

# ODIN - Counter-UAV PLATFORM

## World Leading UAV Identification, Tracking and Denial

Silent Sentinel and SteelRock have partnered to develop ODIN, the world's most advanced Digital Counter-UAV System.

ODIN provides a ready-to-go Counter UAV platform consisting of a Pan / Tilt EO system, comprehensive video tracking capability and a world leading UAV effecting systems.

**Detection:** The Jaegar is ready-made for integration with third party RADAR or RF-based detection systems. The thru-shaft and top mount allow for third party capability to be mounted and remain static leaving the EO and Effector capability free to rotate 360 degrees. The thru-shaft presents a connector with Cat5e and Power that is directly routed to the multi-core bundle on the base of the camera.

**Tracking:** The ODIN platform offers a fused tracking capability utilising information from the RADAR track which is paired with a hardware-based video tracking capability to ensure smooth and reliable tracking at all ranges and speeds.

**Identification:** The Jaegar camera platform at the core of ODIN is highly modular. The standard system ships with a 500mm, 33x, 5MP Daylight combined with a 25-225mm, 11x, 640x480, UnCooled TI imager.

**Denial:** The ODIN platform contains the world-leading SteelRock effector allowing for the reliable denial of any commercial UAV system on the market. The effector allows the user to selectively deny Control, Video or GPS (and any combination) as well as triggering certain behaviour such as 'freezing' the drone in place, returning the drone to the controller or forcing the drone to land safely.

The ODIN system can be configured and optimised for a broad range of applications and operational theatres with the ability to detect, identify, track and effect unauthorised UAVs.



## Key Features;

### Silent Sentinel Jaegar

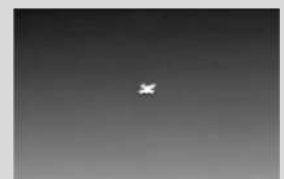
- Single mast solution
- Virtually zero backlash
- IP67 environmental protection
- Absolute positioning feedback for radar control 360° continuous rotation
- Highly ruggedized for extreme environments Harmonic drive trains 80° per second pan speed (Hi-power model)
- Highly modular – options to upgrade optics if required

### SteelRock Effector

- Ground-breaking fully digital counter-UAV technology employing "white noise" technology against its targets
- "Reactive" system with an "intelligent," self-learning algorithm
- A custom-made, multi-band helix and flat panel antenna array
- Broad-ranging operating capabilities with high-powered signal transmission, enabling superior range and target / threat mitigation
- Reactive system with power up to 10W
- Targeted and directional signal capabilities meet class-leading safety parameters, minimising "RF exposure" to operators

### VISION4CE Tracking Board

- Multiple object detection and tracking
- Centroid and edge measurement
- Feature based correlation algorithm
- Moving object detection
- Adaptive background removal
- Automatic coast
- Grey level invariant algorithms
- Robust clutter rejection
- Electronic image stabilisation



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## Silent Sentinel Jaeger PT

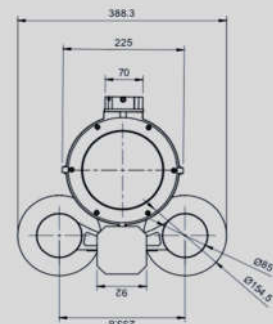
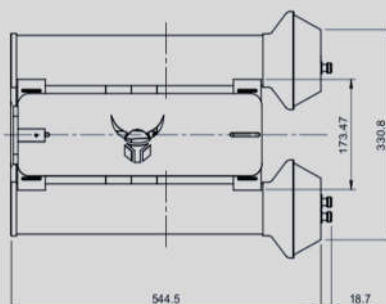
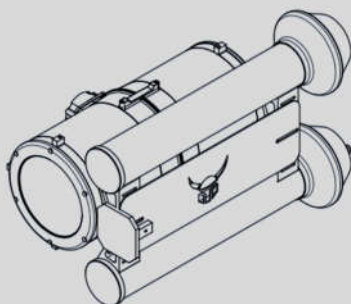
IP rating	IP67
Actuation	Pan and Tilt Stepper Motors
Position encoders	Optical Encoders on Pan and Tilt Motors
Repeatability	0.002°
Pan rotation	360° Continuous
Pan speed	High Power Model: 0.0002° - 80° /sec
Tilt speed	High Power Model: 0.0002° - 80° /sec
Tilt range	Belt Drive: +90° to -90°
Temperature Range	-30°C (-22°F) Up To 65°C (149°F) (-40°C With Optional Heater)
Power	28-32 VDC, 5.0A
Weight	40kg
Parameter Programming	Via RS485 or RS422
Housing Material	Cast Aluminium
Housing Finish	Xylan Undercoat with Epoxy Powder Finish
Fixing Material	Stainless Steel
Privacy Zones	4
Additional features	Programmable Text within Picture (Camera ID), Parameter Control (RS232 or RS485) TCP/IP Prepared
Additional Modules	Laser Range Finder, Strobe Light Illuminator, IR Illuminator, Laser Dazzler, Target Designator

## Jaeger Telemetry

Presets	127
Protocols	Pelco D, SSP, ONVIF Profile-S
Parameter Programming	Via RS485 or RS422
Privacy Zones	4
Compass Heading	Cardinal Point and/or Degrees
Additional Features	Programmable Text within Picture (Camera ID), Parameter Control (RS232 or RS485) TCP/IP Prepared

## SteelRock Effector

Frequency of Operation	A Range of Options are Available (Depending on the Customer Requirement) with FSSH Technology
Bandwidth / Class of Emission.	Digital Phase and Frequency Modulation - Algorithm
Antenna Type	Helix
Antenna Gain	13.5 dBi
Antenna Beam	34 Degrees
Direction of Max Radiation	45 Degrees
Elevation of Max Radiation	41.7 Degrees
Effective Range	Up to 10km (Tested to 5.4km)
RADHAZ	Regulation Public Limit - 61 V/m 1999/519/EC - ICNIRP and Occupational Limit - 140 V/m 2013/35/EU (Passed)



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## Silent Sentinel Optics – Daylight Camera Options

Optical Zoom	<b>33x</b>	<b>60x</b>
Image Sensors	1/1.8" CMOS	
Resolution	5MP	
Signal System	HD: 1080p, SD: NTSC / PAL	HD: 1080p, SD: NTSC / PAL
Lens (Wide to Tele)	F=12mm to 500mm F3 to F800	F=16.6mm to 1000mm F3.5 to F16
Angle of View - Horizontal	28.0° (W) to 0.74° (T)	23.1° (W) to 0.41° (T)
Minimum Illumination (50IRE)	0.008lux Colour, 0.002lux Mono	
Video Output	Composite or HD-IP	
Auto Focus	Yes	

## Silent Sentinel Optics – Thermal Imaging Options

FOV / Lens	2.7 to 24.5° - 25 to 225mm	1.67 to 35.5° - 15 to 330mm	0.83 to 18.2° - 60 to 660mm	0.67 to 13.7° - 40 to 825mm
Array Format	640 x 480			
Optical Zoom	9x	22x	11x	20x
F#	F1.5	F4.0	F4.0	F4.0
Pixel Size	17µ	15µ		
Spectral Band	8-14µm	3.4-5.1µm		
Thermal Sensitivity	<50mK	<25mK @ 30C, nominal. Half Well		
Frame Rates	9Hz, 25Hz	30 Hz		
Image Control	White Hot, Black Hot, Invert	Linear AGC, CLAHE, LAP		
Focus	Fixed, Preset, Athermalised, Auto Focus	Auto Focus		
Zoom	E-Zoom 1-4, Region of Interest			
Sensor Type	Uncooled V0x Microbolometer	Cooled InSb FPA		

## Detection Ranges\*

Target Drone	Phantom DJI			
Target Drone Height	35cm			
Thermal	2.7-24.5° - 25-225mm	1.67-35.5° - 15-330mm	0.83-18.2° - 60-660mm	0.67-13.7° - 40-825mm
Detection (3 pixels)	1544m	2567m	5133m	6417m
Identification (10 pixels)	463m	770m	1540m	1925m
Recognition (16 pixels)	289m	481m	963m	1203m
Daylight	33x	60x		
1% of the Screen	3514m	7028m		
5% of the Screen	660m	1320m		
10% of Screen	327m	654m		

\* Calculated ranges are based on Johnsons Criteria and are subject to environmental conditions

[www.silentsentinel.com](http://www.silentsentinel.com)