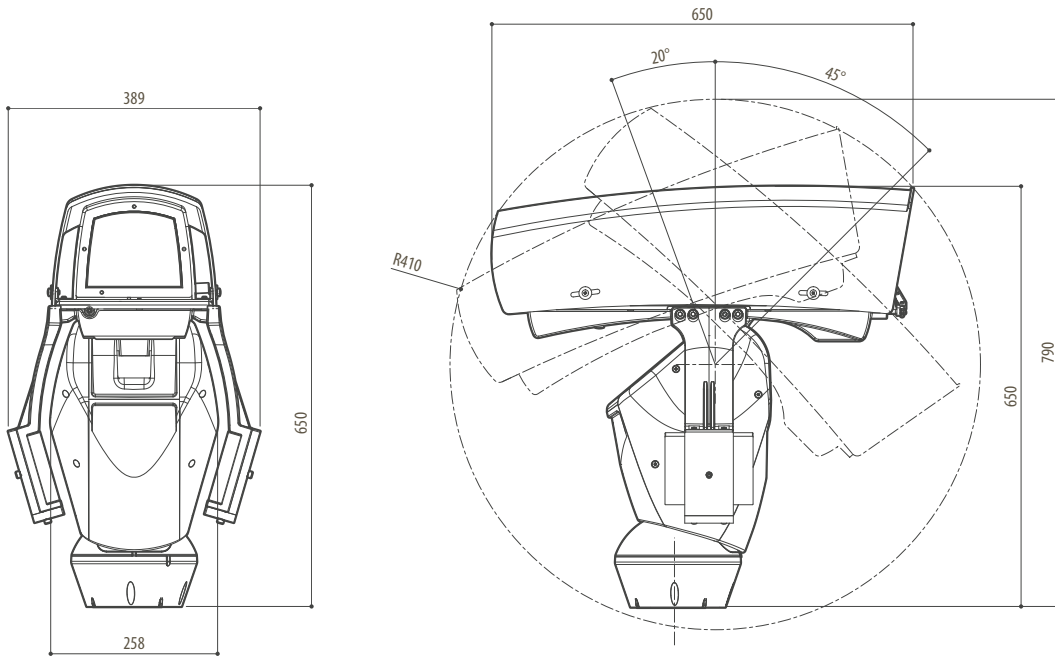
ENVIRONMENT
Indoor/Outdoor
Operating temperature (with heater - automatic on & off): -40 °C (-40 °F)/+85 °C (185 °F)
Surge immunity: up to 2kV line to line, up to 4kV line to earth (Class 4)
CERTIFICATIONS
Electrical safety: EN60950-1
Photobiological safety of lamps and lamp systems (LED illuminators): EN62471
Electromagnetic compatibility: , EN55022 (Class A), FCC Part 15 (Class A)
Immunity: EN50130-4
Outdoor installation: EN60950-22
IP protection degree: EN60529 (IP66)
Resistant to salty fog: EN50130-5, EN60068-2-52
EAC certification
ELECTRICAL
24VAC, 50/60Hz, 160W
* The specification for this product may change without prior notice for product improvement.

SPECIFICATIONS: HOUSING	
GENERAL	
Built in aluminium and ABS	
Epoxy polyester powder painting, RAL9002 colour	
Top mount (OTT)	
Transmission through toothed belt	
Slip-ring	
Electronic limit switches	
Plug installation thanks to connector and easy replacement on-site	
Zero backlash	
MECHANICAL	
Cable glands: 3xM16	
Horizontal rotation: continuous - 360 degrees continuous	
Vertical rotation: from +45° up to -20°	
Horizontal speed (variable): from 0.02°/s up to 20°/s through toothed belt	
Tilt speed (variable): from 0.02°/s up to 20°/s	
COMMUNICATIONS	
Ethernet connection: IEEE 802.3 100Base-Tx	
PROTOCOLS	
Pelco-D	



PAN/TILT HOUSING DIMENSIONS Unit: mm

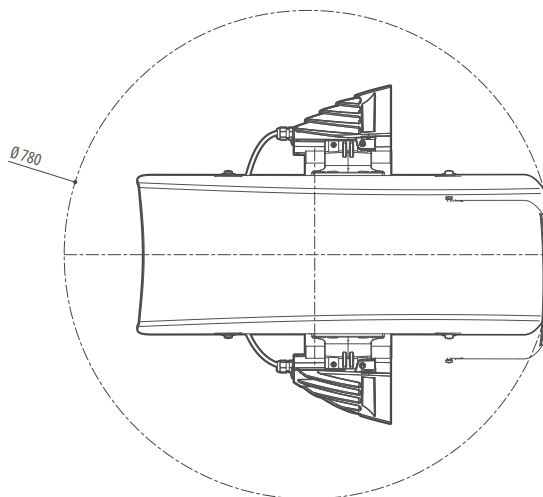
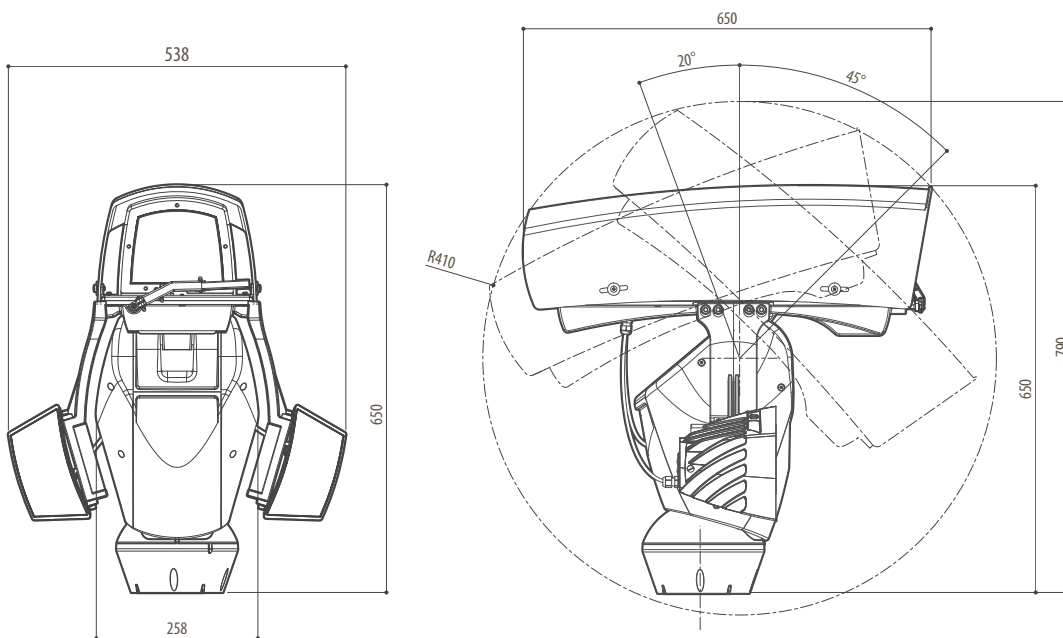
TCAM2500 with Weights





PAN/TILT HOUSING DIMENSIONS Unit: mm

TCAM2500 with Illuminators

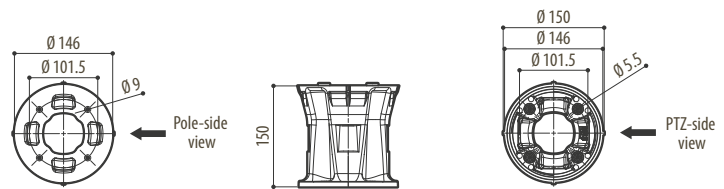




MOUNTING OPTIONS Unit: mm

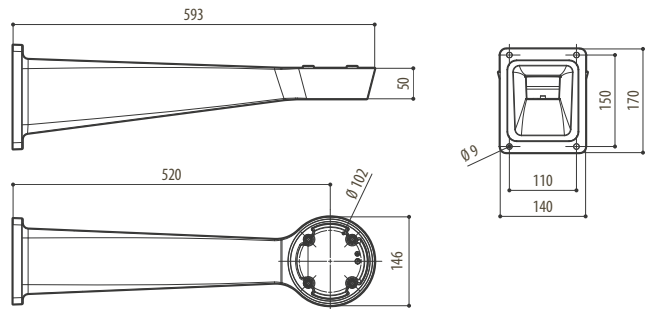
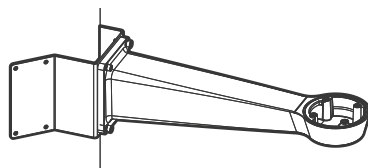
Parapet Bracket, Option A04

- Made of die-cast aluminum
- Epoxypolyester power painting
- Internal cable management
- Unit Weight: 1.6kg (3.5lb)



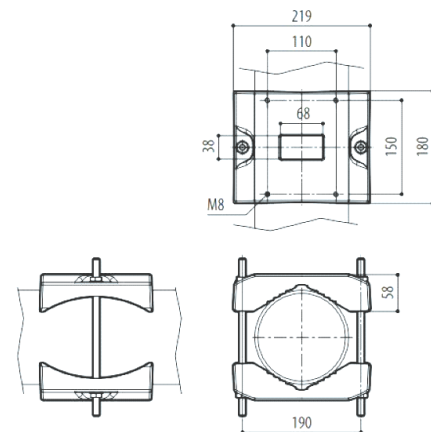
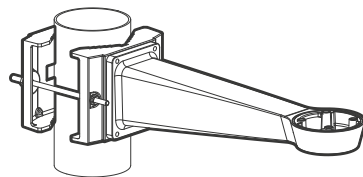
Wall Mount Bracket, Option A08

- Made of die-cast aluminum
- Epoxypolyester power painting
- Wall bracket with internal cable channel
- Unit Weight: 3.1kg (6.6lb)



Pole Mount Bracket with Arm, Option A13

- Pole Installation
- Pole Diameter: 80- 150mm (3.14 - 5.9in)



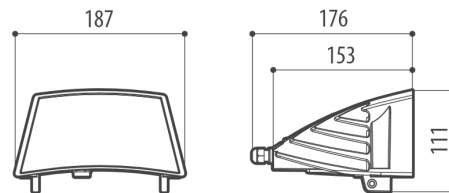
Accessories

Illuminator

- Adjustable built-in twilight sensor for automatic activation and deactivation
- Die-cast aluminium body
- Unit weight: 1.5kg (3.3lb)

Illuminator Power Supply - PS-120IRLED

- 120VAC IRLED Illuminator Power Supply
- Required with PTO4 Housing





CONFIGURATION



BASE UNIT		Description
TCAM2500	Thermal Camera System with combined Day/Night and Thermal	
HOUSING		
PT03	Pan Tilt Housing - 24VAC	
PT04	Pan Tilt Housing - 120VAC	
FIELD OF VIEW		
PL24/PS24	Wide 18MM - 24° - 640 x 512 Pixels (30Hz / 7.5Hz)	
PL50/PS50	Wide 9.2MM - 50° - 640 x 512 Pixels (30Hz / 7.5Hz)	
PL32/PS32	Wide 14MM - 32° - 640 x 512 Pixels (30Hz / 7.5Hz)	
PL18/PS18	Wide 24.4MM - 18° - 640 x 512 Pixels (30Hz / 7.5Hz)	
PL08/PS08	Narrow 55MM - 8° - 640 x 512 Pixels (30Hz / 7.5Hz)	
PL95/PS95	Wide 4.9MM - 95° - 640 x 512 Pixels (30Hz / 7.5Hz)	
DAY/NIGHT CAMERA		
FZ02	High Definition 10x Zoom, 5.1 to 51mm lens	
FZ06	High Definition 36x Zoom, 6 to 216mm lens	
BRACKETS		
A04	Parapet Bracket for Pan/Tilt Housing	
A08	Wall Mount Bracket for Pan/Tilt Housing	
A13	Pole Mount Bracket for Pan/Tilt Housing	
AXX	No Mounting Accessory provided	
ILLUMINATORS <i>(only available with PT03 Housing)</i>		
IR108	10 degree, 850nm, LED Illuminator	
IR308	30 degree, 850nm, LED Illuminator	
IR608	60 degree, 850nm, LED Illuminator	
CABLES		
CLXX	Communications and power cable	

NOTE: If illuminators are used with PT04 housing power supply PS-120IRLED is required.



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