

SENSORTEC MULTI-SENSOR TECHNOLOGY

This file provides a comprehensive overview of various SensorTec high-end multi-sensor systems. You will have an exclusive insight on the hardware units, the embedded Artificial Intelligence and the advanced display technology, which together result in a complete solution that determine the future of video surveillance.



SECURITY BEYOND LIMITS



In the few years since 2000, SensorTec has grown into an international company that it is today. We are among the most innovative technological companies in the world, manufacturing and developing intelligent security and surveillance solutions specifically for largescale projects for military, law enforcement, public authorities and private sectors.

We believe that serving the needs of our clients efficiently can only be achieved by delivering complete solutions. In order to achieve that, we design and manufacture all the critical components of our systems, including hardware, software and embedded computer vision. Our entire product range is manufactured and developed in accordance with the highest quality requirements.

SensorTec provides integrated solutions, which combine a wide range of devices, sensors, and software, such as surveillance cameras, surveillance radars, video analytic software and C3. All of our solutions are designed to work in harmony and provide a comprehensive multi-layer approach to deliver situation awareness and interactive intelligence.

KEY FIGURES

300+	TECHNICAL SUPPORT ENGINEER AND TECHNICIAN
4	<p>BRANCHE OFFICES</p> <p>HQ and Manufacturing Facilities: Cambridgeshire, UK. Budapest, Hungary.</p> <p>Sales and Technical Support Offices: Dubai, UAE. Riyadh, KSA.</p>



END-TO-END SENORTEC SOLUTIONS



Borders
Video Surveillance



Airports
Video Surveillance



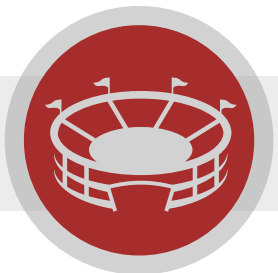
Seaports
Video Surveillance



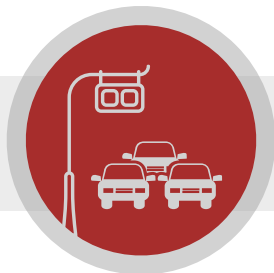
Critical Infrastructure
Video Surveillance



Safe & Smart City
Video Surveillance



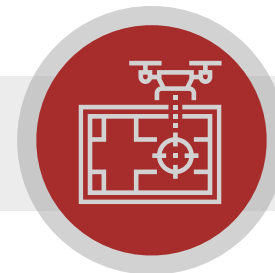
Stadiums & Crowds
Video Surveillance



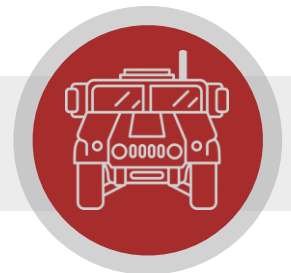
Traffic Management
& Violations Detection



Highway
Video Surveillance



Anti-Drone/UAV
Intelligent System



Mobile (In-Vehicle)
Video Surveillance

SELECTED INTERNATIONAL REFERENCES

BORDERS SURVEILLANCE AND SECURITY

Hungarian Land Borders - Hungary.
 Egyptian Land and Sea Borders - Egypt.
 Kuwaiti Land and Sea Borders - Kuwait.

AIRPORTS SURVEILLANCE AND SECURITY

LaGuardia Airport - New York.
 Hungarian Airport - Hungary.
 Mumbai Airport - India.
 Turkish Airport - Turkey.
 Alexandria Airport - Egypt.

SEAPORTS SURVEILLANCE AND SECURITY

Hungarian Waterway - Hungary.
 Sea Ports - Kuwait.
 Sea Port - UAE.

CRITICAL INFRASTRUCTURE SECURITY

Ministry of Defense - Egypt.
 Egyptian Monument Authorities - Egypt.
 Manarat Al Saadiat Cultural Museum - UAE.
 Private Palace - Kuwait.
 Saudi Arabia Embassy - Geneva.

CITY SURVEILLANCE AND SECURITY

Delhi City - India.
 Luxor City - Egypt.
 Sharm El Sheikh City - Egypt.
 Cairo City - Egypt.
 Port Saeed City - Egypt.

STADIUMS AND CROWDS SURVEILLANCE

Manchester City Stadium - UK.
 Budapest Szusza Ferenc Stadium - Hungary.
 Rijeka Stadium - Croatia.
 Beşiktaş Stadium - Turkey.
 Atatürk Olympic Stadium - Turkey.
 Fenerbahçe Şükrü Saracoğlu Stadium - Turkey.
 Luzhniki Stadium Moscow - Russia.
 Spartak Moscow - Russia.
 Mecca Religious Sites - KSA.
 Dubai Festival Plaza - UAE.
 Pyramids Touristic Area - Egypt.

TRAFFIC LAW ENFORCEMENT

Traffic Management And Violation Detection - Cairo, Egypt.
 Traffic Management And Violation Detection - Kuwait.
 Traffic Management - Armenia.
 Traffic Management - Hungary.

SEE BEYOND HUMAN VISION

SENORTEC MULTI-SENSOR SYSTEM



SensorTec Multi-sensors are electro-optical units that provide continuous observation at short, medium and long ranges regardless to time of day or weather circumstances. They accomplish this by combining multiple sensor types including but not limited to visible light, NIR, SWIR, MWIR and LWIR in one integrated pan-tilt platform for 360° and ±90° coverage.

Cameras are mounted on a Pan-Tilt platform that allows the pointing of those cameras in any direction needed. This combination enables to see in total darkness and bad weather (rain or snow) using the thermal camera and also get a high resolution color image with high sensitivity visible light camera. All cameras support continuous zoom giving the operators ability to reach even the furthest targets with ease.



DO NOT SETTLE FOR A PRE-BUILT SYSTEM THAT IS NOT OPTIMIZED FOR YOUR NEEDS

IN SENSORTEC, WE DESIGN EACH OF OUR HIGH-END SYSTEMS FOR MAXIMUM EFFECTIVENESS BASED ON YOUR BUDGET AND PROJECT REQUIREMENTS.



TAILORED TO YOUR NEEDS MODULAR MULTI-SENSOR SYSTEM



All our multi-sensors are modular, allow the client to select the combination of payloads they need for their specific application. Configuration of every multi-sensor is tailored to requirements of the specific project and the environment in which it will be used (fixed, portable, vehicle mounted, ...).

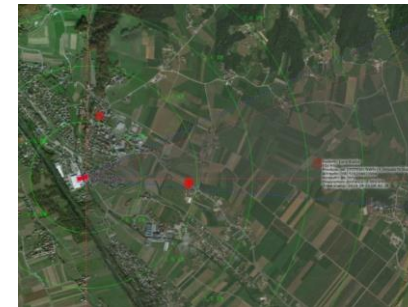
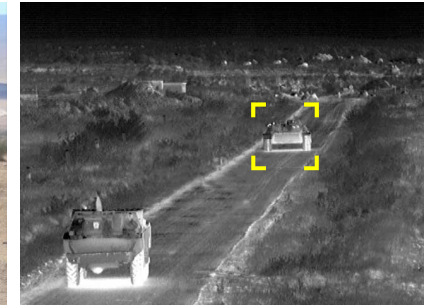
Multiple payloads on one pan-tilt system within a separate housing
Individually removable to enable service of one payload while the other is still operational

- Long-Range Thermal Camera (Cooled MWIR or Uncooled LWIR).
- Medium-Range Thermal Camera (Cooled MWIR or Uncooled LWIR).
- Visible Light Camera (Regular or Low Light).
- SWIR Thermal Camera.
- Ground, Air or Multi-mode Radar.
- Robust Pan Tilt System.
- LASER Range Finder (LRF).
- Video Processing Unit (VPU).
- GPS.
- Digital Magnetic Compass.
- Microphone.
- Electric Mast or Tripod.
- Lens Cleaning System.
- Gyroscope Stabilizer.
- C3 with GIS Software for Preview and Control.



EXTREMELY EFFICIENT HIGH-DEFINITION SURVEILLANCE

- Simultaneous preview of visible light and thermal cameras.
 - Continuous zoom on both payloads.
 - Radar connectivity (Slew to Cue) and tracking.
 - Video tracking with auto/manual target acquisition.
 - Auto/manual/remote focus on both payloads.
 - TCP/IP interface.
 - Compatibility with 3rd party payloads.
 - Electronic image stabilization on both payloads.
 - Rigid system design (up to 90km/h wind speed resistance without damage).
 - Temperature range of the whole system: -32°C to +60°C.
 - Maximum humidity of the whole system: 95%.
 - Long lifetime with extremely high MTBF up to 20200 H.
 - Comply with IP67, built according to MIL-810.
- Vibration test: IEC 60068-2-64.
Shock test: IEC 60068-2-27.
Icing test: NEMA 250.
Salt fog test: IEC 60068-2-52.



MODULAR
VARIETY PAYLOADS
COMBINATION



MULTI-SPECTRAL
Visible, SWIR, MWIR, LWIR



LONGEST RANGE
UP TO 200X ZOOM LENS



WIDE ANGLE
UP TO 47° HORIZONTAL FOV



WEATHERPROOF
60°C TEMPERATURE
AND 95% HUMIDITY



MILITARY GRADE
BUILT ACCORDING
TO MIL-810 STANDARD



RADAR INTEGR.
WITH SLEW TO CUE
AND TRACKING



STABILIZATION
GYRO AND ELECTRONIC
STABILIZATION (EIS)



MOUNTING
FIXED, PORTABLE,
VEHICLE MOUNTED

FINANCIAL BENEFITS



MAXIMUM EFFECTIVENESS BASED ON YOUR BUDGET

In SensorTec, we design each of our high-end systems for maximum effectiveness based on your budget and project requirements.



LONG LIFETIME

SensorTec technologies ensure the multi-sensor cameras are prevented from both physical and technological obsolescence for a long time.



UNINTERRUPTED OPERATION

SensorTec multi-sensor camera components are developed to operate with extremely high MTBF.



DESIGNED TO LAST

SensorTec multi-sensor cameras can withstand intense weather conditions. They are military grade full metal constructions with built-in heating and cooling systems, and they are also available made of marine grade materials.



NO NEED FOR FREQUENT MAINTENANCE

SensorTec multi-sensor cameras are capable of self-maintenance, thanks to their built-in self-cleaning and deicing systems.



REDUCED INFRASTRUCTURE REQUIREMENTS

No need to deploy costly fiber optic networks between cameras and Command and Control Centers. SensorTec provides on-site recording with weather and vandal-proof, outdoor NVRs.



MULTI-SPECTRAL IR SURVEILLANCE IMAGING

There are many types of imaging technologies available, SensorTec provides multi-sensor systems that allow you to easily take advantage of multiple imaging technologies simultaneously.

The following table compares the various imaging technologies in different applications.

	VISIBLE + NIR	UNCOOLED SWIR	UNCOOLED LWIR	COOLED MWIR
Spectral Range	0.4µm - 1.4µm	1.4µm - 3.0µm	8.0µm - 14.0µm	3.0µm - 5.0µm
Cost	Low	High	Medium	High
Resolution	+++++	+++	++	+++
Power Efficiency	++++	++++	++++	++
Long-Range Detection	++	+++	++++	+++++
Long-Range Identification	+++++	+++	+	+
Night Performance	+	+++	+++++	+++++
Smoke Performance	+	++++	+++++	+++++
Fog Performance	++	++++	++++	++++



Visible Light (Day-Night) Camera at 15Km.



LWIR Uncooled Thermal Camera at 15Km.

Click to watch the video
Multi-Sensor Camera - Maritime Border.



ULTRA LONG-RANGE SURVEILLANCE IMAGING

SensorTec provides a leading-edge fully customized multi-sensor cameras employing the longest range visible day/night zoom cameras and the latest focal plane array technology for cooled or uncooled thermal infrared cameras to meet long-range surveillance and target identification requirements.

MWIR COOLED
26Km
Vehicle Detection

LWIR UNCOOLED
17Km
Vehicle Detection

SWIR UNCOOLED
35Km
Vehicle Detection

VISIBLE LIGHT
10Km
Vehicle Detection

The value depends on the selected detector and cooler.



Visible Light Camera at 6Km.



MWIR Cooled Thermal Camera at 8Km.



Click to watch the video
Multi-Sensor Camera - Long Range.

DIGITAL-ANALOG FOG FILTERS

SensorTec multi-sensor cameras are equipped with fog filter allowing clearer long-range imaging during the day time. Fog filters isolate the effects of smoke, haze and light fog, producing an image with better contrast and less distortion.

[Click to watch the video](#)
Multi-Sensor Camera - Image Enhancements.



Digital Fog Filter: OFF.



Digital Fog Filter: ON.



Optical Fog Filter: OFF.



Optical Fog Filter: ON.

DIGITAL IMAGE ENHANCEMENTS

SensorTec multi-sensor systems provide a wide range of digital image enhancements to meet different requirements based on the application and the environment.

- Automatic/Manual Focus.
- Tunable Digital Detail Enhancement.
- Non-uniformity Correction.
- Color Palette.
- True Wide Dynamic Range.

- Electronic Image Stabilization.
- Histogram Equalization.
- White Hot / Black Hot.
- Auto / Manual White Balance.
- Dynamic Noise Reduction.



Auto-Focus: OFF.



Auto-Focus: ON.



Inverted Polarity: White Hot.



Inverted Polarity: Black Hot.

COMPATIBILITY AND INTEGRATION

SensorTec multi-sensor cameras are compatible for integration with other SensorTec systems as well as 3rd party systems and payloads.

SensorTec employs an integrated system referred to as the Multi-Technology Detection and Tracking Unit (MTDU), which provides the ability to track multiple targets simultaneously. MTDU uses Tracking Radar, Long-range Thermal Camera, Long-range Visible Day/Night Camera, Panoramic Camera to enable the detection, tracking, identification, and classification of illegal border entries.

[Click to watch the video](#)
Multi-Sensor Camera - MTDU.



3D RADAR DETECTION

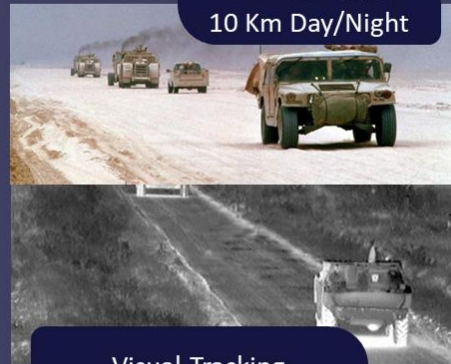


30 Km

Location Map

Early object detection, tracking and identifying location, speed, size and direction.

VISUAL TRACKING



26 Km Thermal
10 Km Day/Night

Visual Tracking

Follow the progress or movements of selected targets.

PANORAMIC VCA VIEW



6 Km

Panoramic View

Multiple targets detection and tracking with full VCA.



VIDEO ANALYTICS AND IMAGE PROCESSING

SensorTec Video processing unit (ST-VPU) is a hardware processing unit of the multi-sensor system. It combines all the payloads and pan-tilt unit into a single unit and enables a single ethernet connection to the whole unit including access to video streams and control of the entire system.

ST-VPU can be used as a stand-alone device or built in the system. It enables a dedicated advanced protocol that includes video as well as status and control. It has a powerful built in processor, that enables functions like video stabilization, H.264 encoding, video tracking and other analytics.



VPU FEATURES:

- Communication interface to combine all payloads to common proprietary or standard protocol (communication protocol can be customized).
- Power control and communication with each payload.
- Built-in test for each device (BIT).
- Integrated ethernet switch.
- Up to three simultaneous video inputs with up to two separated output video streams as well as up to two video outputs.
- ONVIF and/or dedicated advanced protocol:
 - Video streams.
 - Status.
 - Control.
- H.264 Video encoding for all video payloads:
 - MPEG2 TS (H.264+KLV metadata).
 - MPEG4.
 - RTP M-JPEG.
 - Enables up to three input sources.
 - HD and/or SD resolutions.
 - Adjustable bitrate, quality, frame rate, resolution,
- Video presentation:
 - Picture in Picture (PIP).
 - Multi-spectral blending.
 - Switching.
 - Multiple streams.

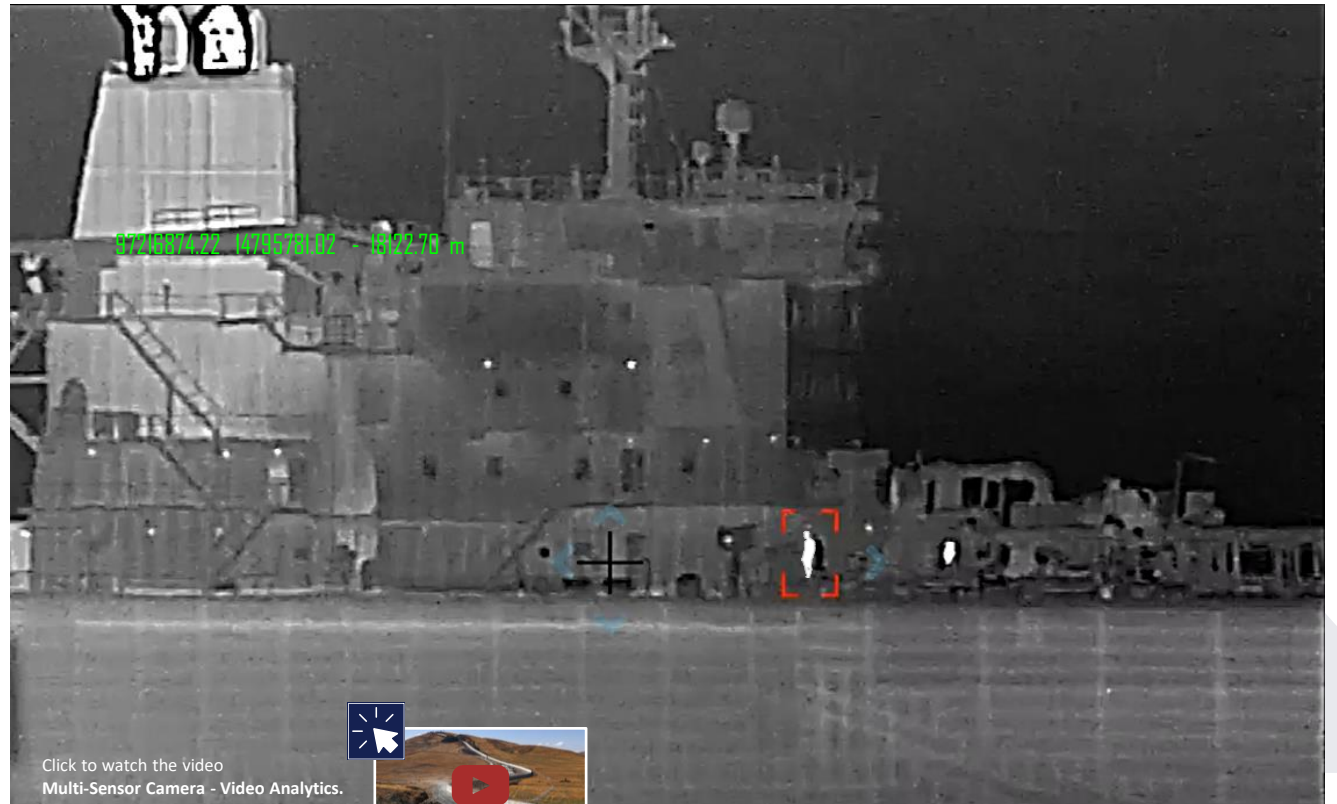
VIDEO ANALYTICS AND IMAGE PROCESSING

- Wide variety of video processing (license based):
 - Video stabilization with roll correction.
 - Advanced hardware scene and object video tracking.
 - Advanced detection algorithm.
 - Telemetry data.
 - KLV metadata.
 - Video overlays.
 - Multiple video presentation (PIP, PBP, Split Screen, Image Blending).
 - Drone detection analytics.
 - Hot air turbulence mitigation.

- Video stabilization with roll correction:
 - Accurate frame to frame change detection.
 - Remove high frequency jitter (flicker).
 - Correction of platform roll motion.

- Video tracking:
 - Robust tracking.
 - Automatic track re-initialization.
 - Track through temporary obstructions.
 - Low latency.

- Motion detection:
 - Detects very small moving objects.
 - Simple track selection method.
 - Three different MTI modes support.
 - Color based (histogram) difference algorithms.



Click to watch the video
Multi-Sensor Camera - Video Analytics.



COOLED MWIR THERMAL CAMERA

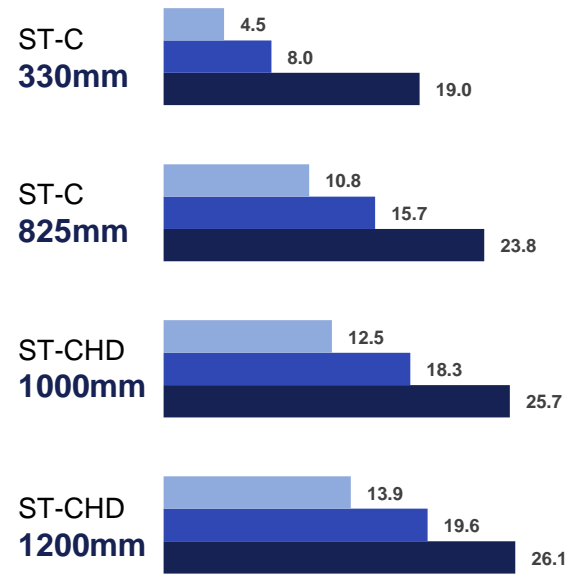


SensorTec Cooled Medium Wave Infra-Red (MWIR) thermal imaging cameras employ the latest focal plane array technology to meet long-range surveillance and target identification requirements. Cooled MWIR series has a very high life span (2X higher than most cameras in this range) as they are fitted with long life cooler and use HOT detector type (XBn) that runs at higher temperatures than regular InSb detectors, thus expanding the lifetime of the cooler. Cooled MWIR cameras incorporate continuous zoom lenses with autofocus and F/4 to ensure high sensitivity even with high magnification. This makes the cooled MWIR cameras an ideal tool for very long range observation over sea and land.

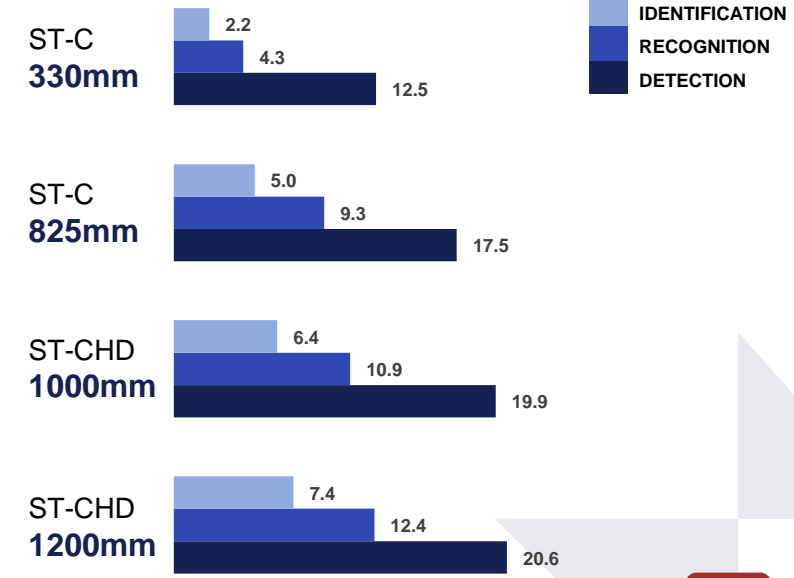


Detector	MWIR InSb XBn (HOT InSb) MCT FPA T2SL FPA
Detector Pitch	15µm
Thermal Sensitivity	20mK
Resolution	640x512 1280x720 1280x1024
Frame Rate	25 / 30Hz
Spectral Range	3.0µm to 5.1µm
Lens	15mm (minimum) to 1200mm (maximum)
Continuous Zoom	Up to 22X Optical Up to 16X Digital
Field of View (H)	Up to 46.6° (wide) Up to 0.6° (narrow)
Enhancements	Image Stabilization Dynamic Range Enhancement
Video Outputs	Analog (NTSC/PAL) Digital (HD-SDI) RTSP H.264
Control	Serial Ethernet

DRI (Km) VEHICLE



DRI (Km) HUMAN



IDENTIFICATION
RECOGNITION
DETECTION

UNCOOLED LWIR THERMAL CAMERA

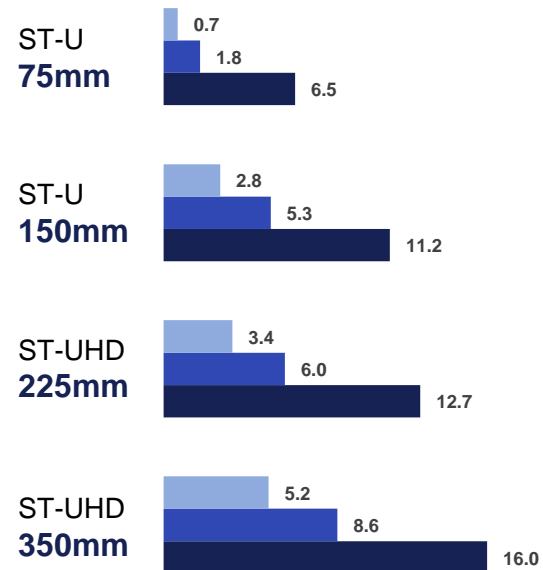


SensorTec Uncooled Long Wave Infra-Red (LWIR) thermal imaging cameras are equipped with a highly reliable, long-wave, un-cooled Vanadium Oxide (VOx) detector which offers good long range detection in all weather conditions. There is no maintenance required since there is no cooling device. These cameras offer a continuous zoom that offers excellent situational awareness while also giving the possibility to zoom in at suspect activities, and have a closer look, once they are detected.

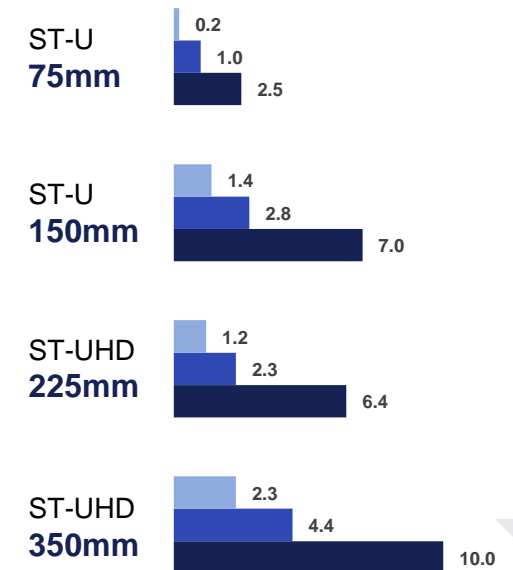


Detector	LWIR VOx
Detector Pitch	12µm 15µm 17µm
Thermal Sensitivity	≤30mK ≤40mK ≤50mK
Resolution	640x512 1280x1024
Frame Rate	25 / 30Hz
Spectral Range	7.5µm to 14.0µm
Lens	21mm (minimum) to 350mm (maximum)
Continuous Zoom	Up to 48X Optical Up to 16X Digital
Field of View (H)	Up to 43° (wide) Up to 1.5° (narrow)
Enhancements	Image Stabilization Dynamic Range Enhancement
Video Outputs	Analog (NTSC/PAL) Digital (HD-SDI) RTSP H.264
Control	Serial Ethernet

DRI (Km) VEHICLE



DRI (Km) HUMAN



IDENTIFICATION
RECOGNITION
DETECTION

UNCOOLED SWIR THERMAL CAMERA

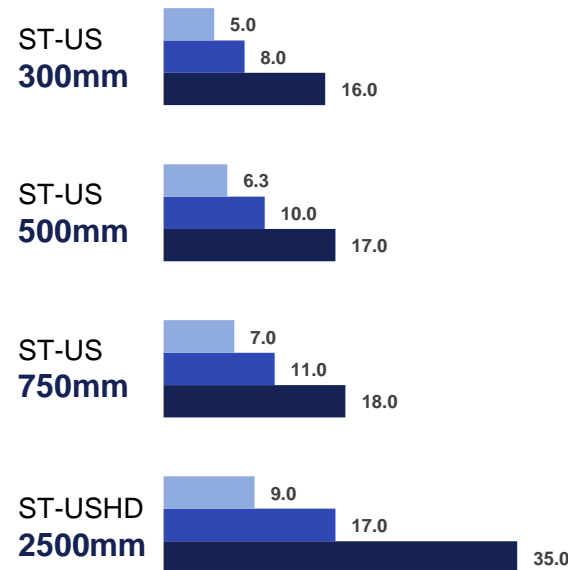


SensorTec Uncooled Short Wave Infra-Red (SWIR) thermal imaging cameras come with un-cooled detector that ensures zero maintenance. SWIR wavelength is not visible to human eyes and as a result can often offer a better image than what is achievable with visible light imaging. SWIR cameras are able to penetrate glass, fog, smoke and other atmospheric conditions. As a result they are particular useful in cities, marine and coastal protection. SWIR cameras are effective for identification unlike MWIR and LWIR cameras, SWIR is a reflected energy like visible light, which makes SWIR cameras viable for identification purposes.

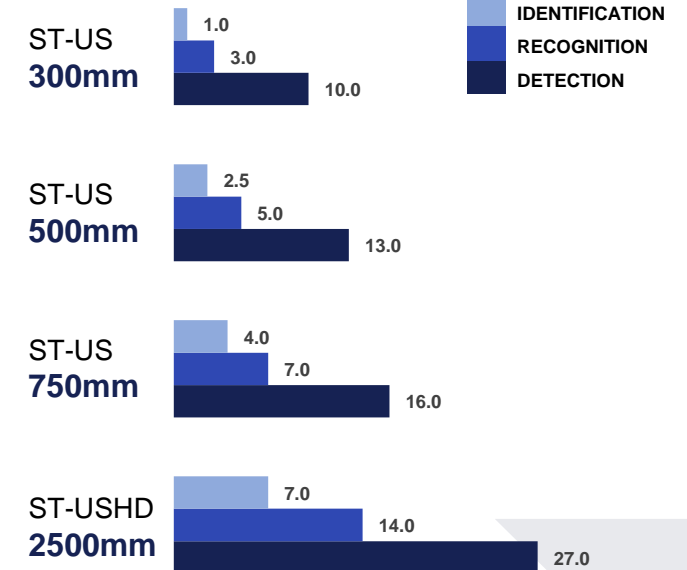


Detector	SWIR InGaAs
Detector Pitch	5µm 10µm 15µm
Resolution	640x480 640x512 1280x1024
Frame Rate	25 / 30Hz
Spectral Range	0.4µm to 1.7µm
Lens	6.5mm (minimum) to 2500mm (maximum)
Continuous Zoom	Up to 35X Optical Up to 16X Digital
Field of View (H)	Up to 27° (wide) Up to 0.22° (narrow)
Enhancements	Image Stabilization Dynamic Range Enhancement
Video Outputs	Analog (NTSC/PAL) Digital (HD-SDI) RTSP H.264
Control	Serial Ethernet

DRI (Km) VEHICLE



DRI (Km) HUMAN



IDENTIFICATION
RECOGNITION
DETECTION

VISIBLE LIGHT DAY/NIGHT CAMERA

SensorTec HD Day/Night cameras are a range of high-performance visible light cameras using high sensitivity CMOS sensors and big aperture continuous zoom lenses. These features combined with selectable optical filters for fog penetration and IR-cut makes them a very versatile medium and long range tool to be used in all conditions such as fog, dusk/dawn, low light and high dynamic range scenery. SensorTec Day/Night cameras are indispensable element of any multi-sensor unit and as such often overlooked, but they play a huge role in its overall performance.



Sensor	Ultra High Sensitivity CMOS Equivalent to EM-CCD
Sensor Size	1/8" (1/2.4") 1/8" (1/3.6") 1/9"
Spectral Response	Visible (Color with IR Cut Filter) Visible with NIR (Monochrome)
Resolution	1920x1080 (2MP) 2688x520 (4MP)
Frame Rate	25 / 30 FPS
Sensitivity	Color 0.001Lux B&W 0.0001Lux
Lens	5.5mm (minimum) to 2200mm (maximum)
Continuous Zoom	Up to 100X Optical Up to 16X Digital
Field of View (H)	Up to 67° (wide) Up to 0.9° (narrow)
Enhancements	Image Stabilization Dynamic Range Enhancement
Video Outputs	Analog (NTSC/PAL) Digital (HD-SDI) RTSP H.264
Control	Serial Ethernet



LASER RANGE FINDER



SensorTec provides the ultimate long-distance LASER range finder. It is light weight and features ranging capability up to 32Km. With reduced measurement ranges, ST-LRF meets high continuous measurement rates up to 40 measurements per second in single mode and up to 200Hz in burst mode.



Wavelength	1.54µm
Safety	Class 1 (Eye Safe) Class 1M
Range Capability	50m to 32,000m
Range (NATO Target)	4,000m 10,000m 16,000m
Single Measuring (SMM Speed)	0.6 sec (minimum) to 1.8 sec (maximum)
Continues Measuring (CMM Speed)	Up to 200Hz
Precision	0.5m - 1.5m
Target Discrimination	< 20m
False Detection Rate	< 1%
Control Interface	Serial Ethernet
IP Rating	IP67, Built according to MIL-810



LENS CLEANING SYSTEM



SensorTec Lens Cleaning System (ST-LCS), unlike traditional cleaning systems that use wipers, our state of the art system uses only high pressured distilled water and air to clean camera lenses. The key advantage of this system is that there is no mechanical contact with the lens that could potentially damage it or its anti-reflective coating. This advantage is especially effective on systems that are subjected to salt water, mist or sand since the traditional wiper cleaning process scratches the surface of these highly priced sensitive lenses.



THE THREE STAGES OF THE CLEANING PROCEDURE

- 1st Stage: Applying distilled water to the lens.
- 2nd Stage: Removing dirt and deposits from the lens with a mixture of air and distilled water.
- 3rd Stage: Air drying the lens.



Nozzles	2 or more, depends on the multi sensor system
Valves	4 or more, depends on the multi sensor system
Water Reservoir	20 liters
Air Reservoir	6 liters
Power Consumption	1.5 KW (while compressor is running)
Temperature Range	0°-60° (can be used with antifreeze liquids if needed)
Weight	25Kg



CONTACT US



SensorTec Security Systems

www.sensortec-eu.com | sales@sensortec-eu.com



SensorTec UK

Sydney House,
62 Lancaster Way, Ely,
Cambridgeshire, UK.
+44 1353 523549

SensorTec UAE

701 Thuraya Tower 1,
Dubai Internet City,
Dubai, UAE.
+971 4 367 0351 | +971 50 496 1750

SensorTec KSA

Prince Muhammad Ibn Saad
Ibn Abdulaziz Rd,
Riyadh, KSA.
+966 53 222 2848