

Citadel Compact

Situation awareness camera for armoured vehicles

Datasheet

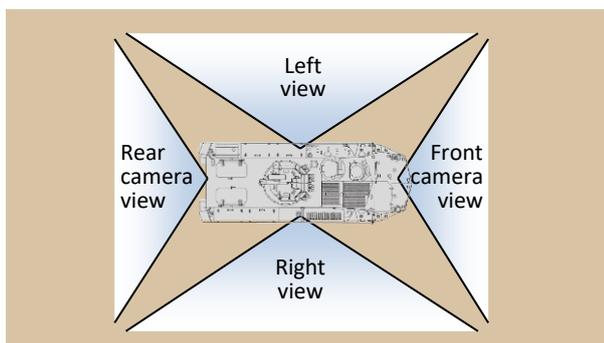


Features

- Up to 95° horizontal Field of View
- Wide temperature range, -40°C to +70°C
- Day / Extended Night modes
- Fog penetration
- Digital Noise Reduction, DNR
- Integrated adjustable mounting bracket
- 24V operating voltage (18 – 36V range)
- Heated protective window

Description

Providing increased safety for the entire vehicle crew of armoured vehicles is of prime importance in the battlefield. Mounting several wide angle cameras on strategic positions on the vehicle provides an unobstructed view over the near surroundings, with all hatches closed.



Rugged design

The Citadel Compact is encased in a rugged IP 66 housing, designed to withstand vibration in accordance with MIL STD 810G. It provides high-performance images, even under the harshest conditions, in temperatures ranging from -40°C to +70°C.

All electrical connections go through a MIL-compliant 10-pin round connector. The camera windows are heated for condensation-free operation.

Configurable Field of View

The special distortion-free wide angle lens of the Citadel Compact can be factory configured for a field of view (FOV) ranging from 47° up to 95°, allowing easy adaptation to the various on-vehicle visualization needs.

Day/Night operation

With the high sensitivity and automatic exposure modes of the Citadel Compact, it can operate from dawn to dusk and even produce images in full moonlit conditions.

The Extended Night Mode allows low light level operation with up to 4 seconds integration.

Improved image quality

The Citadel Compact uses conductive cooling to remove heat from the CCD sensor. This reduces random noise in the CCD sensors, resulting in improved image quality, particularly in low-light conditions.

Expanded Hi-Dynamic Range (XDR)

XDR is useful in conditions where there are large variations in brightness in the picture, i.e. when there are very dark and very bright areas in the picture. XDR amplifies the signal level in dark areas and reduces it in very bright areas thereby improving the visibility in the picture.

Fog penetration

The fog penetration function is designed to automatically increase visibility under conditions such as fog, haze and fire smoke. The camera continuously analyses the picture and once it detects a low-contrast condition, it will automatically enhance the contrast.

Digital Noise Reduction (DNR)

The Digital Noise Reduction function, based on a 2- and 3-dimensional algorithm, helps reduce noise in low-light conditions.

Copenhagen Sensor Technology A/S

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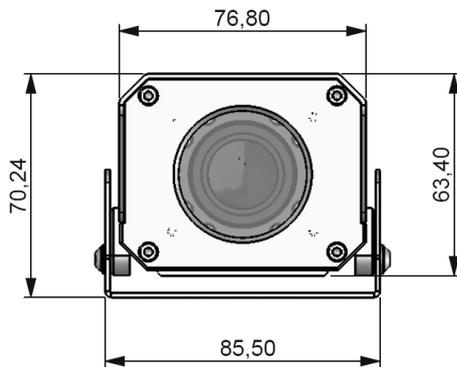
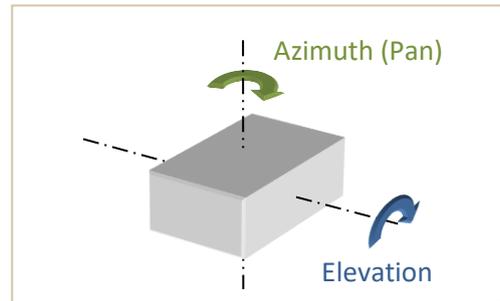
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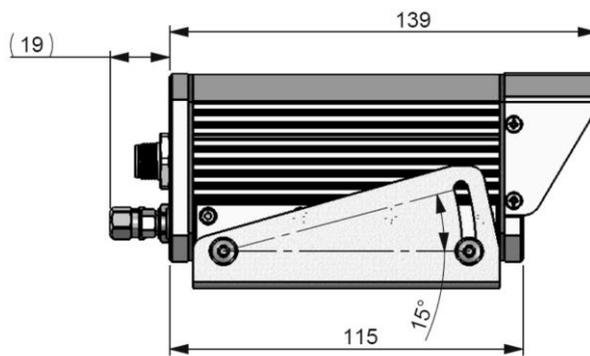
Mechanical outline and dimensions

2 degrees-of-freedom adjustment mounting bracket

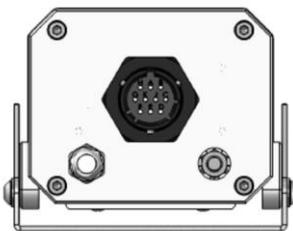
Designed with a 2D mounting bracket that allows alignment of the camera within 2 degrees of freedom, enabling the Citadel Compact to be adjusted to the contours and slopes of the vehicle body.



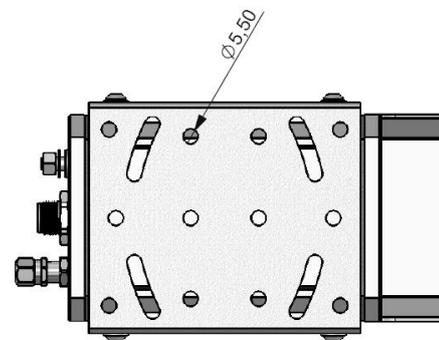
Front view



Side view (left side)



Rear view



Bottom view

Mount options



Option 01: 2D bracket (standard mount). See illustration above.



Option 02: Side mount (rail). See illustration above.



Option 03: Bottom plate. See illustration above.

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Specifications

	PAL	NTSC
Image system		
Sensor	High sensitivity 1/3" colour CCD sensor with complementary mosaic	
Lens	Configurable Field of View (FOV), IR-corrected, f/1.6	
Effective pixels (H x V), per camera	976 x 582 (4:3 image format)	976 x 494 (4:3 image format)
Horizontal FOV	Configurable from 47° to 95° FOV (factory setting with ±0.5° tolerance) (NOTE 1)	
Vertical FOV	Configurable from 35° to 71° FOV (factory setting with ±0.5° tolerance)	
Scanning system	2:1 Interlace	
Horizontal frequency	15.625 kHz	15.734 kHz
Vertical frequency	50 Hz	59.94 Hz
Electrical specifications and functions		
Video output	Composite VBS, 1 Vpp, 75 ohm	
Horizontal resolution	> 600 TVL	
Sensitivity	0.007 lx, 25% video @ f/1.6, AGC on	
Spectral response	400-700nm. Optional 400-950nm (NOTE 2)	
Signal to noise ratio	> 52 dB, AGC Off	
Electronic shutter, fixed	1/50 to 1/10,000 sec.	1/60 to 1/10,000 sec.
Gamma correction	0.45 / 1.0	
Automatic Gain Control. range	0 to +36 dB and 6dB digital gain	
Extended night mode	Up to 4 sec. Integration making it sensitive down to 0.0001 lx	
Extended night mode control	Automatic or manual	
Fog penetration	Off, Low, Mid, High	
White balance	Automatic, Tracking	
Noise reduction	2D and 3D Digital Noise Reduction, levels 0-7 and off function	
Heat haze reduction	On and off function	
Image Mirroring	Horizontal and Vertical image flip	
Configuration, serial interface	RS-422, CST protocol. CAN-BUS is optional with CST protocol. (NOTE 3)	
Mechanical		
Overall dimensions (W x H x L)	76.8 x 63.4 x 139 mm (With sunshade. Not incl. connectors and mounting bracket)	
Mounting bracket footprint	100 x 85.5 mm	
Net weight	0.9 kg	
Housing material	Aluminium with corrosion protection coating	
Mounting bracket alignment	2D bracket with 2 degrees of freedom: Elevation and azimuth (pan) (NOTE 4)	
Protective housing integrity	IP 66, back-filled with dry nitrogen	
Camera window	Glass with AR-coating and heated (NOTE 5)	
Connector (power, data, control)	10-pin round connector, aluminium (MIL-DTL-26482 series 1)	
Environmental		
Operating voltage	18 – 36 V DC (Galvanic separation from housing)	
Over voltage protection	MIL-STD-1275-D	
Current consumption	Max. 8 W with heater. Max. 2.5 W without heater in window	
Operating temperature	-40°C to +70°C	
Storage temperature	-40°C to +70°C	
Vibration	Tracked vehicle MIL-STD 810G , method 514.6 – 6.25grms	
Shock	3 shocks in each direction, 30G @ 11ms	
EMC	MIL STD 461F RS103 and RE102	
MTBF	30 000 hours (MIL-HDBK-217-F) Ground mobile	

NOTE 1: Default factory setting is 60° HFOV

NOTE 2: Order with IR-cut filter for 400-700nm spectral response. Order without IR-cut filter for 400-950nm spectral response.

NOTE 3: If ordered with CAN-BUS it increases the price. Please ask CST for further information.

NOTE 4: Optional bracket is a bottom plate or side mount with rail. Ask CST for further information.

NOTE 5: Inform CST if a heater for deicing is not needed.

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About Us

CST - Copenhagen Sensor Technology A/S is a privately held Danish company specialising in the design and manufacture of high-performance electro-optical solutions for demanding battlefield and surveillance applications.

Founded in 2001, CST has rapidly grown to a mature organisation, capable of serving a global customer base. In modern facilities on the outskirts of Copenhagen, Denmark, CST houses R&D, production, QA and sales and marketing functions. With a collective experience in CCD camera, optics, electronics and software development, the highly skilled staff at CST is committed to creating rugged, durable and innovative electro-optical solutions.

CST is certified to ISO 9001:2008, which applies to the whole process flow of design, development, manufacturing and testing. Furthermore, ISO 10007:2003 configuration management standards are used as a guideline for design and development activities. CST products are not restricted by ITAR.

Customer and OEM solutions

CST has a long tradition of working closely with its customers, identifying unmet needs and creating solutions with sustainable value for the users.

With a strong R&D base at the headquarters in Denmark, CST is able to provide mechanical, optical, software and hardware customisations while meeting the toughest requirements for military, homeland security and high-end surveillance applications.

Whether the need calls for a ruggedized high-precision zoom lens or a highly sensitive CCD camera, or a complete system comprising lens, camera and advanced video processing, CST can offer a fast-track design process. Contact us to discuss your specific requirements. Together we can create a solution that provides the best price and performance ratio.

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