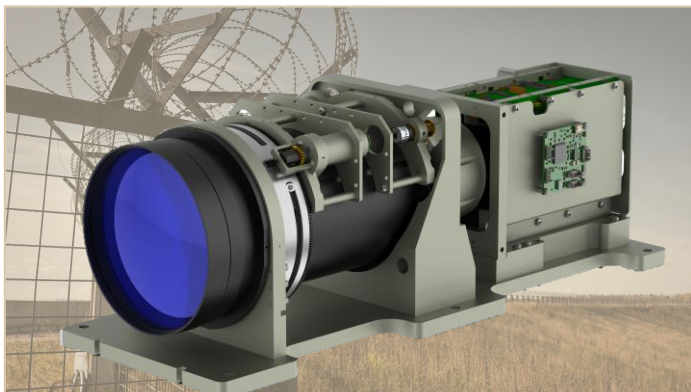


# Open Frame 121000/336

Long-Range Camera System with HR-video – easy integration  
Datasheet



## Features

- High-sensitivity colour CCD camera
- Zoom lens 30 to 1000 mm (33x)
- Excellent Detection, Recognition and ID range
- Fog penetration function
- Day/night mode with moveable IR-cut filter
- Precise boresight through zoom range
- Configuration by serial interface
- Active back-focus temperature compensation

## Description

The Open frame 121000/336 is an integrated unit, based on a highly sensitive HR-video colour CCD camera module and a powerful zoom lens, ideal for day/night surveillance for camp perimeter protection, homeland security, critical infrastructure protection (CIP) applications.

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

## Optical system

The optical system was 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.

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. Active back focus temperature compensation is also applied to maintain the focus area no matter the temperature.

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  $\pm 0.2$  milliradians, the equivalent to staying within a target area of 0.2 m, at a distance of 1 km in NFOV.

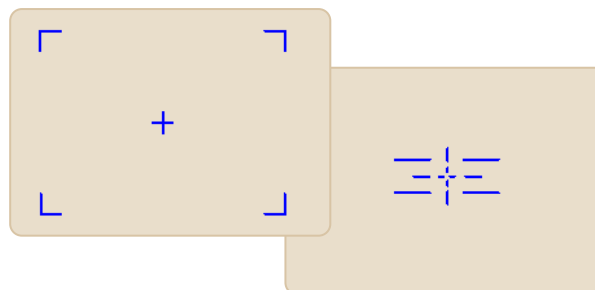
## External video input / Image fusion

In order to reduce the number of channels required for slipping transmission, the system can support input from an external camera, such as a thermal imaging camera. Switching between the daytime and external nighttime camera can be manual or automatic.

## 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 (or optional CAN-BUS) interface. Graphic overlays can be customized to suit specific user requirements.

Below are typical examples of graphic overlays.



## Continuous digital zoom

The Open frame 121000/336 provides continuous digital zoom with 2x range, selectable from the serial interface.

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## 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)

Digital Noise Reduction 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

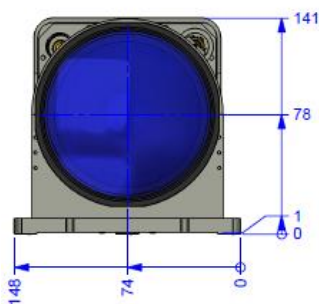
With the Heat haze function turned on, you get a more stable and clear image since the function reduces the disturbance of heat waves that blurs the image.

## DRI calculation

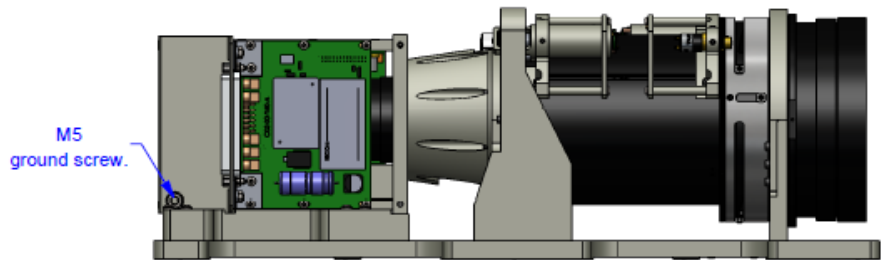
Conditions for SSIP CAM program: Visual band 400-1000nm, Contrast=30 %, Over cast daylight, Sky ratio=3, Visibility 80 km, 50 % probability.

NFOV 0.3° (H)	Man target (0,45 x 1,7 m)	Vehicle target (2,3 x 2,3 m)
Detection	19 km	37.9 km
Recognition	7.5 km	18.6 km
Identification	6.3 km	16.3 km

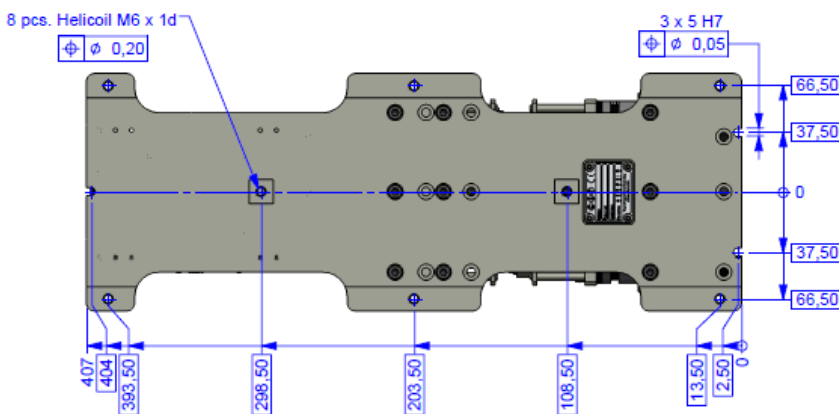
## Mechanical outline and dimensions



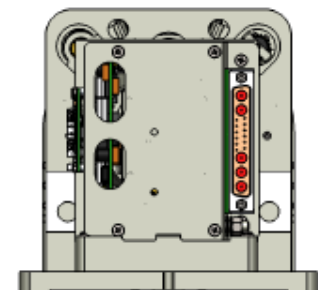
Front View



Side View



Bottom view



Rear view

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## Specifications

	PAL	NTSC
<b>Camera System</b>		
Sensor	High-sensitivity colour 1/3" CCD sensor 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	
System video resolution	≥ 540 TVL @ WFOV	
Sensitivity	0.030 Lux, 25% video, F4.5, WFOV, No IR-cut filter	
Spectral response	400-700nm with IR-cut filter on (day mode) 400-950nm with IR-Cut filter off (night mode)	
Signal to Noise ratio	> 52 dB, AGC off	
Focal length	30 – 1000 mm zoom (33x)	
Horizontal field of view	Wide: 8° /Narrow: 0.3°	
Focus range	3 m to ∞	
Iris range	f/4.5 to 22 @ WFOV	
Zoom control, travel time	≤ 8 sec. (25°C, both ways, Wide to Narrow FOV)	
Focus control, travel time	≤ 10 sec. (25°C, both ways, 2.5 m to ∞)	
<b>Functions</b>		
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	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	Off, Low, Mid, High	
Focus control	Autofocus on demand, Zoom-triggered or Manual focus	
Extern video input	CVBS and YC	
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)	
<b>Mechanical</b>		
Overall dimensions (W x H x L)	148 x 141 x 407 mm (incl. mounting plate)	
Net weight	App. 8 Kg.	
Connector (power, data, control)	Combo SUB-D 17W5	
Bore-sight retention	±0.2 milliradians @NFOV	
Mounting plate	Aluminium with corrosion protection coating	
<b>Environmental</b>		
Operating voltage	15 to 36VDC	
Galvanic isolation	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	Wheeled vehicle MIL-STD 810G , method 514.6 - 3,05 grms	
Shock	Transportation: 3 shocks in each direction, 30G @ 11ms with reference to CST mount plate	
MTBF	30 000 hours (MIL-HDBK-217-F) Ground benign	

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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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