

*"Nothing goes undetected"*



*"Designed to survive the harshest environments"*

*"Guaranteed radiation-tolerant"*

# RADCAM<sup>®</sup> Omega

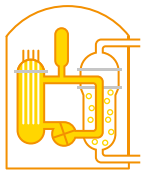
A color sensor camera that offers continuous viewing in un-accessible Nuclear Reactor locations, and other radioactive areas.



**ISEC**  
MONITORING SYSTEMS

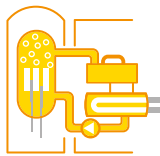
# 24/7 monitoring in any environment

The RADCAM® is a proven standard when it comes to advanced audiovisual process surveillance within NPPs.



## Pressure Water Reactor

- Pump house
- Auxiliary Buildings
- Radwaste Handling cranes/Processes



## Boiling Water Reactors

- Turbine Building
- Pump house
- Auxiliary Buildings
- Radwaste Handling cranes/Processes



## Heavy Water Reactors

- Radwaste Handling cranes/Processes



## Nuclear back-end

- Radwaste handling
- Cementation process
- Compaction process
- Incineration process
- Storage vault
- Final Disposal Handling systems

In close collaboration with the Swedish nuclear industry, we've built the RADCAM Omega, specifically designed for radioactive environments. RADCAM Omega identifies leaks and monitors equipment, while increasing safety and efficiency as it assists operations in decision-making.

With its patented neutron-absorbing outer body, high tolerance to gamma radiation, and an effective on-board cooling system, the RADCAM is designed to survive within the harshest of environments.

The RADCAM incorporates a new patented-protected mode that enhances its radiation protection, which makes it ultra-reliable in the reactor containment building

and other radioactive areas. The RADCAM also offers high availability, excellent picture and sound quality, auto focus, 40x optical zoom, low light sensitivity and high temperature tolerance (up to 85 °C) – all requested features by reactor and turbine operators.

ISEC designed the RADCAM to be easily serviced. The camera module containing the CCD chip and lens is easily removed and replaced via two screws that are accessible through a service opening at the back the control logic.

RADCAM Omega can be acquired as part of a complete ISEC system, but it can also be integrated with an existing system.

Save plants up to 1.5 M\$/year

Equipment operation & monitoring

Configuration testing & training

Reduce doses exposure

Prevention & fire watch

Identify & monitor leaks

System & environment surveillance



## See the difference with RADCAM<sup>®</sup> Omega

The RADCAM Omega is more than a camera, it is a sensor platform that enable plants to generate critical metadata by adding additional modules to the camera:



Radiological data (built-in radiation damage sensors, Dose rate sensor)

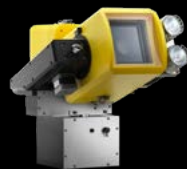


Audio data (Microphone assembly)



Temperature data  
(Temperature sensor, Pyrometer)

Unlock the potential of metadata with the PMP software from ISEC.



## Simplicity

- Backward compatibility
- Advanced PTZ control
- Locally maintainable under 10 minutes
- Seamless IP integration

## Excellence

- Colour Resolution & image quality
- Optical zoom & Lights
- Very high return on investment
- Self-diagnostic and predictive maintenance program

## Endurance

- Neutron & Gamma protection
- Patented Protected mode
- High temperature
- Obsolescence free

## TECHNICAL SPECIFICATIONS

<b>Camera Module</b>	
Sensor	¼" day/night color sensor (670 TVL)
Signal system	PAL (NTSC available as option)
Backlight compensation	Yes
Gain	Auto / manual
Shutter speed	1/1 s to 1/10,000 s, 22 steps
Minimum lighting	0.7 lux at F1.6, 1/50s and 50 IRE
Optical zoom	40x f= 3.06 mm (wide) to f= 122.4 mm (tele)
Horizontal viewing angle	60.0° (wide end) to 1.6° (tele end)
S/N ratio	75 dB due to thermoelectric cooling
Minimum object distance	10 mm (wide end) to 1500 mm (tele end)
Focus / Iris	Yes, auto and manual
<b>Physical features</b>	
Pan / tilt	± 165°, .045° / ± 90°, .045° (variable speed)
Lamps	2 × 35 W following Pan-Tilt (>5 lux @ 30 m)
Size	H: 394 mm, L: 410 mm, W: 300 mm
Weight	23 kg (50.7 lb.)
Power Supply	230/110/100/24 VAC – 50/60 Hz
<b>Communication</b>	
Video output	BNC or balanced 2-wire (1 VPP/75 or 120 Ω)
Control output	LonWorks or Pelco D (RS-422 / RS-485)
Audio (optional)	FM over balanced 2-wire
<b>Environment</b>	
IP class	IP 65 (Sensor Module)
Operating temp.	5 – 60°C (40 – 150°F), max 85°C (195°F) for 8 h
Humidity	0 – 100 % RH, non-condensing
Vibration	2 – 9 Hz 1.5 mm, 9 – 200 Hz acc. 5 m/s <sup>2</sup> Resistance for 6 magnitude earthquake
Pressure	5 Bar above normal atm. pressure
<b>Radiation</b>	
Radiation protection	Gamma mainly – Marginal neutron
Camera design life	Gamma only radiation field: > 30 years before full camera replacement
Total camera integrated dose	Gamma only radiation field: > 250 kGray
Sensor radiation dose rate	> 1 Gray/h continuous up to 1 kGray/h burst/short time
Internal sensor	Internal radiation damage sensors
<b>Maintenance</b>	
Maintenance interval	MTBF > 10 000 h Between 24 and 140 months In average every 42 months (Data collected from 2010 to 2014 over 65 RADCAMs)
Items replaced at maintenance intervals	Sensor module & control module, lamps, fans.
Maintenance task	< 5 – 10 min replacement time Directly at camera position Done by maintenance department



**ISEC**  
MONITORING SYSTEMS

The innovative,  
cost-efficient choice  
in nuclear monitoring  
systems