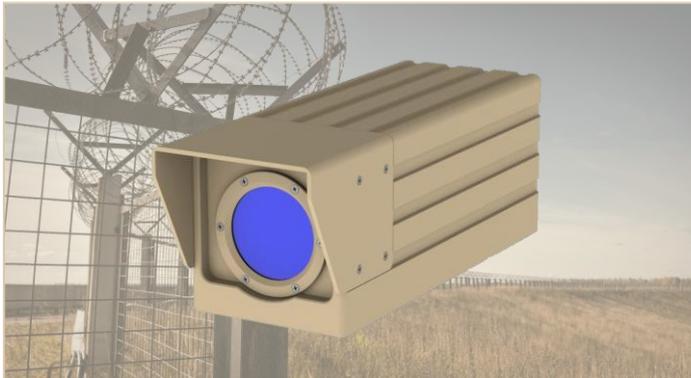


Spectrel 13165/336

Medium-Range Zoom Camera System Datasheet



Features

- High-sensitivity colour CCD camera
- Zoom lens 5.5 to 165 mm (30x)
- Day/night mode with moveable IR-cut filter
- Temperature range -40°C to +70°C
- Factory pre-aligned boresight retention
- Graphical overlays
- Setup and control by serial interface

Description

The Spectrel 13165/336 is an integrated camera system, based on a highly sensitive colour CCD camera and a powerful zoom lens, ideal for Remote Weapon Stations and as daytime (dawn-to-dusk) surveillance/observation camera.

It is designed to deliver high-performance images, even under the harshest conditions, in temperatures ranging from -40°C to +70°C and when exposed to severe shock and vibration.

Optical system

The optical system was developed specifically for use in harsh environment applications. It features continuous zoom, with powerful zoom ratio of 5.5 to 165 mm, auto-iris and focus adjustment from 2.1 m to infinity.

The "Auto-Focus on Demand" lets the camera control the focus by the push of a button.

The lens design incorporates oil-free, low-friction surfaces with special coatings, high-speed motors with zero back-lash and high-precision feedback potentiometers. This design was chosen with the objective of meeting the highest standards for precision and accuracy and low failure rates. All lens elements are surface coated for high response throughout the visible spectrum.

Stay on target with precise boresight retention

The factory pre-aligned boresight, is aligned in parallel with the optical reference axis of the system. This makes for easy on-site installation.

Typical boresight retention is ± 0.2 milliradians, the equivalent to staying within a target area of 0.2 m, at a distance of 1 km in NFOV.

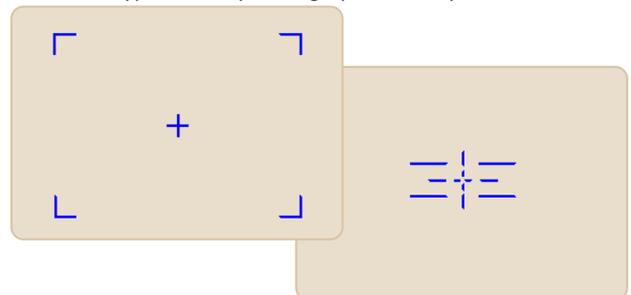
Expanded Hi-Dynamic Range (XDR)

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.

Graphic overlays

The system has a built-in graphic overlay generator that allows arbitrary graphic overlays to be inserted into the image output. Typical overlays are text strings, showing azimuth, elevation, GPS data or status of weapon systems and symbols, such as hair crosses or other reticles. Programming the graphic overlay engine is done via the RS-422 interface. Graphic overlays can be customized to suit specific user requirements.

Below are typical examples of graphic overlays.



Fog penetration

The fog penetration function is an adaptive algorithm that automatically increases 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.

Copenhagen Sensor Technology A/S

Symfonivej 15 Phone +45 44 92 18 55
DK-2730 Herlev E-mail info@copst.com
Denmark Web www.copst.com

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Digital Noise Reduction (DNR)

The Digital Noise Reduction in the Spectrel 13165/336 camera system is a function that analyses the video image and reduces the noise, particularly in low-light conditions. The analysis is based on a 2- and 3-dimensional algorithm.

Reduction of heat haze disturbance

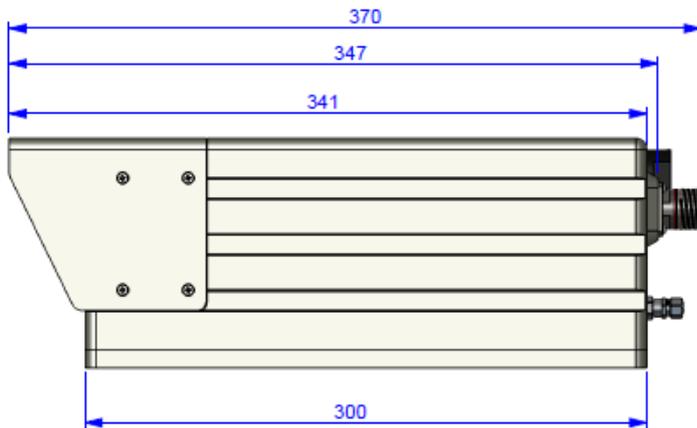
With the Heat haze function turned on, you get a more stable and clear image since the function reduces the disturbance of heat waves that blurs the image.

DRI calculation

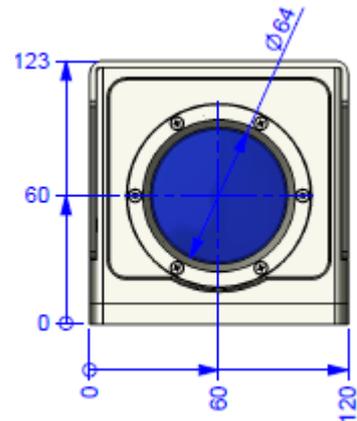
Conditions for SSIP CAM program: Visual band 400-1000nm, Contrast=30 %, Over cast daylight, Sky ratio=3, Visibility 80km, 50 % probability.

NFOV 1.7° (H)	Man target (0,45 x 1,7 m)	Vehicle target (2,3 x 2,3 m)
Detection	8.8 km	26.6 km
Recognition	2.2 km	8.5 km
Identification	1.7 km	6.9 km

Mechanical outline and dimensions



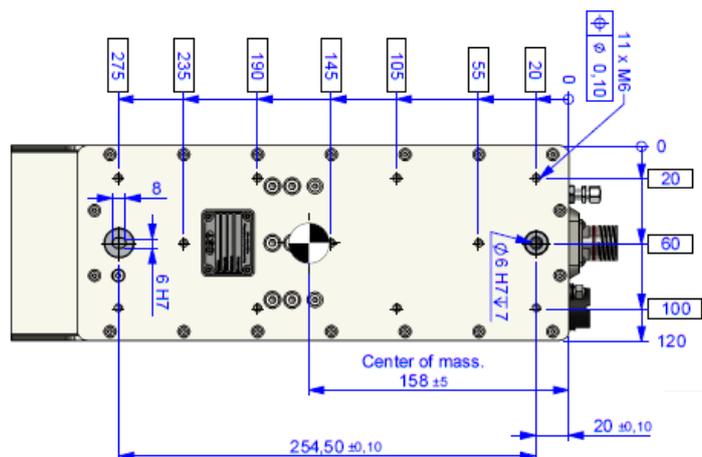
Side view



Front View



Rear view



Bottom View

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Specifications

	PAL	NTSC
Camera System		
Sensor	1/3" colour CCD with complementary mosaic	
Effective pixels (H x V)	976 x 582	976 x 494
Aspect ratio	4:3	
Video output	Composite CVBS and YC, 1 Vpp, 75 ohm	
Video resolution, CVBS	560 TVL (15% video modulation, with lens in WFOV)	
Sensitivity	0,010 lx, 25% video, F1.9, AGC on	
Spectral response	400-700nm with IR-cut filter on (day mode / with IR-cut filter) 400-950nm with IR-Cut filter off (night mode / No IR-cut filter)	
Signal to Noise ratio	> 52 dB, AGC off	
Scanning system	2:1 Interlace	
Horizontal frequency	15.625 kHz	15.734 kHz
Vertical frequency	50 Hz	59.94 Hz
Focal length	5.5 to 165 mm (30x)	
Field of view	Wide: Hor. 46° / Narrow: Hor. 1.7°	
Focus range	2.1 m to ∞	
Iris range	f/1.8 to 22 @ WFOV	
Relative aperture	f/1.8 to 2.9 (breakpoint at f=110 mm)	
Zoom control, travel time	≤ 5 sec. (25°C, both ways, Wide to Narrow FOV)	
Focus control, travel time	≤ 6 sec. (25°C, both ways, 1.5 m to ∞)	
Functions		
Electronic shutter, fixed	1/50 to 1/40,000 sec.	
Gamma correction	0.45 / 1.0	
Automatic Gain Control. range	Max 36 DB Analog + 6 DB DGC	
Continuous Digital Zoom	x 2	
White balance	Automatic, Tracking	
Lens Iris control	Automatic	
Integration mode	Up to 64 fields exposure time, for low light level imaging	
Noise reduction	2D and 3D Digital Noise Reduction 2 Levels	
Heat haze reduction	On and off function	
Fog Penetration	Image contrast enhancement 3 Levels	
Auto focus	On demand, Zoom-triggered	
Extern video input	CVBS	
Video overlays	On screen text and reticles (customizable)	
Configuration, serial interface	RS-422 interface(galvanic separation), VISCA/CST protocol (optional CAN-BUS with CST protocol)	
Mechanical		
Overall dimensions (W x H x L)	120 x 123 x 341 mm (excl. connectors)	
Net weight	< 6 kg	
Housing material	Aluminium with corrosion protective coating	
Protective housing integrity	IP 67	
Connector (power, data, control)	22-pin circular - In accordance with MIL 38999	
Bore-sight retention	±0.2 milliradians @ NFOV	
Environmental		
Operating voltage	15 to 36VDC (power supply ground isolated from camera housing)	
Power consumption	< 15W	
Operating temperature	-40°C to +70°C	
Storage temperature	-40°C to +70°C	
Vibration	MIL STD 810F, tracked vehicle 5.7G-rms, 45 min each direction MIL STD 810F, method 514.5, procedure 6	
Shock	3 shocks in each direction, 30G @ 11 ms	

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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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