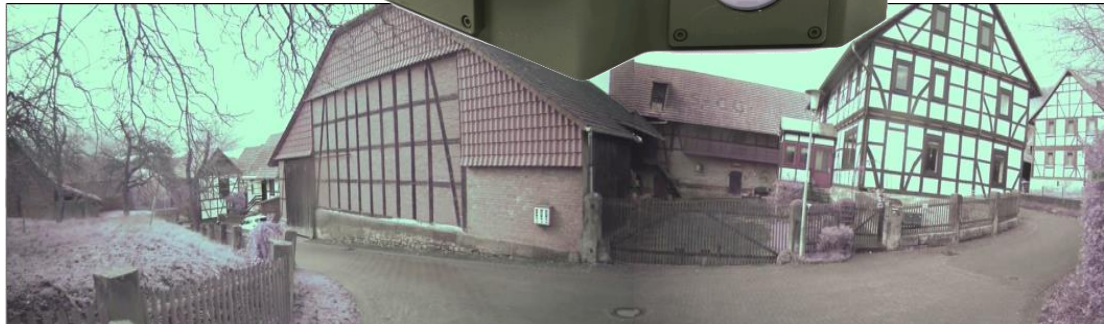










# Armor Eye – Quad Camera High Quality SDI (3VIS+1LWIR)

High quality SDI four-channel multispectral camera set-up for latency-free 180° view, driver rear-view and 360° local situational awareness (LSAS) as a part of Kappa's turnkey system solutions for ground vehicles.











Shown use case: Installation on Wisent II tracked vehicle (left), Driver 180° View for junction crossing under hatch (right)

## Strong Points

-  Multispectral set-up with 3 low-light CMOS and 1 LWIR sensor
-  180° view stitching
-  Latency-free
-  Extreme DRI capabilities
-  Smooth, low-vibration video
-  Homologated components
-  Easy vehicle integration
-  Modular and scalable

## Your Benefits

-  Ultra-fast reactions
-  Safe & exact threat detection
-  Day & night missions
-  Nausea & fatigue prevention
-  Itar-free
-  Clear product roadmap for future upgrades
-  Long-term available
-  Turnkey solution with flexible design

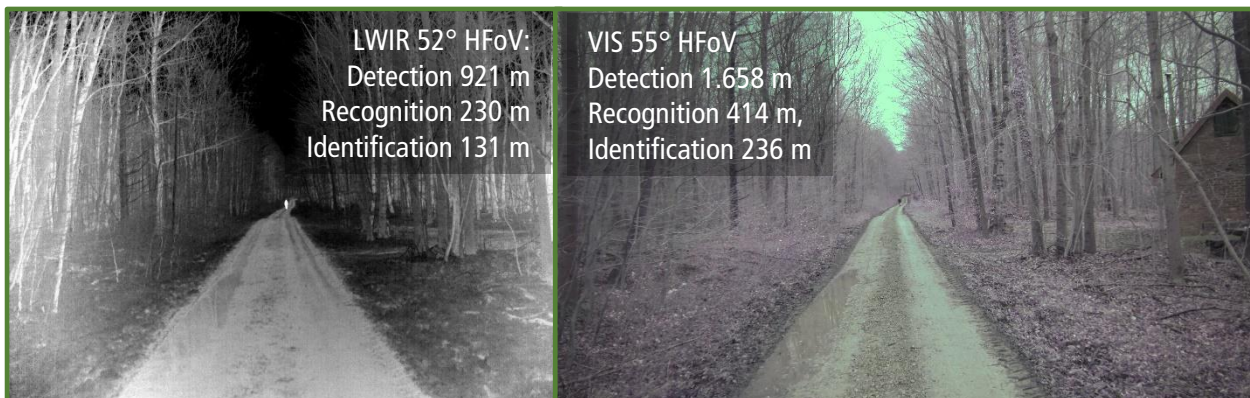
## References | In the Field

- FFG WISENT II
- Royal Norwegian Army
- Bundeswehr
- JCB High Mobility Engineer
- Excavator



Read more: [kappa-optronics.com/dve](http://kappa-optronics.com/dve)

See more: Video footage from test drive:



We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request. Technical data are subject to change without notice!

### Headquarters

Kappa optronics GmbH | 37130 Gleichen | Germany  
 info@kappa-optronics.com | www.kappa-optronics.com

Kappa optronics GmbH | USA  
 contact@kappa-optronics.com

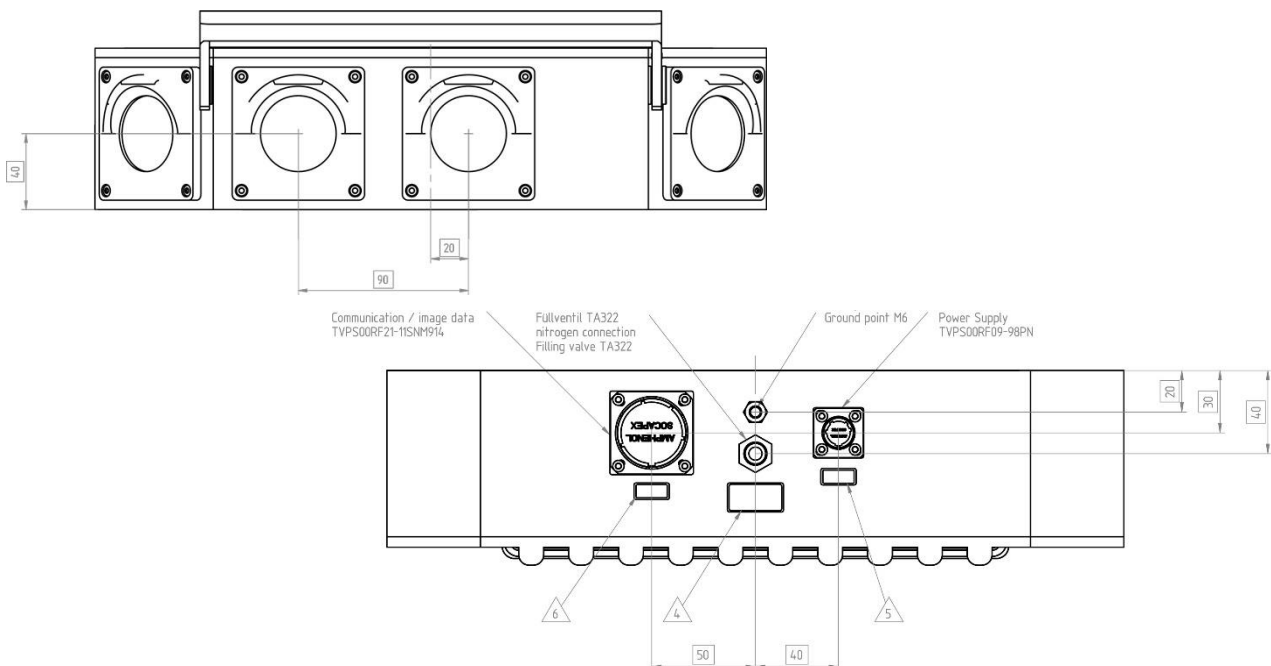
realize visions .

# Armor Eye – Quad Camera High Quality SDI (3VIS+1LWIR)

High quality SDI four-channel multispectral camera set-up for latency-free 180° view, driver rear-view and 360° local situational awareness (LSAS) as a part of Kappa’s turnkey system solutions for ground vehicles.

Technical Data Sensor	VIS	LWIR
Sensor	Low Light	Thermal
Light Sensitivity	0.05 lux	< 50 mK
Type	CMOS	Microbolometer a-Si
Shutter	Global	Rolling
Color	RGB	Black hot or white hot
Number of pixels (H x V)	1920 x 1080 pixels (2.1 MP)	1024x768
Interface		
Data interface	HD-SDI (SMPTE 296M and SMPTE 292M); 3G-SDI	HD-SDI (SMPTE 296M and SMPTE 292M)
Control interface	RS422 or CAN on request	
Frame rate	30p or 60p	30p
Latency	< 16,67ms including the exposure time of maximal 16.67 ms	< 33,34ms including the exposure time of maximal 33.34 ms
Functions		
Exposure	manual/ automatic 60 fps: 29 µs to 16.6 ms	Shutterless calibrated fixed exposure
Gain	manual/ automatic 0 dB to 24 dB (analog gain)	Automated histogram stretching and tone mapping
Diagnostics	integrated self-test (power supply, temperature)	

Dimensions Construction Drawing



We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request. Technical data are subject to change without notice!

**Headquarters**

Kappa optronics GmbH | 37130 Gleichen | Germany  
 info@kappa-optronics.com | www.kappa-optronics.com

Kappa optronics GmbH | USA  
 contact@kappa-optronics.com

realize visions .

# Armor Eye – Quad Camera High Quality SDI (3VIS+1LWIR)

High quality SDI four-channel multispectral camera set-up for latency-free 180° view, driver rear-view and 360° local situational awareness (LSAS) as a part of Kappa's turnkey system solutions for ground vehicles.

General Data		
Channels	3 channels visible light cameras,	1 channel LWIR camera
Dimensions	220 mm x 355 mm x 95 mm Or 250 mm x 355 mm x 104 mm with cover	
Weight	7.000 g	
Power supply	24/28 V DC, max 20 W with heater, max 5 W without heater or 28V DC MIL1275E	
Connectors	Power D38999, Image Data D38999	
Lenses	55° HFOV, 31° VFOV 95° HFOV, 52° VFOV	52° HFOV, 39° VFOV 106° HFOV, 79° VFOV
Filter	NIR optimized	Without
Inner Housing	Nitrogen flooded	
Cooling	Radiator housing conducted	
Mounting Points	Four mounting holes	Twelve mounting holes
Detection, Recognition, Identification (Humans)	95° HFOV: Detection 911 m, Recognition 227 m, Identification 130 m 55° HFOV: Detection 1.658 m, Recognition 414 m, Identification 236 m	106° HFOV: Detection 392 m, Recognition 98 m, Identification 56 m 52° HFOV: Detection 921 m, Recognition 230 m, Identification 131 m
Detection, Recognition, Identification (Tanks)	95° HFOV: Detection 2.681 m, Recognition 670 m, Identification 383 m 55° HFOV: Detection 4.878 m, Recognition 1.219 m, Identification 696 m	106° HFOV: Detection 1.154 m, Recognition 288 m, Identification 164 m 52° HFOV: Detection 2.710 m, Recognition 677 m, Identification 387 m
Temperature	33 °C to 71 °C (MIL STD 810 G 501.5 - High Temperature Procedure II- operation hot dry (A1)) -51 °C (MIL STD 810 G 502.5 - Low Temperature Procedure II- operation severe cold (C3)) 33 °C to 71 °C (MIL STD 810 G 501.5 - High Temperature Procedure I- storage hot dry (A1)) -51 °C (MIL STD 810 G 502.5 - Low Temperature Procedure I- storage severe cold (C3))	
Relative humidity	MIL STD 810 507.5-5 Natural Cycle B2- Cyclic high humidity	
IP code	IP69K frontal / IP67	
Shock	MIL STD 810 G 516.6 Procedure I - Functional Shock (40 g/ 11 ms)	
Vibration	MIL STD 810 G 514.6 Vibration Category 20 Tracked Vehicle (5 Hz to 2000 Hz) AECTP400 Figure B-3 Heavy Vehicle	
EMI (emissions)	Electric field emissions: RE102-4 (MIL-STD-461G) Conducted emissions: CE102-1, basic curve (MIL-STD-461G)	
EMI (susceptibility)	Radiated susceptibility: RS103, 2MHz to 18GHz (MIL-STD-461G) Conducted susceptibility: CS101-1, CS101-2, CS114-1, CS115-1, CS116-1 (MIL-STD-461G)	
EMI (ESD)	CS118, +/-8 KV contact discharge (MIL-STD-461G)	

We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request. Technical data are subject to change without notice!

#### Headquarters

Kappa optronics GmbH | 37130 Gleichen | Germany  
info@kappa-optronics.com | www.kappa-optronics.com

Kappa optronics GmbH | USA  
contact@kappa-optronics.com

realize visions .

# Cameras and Vision Systems for Anything that Drives or Flies

Rugged & certifiable: When lives and safety are at stake, Kappa delivers the best, most reliable, and most precise vision solutions.



Kappa has 40 years of experience with application-specific cameras and vision systems in rugged and certifiable design – in small and mid-sized series.

We offer innovative vision solutions for day and night operations, ensuring maximum performance of higher level systems. Our solutions are especially suitable for safety-critical applications. We provide on-site consulting, dynamic project management, and a highly experienced development team. Special signal processing, mechanical modifications and customer-specific interface configuration are all part of the Kappa concept, as are integration of optical components, illumination and video management.

We are leaders in technology. Moreover, we meet all safety requirements on design assurance procedures in hardware and software development, qualification and certification (up to SIL 2/ASIL-B/ DAL-B, ISO 26262, DO-254, DO-160, DO-178, MIL STD 810/704, Nato-Supplier Code C4792).

Your benefits at a glance

Extremely rugged design | High integration capability | ITAR free | Certifiable maximum safety | Vision (sub-) systems, glass-to-glass, board level cameras | Latency-free images | Long-term availability & functional warranty | Day & night vision, 24/7

We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request. Technical data are subject to change without notice!

#### Headquarters

Kappa optronics GmbH | 37130 Gleichen | Germany  
info@kappa-optronics.com | www.kappa-optronics.com

Kappa optronics GmbH | USA  
contact@kappa-optronics.com

realize visions .