

# Digital Intelligence

**BAE SYSTEMS**

## Future-proofing Platforms for CEMA

### Cyber and Electromagnetic Activities



## Future-proofing Platforms for CEMA

Military vehicles have typically been retrofitted with the latest Force-Protection ECM capabilities as a defence against emerging threats. This approach has raised many challenges, both organisational and technical, around the complexity of integration and through-life support. Establishing a baseline interoperable with existing communications systems has been challenging enough, before considering how to incorporate force-multiplying capabilities such as Electronic Support and Attack.

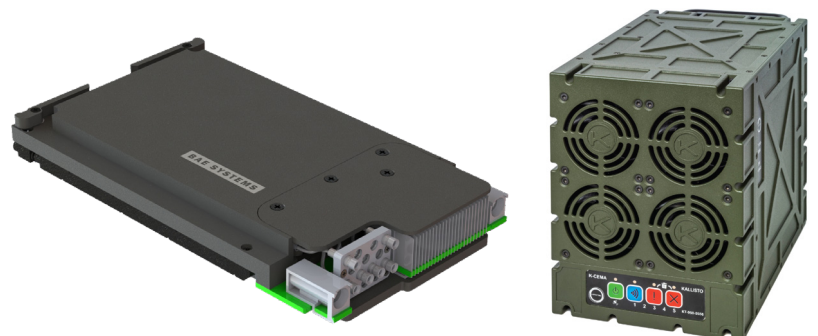
Future CEMA requires effective, well-architected, open hardware systems that can be integrated onto vehicles to support software-based capability insertion with minimum disruption. These architectures and standards have been evolving over the past decade, but need realising in a way that achieves the underpinning objectives. At the core of this architecture is a software defined radio that must be performant and versatile, while at the same time capable of supporting open portable applications produced by a diverse range of suppliers.

#### Successfully future-proofing platforms will involve:

- Agreeing and using standards for mechanical, electrical, and digital interoperability
- Having ownership or complete freedom-of-use of these standards so that they may be opened to industry partners
- Considering the alignment of standards with allies to enable access to a wider pool of solutions
- Embedding forward-thinking in the platform procurement process: designing platforms with space and potential cable routes to enable future fit

We can assist with the development of open standards reference systems and provide middleware, development and implementation expertise. With knowledge of both platform integration and CEMA technology itself, we can provide support through life - including operational analysis informing the procurement stage, equipment, processes, and fitting.

**BAE Systems Radio for CEMA (C100)** is an Open-Standards compliant, highly performant software-defined radio card. Based on the latest AMD Ultrascale+ and Analogue Devices RFSocS, it provides multi-channel, multi-GHz RF transmit and receive, with up to 2.4 GHz instantaneous bandwidth, while remaining power efficient. Precision timing interfaces are provided, and an OpenCPI board support pack makes software integration easy. The Kallisto vehicle-ready, IP65 deployable OpenVPX chassis provides management functionality and enables the interface of plug-in cards such as the C100 SDR; single-board computers; GPUs; storage; position, navigation and timing (PNT). This combination provides a multi-function, multi-capability CEMA system which can evolve and adapt to meet emerging threats.



## Cyber and Electromagnetic Activities

The electromagnetic spectrum (EMS) underpins our daily lives, and modern warfare. It enables both communication and sensing. But as the demand placed on it continues to grow, it is increasingly both congested and contested. Cell phones use spectrum close to safety-critical radars, while in combat, commanders wish to deny their enemies' use of the EMS while guaranteeing their own. The increasing complexity and interconnection of wireless systems have blurred the traditional lines between 'cyber' and 'electronic warfare' (EW), leading to the concept of 'cyber and electromagnetic activities' (CEMA).

Increasingly, CEMA is being seen as a fifth domain of warfare. To maintain their defensive strength, states must ensure they have a CEMA enterprise that can operate with:



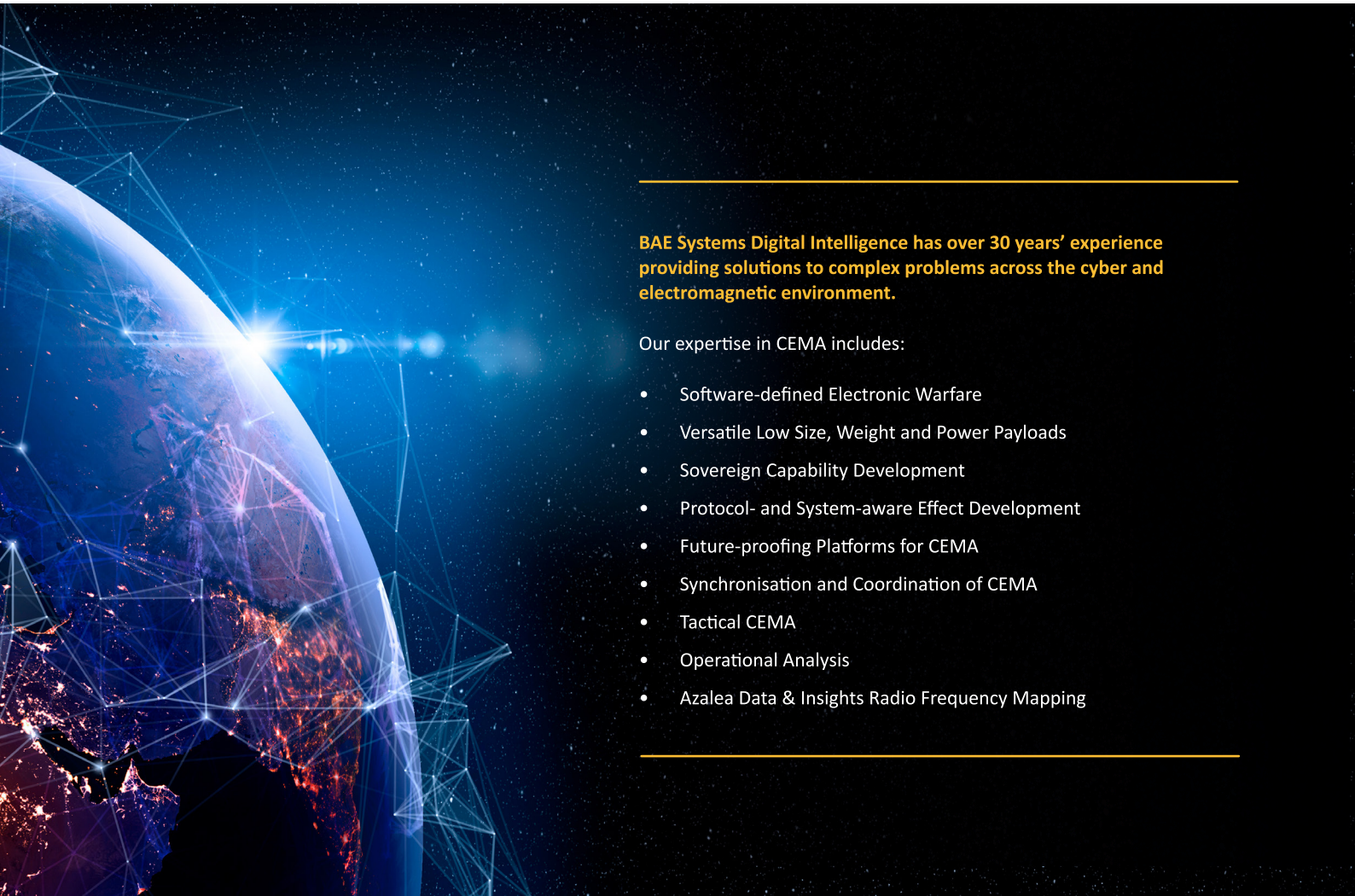
Speed



Agility



Versatility



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**BAE Systems Digital Intelligence has over 30 years' experience providing solutions to complex problems across the cyber and electromagnetic environment.**

Our expertise in CEMA includes:

- Software-defined Electronic Warfare
  - Versatile Low Size, Weight and Power Payloads
  - Sovereign Capability Development
  - Protocol- and System-aware Effect Development
  - Future-proofing Platforms for CEMA
  - Synchronisation and Coordination of CEMA
  - Tactical CEMA
  - Operational Analysis
  - Azalea Data & Insights Radio Frequency Mapping
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To learn more about our CEMA integration capabilities, visit [baesystems.com/CEMAintegrator](https://baesystems.com/CEMAintegrator)

Europe & ME: +44 (0) 203 296 5900 | Americas: +1 877 277 22315 | Australia & NZ: +61 3 8623 4400 | Asia :+65 6714 2100

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