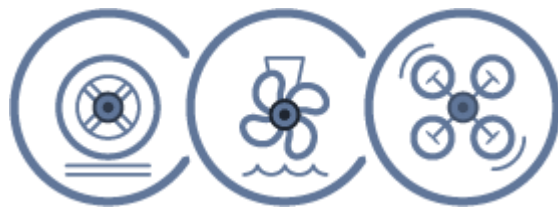


DEFENSE & SECURITY

INTERNATIONAL
ARMOURTM
www.armour.gr



DEACTIVATE ENGINE

The ultimate in target deactivation technology

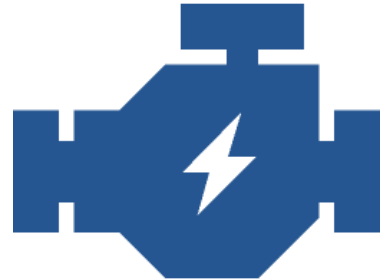
State-of-the-art, non-contact, non-kinetic disruption system

Minimal risk of collateral damage

Jams the engine management system of vehicles, boats and UAVs;

Safely brings vehicles/boats/UAVs to a controlled stop

Vehicle/boat/UAV is unable to restart until radio waves are turned off



Stops Unmanned Aerial Vehicles

The UAVs/Drones are stopped mid-flight, and can either be brought down (Hard Kill) or if preferred in some cases landed safely on the ground



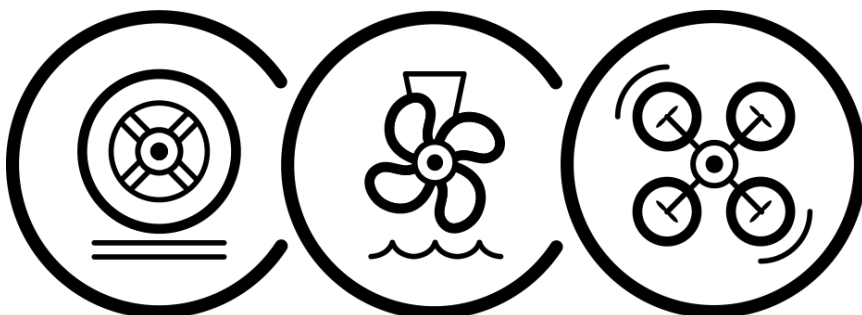
Field trials undertaken with high percentage success rate

Cars, Trucks, Motorcycles, Outboard, Inboard Engines and UAVs Driver maintains control of steering and brakes (vehicles)

Static, dynamic and pursuit scenarios have been demonstrated



Revolutionary Life Saving System



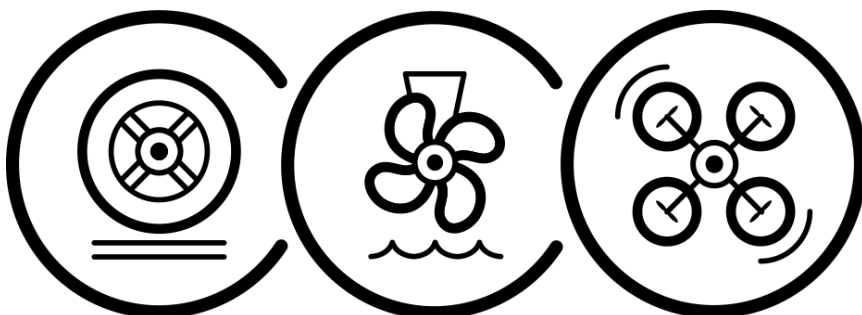
DEACTIVATE ENGINE

The ultimate in target deactivation technology

- The future of Non-lethal engine stop technology.
- One of a kind, non-contact, non-kinetic jamming system
- SAFE STOP jams the engine management system of vehicles and boats and drones



**POWERFUL RF TRANSMITTER
REMOVELY JAMS THE ENGINE
MANAGEMENT SYSTEM
CAUSING THE TARGET TO STOP SAFELY**



[illegible]

APPLICATIONS



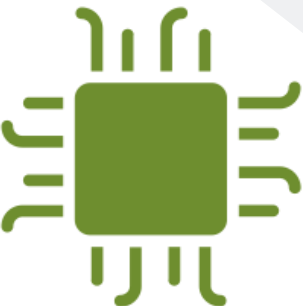
**VEHICLE
APPREHENSION**



**UAV
AERIAL DENIAL**



**MOBILE ASSET
PROTECTION**



**FIXED ASSET
PROTECTION**



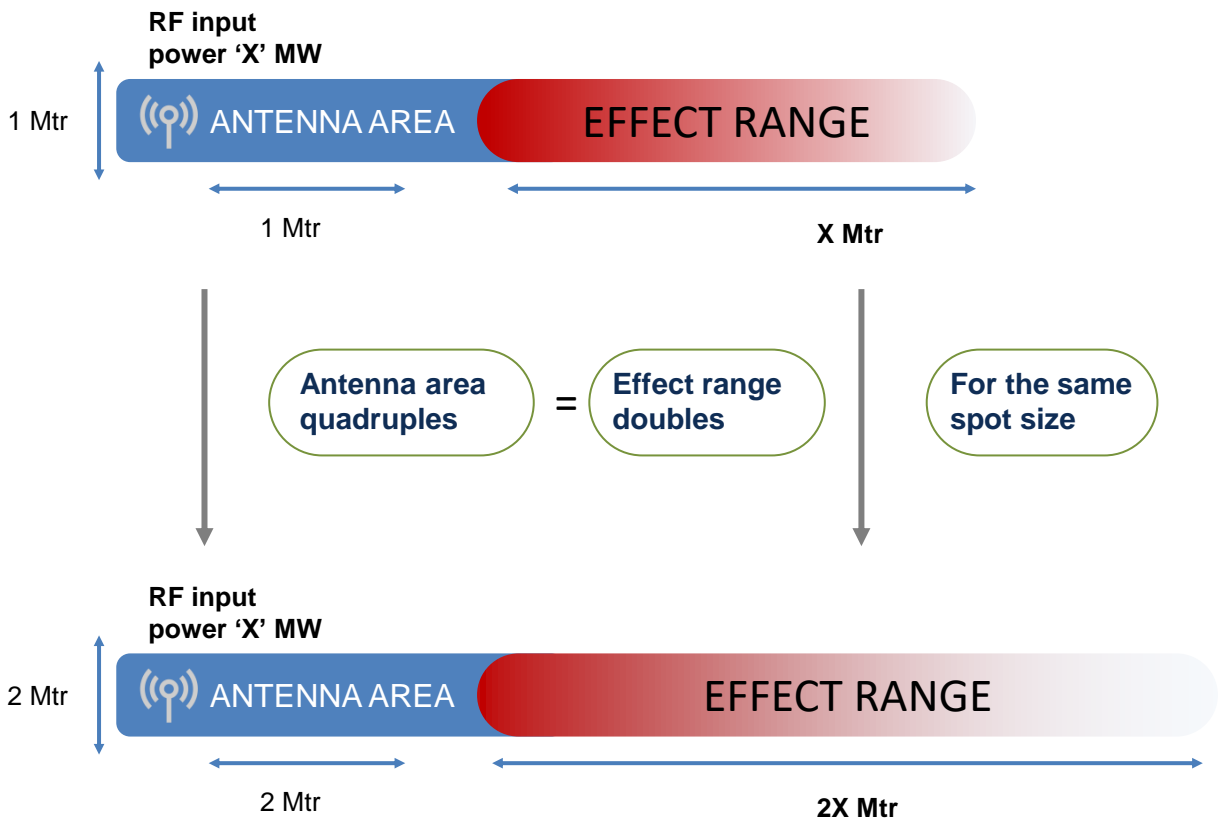
**MARINE ASSET
PROTECTION**



**HARBOUR
ACCESS CONTROL**

POSSIBLE RANGE

System range was successfully demonstrated at hundreds of meters



SYSTEM OPTIMISATION

The stopping range performance of Safe-Stop is strongly influenced by the RF input power and antenna area.

- Typically there is a direct correlation between these factors and system size/weight

For any proposed scenario of use, an assessment would be conducted to carefully consider;

- The balance between system performance
- The acceptable size and weight

HEALTH & SAFETY

Demonstration

All occupied testing has been carried out within the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines 1998

Field strength measurements at 10m are better than 7 times lower than the threshold at which pacemakers may begin to be affected and >100 times lower than the threshold at which they may fail [2]

System Deployment

A full risk assessment and safety case for scenario of use needs to be carried out prior to operation

References

[1] ICNIRP 1998 & 2010

Guidelines 'For Limiting Exposure to Time - Varying Electric, Magnetic and Electromagnetic Fields

[2] HDL-TR-2197

November 1991- The Effects of Electromagnetic Pulse (EMP) on Cardiac Pacemakers

Vincent J. Ellis, U.S Army
Laboratory Command, Harry
Diamond Laboratories

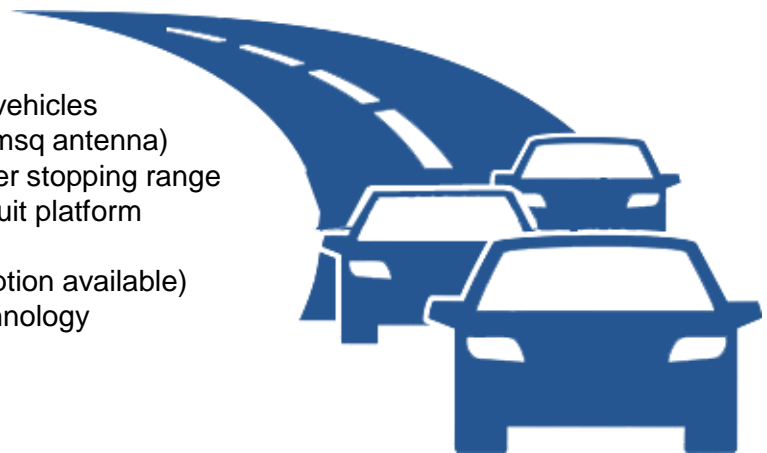
LAND USE / KEY FEATURES

Capabilities

When applied, the target vehicle retains limited controllability, resulting in steering and brakes maintaining functionality; the target will be unable to move until RF Safe-Stop™ is put back in passive mode. Vehicle occupants remain unharmed allowing greater precautionary use.

Key Features

- Compact and discreet: fits into 4x4 vehicles
- Stopping distance of up to 100m (1msq antenna)
- Larger antennas can produce greater stopping range
- Modular: allows reconfiguration to suit platform
- Silent, permits covert operation
- Energy efficient (battery-powered option available)
- Non destructive Utilises proven technology
- Easy to operate
- Output optimisation



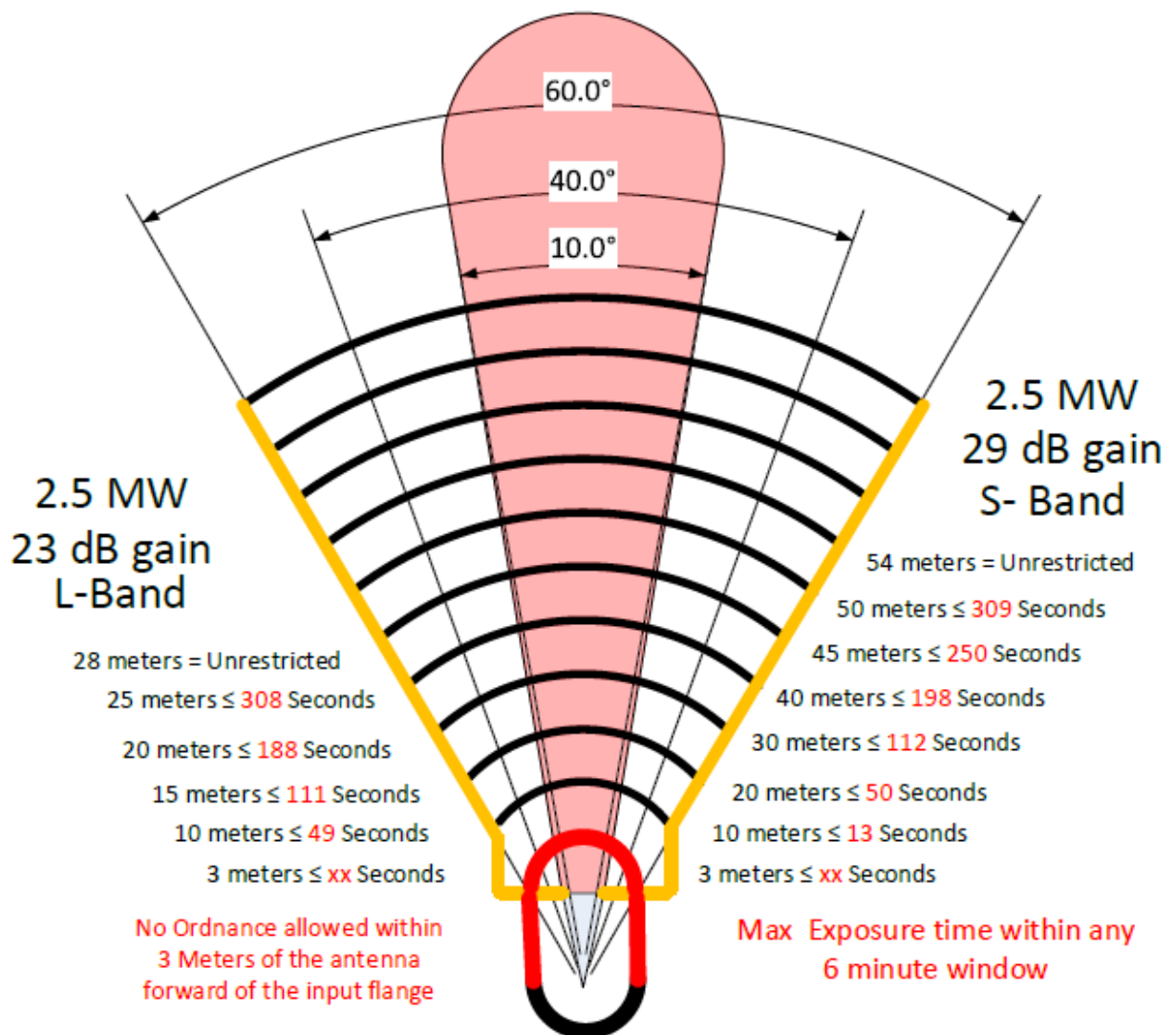
PEL

L-Band keep out zone width 28 meters in front of the antenna is ± 3 meters ($\pm 5^\circ$) from the antenna center line.

Keep out zones for the side and rear of the antenna will be based on measurements.

S-Band keep out zone width 54 meters in front of the antenna is ± 4 meters ($\pm 4^\circ$) from the antenna center line.

Keep out zones for the side and rear of the antenna will be based on measurements.



NOTE: Side and rear keep out distances shall be minimized by applying mitigation efforts such as adding absorber around the perimeter of the antenna.

OUTLINE (PROVISIONAL)

SAFE STOP – L Band Transmitter

SPECIFICATION

RF Performance

Frequency range (note 1): 1.305 to 1.3685GHz

Output Power (EIRP): 86dBW Output

Power can be varied between: 60 to 100%

Pulse width can be varied between: 1 to 3 μ s*

Typical PRF range: 10 to 800Hz

Maximum PRF: 1000Hz

Maximum duty cycle: 0.1%

Transmit duration (note 2): 30s

Polarisation: Linear Vertical

3dB beam width (note 3): 11.5°, 9.5°

Side Lobe amplitude: -11dBc

RF Field profile on bore sight (note 4): At 25m 4370V/m
At 40m 2730V/m

***Duty cycle applies*

Mechanical

Dimensions: See Outline

Weight: 465kg max

Cooling (note 5): Integral water

Electrical

Input Voltage: 3 phase+N+E 400V ac 50/60Hz

Input Power Standby: 3kW max / Transmit: 17kW max

Connectors

RCU Monitoring and Control: MIL-DTL-38999 socket

Prime Power: IEC60309-2, 5 pin, 32A

Interlock: Circular connector shell size 14

RS485 data link: 9 way D-type socket

Environmental

Ambient Operating Temperature: 0°C to +30°C

Storage Temperature: 0°C to +60°C

Relative Humidity: 90% non-condensing

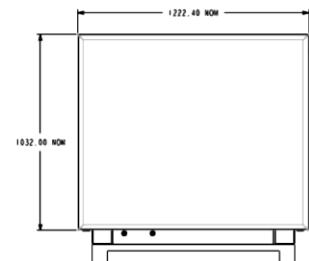
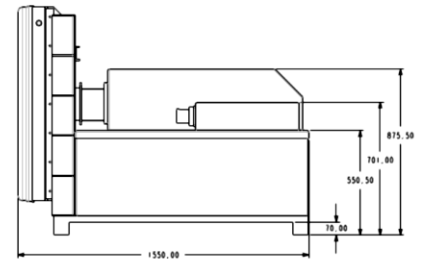
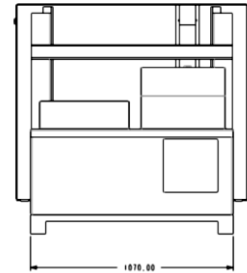
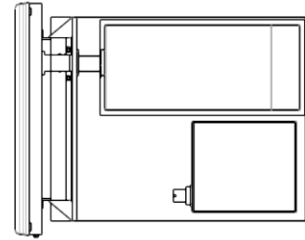
Altitude (Operating): 2km max

Altitude (Non-operating): 12km

Vibration: (20-200Hz, 0.0255g² Hz⁻¹) 2.2g rms

Shock: (11ms, half sine) 25g max

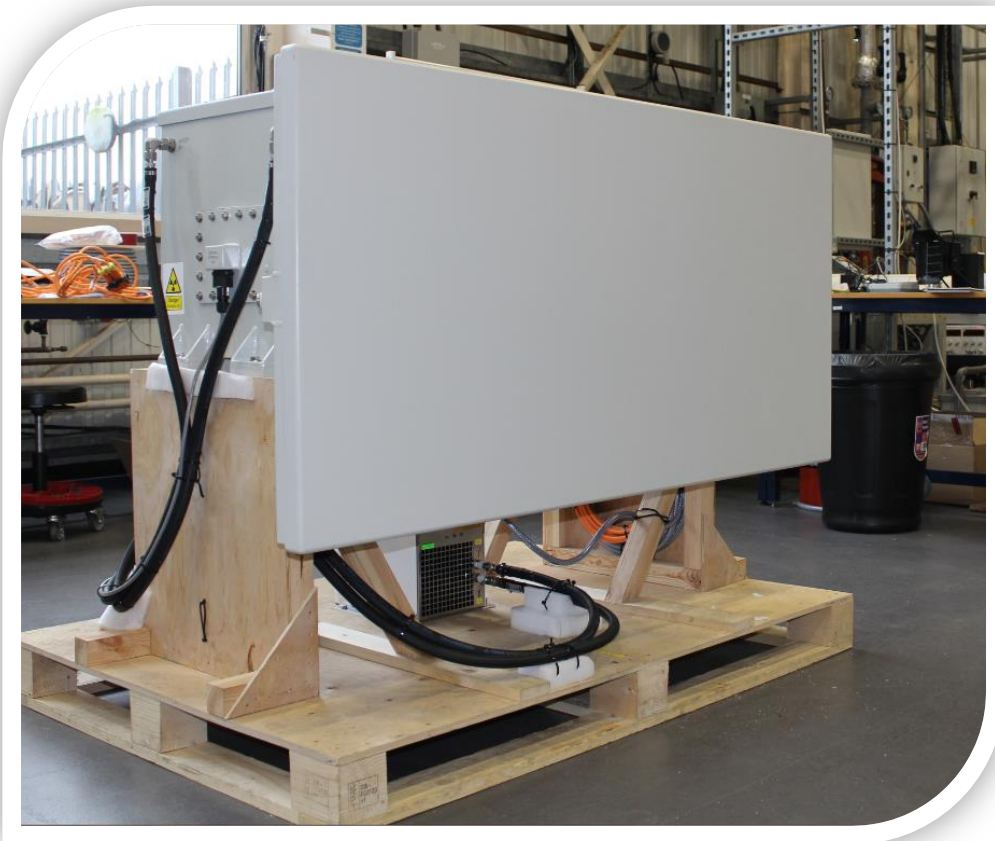
IP (rating): IP20



NOTES

1. Frequency can be tuned at Terra and set prior to system delivery, in field adjustment is not possible.
2. Repeated transmissions are possible; system rated for transmit to standby duty ratio of 1:8 at highest power dissipation.
3. Free space beam width E plane and H plane respectively (nominal values).
4. The LCMOD_L3_100V is sold as a Radio Frequency Transmitter which produces the given field strength in free space (verified by calculation). Actual RF field strength measurements will be taken at a range of distances during the factory acceptance testing to confirm high power transmission.
5. Internal heat exchanger takes air from environment immediately surrounding system, air movement into air vent must not be restricted.

OUTLINE (PROVISIONAL)



DEMONSTRATED VEHICLES

69 Vehicle Types /33 Different Manufacturers

54 cars, 10 motorcycles, 7 trucks

Cross Section of Vehicles tested (Cars)		
Audi A6	Citroen Xara	Mercedes E Class
Ford Mondeo 56	MG ZT V6	Mazda 6 Auto
Jaguar S Type	Renault Laguna	Volvo S40
Nissan Maxima	BMW 3	Mazda CX5
BMW 735i	Opel Omega	Citroen Berlingo
Ford Mondeo V6	Opel Astra	Nissan 100X
Volvo 940	Mazda 6 man	Seat Leon
Subaru Forrester	Peugeot 406	Hyundai Accent
Citroen Jumpy	Jaguar X type	Opel Vectra V6
MG Z	Toyota Land Cruiser	BMW 520i
Honda Accord	Volvo V70	Lexus GS300
BMW 330	Nissan Primera	BMW 323i
BMW 730	Alfa 147	Ford Mondeo Diesel
Citron Picasso C3	Toyota Corella	Volkswagen Passat
Toyota Celica	Ford Cougar	Audi Q7
BMW X5	Citroen C5	Audi A3
VW Phaeton	Lancia Ypsilon	Honda Accord
Opel Combo Van	Mercedes E300	Nissan Pathfinder
Mitsuibishi truck	DAF Trucks	Volvo F40 Truck
Ford Transit	Kawasaki ER5	Kawasaki GPZ305
Yamaha 750	Yamaha 600	Kawasaki 600
Honda Scooter	Triumph 900	BMW 1000 Tourer
Toyota tundra	VOLVO F12 truck	

USE AT SEA / KEY FEATURES

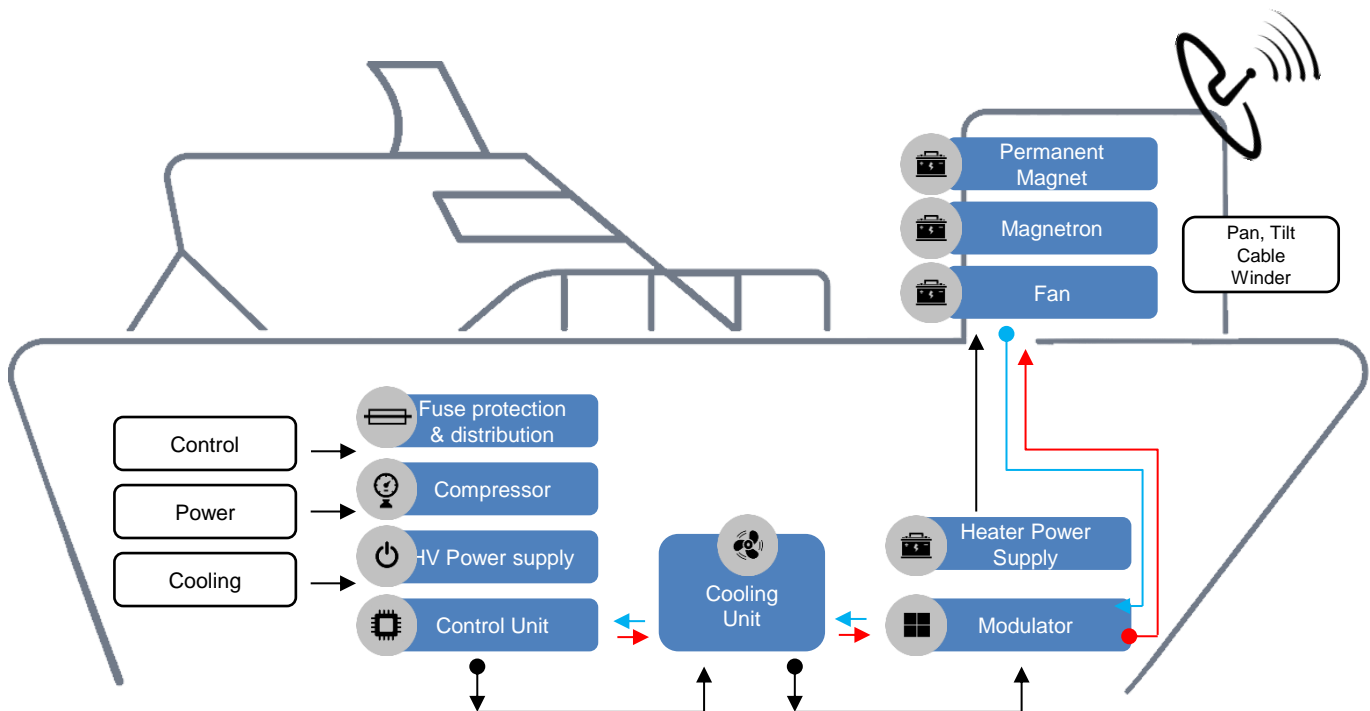
Capabilities

Typically applied for harbour entry protection, maritime policing and anti-piracy, target vessel retains limited controllability, and will be unable to move until RF Safe-Stop™ is put back in passive mode. Vessel occupants remain unharmed allowing greater precautionary use.

Key Features

- Compact and discreet Stopping distance in excess of 100m (1msq antenna)
- Larger antennas can produce greater stopping range
- Modular: allows reconfiguration to suit platform
- Silent, permits covert operation
- Energy efficient (battery-powered option available)
- Non destructive
- Utilises proven technology
- Easy to operate
- Output optimisation

BOAT STOP



DEMONSTRATED VESSELS

Brand	Type	Brand	Type
Mercury	30HP Outboard (2 Stroke)	Boomerang Inboard	Twin Rolls Royce 500HP Diesel Inboard
Mercury	115 HP Outboard	Fishing Boat	Twin 550HPOutboard
Mercury	200 HP Outboard (2 Stroke)	Suzuki	200 HP Outboard
Mercury	225 HP Outboard	Suzuki	40 HP Outboard
Mercury	300 HP Outboard	Tohatsu	25 HP Outboard
Mercury	300V HP Outboard	Tohatsu	150 HP Outboard
Yamaha	300HP Outboard	Evinrude	75 HP Outboard
Yamaha	242HP Twin Jet Boat Inboard	Evinrude	250 HP Outboard
Yamaha	115Hp Outboard	Honda	40 HP Outboard
Yamaha	225 HP Outboard	Sea Doo	C400 Jet Ski
Yamaha	250G HP Outboard		
Yamaha	250HP Jet Ski		



USE IN AIR

DEMONSTRATED UAVs/DRONES



Brand	Type
DJI	Phantom 2
DJI	Phantom 2 +
DJI	Phantom 3
DJI	Phantom 4
Yuneec	Typhoon G
Blade	350 QX3
3DR	Solo SA11A Smart UAV
Dromida	Ominus FPV
Traxxas	TRX37054
E-flite	APPRENTICE ESP 15E RTF
HobbyZone	Sport Cub S RTF
..... And many - many other!	

