

Transforming access to and use of ESM in warfare and defense

By passively identifying radar signatures, Electronic Support Measures (ESM) is a vital capability for both protecting friendly forces and rapidly locating and addressing threats such as hostile artillery, attack helicopters, vessels and surface and airborne unmanned vehicles. Now, with very low SWAP, autonomy and the ability to be networked across a battlefield or along

a coastline, MicroESM enables ESM to become pervasive. This ESM breakthrough has been possible because of ESROE's deep domain and software development expertise. A spinout from the UK's Defence Science & Technology Laboratory, ESROE is recognised as at the forefront of ESM software for multiple applications.

MicroESM at a glance

- 2 – 18 GHz frequency range
- Fully automatic operation
- Battery powered
- 10° rms bearing accuracy
- Full 360° azimuth coverage from 4 antennas
- Sensor weight < 2 Kg (excluding tablet display)
- Highly affordable

The MicroESM 1t Miniature Radar ESM system is the first fully functional system of its type. Combining an ultra-lightweight, 4-channel, crystal video/digital receiver with ESROE's GLAMDRING automatic processing software running on a tablet computer, it automatically identifies radar emitters that have been programmed into its radar library. To continuously improve the software's situational awareness, it also intelligently reports unknown radar emitters and adds them to its internal library.

The standard system comes complete with ruggedized tablet display, two ruggedized battery packs and charger, lightweight carbon fibre tripod and ruggedized cables.

- Intelligent radar libraries**
 Load radar libraries from internal or external storage, through the tablet touch screen interface. Library entries created automatically by the system for unknown radar emitters can be saved to internal or external storage.
- Pulse logging facility**
 All measured radar pulse data can be continuously saved to internal or external storage for offline analysis. Logged pulse data can also be replayed by the user through the tablet display, providing a typically faster than real time view of recorded missions.
- Automated radar identification**
 Automatic reporting and identification of radar signals on a map display is performed by a tablet-based app that the user can interact with through the touch screen.
- Direction finding capability**
 Direction finding of detected signals is achieved using the four antennas.
- Power supply convenience**
 The MicroESM can be powered from an external 12V power supply or an external swappable battery pack that provides power for up to 12 hours of typical continuous operational use.



Functionality	Metrics	Description
Frequency Range	2.0 GHz to 18 GHz	Switches automatically between 2 - 12 and 12 - 18 GHz bands
Frequency Measurement	3.5 MHz (2 - 12 GHz) 2.5 MHz (12 - 18 GHz)	Measurement resolution Accuracy ≤ 2 MHz rms
Enhanced Frequency Measurement	0.85 MHz	Measurement resolution and accuracy possible for pulse density < 100 000 pulses per second
Azimuth Coverage	360 degrees	
Bearing Measurement	10 degrees	Typical rms accuracy
System Sensitivity	-55 dBm -70 dBm	With bearing measurement For CW signals without bearing measurement
Dynamic Range	50 dB	
Minimum Pulse Width	40 ns (2 - 12 GHz) 50 ns (12 - 18 GHz)	
Time of Arrival	20 ns (2 - 12 GHz) 25 ns (12 - 18 GHz)	Measurement resolution Accuracy ≤ 20 ns rms
Environment Pulse Density	Up to 200,000 pulses per second*	Fast response time up to stated density, graceful gradation thereafter.
Emitter Library Capacity	200 emitter mode lines*	Capable of expansion
Reported emitters	100 simultaneous emitters*	Capable of expansion
Operating Voltage Range	10 - 18V DC (12V nominal)	
Power Consumption	< 20W < 10W	Full operating mode (Main unit) Standard mode (Main unit)
Size	180mm x 180mm x 96mm	Length x depth x height
Weight	< 2 Kg 1 Kg 0.62 Kg	Main unit Tablet display 9 Ah battery pack
Operating Temperature Range	-20 degrees C to + 48 degrees C	
Environmental Certification	IP 68 IP 65	Main unit Tablet display
Operational Battery Life		
LIPS 14 battery	Up to 3 hrs	Main unit
BB 2590 battery	Up to 12 hours Up to 8 hrs	Main unit Tablet display
Data Logging	3 hrs	Continuous logging of pulse data to tablet internal storage at maximum pulse density (22.4MB/sec). Logging also includes emitter track data and library data generated by the system.

* These values are fundamentally dependent on tablet performance and can be higher with a higher performance tablet

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