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Detect, Identify, Act

Obsidian Counter Drone System

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System Specification

Command and Control

Type	Command and Control system with primary purpose of displaying track data from the Obsidian tracker on a map based user interface.

Features

Map display	User definable map image
	Map pan and zoom controls
	User definable exclusion zones and alert prohibit zones in 3 dimensions
	User selectable data layers
	Alert Tracks (for any target classification type marked as Alterable by the User e.g. Drone, Air (Small) etc.
	Non-Alert Tracks (all target classifications can be shown or a subset selected by the user)
	Radar detection data plots
Alert detail display	Displaying track ID, current location data, track classification and time statistics of alert tracks. Highlighted alert track on map display
Non alert display	Displaying track ID, current location data, track classification and time statistics
BITE display	Real time indication of operational status of major subsystems

Platform

	Hosted on Windows 10 Professional platform Typically Tracker & C2 operate on a separate PC/Server System specification may be subject to modification

Radar General

Radar type	3D
Cycle rate	Multi-sector, electronic beam formed (static staring radar)
Frequency	X- Band (10.2 to 10.4GHz)
Waveform	FMCW

Tracker Description

Type	High update rate three dimensional multiple distributed radar sensor tracker with sensor recognition and track recognition association, operating on Windows 10 laptop or portable computer.

Tracker Performance

System Configuration	2km/3.5km
Maximum radar inputs per tracker	2 (Future roadmap 4)
Track update rate	~0.5 seconds[1,2]
Track initiation time	Typically <2 seconds
Maximum simultaneous tracks	>100

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Target classifications	Targets separated into multiple Air or Ground classes e.g. Drone, Air (Small), Ground (Fast) to represent typical targets such as Vehicles, aircraft, people, Drones
Elevation angle	90 degrees (-10 to +80 degrees)
Azimuth angle	360 degrees[3]
Simultaneous targets	>100
Transmit power	33dBm
Max EIRP	43dBm (13dBW)
Minimum range	20m/40m
Minimum detectable velocity	0.5m/s
Max (Instrumented) range[4]	2km/3.5km
Detection range	Up to 2km <20kg/up to 3.5km > 20kg
Range accuracy	3m/6m
Drone recognition range[5]	Up to 800m <20kg
Accuracy (elevation and bearing)[6]	1 degree
Detectable Drone types	Moving, hovering, single and multi-rotor, fixed wing with propellers

Interfaces

Mechanical mount	Mounts to 40mm spigot
Power supply connection	D38999 series 3 leading earth
Data output	D38999 series 3 RJ45
Radar master/slave link	D38999 series 3 RJ45
Service port	D38999 series 3 RJ45
Data output format	TCP/IP binary
Data I/O connections	RJ45
Data output format	TCP/IP Binary
Ethernet	1000 Base-T

Radar Physical

Dimensions	800 x 490 x 565mm W:D:H
Weight	<45kg
Materials	Fiberglass and aluminium construction

Radar Power Requirements

Mains power	100 VAC to 240 VAC 50-60Hz
Consumption	500W

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Radar System Environmental

Ingress protection	IP54
Operating temperature	-46 to +49°C[7]
Minimum storage temperature	-40°C

Camera[8]

Camera grade	Uncooled mid-range
Camera type	PTZ
Colour camera resolution	1920 x 1080
Colour Field of View	Narrow: 2.3° x 1.3° Wide: 63° x 35°
Colour zoom	x30 (optical), x12 (digital)
Frame rate	25 fps
Thermal type	Uncooled
Thermal camera resolution	1024 x 576
Thermal Field of View	Narrow: 5.4° x 3.1°, Wide: 16.8° x 9.3°
Thermal zoom	2 fixed optical FOVs and a continuous 16x digital zoom in-between
Interface	IP (RJ45)
Ethernet	1000 Base-T Minimum
IP rating	IP66
Operating temperature	-32 to + 60°C
Minimum storage temperature	-46°C

Note: Cameras are site dependent, other higher resolution options available.

1. Driven by radar sensors input data rate and can take values between 0.5 – 0.625 seconds
2. Please note that GUI update rate is 1 Hz.
3. Two radars back to back (each radar covers 180 degrees)
4. Firmware limited to 2 km or 3.5 km (configurable). Typical range based upon line of sight performance against a <20 kg drone in good environmental and weather conditions, and elevated radar position.
5. Practical upper limit on range for detection of drone propeller (micro-Doppler) – target type, flight characteristics, and environment dependent.
6. Nominal angular accuracy when radar is installed in an optimal location.
7. While the minimum steady state operating temperature is -46°C, the minimum start-up temperature (cold start) is -40°C. On cold start internal heaters activate and warm the interior of the radar. After this the radar can operate if the ambient temperature reduces to -46°C.
8. Typical example for small site protection. Cameras are site dependent, other higher resolution options are available.