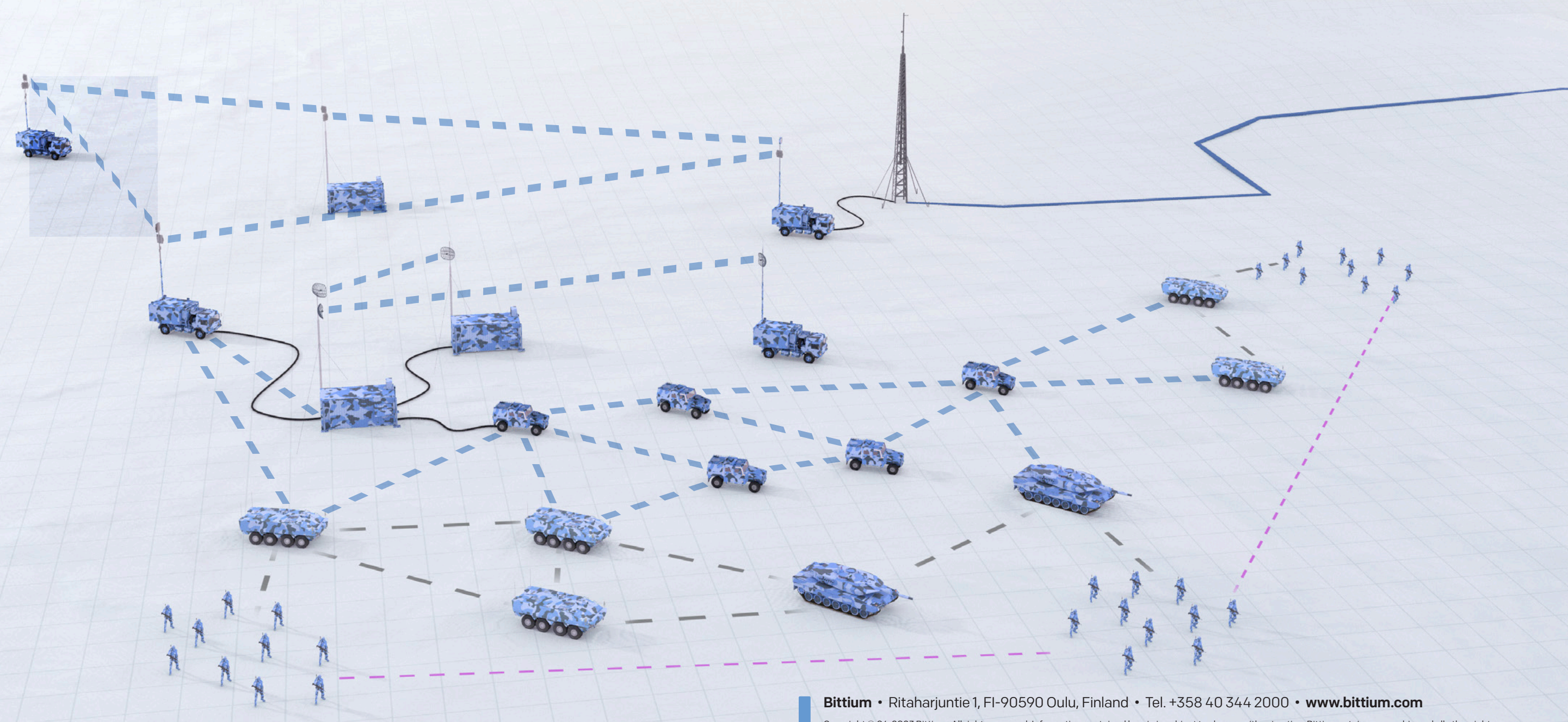


**Bittium Tough SDR Vehicular and Handheld radios** can also be integrated with the TAC WIN network. Combat vehicles can be installed with either TAC WIN Radio Heads or Tough SDR Vehicular radios to achieve the best possible solution. The combination of both systems is the perfect solution for connectivity and communications across the battlefield.

# Bittium

Bittium Tough SDR™  
 Next-Generation  
 Tactical Radios



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# Bittium Tough SDR™ Next-Generation Tactical Radios

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 25 Mbps
- › ESSOR High Data Rate Waveform (1.25 MHz) with data throughput up to ~700 kbps. Under ratification as 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, including software and device configurations and updates
- › Bittium Tactical Network Management™ for comprehensive network planning, management and analytics

### 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 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



FOR MORE INFORMATION, PLEASE CONTACT:  
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Founding Member of  
a4ESSOR and Developer  
of ESSOR Waveforms



# 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

# 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