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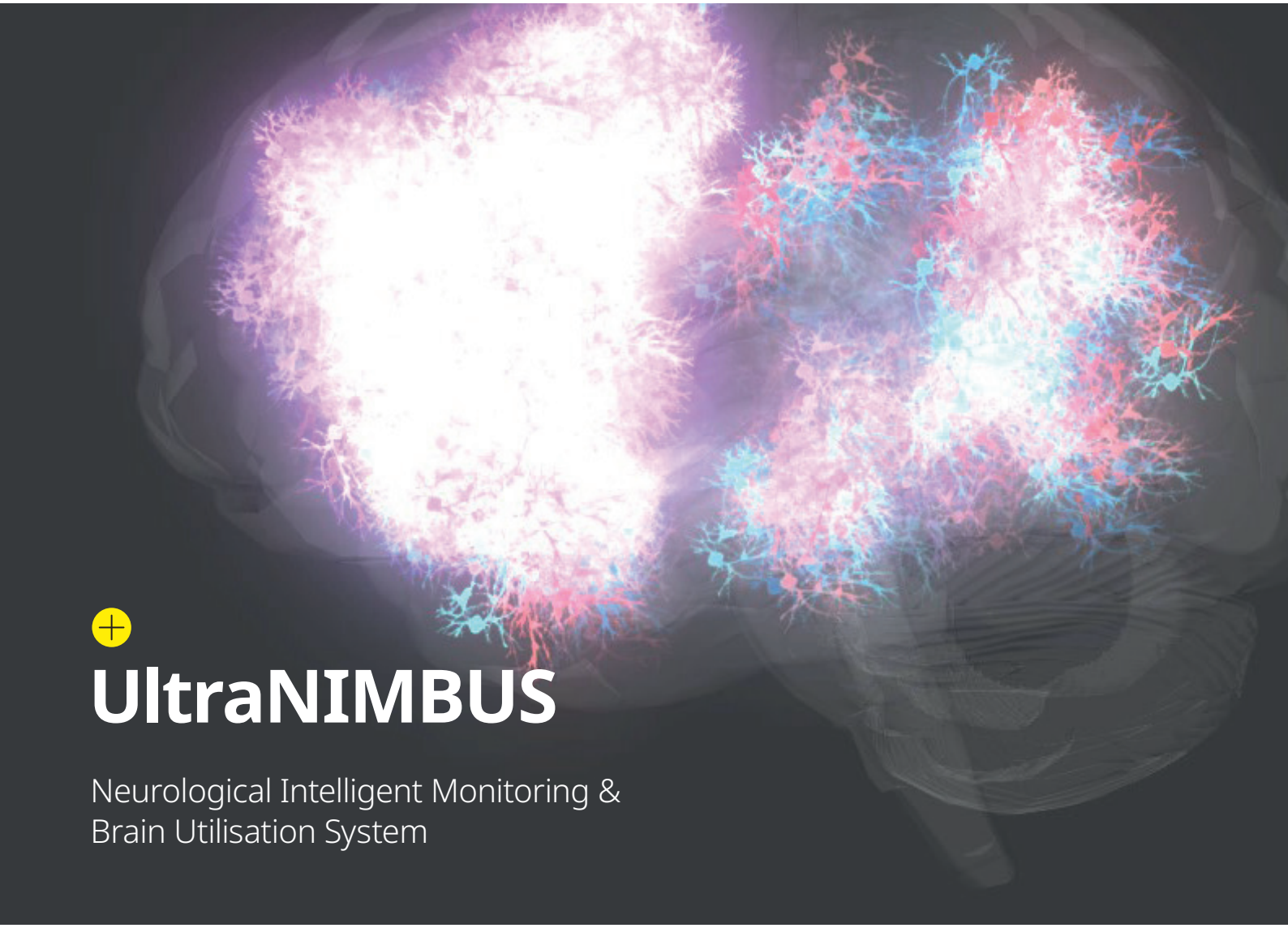

UltraNIMBUS

Neurological Intelligent Monitoring &
Brain Utilisation System

Overview

As programmes move forward to "digitise" the warfighter, then it is reasonable to expect their cognitive burden to increase, as more information, flowing in real time will need to be processed by the individual during increasing stressful missions.

The ability for a warfighter to self-regulate their emotional states impacts their immediate performance and long term health benefits. Increasing a their capacity for situational awareness, whilst staying on task in highly stressed situations, is key to optimising their performance and improving the impact on their physical and mental health.

UltraNIMBUS provides the means to harness the signals from the brain and integrate them with Heart Rate Variability to measure not only a true state of well-being but provide the possibility to control systems by thought alone.

Key features

- EEG sensors embedded into the helmet
- Algorithms hosted on UltraLYNX hub
- Wireless connectivity
- Local and remote monitoring
- Open architecture
- Supports any End User Device

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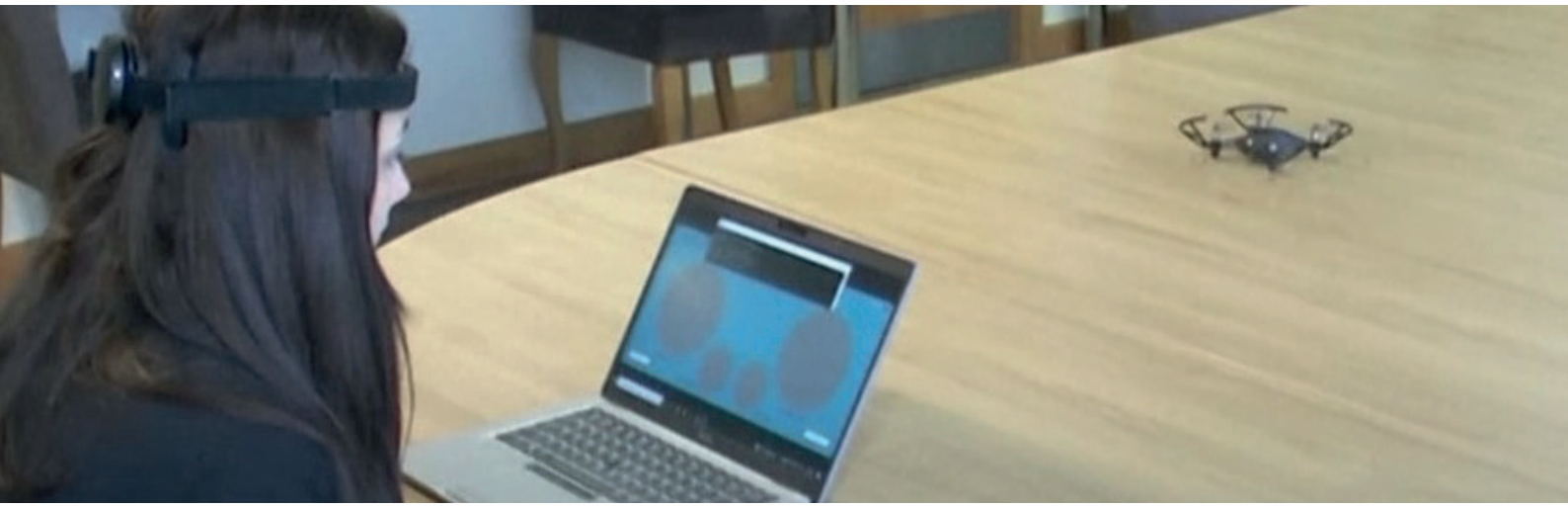


Features and specifications

Monitoring

Sensors embedded in the helmet provide electrical connection to the skull, where the low-level brain signals are detected.

Smart algorithms convert the raw data to meaningful timestamped feeds including indications of Stress, Interest, Focus and Engagement

Adding a device to measure Heart Rate Variability (HRV) and combining this with the brain signals gives a clear indication of Cognitive Burden and overall performance

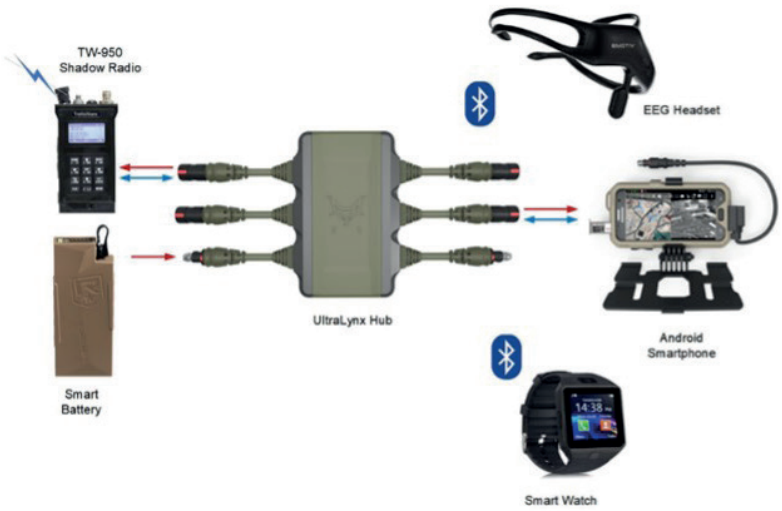
Control

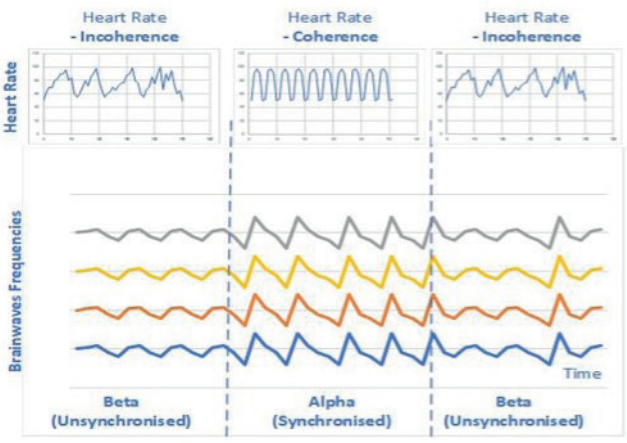
UltraNIMBUS can learn a variety of thought patterns that can then be mapped via the UltraLYNX hub to control any of the devices connected to it.

This makes it possible to control the radio, a camera or even an unmanned platform by thought

Training

Warfighters are typically multi-tasking under stress. This is when performance reduces, energy in the brain is lost, concentration is diminished, and they make mistakes and wrong decisions. We practice going from a narrow focus to a divergent or open focus - this can reset the brain into coherence, reducing cognitive burden and increasing performance





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General hub specifications

Hub modes	Embedded host ('smart'). An embedded application processor is the USB host (ready to support advanced future architectures). The EUD (if present) can be either a USB host or USB device	Expansion 'dumb'. An external EUD is the USB host (plug and play support for current in-service architectures). 2. Facilitates 'daisy-chaining' of UltraLYNX hubs
PAN ports	• 6 USB Ports, ; 2x dual role (USB OTG) • High level of system scalability via 'daisy chained' expansion hubs • Robust circuit protection (overcurrent/overvoltage/reverse voltage	
Power input (all ports)	8-36V DC VBATT power input on all ports (multiple simultaneous power sources). 5V DC hold-up power input on two ports	
Data Bus	USB 2.0 high-speed MTT hub; 6x DFPs or 5x DFPs + 1x UFP. Data function of each port individually switchable between USB and SMBus	
USB-C PD	2x USB-C power delivery capable ports; enables EUD sinking host functionality	
HMI	Built-in-test/status LED	
Power consumption	Dumb: 0.7W typical, 1.0W max Smart: 1.0W typical, 1.5W max	
Dimensions	x 79 x 17 mm (4.9 x 3.1 x 0.7 in)	
Weight	200g (7.1oz)	
Colour	Tan 499, black	
Certifications	MIL-STD-810G, MIL-STD-461G, DEF STAN 00-35, IP68, CE, RoHS	
Temperature	Operating: -20 to 55°C (-4 to 131°F). Storage: -46 to 71°C (-51 to 160°F)	
Immersion	2 metres for 60 minutes; fully functional with connectors mated or unmated	
Reliability	MTBF: 20,000+hrs; high level of internal BIT coverage. Reversionary mode ensures availability of power	

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