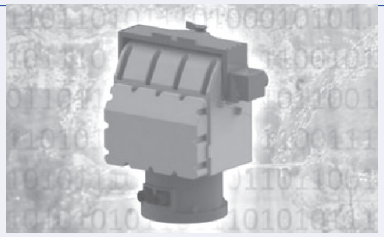
DEFENCE VISION SYSTEMS

SWIR System with Laser Designator

A compact, imaging system, combining a high definition, short wave infrared (SWIR) camera with a SWIR zoom lens plus a 1550nm laser designator all integrated into a single sealed housing.

The system is designed around the latest SWIR technology using a high definition sensor providing 640 x 512 active pixels. The camera provides excellent images over the hours of daylight from early dawn to early dusk. The system incorporates a fully motorised, customer specified, 300mm or 750mm SWIR zoom lens, offering a wide field of view at f2.8 (300mm) or f4.6 (750mm) to a narrow field of view at f32 (300mm) or f36 (750mm). The camera and lens are coupled to a powerful, continuous wave, 1550nm laser designator able to place a spot on the target out to 5Km, subject to atmospheric conditions. The system is mounted on a powered pan and tilt head providing a full 360 degrees rotation and upto 60 degrees elevation. The whole system is controlled and operated via a GigE interface which also carries the images from the system. The system may be controlled remotely using the available system control firmware. This would be supplied on a hard memory stick enabling the user to upload this onto a laptop. Alternatively an option of a fully conformed laptop can be selected. Due to the interface being GigE the laptop can be upto 100m from the position of the system.

System Parameters		
External Dimensions	Approximately 400mm high x 500mm wide x 600mm long	
Weight	≤5 kg (300mm lens)	≤8 kg (750mm lens)
Supply Voltage	18Vdc - 32Vdc	
Power	24W Maximum	
SWIR Camera	Resolution 680 x 512, Peltier cooled. GEV compliant	
Powered Zoom Lens	Focal length: 25mm–300mm Iris Range: f2.8–f32 Minimum Focus Range: 2m Field Angle: Hor. 28.6 degrees and 2.5 degrees	Focal length: 20mm – 300mm Iris Range: f4.6 – f360 Minimum Focus Range: 5m Field Angle: Hor. 17.8 degrees and 0.5 degrees
Laser Designator	Type: Continuous wave laser diode Wavelength: 1550 nm Range: 5km	
Housing	Sealed to IP67 Connectors; Power and GigE	
Optional Pan & Tilt Head	Gyro stabilised modular pan and tilt Rugged compact design for mast or tripod mounting Environmentally sealed (IP67) Elevation (Tilt) range: +60°–90° Azimuth (Pan) range: continuous 360° Minimum velocity: 0.0056°/s High accuracy, high axis speed (100°/s) Slip ring for continuous rotation Highly resistant to shock and vibration Weight: 15kg Dimensions: 341mm H x 320mm W x 207mm D	

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Contact: info@dvsmil.com Tel: +44 (0) 1580 881199 http://dvsmil.com

System Control	Via an on screen menu providing full control of the camera. Zoom and focus functions and illuminator.		
System Digital Interface	GigE		
Operating Temperature	-40°C to +60°C		
Storage Temperature	-50°C to +70°C		
Lens 300mm focal length	Detection (km)	Recognition (km)	Identification (km)
NATO Man Target	5	1.25	0.3
NATO Vehicle Target	15	3.8	1
Lens 750mm focal length	Detection (km)	Recognition (km)	Identification (km)
NATO Man Target	12	3	0.75
NATO Vehicle Target	38	9.5	2.3

Brief overview of the individual parts of the system.

High Performance SWIR Camera
The camera is fully automatic and based around the latest SWIR sensor with 15 micron pixels providing 640 x 512 active pixels. Has both high and low gain functions to provide the optimum image in varying light conditions. The camera parameters are set by the integral firmware but all functions can be controlled by the user via the GigE interface.

High Resolution Zoom Lens
Integrated with the camera is a high resolution SWIR optimised zoom lens which is customer specified selected from a 300mm or 750mm focal length lens. The lens is a 3 motor power unit operating zoom, focus and iris all controlled via the GigE interface and on screen menu.

Laser Designator
A 1550nm laser diode system providing a full 5km capability. Integrated into the overall system and controlled via the GigE interface and on screen menu.

Proof of system concept
The following image was taken using the prototype system for proof of concept. The prototype uses the same concept as for the production units of a SWIR channel and a 1550nm designator. The image shows the designator spot on a low reflectance target (trees) at a range of 1.7km. There is a slight atmospheric mist hence the line of the laser is visible due to reflectance of the laser from the mist particles. The clarity of the image also provides evidence of the ability of the SWIR wavelength to provide clear images in light mist conditions.

Target at 1.7km

Defence Vision Systems , Millham, Mountfield, Robertsbridge, TN32 5JU
Contact: info@dvsmil.com Tel: +44 (0) 1580 881199 http://dvsmil.com