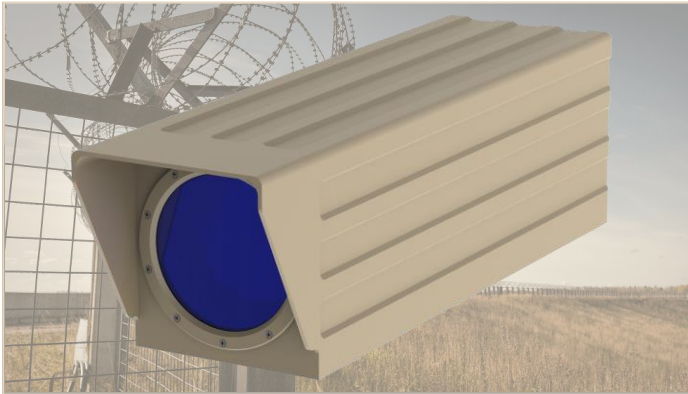


# Spectrel 121000/340 HD

Long-Range High Definition Camera System  
Datasheet



## Features

- Full HD-SDI Camera system
- Optical Zoom 30 to 1000 mm (33x)
- HD-SDI digital video output
- Continuous 6x digital zoom
- Digital image stabilization
- Configuration by serial interface
- Active temperature compensation
- Extended Night mode

## Description

The Spectrel 121000/340 is an integrated unit, based on a highly sensitive HD megapixel colour C-MOS camera and a powerful zoom lens, ideal for day and night coastal/border surveillance, camp perimeter protection or protecting critical infrastructure and similar applications.

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

## Optical system

The advanced optical system is developed specifically for use in long range surveillance. It features continuous zoom, with powerful zoom ratio of 30 to 1000 mm, auto-iris and focus adjustment from 3 m to infinity.

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

## Boresight precision

Excellent boresight for high performance and precision to the target. Optical boresight retention is  $\pm 0.2$  milliradians, the equivalent to staying within a target area of 0.2 m, at a distance of 1 km in NFOV.

## Digital zoom

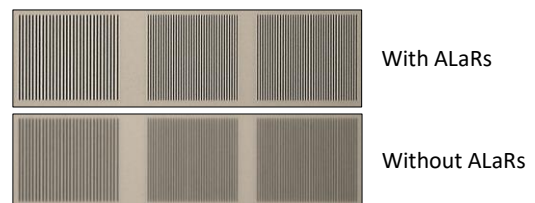
Digital zoom is provided as a continuous digital zoom with 6x range, selectable from the serial interface. The system can be configured to automatically switch from optical zoom to digital zoom.

## Digital image stabilization

Advanced image processing algorithms for stabilizing the image is integrated into the core of the camera to ensure the best performance without increased image delay.

## Build in ALaRs

ALaRS is the abbreviation of Automatic Light and Resolution system, which optimizes the light regulation and resolution, resulting in an improved image quality



- A larger dynamic area
- No image disruption or flashing when exposed of shock and vibration
- Fast exposure: Leading to a sharper image when there are moving objects
- Higher resolution during daylight conditions

## CMOS sensor with Global Shutter

Global shutter defines the way the image is handled from the sensor. Global shutter is preferable for applications on the move or where the target is moving. The Global Shutter ensures a stable clear image on all moving objects.

## Digital Noise Reduction (DNR)

The Digital Noise Reduction is a series of 2-dimensional and 3-dimensional algorithm and analysis to filter and reduce noise, particularly in low-light conditions.

## 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.

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#### Active temperature compensation

The temperature compensated lens ensures that the lens parts and mechanical design of the lens will maintain its position when exposed to temperature changes between -40°C to +70°C. With the active temperature compensated lens, you therefore avoid getting a blurred image, which temperature changes would normally cause.

#### Reduction of heat haze disturbance

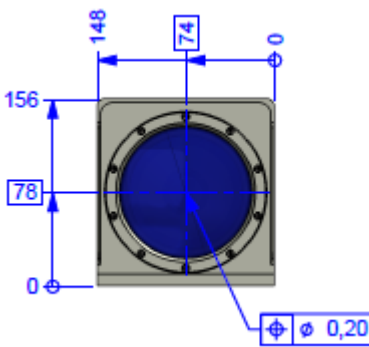
With the Heat haze function turned on, you get a more stable and clearer image since the function reduces the disturbance of heat waves that blurs the image.

#### DRI calculation

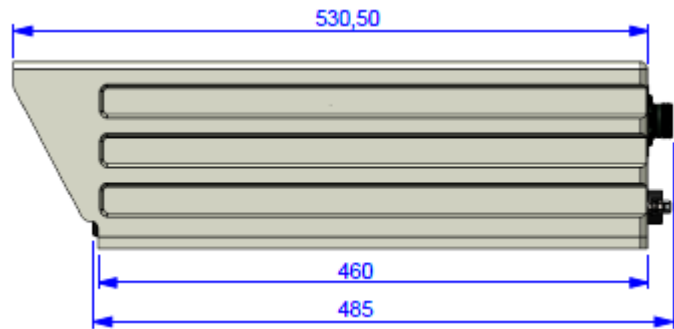
Conditions for SSIIP CAM program: Visual band 400-1000nm, Contrast=30 %, Over cast daylight, Sky ratio=3, **Visibility 80km**, 50 % probability. Full HD-SDI 1920x1080

NFOV 0.4° (H)	Man target (0,45 x 1,7 m)	Vehicle target (2,3 x 2,3 m)
Detection	21 km	40.8 km
Recognition	8.8 km	20.6 km
Identification	7.6 km	18.2 km

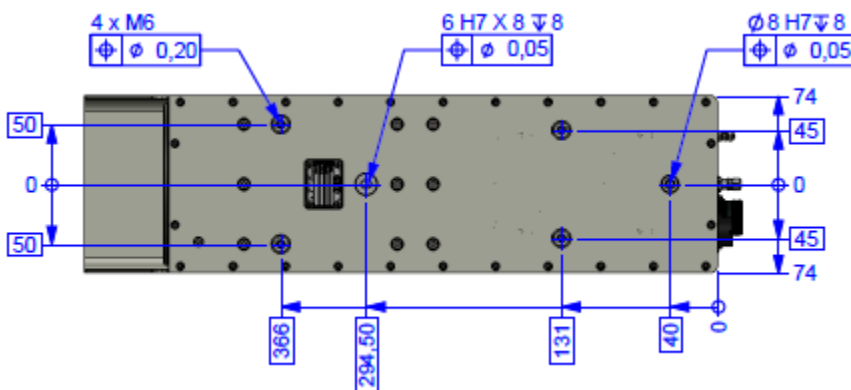
#### Mechanical outline and dimensions



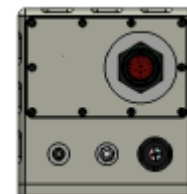
Front view



Side view



Bottom view



Rear view

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## Specifications

Camera System	
Sensor	High resolution 3,2Mp, High-sensitivity 1/1,8" colour CMOS with Global shutter
Effective pixels (H x V)	1920 x 1080
Image format	16:9
Scanning system	Progressive/Interlaced
Output 3G - SDI	1080 p50/p60
Output HD-SDI	1080 i60/ i50/ p30/ p25 720 p60/ p50
Video out analogue	CVBS, video 1Vpp *1
System video resolution analogue	Equivalent to 540 TVL 15% video modulation,
Sensitivity	0,08 Lux at F4.5 Full HD
Extended night mode	0,04 Lux at F4,5 VGA resolution (pixel binning)
Spectral response	400-700nm with IR-cut filter on (day mode) 400-990nm with IR-Cut filter off (night mode)
Signal to Noise ratio	> 50 dB, AGC off
Ext. Sync	LVDS, HD and VD
Focal length	30 – 1000 mm zoom (33x)
Horizontal field of view HD output	Wide: 12° / Narrow: 0.4° (16:9)
Focus range	3 m.(WFOV) to ∞
Iris range	f/4.5 to 22 at WFOV
Zoom control, travel time	≤ 8 sec. (25°C)
Focus control, travel time	≤ 10 sec. (25°C)
Auto focus travel time	Approx. 4 sec (range from 30m to infinity)
Functions	
Gamma correction	0.45/1.0
Automatic Gain Control. range	Max 48db
White balance	AWB
Noise reduction	2D and 3D Digital Noise Reduction 3 Levels
Fog Penetration	Image contrast enhancement 3 Levels
Day/Night mode	Movable IR-cut filter (Colour ↔ Monochrome/Near-IR)
Auto focus	On demand, Zoom-triggered
Digital image stabilization	On/off (HD-SDI only) (will switch off analogue output and autofocus) ON= FOV will be reduced with 5%
Heat haze reduction	On and off function
Fog Penetration	Image contrast enhancement 3 Levels
Digital zoom	6x continuous digital zoom
Configuration, serial interface	RS-422 interface (galvanic separation), VISCA/CST protocol (optional CAN-BUS interface with CST protocol)
Mechanical	
Overall dimensions (W x H x L)	148 x 156.2 x 530.5 mm (not incl. connectors & mounting studs)
Net weight	<12 kg
Housing material	Aluminium with corrosion protection coating
Protective housing integrity	IP 67
Connector (PWR, control, video)	MIL 38999 (TVS07RB1799PN)
Bore-sighting retention	±0.2 milliradians @ NFOV
Environmental	
Operating voltage	15 to 36VDC (power supply ground isolated from camera housing)
Power consumption	< 20W
Operating temperature	-40°C to +70°C
Storage temperature	-40°C to +70°C
Vibration	Wheeled vehicle MIL-STD 810G, method 514.6, 3.05 grms
Shock	3 shocks in each direction, 30G @ 11ms
MTBF	30 000 hours (MIL-HDBK-217-Fusing (GM) ground mobile environment @25°C)

\*1 Field of view may change on the analogue output depending of the digital output chosen.

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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 C-MOS 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 9001:2015, 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 C-MOS camera, or a complete system comprising of 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 high performance solutions that provide a significant benefit to both customer and end user.

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