ARC

# Ultra Long-Range Multi-Sensor PTZ Camera

INFINITI

The Arc offers the highest level of customization with the ability to integrate various technologies and sensors including ZLID illumination up to 6km, LRFs (Laser Range Finders) rated up to 30km, radar Slew-to-Cue integration for automated tracking, and GPS telemetry. Heavy duty gearing systems ensure that the systems are self-locking even when not in operation. Weatherproof military connectors and corrosion resistant anodized aluminum is available for enclosures, ensuring these systems will stand up to any environment.

## Key Features:

- 20–1225mm 4K/8MP 61X Day/Night Zoom Camera
- Other camera options with zoom ranges up to 135X
- 1280×1024 or 640×480 Cooled/Uncooled Thermal options
- Thermal lens options available up to 1215mm in HD resolution or 1400mm in SD resolution
- Optional ZLID™ illumination for up to 6km of High Definition NIR imaging in complete darkness
- Military Grade pan/tilt with speeds from 0.005–48°/s
- Up to 75kg (165lbs) payload handling
- Rugged IP66/67 and -40° to +65°C with Anti-Corrosion Finish

## Optional Features:

- 30km Rated LRF
- HD SWIR Camera
- Auto Tracking
- HD LWIR Thermal
- Laser Pointer
- 1280×1024 HD Cooled Thermal
- GPS & DMC for Accurate Positioning
- Laser Dazzler or Spot/Strobe Light
- Rapid Deployment Kit
- Other customizations available

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# Visible/NIR HD Zoom Camera

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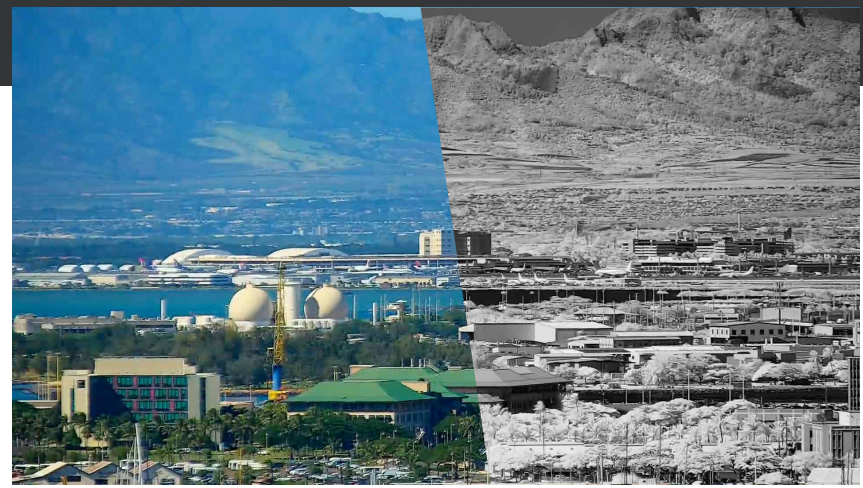


**Standard Color Visible Image**
(Optical Fog Filter Disabled)

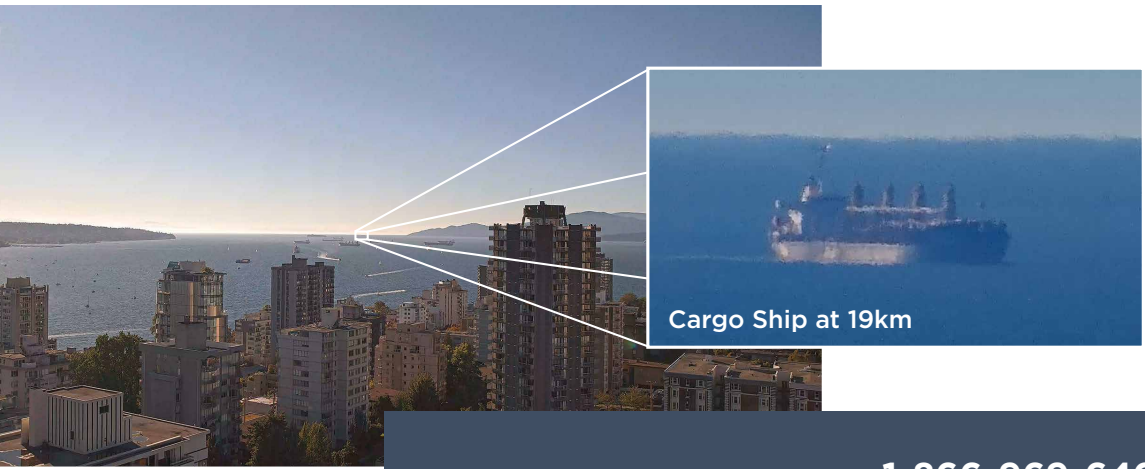
**NIR Image**
(Optical Fog Filter Enabled)

## VIS/NIR Optical Camera

Infiniti's zoom camera modules utilize high-end CMOS sensors to offer excellent spectral sensitivity in the visible and near-infrared wavelengths of light, providing high-quality images optimized for long-range surveillance. They are designed to provide industry-leading performance and quality, with image resolutions ranging from 2MP (1080p HD) to 8MP (4K UHD) and 12MP. Precision engineered IR-corrected continuous zoom lens options offer a range of focal lengths with up to 135X optical zoom and integrated rapid autofocus to allow for long-range surveillance of targets without operator intervention.

## Wide Angle Spotters

The Arc PTZ can also support our optional wide angle spotter cameras. By integrating a second high resolution sensor with a wide angle lens, operators can maintain wide area situational awareness while simultaneously achieving detailed surveillance of targets at long ranges.




## Optical Fog Filter (NIR Only Mode)

While most surveillance cameras offer a nighttime NIR + visible mode for optimized sensitivity in low light, the Arc's cameras are also equipped with our NIR bandpass filter (also referred to as a "fog filter") allowing users to isolate the NIR (near-infrared) wavelength of light during the day for clearer long-range daytime imaging.

Long-range imaging needs to see through large amounts of atmosphere which often contains particulates like smoke, haze/fog, and other atmospheric distortions. Cutting out the visible wavelength and isolating the NIR can mitigate the effects of smoke, haze and light fog, producing an image with better contrast and less distortion. Our optical fog filter lenses incorporate a motorized filter that is used with the camera's monochrome mode and de-haze image processing to see through smoke, smog and haze.

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# ZLID™ & Thermal Technologies

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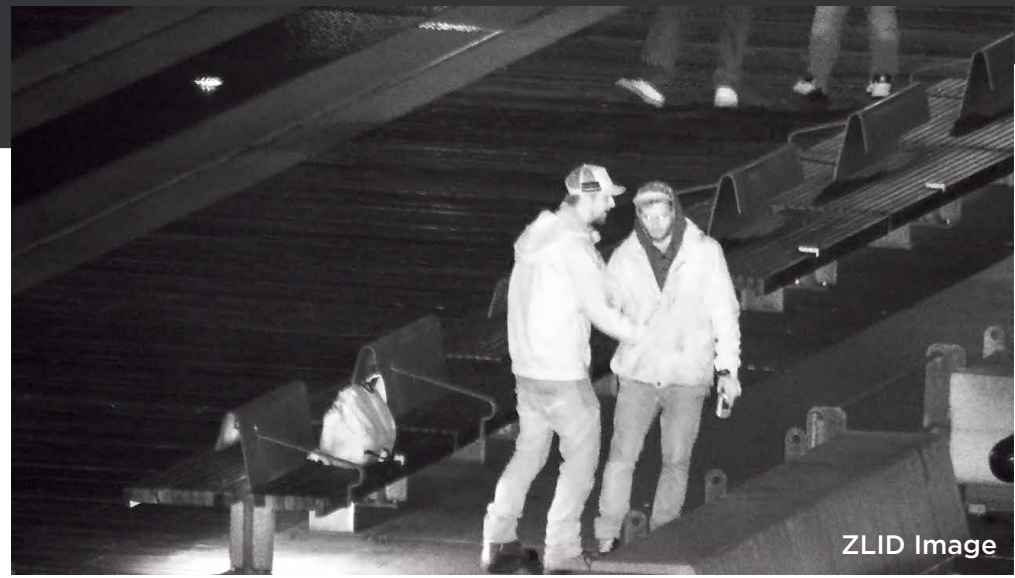
ZLID Image

## ZLID™ Laser IR Illumination

IR illumination allows for detailed video when there isn't enough natural light, however common IR LED illuminators have very limited ranges. For long-range illumination, a laser is needed. Many laser illuminators overexpose the center of the screen and leave the edges dark. Infiniti's ZLID (Zoom Laser IR Diode) technology synchronizes the IR intensity and area illumination with the zoom lens for outstanding active IR performance, eliminating over-exposure, washout, and hot-spots for clear images in complete darkness.

## See Further with Thermal

The Arc boasts industry-leading thermal cameras with uncooled LWIR and cooled MWIR options from resolution of 384×288 up to 1280×1024 HD to ensure mission success.

Thermal cameras, unlike traditional visible cameras, use heat rather than light to see objects. Humans, animals, and vehicles are all quite hot in contrast to most surroundings, making intruders hiding in shadows or bushes easy to spot. Thermal images are also unaffected by bright lights and can see through atmospheric obstructions such as smoke, dust, and light fog. This makes thermal imaging an ideal technology for many applications including surveillance and security, search and rescue, fire fighting, marine and land navigation, wide area situational assessment, and much more.


Thermal Image

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# Thermal Imaging Options: Cooled vs Uncooled

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## Uncooled Long Wave Infrared (LWIR)

Infiniti uses cutting-edge 12µm LWIR VOx uncooled thermal sensors with resolutions up to 1280×1024 HD. The 12µm pixel pitch provides a narrower field of view without changing the lens, allowing it to achieve 40% further range than 17µm sensors.

These sensors are paired with large aperture lenses of f/1.0–f/1.3, compared to the standard f/1.5–f/1.6, allowing up to 2.3 times more heat to reach the sensor. This results in higher sensitivity, sharper images, and longer ranges, making LWIR one of the most cost-effective long-range imaging solutions.

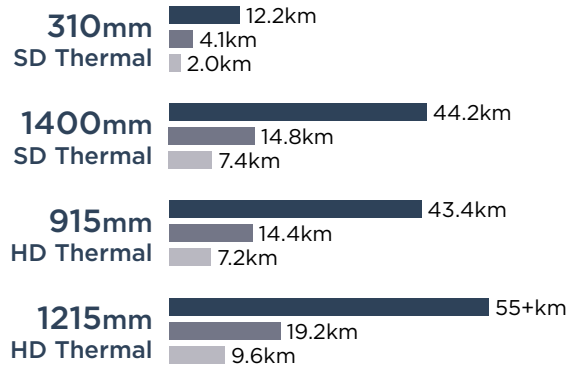
## Cooled Mid-Wave Infrared (MWIR)

Infiniti offers cooled thermal in SD or HD options. Our 15µm 640×480 InSb or MCT sensors are comparable to the standard MWIR offerings in the industry. Our 10µm 1280×1024 HD X-Hot sensor provides 400% higher resolution and 50% longer range than traditional 15µm sensors. This means a 400mm lens on our X-Hot sensor is equivalent to a 600mm lens on a traditional 15µm sensor allowing it to provide a narrower angle (further zoom) for more detail at long distances.

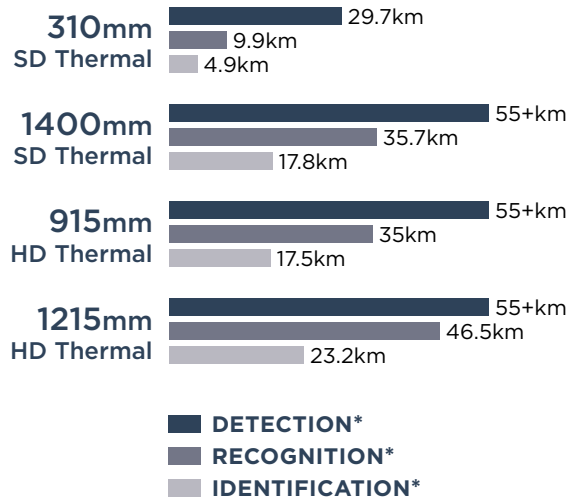
MWIR sensors use integrated cryo-coolers to cool the sensors down to -196°C (InSb) or -123°C (X-Hot). This exponentially increases the sensitivity of the thermal camera, allowing MWIR cameras to use smaller and more powerful lenses than uncooled LWIR cameras, however the cryo-coolers do require maintenance at intervals that vary depending on sensor type and environment.

Our new **Thermally Compensated Optics (TCO)** technology maintains MTF, back focal distance, and effective focal length across a wide range of operating temperatures. This TCO technology effectively mitigates challenges posed by thermal expansion. Paired with our HD InSb or X-HOT MWIR thermal cores, Infiniti's systems provide high contrast and ultra long distance infrared imaging for mission critical applications such as threat detection, surveillance, auto-tracking and targeting. With lens options capable of detection ratings* over 55km (based on DRI ratings in ideal conditions), the Arc is the ultimate thermal surveillance platform.

### Human DRI:




### Vehicle DRI:




*DRI detection ratings are based on industry-wide standards (Johnson's Criteria) that can be misleading if not properly understood. For more information, please see our whitepaper about understanding DRI measurements at: www.infinitioptics.com/dri

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# Pan/Tilt Positioner


The Arc motion control pedestal is a rugged, military-grade, multi-use pan-tilt system designed to offer precision, speed, and torque for military and defense applications. It comes in three different options for payloads of 40kg, 55kg, and 75kg. The Arc features harmonic drive with magnetic braking, boasting low backlash for high accuracy pan and tilt pointing and tracking.

The base magnetic encoder offers 0.0048° of position feedback, with an optional 0.00036° for fast, low-latency feedback. The encoder motor count (optional) can provide 0.0002° of feedback at lower refresh rates. This allows the pan/tilt to be integrated with third-party systems or used as a standalone video tracker when paired with our electro-optics and video processing. The Arc is not only precise but also boasts 9,600X dynamic speed ratios ranging from 0.005°/s to 48°/s, making it an ideal choice for mission-critical applications such as ground, air and marine surveillance.

## Geo-Targeting & Orientation

The Arc can be outfitted with variety of sensors that allow it to know its orientation and position, ensuring tracking and geo-positioning even when the platform is moving such as a vehicle or vessel installation. The Arc can integrate a variety of sensors such as DMC with true north for real-time orientation of the elevation and azimuth without relying on the optical encoders for position feedback. Dual or single GPS can be added as well as AHRS/MEMS for geo-pointing and measurements of dynamic motion. When combined with our LRF (Laser Rangefinder), this allows for the extrapolation of the target's GPS position in real-time. For GPS in GPS-denied environments Infiniti can provide accurate positioning using a HGR (Hemispherical Resonator Gyro) allowing the Arc to be optimized for any mission profile.

## Multi-Mission Payload Support

The Arc comes standard with slip rings that allow for 360° endless rotation with a variety of options to suit your payload requirements such as serial, 10Gb ethernet, SDI/analog, fiber optic and high power as well as no slip ring for special payloads. The tilt axis allows for ±90° movement, which combined with the 360° endless rotation ensures full coverage with no blind spots. The Arc is capable of integrating any of our EO/IR camera payloads such as thermal, visible, SWIR or NIR in addition to LRF, ZLID illuminators, laser pointers, jammers, DEW (Directed Energy Weapons) or other third party payloads up to 75kg/165lbs. All can be integrated into a rugged MIL-810 IP66 -40°~65°C enclosure with anti-corrosion powder coating.

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# Visible/NIR Camera Options

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| | | 8M-2050TO | 2075-LSM | 8M-95X | 8M-53X | 4M-53X |
|---|---|---|---|---|---|---|
| Simulated FOV @ 1km | |  |  |  |  |  |
| Pixels Per Meter @ 1km | | 1025ppm | 553ppm | 508ppm | 400ppm | 274ppm |
| DORI | D: 25ppm | 41,000m Detection | 22,133m Detection | 20,300m Detection | 16,000m Detection | 10,944m Detection |
| | O: 62ppm | 16,532m Observation | 8,925m Observation | 8,815m Observation | 6,452m Observation | 4,413m Observation |
| | R: 125ppm | 8,200m Recognition | 4,427m Recognition | 4,060m Recognition | 3,200m Recognition | 2,189m Recognition |
| | I: 250ppm | 4,100m Identification | 2,213m Identification | 2,030m Identification | 1,600m Identification | 1,094m Identification |
| Output Resolution | | 8MP/4K @ 30fps (3840×2160) | 2MP/1080p @ 60fps (1920×1080) | 8MP/4K @ 30fps (3840×2160) | 8MP/4K @ 30fps (3840×2160) | 4MP @ 30fps (2688×1520) |
| Image Sensor | | 8.4 Megapixel 1/1.8" W CMOS | 2.0 Megapixel 1/2" W CMOS | 8.4 Megapixel 1/1.8" W CMOS | 8.4 Megapixel 1/1.8" W CMOS | 4.1 Megapixel 1/1.7" W CMOS |
| Lens* | Focal Length | 2050mm | 15.4–2075mm (with IZE doubler) | 10.6–1015mm | 15–800mm | 15–800mm |
| | Zoom | No Optical Zoom, 16X Digital | 135X Optical Zoom, 4X Digital | 95X Optical Zoom + 16X Digital | 53X Optical Zoom + 16X Digital | 53X Optical Zoom + 16X Digital |
| | Angle of View | 0.21° Horizontal<br>(0.03° with 8X Digital Zoom) | 27°–0.2° Horizontal<br>(0.05° with 4X Digital Zoom) | 42.0°–0.43° Horizontal<br>(0.05° with 8X Digital Zoom) | 28.7°–0.55° Horizontal<br>(0.07° with 8X Digital Zoom) | 29.4°–0.56° Horizontal<br>(0.14° with 4X Digital Zoom) |
| | Focus | Manual | Auto / Manual | Auto / Manual | Auto / Manual | Auto / Manual |
| Minimum Illumination | | Color: 0.03 Lux @ f/1.2;<br>B&W: 0.003 Lux @ f/1.2 | Color: 0.006 Lux @ f/1.2;<br>B&W: 0.0006 Lux @ f/1.2 | Color: 0.1 Lux @ f/2.1;<br>B&W: 0.01 Lux @ f/2.1 | Color: 0.1 Lux @ f/1.5;<br>B&W: 0.01 Lux @ f/1.5 | Color: 0.05 Lux @ f/2.8;<br>B&W: 0.005 Lux @ f/2.8 |
| Optical Fog Filter (NIR) | | Yes | Yes | Yes | Yes | Yes |
| Heatwave Mitigation | | No | No | Yes | Yes | Yes |
| NDAA Compliant | | Yes | Yes | No | Yes | No |
| Video Network | Compression | H.265/H.264/MJPEG | | | | |
| | Protocol | ONVIF, HTTP, RTSP, RTP, TCP, UDP | | | | |
| Image Stabilization | | Electronic Image Stabilization (EIS) | | | | |
| Image Enhancements | | AWB, BLC, WDR, DNR | Auto White Balance, 120dB WDR, 3D DNR, BLC | White Balance, 100dB WDR, 2D/3D DNR, BLC, HLC, Digital Defog | White Balance, 100dB WDR, 2D/3D DNR, BLC, HLC, Digital Defog | White Balance, 100dB WDR, 2D/3D DNR, BLC, HLC, Digital Defog |
| Edge Storage | | Supports MicroSD Card up to 256GB | | | | |

*Lens measurements and angle of view are accurate to ±10% due to back focus distances, sensor sizes, lens manufacturing, etc.

# ZLID™ Illumination Options

| | 500m IR LED | 1km ZLID | | 1.5km ZLID | | 2km ZLID | | 3km ZLID | 4km ZLID | | 5km ZLID | 6km ZLID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illumination Distance | 500m | 1000m | | 1500m | | 2000m | | 3000m | 4000m | | 5000m | 6000m |
| Wavelength | 808nm | 808nm | 940nm | 808nm | 940nm | 808nm | 940nm | 808nm | 808nm | 940nm | 808nm | 808nm |
| NOHD | 0m (eye safe) | 50m | 36.6m | 56.4m | 45.2m | 226m | 166m | 238m | 266m | 555m | 376m | 752m |

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# Thermal Camera Options

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## SD Thermal Camera Options

| | 31–310mm (-310TIZ) | | | 38–875mm (-875CTZ) | | | 46–1100mm (-1100CTZ) | | | 85–1400mm (-1400CTZ) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Image Sensor | Uncooled VOx Microbolometer, 30Hz | | | High Sensitivity Cooled InSb or MCT, 30Hz | | | | | | | | |
| Resolution | 640×512 pixels (1280×1024 optional) | | | 640×480 pixels (NTSC) / 640×512 pixels (PAL) | | | | | | | | |
| Pixel Pitch | 12µm (40% further range than 17µm sensors) | | | 15µm | | | | | | | | |
| Lens | 31–310mm ƒ/1.3 Motorized Zoom | | | 38-875mm ƒ/5.5 Motorized Zoom | | | 46–1100mm ƒ/5.5 Motorized Zoom | | | 85–1400mm ƒ/5.5 Motorized Zoom | | |
| Focus | Motorized Autofocus | | | Motorized Autofocus | | | Motorized Autofocus | | | Motorized Autofocus | | |
| Field of View | 14.1°–1.42° HFOV (27.8°–2.84° HD) | | | 14°–0.63° Horizontal FOV | | | 11.9°–0.5° Horizontal FOV | | | 6.4°–0.39° Horizontal FOV | | |
| Pixels Per Meter @ 1km | 26ppm | | | 58ppm | | | 73ppm | | | 93ppm | | |
| Human DRI Ratings* | 12.2 km | 4.0 km | 2.0 km | 27.6 km | 9.2 km | 4.6 km | 34.7 km | 11.6 km | 5.8 km | 44.2 km | 14.7 km | 7.3 km |
| Vehicle DRI Ratings* | 29.7 km | 9.9 km | 4.9 km | 55+ km | 22.3 km | 11.1 km | 55+ km | 28.1 km | 14.0 km | 55+ km | 35.7 km | 17.8 km |
| Image Optimizations | DICE, BPR, NUC, & AGC user configurable via SDK, GUI | | | | | | | | | | | |
| Digital Zoom | 2X & 4X dynamic zoom/pan with range switching | | | | | | | | | | | |
| Spectral Range | LWIR (7,000–14,000nm) | | | MWIR (3,000–5,000nm) | | | | | | | | |
| Thermal Sensitivity | 50mK | | | 20–25mK | | | | | | | | |
| Cooler Lifetime | Uncooled Maintenance-Free | | | 20,000 Hour Rated MTBF | | | | | | | | |
| Image Display Modes | White Hot, other color palettes available upon request | | | | | | | | | | | |

## HD Thermal Camera Options

| | 30–460mm HD (-460CTZ-HD) | | | 60–705mm HD (-705CTZ-HD) | | | 73–915mm HD (-915CTZ-HD) | | | 100–1215mm HD (-1215CTZ-HD) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Image Sensor | High-Sensitivity Cooled InSb or X-Hot Detector, 30Hz | | | | | | | | | | | |
| Resolution | 1280×1024 pixels | | | | | | | | | | | |
| Pixel Pitch | 10µm (50% further range than 15µm sensors) | | | | | | | | | | | |
| Lens | 30-460mm ƒ/4.0 Motorized Zoom | | | 60–705mm ƒ/4.0 Motorized Zoom | | | 73–915mm ƒ/4.0 Motorized Zoom | | | 100–1215mm ƒ/4.0 Motorized Zoom | | |
| Focus | Motorized Autofocus | | | Motorized Autofocus | | | Motorized Autofocus | | | Motorized Autofocus | | |
| Field of View | 24.1–1.59° Horizontal FOV | | | 12.1–1.04° Horizontal FOV | | | 10.0–0.8° Horizontal FOV | | | 7.3–0.6° Horizontal FOV | | |
| Pixels Per Meter @ 1km | 46ppm | | | 70.5ppm | | | 91.5ppm | | | 121ppm | | |
| Human DRI Ratings* | 21.8 km | 7.2 km | 3.6 km | 33.4 km | 11.1 km | 5.5 km | 43.4 km | 14.4 km | 7.2 km | 55+ km | 19.2 km | 9.6 km |
| Vehicle DRI Ratings* | 52.9 km | 17.6 km | 8.8 km | 55+ km | 27.0 km | 13.5 km | 55+ km | 35.0 km | 17.5 km | 55+ km | 46.5 km | 23.2 km |
| Special Features | Digital Image Contrast Enhancement (DICE), Thermally Compensated Optics (TCO) | | | | | | | | | | | |
| Digital Zoom | 4X Digital Zoom (16X optional) | | | | | | | | | | | |
| Spectral Range | 3,000–5,000nm (MWIR) | | | | | | | | | | | |
| Thermal Sensitivity | 20–25mK | | | | | | | | | | | |
| Cooler Lifetime | 20,000 Hour Rated MTBF (InSb) / 30,000 Hour Rated MTBF (X-Hot) | | | | | | | | | | | |

* D R I DRI detection ratings are based on industry-wide standards (Johnson's Criteria) that can be misleading if not properly understood. For more information, please see our whitepaper about understanding DRI measurements at: www.infinitioptics.com/dri

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# Other Specifications

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| Optional LRF | LRF4 | LRF7 | LRF20 | LRF21 | LRF25 | LRF30 |
|---|---|---|---|---|---|---|
| Extended Range | 4.2km | 7.1km | 20km | 21km | 25km | 30km |
| Range to NATO Vehicle* | 3.5km | 6km | 8km | 10km | 12km | 18km |
| Range to Human* | 2km | 3.8km | 4km | 5km | 6km | 9km |
| Wavelength | 1530nm (±5) | | | | | |
| Precision** | 0.1–1.5m | | 0.2–2.5m | | | |

*Range performance is dependent on distance and target reflectivity. Calculated using NATO Vehicle size of 2.3×2.3m, Human size of 0.5×1.8m, with target visibility 25km, maximum measuring time, target reflectivity 30%, detection probability 90%. Depending on received signal level. Up to three (3) targets: First, Second and Third. See our LRF brochure for more information **LRF accuracy is based on ideal conditions. See our LRF brochure for more information.

| Pan/Tilt Mechanical | |
|---|---|
| Drive System | Harmonic Drive with Magnetic Braking |
| Pan Angle | Endless 360° |
| Pan Speed | 0.005°/s – 48°/s (depending on configuration) |
| Tilt Angle | +90° to -90° (with pedestal) |
| Tilt Speed | 0.005°/s – 48°/s (speeds may differ depending on configuration) |
| Proportional Pan/Tilt | Auto adjusts pan/tilt speed based on zoom level |
| Encoder Resolution | 0.0048° (magnetic encoder with high refresh rate) |
| Hardware Encoder Count | 0.0002° (optional, low refresh rate) |
| MIL-STD Ratings | Electromagnetic Compatibility: MIL-STD-461E, Vibration Compatibility: MIL-STD-810G Method 514.6, Maximum Operating Temperature: MIL-STD-810G Method 501.5, Minimum Operating Temperature: MIL-STD-810G Method 502.5, Moisture Resistance: MIL-STD-810G Method 507.5 |
| **Physical** | |
| Construction | Fully Machined Construction: High Strength Aluminum Alloy with Anti-Corrosion Finish |
| Payload Capacity | 40kg, 55kg or 75kg (depending on configuration) |
| **Environmental** | |
| Operational Temperature | -20°C to +55°C (-40°C to +65°C optional) |
| Environmental | Designed to meet or exceed IP66 (camera enclosures), IP67 (pan/tilt) |
| **Electrical** | |
| Input Voltage | 48VDC (36–70VDC optional) |
| Power Consumption | 150W – 500W (depending on configuration) |
| Control | Pelco-D, Octagon API Serial and IP available |

**Optional Features:** Wiper and Washer for Visible, LRF (Laser Rangefinder), Wide-Angle 4K Spotter Camera, Wide-Angle Thermal Spotter Camera, Military GPS, Reflective Paint or Customized Paint Finish, Joystick (Pelco-D or IP 3-axis joysticks), Wireless Analog or IP Radios P2P or mesh

Brochure specifications subject to change. *Pan/tilt specs assume ideal conditions and a balanced payload.