



RADIATION TOLERANT CAMERA

R981™

System Camera

Mirion Technologies is one of the world's most experienced suppliers of large turnkey television surveillance systems to the nuclear industry. Major multi-camera radiation tolerant system installations are an essential part of the process monitoring requirements for nuclear power stations and waste handling facilities. Safety requirements relating to plant life extensions and new power plant construction demand the use of television systems to continuously monitor machinery and key plant areas within secondary containment.

The R981 camera range has been specifically designed to suit these large multi-camera configurations. Alternatively, single camera channels can be supplied as ideal inspection and surveillance tools.

The control and cabling system used to support our R981 series of radiation tolerant camera systems is also capable of supporting a range of Mirion camera products. Both our C981 Color System cameras as well as our Hyperion™ Compact Gen II Camera System cameras can be easily integrated with just a control card swap. The control cards simply slide in/out of the multi-camera control racks and are matched to the selected system cameras.



FEATURES

- ✓ Class leading radiation tolerance
- ✓ Pan, tilt, zoom, video and power over three twisted pairs
- ✓ High resolution monochrome picture
- ✓ Radiation tolerant telemetry
- ✓ One 19" sub-rack to control up to eight cameras
- ✓ Eight channel lighting and microphone sub-racks
- ✓ RS-485 control of sub-racks
- ✓ Change cameras without adjustment
- ✓ Software protocol and hardware can address up to 128 channels of cameras and lighting
- ✓ Seismic qualification available
- ✓ Captions at the source
- ✓ Modular design for easy assembly/install
- ✓ Simple cable
- ✓ Integral version available
- ✓ Option available without pan and tilt

APPLICATIONS

- ✓ Process monitoring
- ✓ Safeguard surveillance
- ✓ In-containment viewing
- ✓ Waste management
- ✓ Guidance and posting

R981 SYSTEM CAMERA

SPECIFICATIONS AND PERFORMANCE

Camera Outstation:

- Housing Material: Stainless steel
- Operating Dose Rate: 1 kGy/hour (Chalnicon tube)
- Operating Temperature Ambient: 0 to 55 °C (35 to 131 °F) (Chalnicon tube)
- Radiation Tolerance: 1 MGy [⁶⁰Co] (H₂O); 10⁸ Rad [⁶⁰Co] (H₂O)
- Camera Midpoint Connector: 24-way
- Weight: Approximately 13 kg (28.7 lb)
- Maximum Operating Depth: 20 m (66 ft)
- Cable Connection: 18-way remote handling LEMO or 12-way Fischer
- Maximum Submersion Depth: 60 m (197 ft)
- Pan and Tilt:
Speed: 6° per second
Travel: ±180° (adjustable)
- Size with Pan and Tilt: 294 x 267 x varying 241 to 320 mm (H x W x varying D) (11.6 x 10.5 x varying 9.5 to 12.6 in)
- Sealing: IP68 (IEC529) 60 m water depth (W.W. Fischer stainless steel connector type SE105Z069-27) IP66 (IEC529) fully washable (LEMO stainless steel remote handling cable connector type FZJ3N318TLMY)

Camera Channel Performance (Camera and CCU Combined):

- Horizontal Resolution: 550 HTV lines
- Sensitivity (faceplate): 1 lux (Chalnicon tube)
- AGC Range: -6 dB to 20 dB
- Signal to Noise Ratio: 43 dB (CCIR weighted, AGC at 0 dB)
- Geometric Distortion: 2% maximum

R981 Non-Browning Lens Options:

- Lens: Horizontal Viewing Angle: In Air
- 6:1 12 mm-72 mm zoom: 40° wide; 7° narrow
- 6:1 24 mm-144 mm zoom: 21° wide; 3.5° narrow
- 3:1 8 mm-24 mm zoom: 58° wide; 21° narrow

Eight Channel Camera System Sub-Rack:

- Nominal Power Supply Input: 100-120/200–240 V (auto-ranging); 50/60 Hz
- Operation Range: 85-132/170–264 V (auto-ranging); 47–440 Hz
- Power Requirement: 150 VA for a fully populated 8-channel CCU
- Outstation Cable Length: 300 m (984 ft) maximum CCU to camera (consult Mirion)
- Operating Ambient Temperatures:
Fully populated, convection cooling: 0 to 40 °C (32 to 104 °F)
Up to 6 channels, convection cooling: 0 to 50 °C (32 to 122 °F)
Fully populated, forced air cooling at 500 litres (132 gallons)/minute: 0 to 50 °C (32 to 122 °F)
- Relative Humidity: 80% for temperatures up to 31 °C decreasing linearly to 50% at 40 °C
- Size: 134 x 483 x 300 mm (H x W x D) (5.3 x 19 x 11.8 in) (excluding handles and connectors)
- Weight: 7 kg (15.4 lb)

CCU Connector Types:

- AC Power: IEC 320 plug (fitted with T4A fuse)
- Camera Inputs (8 off): 15-way D type socket
- Video Outputs (8 off): 75R BNC
- Genlock Input: 75R BNC (with 75R termination switch)
- Sync Pulse Output: 75R BNC
- Serial Control Input: 9-way D type plug
- Serial Control Loop Through: 9-way D type socket

Optional Accessories:

- Camera Attachments: Camera allows for up to four attachment positions for a combination of microphone and lights
- In-air or Underwater Lights: Up to 300 W using 50 or 75 W lamps
- Lighting Sub-rack: Eight Channel
- Microphone: For in-air use only
- Microphone Sub-rack: Eight Channel

