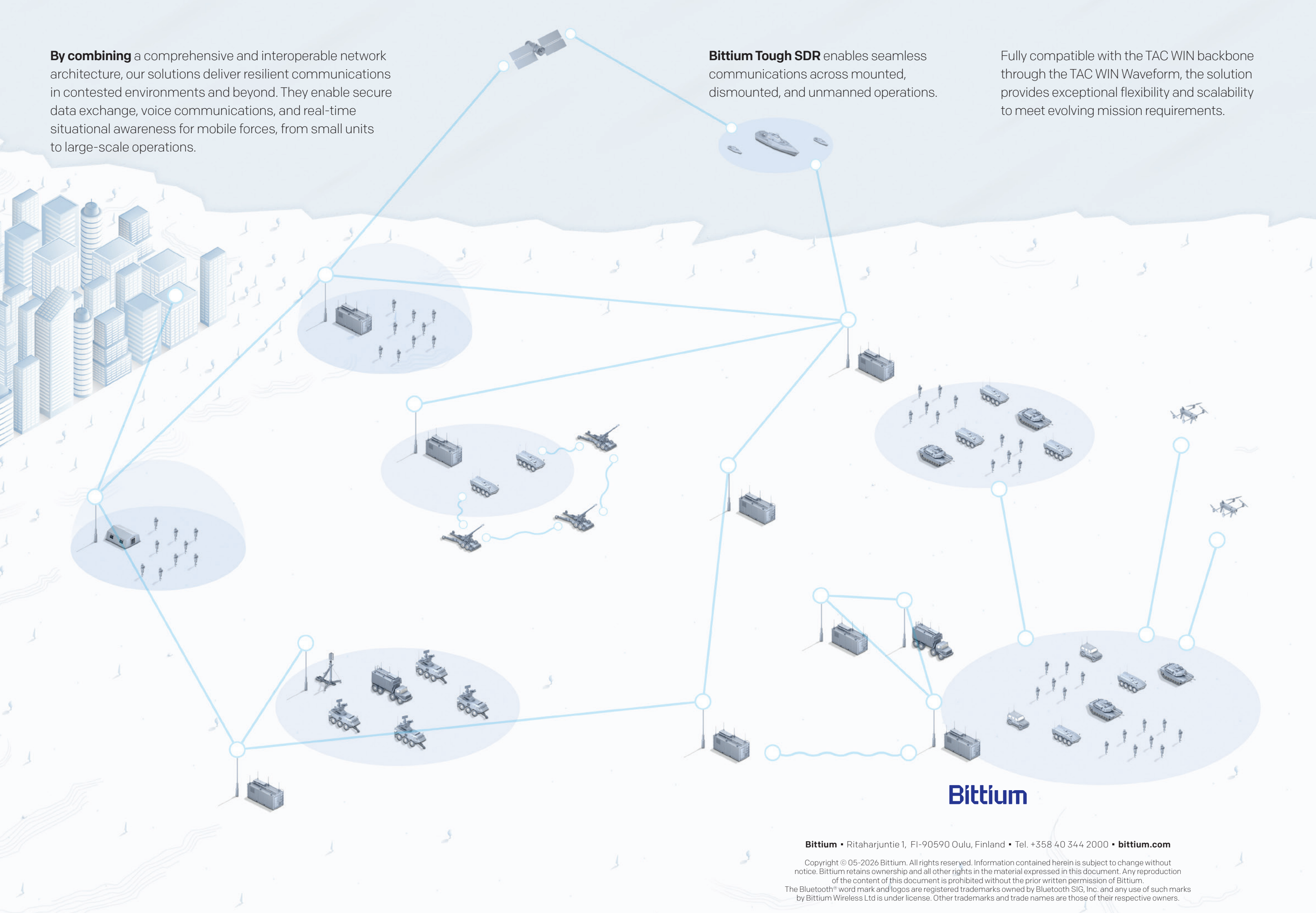


By combining a comprehensive and interoperable network architecture, our solutions deliver resilient communications in contested environments and beyond. They enable secure data exchange, voice communications, and real-time situational awareness for mobile forces, from small units to large-scale operations.

Bittium Tough SDR enables seamless communications across mounted, dismounted, and unmanned operations.

Fully compatible with the TAC WIN backbone through the TAC WIN Waveform, the solution provides exceptional flexibility and scalability to meet evolving mission requirements.



■ BITTIUM TOUGH SDR™

Next-generation tactical radios for soldiers, vehicles, and platforms

Bittium • Ritaharjuntie 1, FI-90590 Oulu, Finland • Tel. +358 40 344 2000 • bittium.com

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Bittium
■ DEFENCE & SECURITY

BITTIUM TOUGH SDR™

The software defined vehicular and handheld tactical radios provide voice and data over the widest frequency range, and the highest data throughput across several frequency bands. Together with flexible configuration options and routing networks, the radios support even thousands of radios in one network.

With the radios, troops can communicate securely over narrowband and wideband waveforms, including ESSOR High Data Rate Waveform. Also legacy and national proprietary waveforms can be ported to the radio with national COMSEC and TRANSEC. The unique application sandbox provides flexibility for integration of different C2 applications, such as BMS and blue force tracking. The radios and the waveforms can be security certified nationally and internationally by the customer or a 3rd party.

Waveform catalogue

- Bittium Narrowband Waveform™ (50 kHz)
- Bittium TAC WIN Waveform™ (5/10 MHz) with data throughput up to 36 Mbps
- ESSOR High Data Rate Waveform (1.25 MHz) with data throughput up to ~700 kbps. NATO STANAG 5651.
- Radios support also porting of legacy and national proprietary waveforms

Device and network management

- Bittium Tactical Device Management™ for secure and easy management of tactical devices prior, during and after deployment.
- Bittium Tactical Configuration Tool™ for easy and intuitive planning of communications and exporting waveform configurations
- Bittium Tactical Network Management™ for comprehensive network planning communications and creating wavelfrom management

Tactical VoIP service

- Integrated Bittium Tough VoIP Service™ (see separate datasheet for more information)

Security

- Red/black separation
- Secured boot
- Tampering detection and response
- Emergency erase
- COMSEC and TRANSEC allowing implementation of national algorithms
- Application Sandbox for customer applications with development tools available

Benefits

- Widest frequency range providing frequency agility and less interference
- Support for several different waveforms, including ESSOR HDR WF (NATO STANAG 5651) for coalition interoperability
- Porting also for legacy and national proprietary waveforms
- Support for several routing networks and even thousands of radios in one network with built-in routing between channels
- Best-in-class user interface and usability for easy operation
- Application sandbox for flexible integration of C2 applications, such as BMS and blue force tracking
- Access to information security implementation and certification both nationally and internationally
- Utilizing latest mobile technologies
- Compatible with Bittium Tactical Wireless IP Network™ (TAC WIN)
- Wired or wireless integration of Tough SDR Handheld to soldier tablets or smartphones, such as Android based Bittium Tough Mobile product family



Founding Member of
a4ESSOR and Developer
of ESSOR Waveforms



For more information, please contact:
defence@bittium.com

BITTIUM TOUGH SDR VEHICULAR™

High performance and secure vehicular radio with two independent channels



Physical interfaces

- **Antenna**
Two RF antenna ports
- **Antenna control**
External antenna control interface for antenna tuning or other control
- **Audio**
Two analog audio interface ports with dual PTT support. One port with additional HMI USB support and other with power amplified audio for external speaker. Support for intercom integration in both ports
- **LAN/WAN**
Two 1 Gbps Ethernet ports with PoE IEEE 802.3af
- **Data**
I/O interface with combined 100M Ethernet and USB 2.0 (Device and Host mode)
- **GNSS**
Interface for an external GNSS (GPS and Galileo) antenna
- **Extension slot (optional)**
Extension card slot for mini-PCIe form factor modules such as LTE/5G, mass memory, etc.

Wireless interfaces

- WLAN 802.11 b/g/n
- Bluetooth® 4.2

HMI

- **Display**
Transflective TFT LCD (320 x 426)
- Status LEDs
- Keypad
- **Rotary switch**
A rotary switch with 12 positions: OFF, 1–9 presets, REMOTE and ERASE

Technical specifications

- **Frequency range**
ANT1: 225 MHz to 2500 MHz
ANT2: 30 MHz to 512 MHz
Receiver: 30 MHz to 2500 MHz for both ANT1 and ANT2
- **Transmit output power**
ANT1: 40 W (PEP)
ANT2: 50 W (PEP)
- **Channel bandwidth**
ANT1: 25 kHz to 10 MHz
ANT2: 25 kHz to 5 MHz
- **Integrated co-site filters**
- **Power supply**
28 V DC according to MIL-STD-1275E
- **Environmental and EMC standards**
MIL-STD-810G w/CHANGE1
MIL-STD-461G

- **Temperature range**
Operating: -40 °C to +55 °C
Storage: -40 °C to +85 °C
- **Ingress protection class**
IP67, also for open connectors
- **Dimensions (H x W x D)**
210 x 270 x 300 mm
- **Weight**
15 kg
- **Material**
Surface treated aluminum alloy
- **Declaration of conformity**
CE

Standard accessories

- Vehicle installation kit with shock absorbers
- Several antenna types
- Several audio accessories

Bittium product code 9400133
NSN 5820-58-001-5343
NCAGE A850G

BITTIUM TOUGH SDR HANDHELD™

Secure communications for dismounted soldiers such as squad or platoon leader



Physical interfaces

- **Antenna**
Antenna port (TNC) for variety of antenna options. Default antenna for 30 – 512 MHz included
- **Battery**
70 Wh rechargeable Lithium-Ion battery
- **Audio**
Analog audio interface port to connect e.g. headset and external PTT device. Interface includes additional HMI USB support
- **Data**
I/O interface with combined 10/100M Ethernet and USB 2.0 (Device and Host mode)
- Dual PTT
- Integrated microphone and speaker

Wireless interfaces

- GNSS (GPS and Galileo)
- WLAN 802.11 b/g/n
- Bluetooth® 4.2

HMI

- **Display**
Transflective TFT LCD (320 x 426)
- Status LEDs
- Keypad
- Volume key
- **Rotary switch**
A rotary switch with 12 positions: OFF, 1–9 presets, REMOTE and ERASE

Technical specifications

- **Frequency range**
30 MHz to 2500 MHz
- **Transmit output power**
up to 5 W (PEP)
- **Channel bandwidth**
25 kHz to 10 MHz
- **Integrated co-site filters**
- **Power supply**
9 V DC to 13 V DC with 10.8 V DC nominal operating voltage
- **Environmental and EMC standards**
MIL-STD-810G w/CHANGE1
MIL-STD-461G
- **Temperature range**
Operating (radio with battery): -20 °C to +55 °C
Operating (radio with remote battery pack): -40 °C to +55 °C
Storage (radio): -40 °C to +85 °C
Storage (radio with battery): -40 °C to +70 °C

- **Ingress protection class**
IP67, also for open connectors
- **Dimensions (with battery)**
245 x 79.5 x 48 mm
- **Weight**
800 g (radio unit), 1200 g (with battery)
- **Material**
Surface treated aluminum alloy/plastic
- **Declaration of conformity**
CE

Standard accessories

- Dismounted soldier kit including headset, MOLLE pouch, bodyworn kit for antenna
- Several antenna types

Bittium product code 9400132
NSN 5820-58-001-5342
NCAGE A850G