UltraLYNX™
Smarter technology
at the tactical edge

# Intelligent Power &
Data Management

Ultra PCS has a 40+ year track record in design, development and manufacture of rugged electronics for military platforms.

We continue to produce innovative market leading solutions tailored for soldiers, operating bases and armoured vehicles.

As a member of the NATO and UK MoD working groups, we support the development of new Defence Standards and technologies.

Ultra's capabilities span:

- ⊕ Electronic Architecture solutions – Soldier and Vehicle
- ⊕ Power Management
- ⊕ Networking
- ⊕ Edge Computing
- ⊕ System Integration
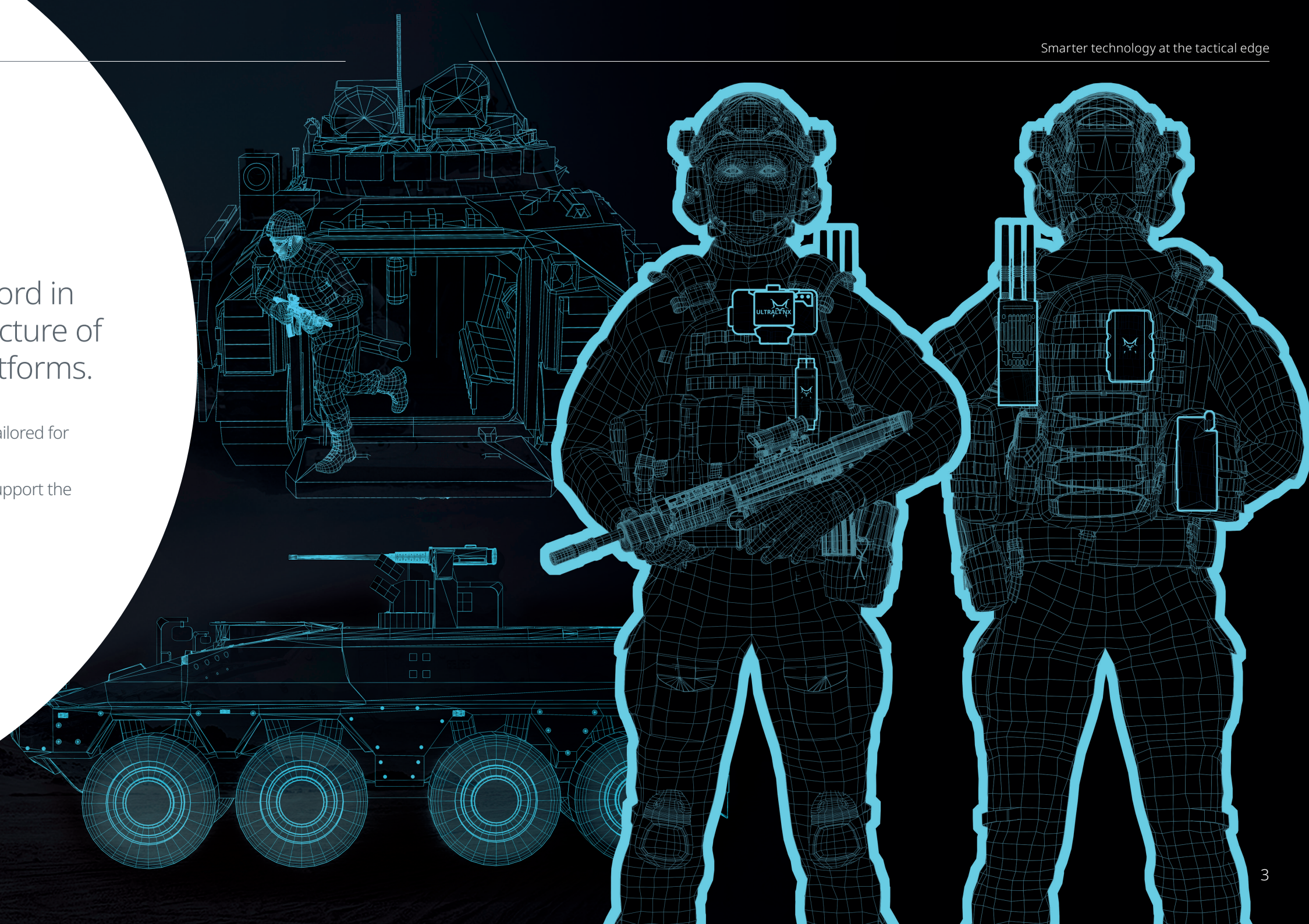
The **UltraLYNX™** journey

Ultra PCS first started working in the Soldier Systems space in 2009, building on its expertise in Vehicle Electronic Architecture to investigate how soldiers could be integrated into a digitised vehicle.

In 2012 Ultra PCS participated in a UK MOD Technology Demonstration Program (TDP), looking at Man Worn Power and Data. Following a second TDP in 2014, Ultra PCS launched its integrated power and data hub - CombatConnect.

Between 2015 and 2017, CombatConnect was evaluated by land forces in the UK, US, Australia and New Zealand. During this time, Ultra PCS collaborated with the MOD, DTSL and US Nett Warrior team, demonstrating how the "smart hub" approach could bring real benefit to the modern-day warfighter.

2017 saw CombatConnect successfully evaluated at both the UK AWE & US AEWE. Following feedback from these events Ultra PCS enhanced the hub design, making it possible to be internally integrated into body armour, or externally mounted in a conventional pouch.

Now in full production and known as UltraLYNX™, our product range provides options in both form factor and connectors. With embedded edge computing technology as standard, UltraLYNX™ is leading the way in advanced Soldier Systems.

UltraLYNX™
Software Defined Hubs

Miniature rugged soldier worn hubs with embedded edge computing capability.

Scalable and flexible open architecture that allows simplified integration of devices that were never designed to work with each other; hubs can be daisy-chained for system expansion.

Software defined capability aids interoperability and enables USB driver offload, network routing, middleware deployment and container hosting on the hub.

Future architectures employing devices such as weapon mounted HMI, HUD/HMDs and physiological monitors are simplified as the data infrastructure is managed within the hub.

Not dependent on an EUD; system operation and configuration are decoupled from the connected EUD.

Power distribution to connected devices from a central power source can be monitored and controlled through the built-in web-based user interface.
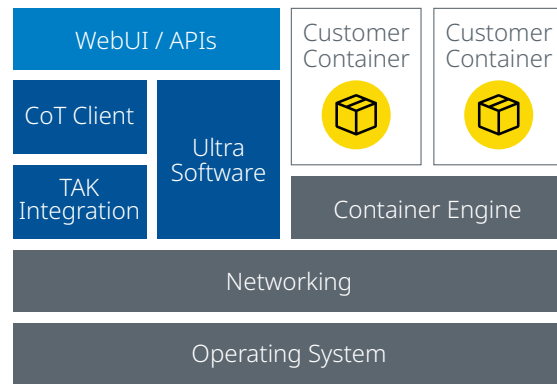
UltraLYNX™

Computing & Containerized apps at the edge.

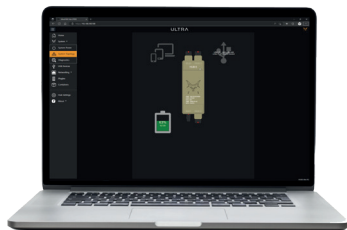### UltraLYNX™ Software Architecture

Future-proof: A configurable and upgradeable platform that simplifies integration and future-proofs the system.

Reduced complexity: The EUD sees one USB network interface which removes the need for custom EUD ROMs and reduces operator burden.

Open architecture: Connected devices and networks can be accessed by third party apps deployed in containers.

WebUI / APIs

Customer Container

Customer Container

CoT Client

Ultra Software

TAK Integration

Container Engine

Networking

Operating System

UltraLYNX™ WebUI & TAK Plugin

Configuration of the software-defined functionality is achieved via a built-in web-based user interface – no separate apps are required.

System presets are configured ahead of time to provide true plug-and-play functionality that is transparent to the operator.

An optional UltraLYNX™ TAK plugin makes essential power and system status information available to the operator whilst the open network APIs can be used to develop custom plugins for any BMA.

UltraLYNX™ Software Features

Power Management & Control
Monitoring of power usage per device & individually switchable power inputs / outputs

Tactical IP Networking
Multi-bearer IP bridging & routing to address the limitations of current architectures

USB Device Drivers
USB device driver offload and automatic device recognition / classification

BMA Integrations
Transparent integration of mission equipment with in-service apps to reduce operator workload

Field Loadable Software
Application software securely updatable in the field to support future capability uplifts

Web User Interface
Built-in web based UI for system setup & configuration of mission profiles

Secure Boot
Application software boot verification to prevent loading of malicious / unauthorized software

Plug & Play / Zeroconf
Minimize operator interaction with the system to deliver true zero configuration operation

Network APIs
Third party integration possible via APIs for power, status and management

OTA Reconfiguration
Over the air management and system configuration from a single node

Containerized Apps
Deploy additional third party functionality as virtualized apps e.g. edge TAK Server container

Routing / Tactical Gateway
Configuration of advanced routing, firewall, NAT, QoS, etc to provide the flexibility to support all required network architectures

UltraLYNX™
Software Defined Hubs

Embedded processor specifications	
CPU	Low-power 700MHz ARM Cortex-A
Memory	512MB RAM (1GB option). 8GB non-volatile storage (64GB option)
OS	Custom embedded Linux OS with sub 10s boot time
Security	Software integrity verification and secure boot. Read only OS – no data at rest
Wireless	Bluetooth v4.2 central and peripheral. Embedded ISW option in development

Alternative connectors & form factors...

...same architecture & embedded processing capability

Common specifications		
Hub modes	Smart (embedded host): the embedded application processor is the USB host	Dumb (expansion): daisy-chaining & drop-in support for current systems
Power	Smart: 1.0W typ, 1.5W max	Dumb: 0.7W typ, 1.0W max
Environmental	MIL-STD-810G, MIL-STD-461G* -20 to 55°C (-4 to 131°F) operating, -46 to 71°C (-51 to 160°F) storage IP68, 2m immersion for 60 minutes	
Reliability	20,000+hrs MTBF with high level of internal BIT coverage Reversionary mode ensures availability of power	

6 port hub power & data specifications	
PAN ports	6 GSA and Nett Warrior compatible smart ports Robust circuit protection (overcurrent/overvoltage/reverse voltage)
Power inputs	8-36V DC Vbat power input on all ports (multiple simultaneous, user selectable) Primary and secondary batteries, auxiliary and scavenged power sources
Power outputs	Vbat power outputs: 5.0A max per port (max 5.5A hub total) 5V DC power outputs: 2x 1.5A + 4x 0.5A (max 5.0A hub total)
Data	USB 2.0 high-speed MTT hub; 6x DFPs or 5x DFPs + 1x UFP (mode dependent) Data function of each port individually switchable between USB and SMBus
USB PD	2x USB Power Delivery capable ports; enables EUD sinking host functionality
Physical	Dimensions: 125 x 79 x 17 mm (4.9 x 3.1 x 0.7 in), Weight: 200g (7.1oz) (rectangular connector variant)

4 port hub power & data specifications	
PAN ports	4 Nett Warrior compatible ports (1x Power, 1x EUD, 2x PAN) Robust circuit protection (overcurrent/overvoltage/reverse voltage)
Power inputs	1x 8-36V DC Vbat power input - 1x bidirectional power for holdup from radio power Primary and secondary batteries, auxiliary and scavenged power sources
Power outputs	Vbat power outputs: 5.0A max per port (max 5.5A hub total) 5V DC power outputs: 3x 2.0A (max 5.0A hub total)
Data	USB 2.0 high-speed MTT hub; 3x DFPs or 2x DFPs + 1x UFP (mode dependent)
USB PD	1x USB Power Delivery capable ports; enables EUD sinking host functionality
Physical	Dimensions: 142 x 42 x 19.5 mm (5.6 x 1.65 x 0.77 in), Weight: 140g (4.9oz)

Our UltraLYNX™ range is fully supported with a range of cables and textile options.

Our Cheltenham facility is the centre of excellence for UltraLYNX™ technology.

From concept through to qualification, we have a dedicated engineering & software team, combined with in-house test facilities to continually evolve the product range.

The UltraLYNX™ technology is fully supported by manufacturing facilities in the UK and USA.

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