MODULAR MULTI SENSOR SYSTEM

Long range

dat con

FUNCTIONALITY

Multi sensors are electro optical units that enable continuous observation at short and long range regardless to time of day or weather circumstances. They accomplish this by using more than one type of camera (hence the name “multi sensor”), typically day / night camera and thermal camera. The cameras are mounted on a moving platform called pan - tilt that allows the pointing of those cameras in any direction needed. This combination enables operators to see in total darkness and bad weather (for, rain or snow) using the thermal camera and also get a high resolution colour image with high sensitivity day / night camera. All cameras support continuous zoom giving the operators ability to reach even the furthest targets with ease.

All our multi sensors are modular and allow the customer to select the combination of payloads they need for their specific application. Configuration of every multi sensor is tailored to requirements of the specific project and the environment in which it will be used (portable, fixed, remote, vehicle mounted…).

GENERAL FEATURES

- Simultaneous preview of day/night camera and thermal
- Continuous zoom on both payloads
- Radar connectivity (Slew to Cue)
- Radar tracking possibility
- Video tracking with auto/manual target acquisiton (optional)
- Auto / manual / remote focus on both payloads
- Rigid system design (up to 90 km/h wind without damage and 50 km/h in use)
- CE marked
- TCP/IP interface
- Gyro stabilized pan-tilt platform (optional)
- Electronic image stabilization on both payloads
- Temperature range of the whole system: -32 to +55°C
- Maximum humidity of the whole system: 95 %
- Complys with: IP67
  Vibration test: IEC 60068-2-64
  Shock test: IEC 60068-2-27
  Icing test: NEMA 250
  Salt fog test: IEC 60068-2-52

SYSTEM CONFIGURATION

Multiple payloads on one pan- tilt system within a separate housing (individually removable to enable service of one payload while the other is still operational):

- Thermal camera (cooled MWIR)
- Day/Night camera or/and SWIR
- Laser range finder (optional)
- Radar (optional)
- Robust Pan Tilt system
- software SOVA for preview and control (optional)
- GNSS positioning and heading unit

Compatibilitywith 3rd party payloads
- Flir HRC and HDC series of thermal chameras
- Leonard Horizon and SLX series of thermal chameras
- Other 3rd party payloads upon customer demand

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CLRT - Series

CLRT-Series are a range of cooled Medium Wave Infra-Red (MWIR) thermal imaging cameras. They employ the latest focal plane array technology to meet long-range surveillance and target identification requirements. CLRT-Series have a very high life span because they are fitted with long life cooler. CLRT- Series cameras incorporate continuous zoom lenses with autofocus and F/4 aperture to ensure high sensitivity even at high magnifications. This makes CLRT-Series cameras an ideal tool for very long-range observation over sea and land.

DRI – Detection, recognition and identification

TARGETS	**Human target**	**NATO (Vehicle) target**
Method	**STANAG 4347**	
Probability	**50 %**	
Target size	**1.8 m x 0.5 m**	**2.3 m x 2.3 m**
delta T	**2 K**	
Background temperature	**288 K**	
Atmosphere extinction coefficient (σ)	**0.2 / km; 1.0 / km**	

DRI	**CLRT-825**	**CLRT-900**	**CLRT-825**	**CLRT-900**
Atmosphere extinction	σ = 0.2 / km		σ = 1.0 / km	
DRI – NATO (VEHICLE) TARGET (2.3m x 2.3m)				
Detection	23.75 km	24.09 km	6.36 km	6.41 km
Recognition	15.70 km	16.20 km	5.32 km	5.38 km
Identification	10.81 km	11.30 km	4.52 km	4.60 km
DRI - HUMAN TARGET (1.8m x 0.5m)				
Detection	17.42 km	17.91 km	5.53 km	5.59 km
Recognition	9.27 km	9.84 km	4.29 km	4.35 km
Identification	4.98 km	5.30 km	3.19 km	3.29 km

Technical specifications

Model	**CLRT-825**	**CLRT-900**
Detector	Cooled MWIR	
Resolution	640 x 512	
Frame rate	25 / 30Hz	
Detector pitch	15 µm	
Spectral range	3 to 5 µm	
NETD	≤ 21mK	
Focal length	40 to 825 mm	45 to 900 mm
Field of View	13.7° to 0.7° (H)	11.4° to 0.6° (H)
Continuous Optical Zoom	Yes, up to 22x	Yes, up to 20x
Continuous Digital Zoom	Yes, up to 16x	
Focus	Automatic or Manual (remote)	
Image stabilization	Yes*	
Image processing	Tuneable Digital Detail Enhancement Histogram Equalization Non uniformity correction White Hot / Black Hot Colour Palette	
Video outputs	Analog or HD-SDI, RTSP H.264 Ethernet stream*	
Control interface	Serial, Ethernet	
Consumption	35 W typical, <120 W maximum with heaters / lens defrost	
Operating voltage	18 - 48 Vdc	
Operating temperature range	-32°C to +55°C	
IP rating	IP67, built according to MIL-810	
Dimensions	572 x 247 x 242 mm	620 x 290 x 290 mm
Weight	19 kg	21 kg
Motorised lens cover	Optional	
MTBF including cooler	Up to 20200 hours**	

*This function is only available if the device is used in combination with VPU/ST unit.
**The value depends on the selected detector and cooler.

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CLRT/HD - Series

CLRT/HD-Series cameras are a range of cooled Medium Wave Infra-Red (MWIR) HD thermal imaging cameras. They employ the latest focal plane array technology with 10-micron HD detector. CLRT/HD-Series have a very high life span because they are fitted with long life cooler. CLRT/HD-Series cameras incorporate continuous zoom lenses with autofocus and F/4 aperture to ensure high sensitivity even at high magnifications. This makes CLRT/HD-Series cameras an ideal tool for very long-range observation over sea and land.

DRI – Detection, recognition and identification

TARGETS	Human target	NATO (Vehicle) target
Method	STANAG 4347	
Probability	50 %	
Target size	1.8 m x 0.5 m	2.3 m x 2.3 m
delta T	2 K	
Background temperature	288 K	
Atmosphere extinction coefficient (σ)	0.2 / km; 1.0 / km	

DRI	CLRT/ HD-800	CLRT/ HD-900	CLRT/ HD-1000	CLRT/ HD-800	CLRT/ HD-900	CLRT/ HD-1000
Atmosphere extinction	σ = 0.2 / km			σ = 1.0 / km		
DRI – NATO (VEHICLE) TARGET (2.3m x 2.3m)						
Detection (km)	22.94	23.58	24.13	6.14	6.25	6.34
Recognition (km)	15.66	16.52	17.22	5.12	5.23	5.33
Identification (km)	10.30	11.15	11.93	4.38	4.52	4.63
DRI - HUMAN TARGET (1.8m x 0.5m)						
Detection (km)	17.14	17.99	18.74	5.32	5.44	5.54
Recognition (km)	8.97	9.77	10.52	4.14	4.29	4.41
Identification (km)	5.11	5.65	6.18	3.18	3.35	3.49

Technical specifications

Model	CLRT/HD-800	CLRT/ HD-900	CLRT/HD-1000
Detector	Cooled MWIR		
Resolution	1280 x 720		
Frame rate	25 / 30Hz		
Detector pitch	10 µm		
Spectral range	3 to 5 µm		
NETD	≤ 25mK		
Focal length	40 to 800 mm	72 to 900 mm	40 to 1000 mm
Field of View	18° to 0.92° (H)	9.3° to 0.8° (H)	18° to 0.73° (H)
Continuous Optical Zoom	20x	12.5x	25x
Continuous Digital Zoom	Yes, up to 16x		
Focus	Automatic or Manual (remote)		
Image stabilization	Yes*		
Image processing	Tuneable Digital Detail Enhancement Histogram Equalization Non uniformity correction White Hot / Black Hot Colour Palette		
Video outputs	HD-SDI, RTSP H.264 Ethernet stream*		
Control interface	Serial, Ethernet		
Consumption	35 W typical, < 120 W maximum with heaters / lens defrost		
Operating voltage	18 - 48 Vdc		
Operating temperature range	-32°C to +55°C		
IP rating	IP67, built according to MIL-810		
Dimensions	572x247x 242 mm w/o lens cover	620x290x 290 mm w/o lens cover	621x300 x300 mm w/o lens cover
Weight	18.5 kg w/o lens cover	21 kg w/o lens cover	22 kg w/o lens cover
Motorised lens cover	Optional		
MTBF including cooler	Up to 20200 hours**		

*This function is only available if the device is used in combination with VPU/ST unit.
**The value depends on the selected detector and cooler.

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LRCS - series

The LRCS-series are a range of high-performance Day/Night HD cameras using high sensitivity CMOS sensors and big aperture continuous zoom lenses. These features combined with selectable optical filters for fog penetration and IR-cut makes them a very versatile long-range tool to be used in all conditions such as fog, dusk/dawn, low light and high dynamic range scenery. LRCS-series Day/Night cameras are indispensable element of and multisensor unit and as such often overlooked but they play a huge role in its overall performance.

Technical specifications

Model	LRCS-A850	LRCS-A1000
Sensor	1/1.9" CMOS sensor	1/1.8" CMOS sensor
Pixels (H x V)	1920 (H) x 1080 (V)	
Sensitivity	Colour 0.001 Lux@(F2.0, 25fps); B&W 0.0001 Lux@(F2.0, 25fps);	Colour 0.02 Lux@(F2.1, 25fps); B&W 0.001 Lux@(F2.1, 25fps);
Focal length	10 to 850 mm	11 to 1000 mm
Field of view	36°- 0.49°	28°- 0.35°
Continuous Optical Zoom	Yes, up to 85x	Yes, up to 90x
Continuous Digital Zoom	Yes, up to 16x	
Focus	Automatic or Manual (remote)	
Image stabilization	Yes*	
Optical filters	Colour: IR Cut filter / B&W: VIS + NIR / B&W: Defog Filter – NIR only	
Image processing	Auto / Manual White Balance Auto / Manual Gain Control True Wide Dynamic Range Digital Fog Removal / Auto Contrast Dynamic Noise Reduction	
Video outputs	HD-SDI or analog, RTSP H.264 Ethernet stream*	
Control interface	Serial, Ethernet	
Consumption	15 W typical, < 60 W maximum with heaters / lens defrost	
Operating voltage	18 - 48 Vdc	
Operating temperature range	-32°C to +55°C	
IP rating	IP67, built according to MIL-810	
Dimensions	777 x 216 x 206 mm	
Weight	18 kg	

* This function is only available if the device is used in combination with VPU/ST unit.

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DAT-CON LRSW and LRSW/HD-series

LRSW-series are long-range Short-Wave infra-red (SWIR) cameras with lates 5-micron detectors. SWIR wave-length is just below MWIR and although is not visible to human eyes, SWIR cameras represents the most eye friendly B&W image while still retaining the atmosphere penetration of a thermal camera. Unlike thermal cameras they rely on reflected light and with that comes their disadvantage; they cannot “see” at night. Despite this disadvantage, they are a very important part of a multisensor unit either as a replacement or an add on to the Day/Night camera on systems where the added atmosphere penetration during the day is crucial. They are however not considered as a replacement for true LWIR or MWIR thermal cameras.

Technical specifications

Model	LRSW-500/5	LRSW/HD-500/5
Detector	InGaAs	
Resolution	640 x 480	1280 x 1024
Frame rate	25 / 30Hz	
Detector pitch	5 µm	
Spectral range	1.1 to 1.7 µm	
Focal length	16.6 to 500 mm	
Field of View	11° to 0.4° (H)	22° to 0.7° (H)
Continuous Optical Zoom	Yes, up to 30x	
Continuous Digital Zoom	Yes, up to 16x	
Focus	Autofocus, manual	
Image stabilization	Yes*	
Image processing	Auto / Manual Gain Control Digital Fog Removal / Auto Contrast Dynamic Noise Reduction	
Video outputs	Analog, RTSP H.264 Ethernet stream*	HD-SDI, RTSP H.264 Ethernet stream*
Control interface	Serial, Ethernet	
Consumption	25 W typical, < 70 W maximum with heaters / lens defrost	
Operating voltage	18 - 48 Vdc	
Operating temperature range	-32°C to +55°C	
IP rating	IP67, built according to MIL-810	
Dimensions	777 x 216 x 206 mm	
Weight	18 kg	

* This function is only available if the device is used in combination with VPU/ST unit.

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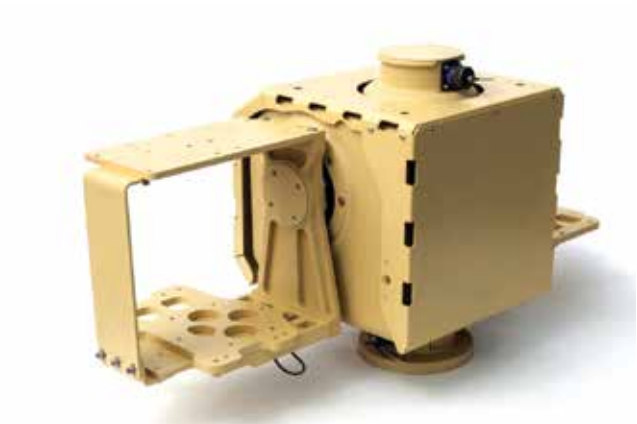

PAN-TILT - series

DAT-CON Pan-Tilt systems are the base of any multisensor system. They deliver high performance and stability for most demanding payloads. Their high payload to weight ratio and compact size makes them not only appropriate for fixed installation but ideal for mobile solutions as well. All systems are IP67 approved to make them suitable for all weather conditions and harsh environments, proven in critical security and observation applications with 24/7 operation. In a fully machined aluminium body lies a single powerful motion control board. Simplicity in construction and design adds to their robustness and long-life time. All units undergo a series of environmental and endurance tests before leaving production to ensure end-user satisfaction

Model	Tracer 	Locator 	Blade 
Load capacity / Torque	35 kg / 60 Nm	50 kg / 80 Nm	30 kg + 30 kg/80 Nm
Static top	/	/	Optional (up to 50 kg)
Weight	17 kg (without arms)	40 kg	46 kg (full configuration)
Dimensions (H x W x L)	323 x 220 x 336 mm	552 x 754 x 172 mm	412 x 735 x 302 mm
Materials	Aluminium		
Operating temp.	-32°C to +55°C		
Pan axis range / angle	n x 360°		
Pan axis speed	0.001°/s - 60 °/s	0.001°/s - 100 °/s	
Tilt axis range / angle	± 90° (limited by application between ± 35° and ± 45°)		
Tilt axis speed	0.001°/s - 60 °/s	0.001°/s - 100 °/s	
Accuracy	0.02°	0.005°	0.002°
Backlash	None		
Stabilisation (Optional)	< 9 mrad	< 0.3 mrad	
Brake	Self-Locking	/	/
Operating voltage	24 - 48 VDC		
Maximum power	160 W	120 W	
Communication to the unit	Eth 10/100 Base-T, RS-232, RS-485, 422 (optional)		
Control protocol	DC-PT protocol, Pelco-D (optional)		
Protection / IP rating	IP67, built according to MIL-810		

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AHRS-TH unit is a high performance true geographical headings unit. It provides position, true heading and two Euler angles (pitch, roll). It supports multiple serial and Ethernet communication. It is housed in a IP 67 enclosure with a military standard connector.

Features: Applications:
- True north system - Positioning
- Multiple communication options - Navigation
- IP 67 enclosure - Targeting
- Fast update rate

Specifications:

Specifications Weight	1.4 kg
Dimensions (H x W x L)	800 x 150 x 110 mm
Materials	Plastic/Aluminium
Protection / IP rating	IP 67
Operating temperature	-40°C to +55°C
Input voltage	12 VDC – 48 VDC
Power consumption	2.1 W
Communication	RS-232, RS-485, RS-422, Ethernet Base 10T
Protocol	NMEA

Accuracy:

Positioning:	**Horizontal (RMS (67%))**	**Vertical (2DRMS (95%))**
Autonomous, no SA: *	1.2 m	2.5 m
SBAS: *	0.3 m	0.6 m
Atlas Basic: *	0.50 m	1.0 m
RTK: *	10 mm + 1 ppm	20 mm + 2 ppm
Heading (RMS):	0.30° @ 0.5 m antenna separation 0.15° @ 1.0 m antenna separation 0.08° @ 2.0 m antenna separation 0.04° @ 5.0 m antenna separation	
Pitch/Roll (RMS):	1° Heave (RMS): *	
Heave (RMS): *	30 m (DGPS), 10 cm (RTK)	

*Depends on multipath environment, number of satellites in view, and satellite geometry

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LDCO - Series

LDCO represents the ultimate long-distance laser rangefinder. It is light weight and features ranging capability up to 32 km. With reduced measurement ranges LDCO meets high continuous measurement rates up 40 measurements per second in single mode and up to 200 Hz in burst mode.

Technical specification:

Model	LDCO/10	LDCO/16
Eye safety	Laser Class 1	Laser Class 1M* (Optional Class 1 available with limited continuous
Measurement range	50m – 32 000m	
Measurement range (Standard target):	10 000m – Target size 2.3 x 2.3 m, visibility 15 km, target reflectivity 30%, detection probability >90%	16 000m – Target size 2.3 x 2.3 m, visibility 20 km, target reflectivity 30%, detection probability >90%*
Precision	0.5 – 1.5 m depending on the distance and target reflectivity	
Beam divergence	0.35 mrad	0.25 mrad
Wave length	1.54 µm	
Measurement rates	40 meas. per min*	
Control interface	Serial, Ethernet	
Operating voltage	18 - 48Vdc	
Power consumption	3 W on standby, 7 W max on measurement	4 W on standby, 7 W max on measurement
IP rating	IP67, built according to MIL-810	
Operating temperature	-32°C + 55°C	
Dimensions	172 x 151 x 75 mm with connector	
Weight	2 kg	

*Laser safety parameter will influence this parameter

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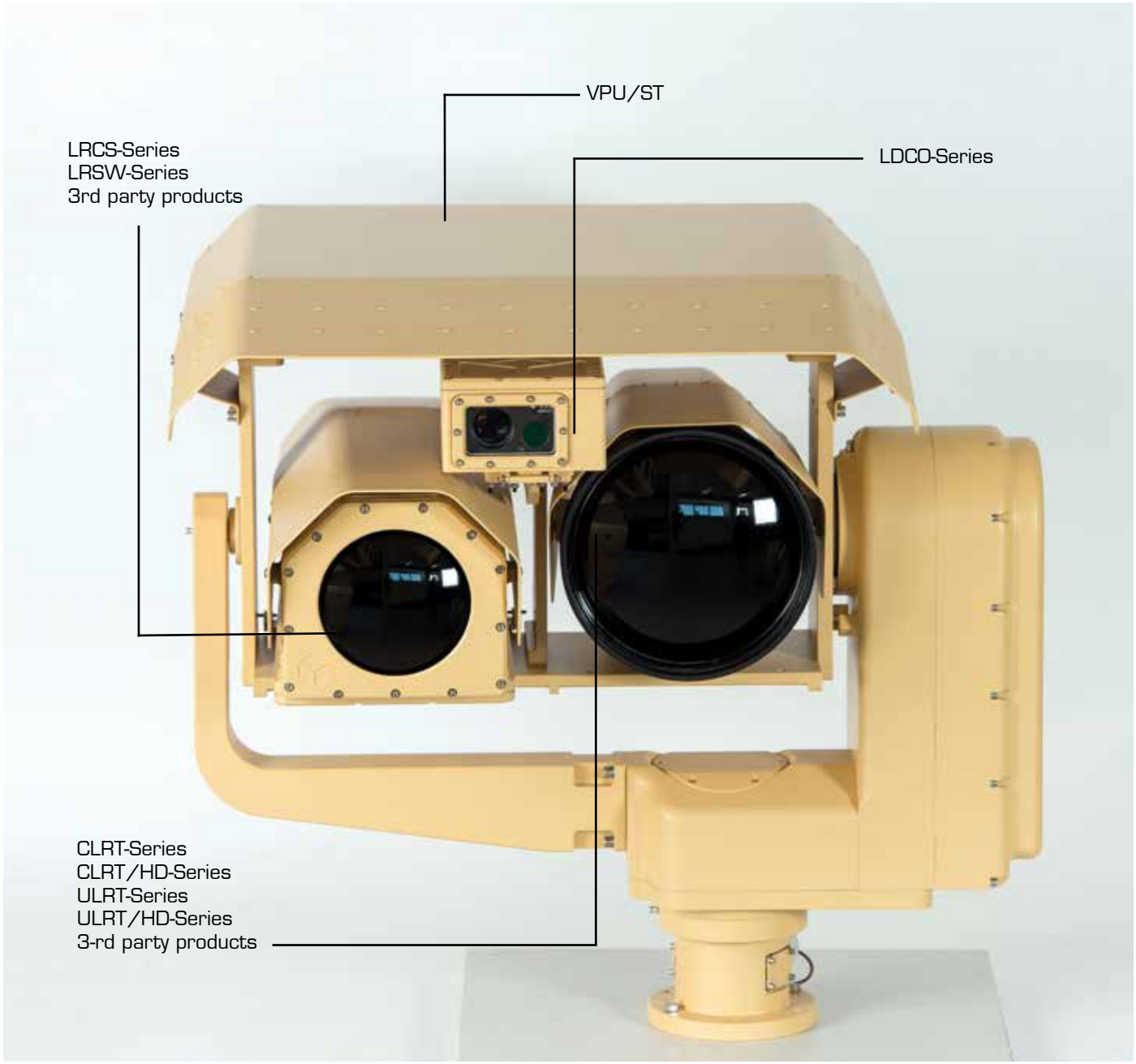
Locator - possible payloads



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External Video Processing Unit (VPU-ST)

Video processing unit (VPU-ST) is a hardware processing unit that is the “brains” of the multi sensor system. It combines all the payloads and Pan-Tilt unit into a single unit for the external observer and enable a single Ethernet connection to the whole unit including access to video streams and control of the entire system. VPU-ST enables dedicated advanced protocol that includes video as well as status and control. It has a powerful built in processor, that enables functions like video stabilization, H.264 encoding, video tracking.

- Power control and communication with each device
- Built in test for each device (BIT)
- Integrated Ethernet switch
- Communication interfaces: Ethernet (UDP), Serial
- H.264 Video encoding for all video payloads
- Two separated output video streams
- Control and video interface through Ethernet and serial (control only)
- Wide variety of video processing:
  - Video stabilization with roll correction
  - Advanced hardware scene and object video tracking
  - On Screen Display (OSD)
- Connectivity: four military standard connectors; 3 x input / 1 output
- Power: 18 – 48 Vdc; 30 W max.
- Environmental: IP 67, build with accordance to MIL-810
- Operating temperature range: -32 to 55°C
- Dimensions: 261 x 185 x 73 mm
- Weight: 3000 g

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