

# Spectrel PTZI-1000 HD

Integrated PTZI long-range camera and laser illuminator  
Datasheet



## Features

- Camera zoom range 30 to 1000 mm (33x)
- Digital video output (Streaming IP)
- Laser illuminator bore-sighted to camera
- Fast Pan/Tilt/Zoom operation
- 808 nm semiconductor laser
- True day/night operation
- Wide temperature range, -40°C to +70°C

## Description

The Spectrel PTZI-1000 is an integrated, ruggedized, MIL-grade, ready-to-use, high-precision pan/tilt/zoom camera unit with built-in laser illuminator. The laser illuminator uses the same type of optics as the zoom camera, thus illuminating the camera field of view optimally at all zoom settings.

The camera and laser unit are bore-sighted, ensuring optimal scene illumination regardless of distance to the object, making it ideal for day/night surveillance for border protection, camp perimeter protection, homeland security, and critical infra-structure protection (CIP) applications.

## 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



With ALaRs



Without ALaRs

- 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

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## 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.



## 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 in the 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.

## Easy installation and operation

The camera and laser unit has been developed for easy installation and operation in complex surveillance applications. Video output is via IP and the unit is controlled via RS-485 with Pelco-D protocol.

The unit can be controlled locally with keyboard and has an digital video output.

## Alternative configurations

The unit can be ordered with other camera types mounted on the pan & tilt, e.g. a thermal camera or another daylight camera. Contact CST to learn more about the possible combinations.

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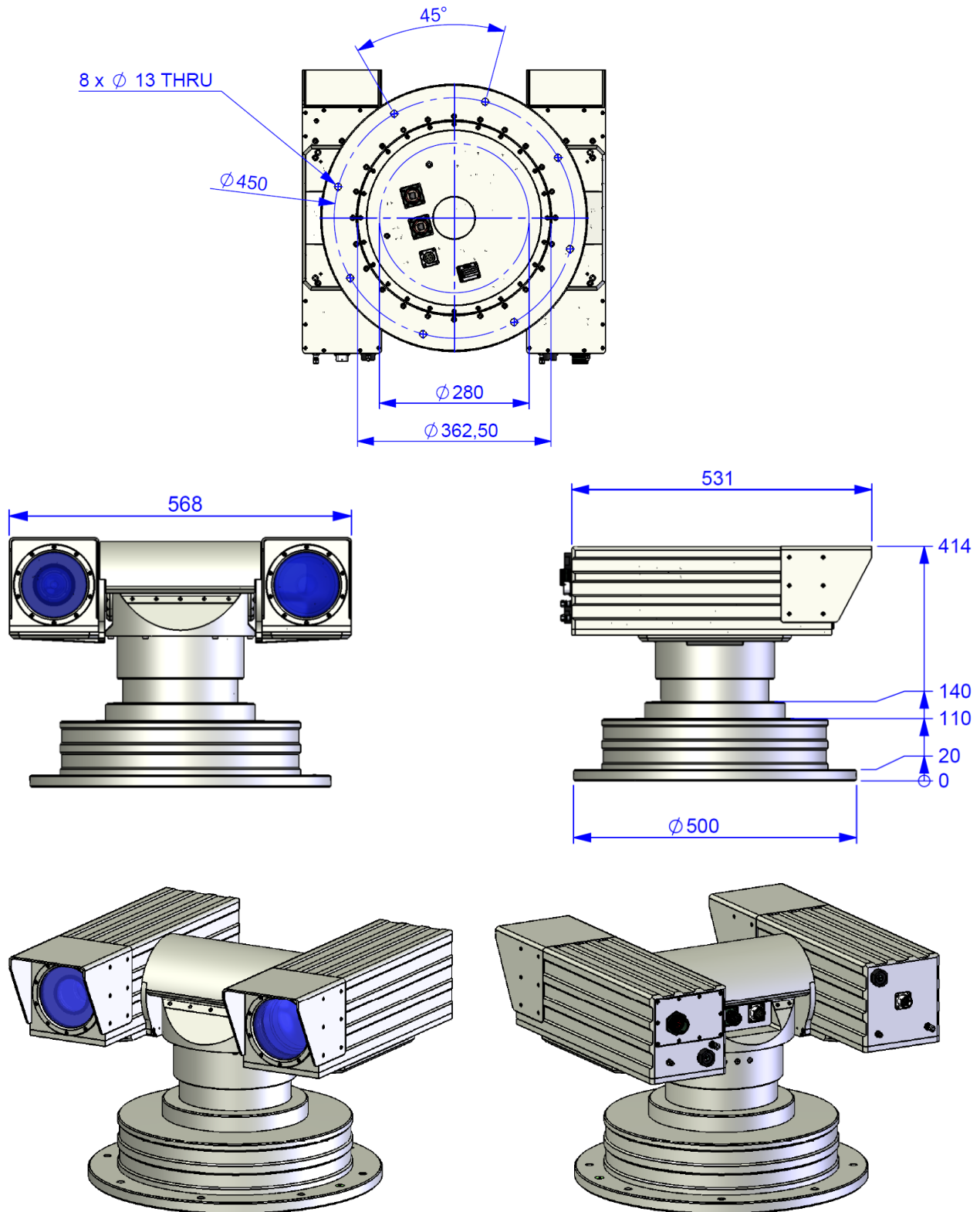
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## Mechanical outline and dimensions



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## Specifications

Zoom camera Spectrel 121000/340 (NOTE 1)	
Sensor	High resolution 3,2Mp, High-sensitivity 1/1,8" colour CMOS with Global shutter CMOS
Effective pixels (H x V)	1920 x 1080
Aspect ratio	16:9
Scanning system	Progressive/Interlaced
HD-SDI output 3G	1920 x 1080 50p/60p
HD-SDI output SDI	1920x1080-60i/50i/30p/25p
System video resolution analogue	Equivalent to 540 TVL 15% video modulation,
Sensitivity	0,04 Lux at F4.5 Full HD
Extended night mode	0,0005 Lux at F4,5 VGA resolution (pixel binning) and intergration
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	HD and VD
Focal length	30 – 1000 mm zoom (33x)
Horizontal field of view	Wide: 11° / 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)
Focus range	3 m to ∞ (Active back focus temperature compensation)
Bore-sighting retention	±0.2 mRad ≈ ± 2m @ 10km
Image stabilization	incl
Spectrel Laser illuminator	
Laser type / optical power	Laser diode / 10 W
Wavelength	808 nm
Range	>6km
Divergence	8° to 0.3° (synchronous to the camera pre-set)
NOHD – Safety distance to laser	29m for wide beam, 239m for narrow beam
MTBF	30 000 hours (MIL-HDBK-217-F)
Pan/Tilt	
Speed, Pan (Azimuth)	Max. 60°/sec, Min. 0.03°/sec continuous speed at 25°
Speed, Tilt (Elevation)	Max. 60°/sec, Min. 0.03°/sec continuous speed at 25°
Position resolution	0.01°
Range of motion, Pan	365° continuous rotation
Range of motion, Tilt	+40°/-45°
Gear head backlash	Direct drive, zero backlash
Electrical specifications and functions	
Video output	Streaming IP (H.264 or MJPEG) / Composite CVBS, 1 Vpp, 75 ohm
Commands/status	IP Pelco-D Protocol

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Mechanical	
Overall dimensions (H/W/L)	414/568/531mm
Mounting holes	8x Ø13mm
Net weight	52kg
Environmental	
Operating voltage	24 VDC ±10% MIL-1275
Max Current consumption (day/night)	1.5A + 2A for heater/6.5A + 2A for heater
Max Current cons., moving (day/night)	5.5A + 2A for heater/10.5A + 2A for heater
Connectors (power, control)	In accordance with MIL 38999
Chock/vibrations	Vibration 3.05 Grms and chock 11ms 30g
Operating temperature	-40°C to +70°C
Storage temperature	-46°C to +75°C
Surface treatment	Chromit AL TCP / Painting
Protection	IP 65
Bore sight relation Camera/Laser	±0.5 mRad @ NFOV

## DRI calculation

Conditions for SSIP 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

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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 9001:2015, 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 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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