









TeamEngage® Mesh

Advanced wireless mesh for mobile teams

- Low-power multi-hop mesh connectivity
- Autonomous team split and join
- SheerWave® radio equalization for multipath environments
- Secure AES-256 encryption
- Dual mode for mounted and dismounted operation

Secure, resilient, and reliable wireless mesh communications

Empower teams with RTX's mesh-based wireless intercom solution, designed for easy integration. TeamEngage® Mesh technology enables decentralized multi-hop communication, where each device acts as a Node in a self-configuring and self-healing network - enabling fast-moving teams to split up, roam independently, and rejoin effortlessly. By relaying voice traffic between Nodes without fixed infrastructure, TeamEngage® Mesh delivers extended coverage, autonomous connectivity, and resilient communication - ideal for teams using portable communications products in dynamic and mission-critical environments.

TeamEngage® Mesh keeps teams connected, coordinated, and in control

TeamEngage® Mesh is designed for easy integration into belt packs, dongles, headsets, and other professional portable communication devices used by prosumer and professional teams, who depend on robust and reliable communications - delivering clear, high-quality audio and secure real-time communications in the most challenging environments. With a wealth of features and benefits designed to address the needs of mobile teams, such as those supporting live event production, industrial sites, first responders, defense and military tactical teams, and other mobility-driven scenarios, where resilience and secure communication are essential - TeamEngage® Mesh helps teams stay connected, coordinated, and in control.

Advantages of TeamEngage® Mesh:

Simple integration
Runs on the compact RTX1090 and RTX1090R1 radio modules controlled via a simple API interface.

Dedicated and license-free spectrum
Operates in a dedicated, near-global coverage, license-free spectrum bands, minimizing interference from other wireless devices - vital for maintaining high-quality, uninterrupted communications.

Low cost and flexible solution
The small form factor of the RTX1090/R1 radio modules and flexibility of the TeamEngage® Mesh application allows for easy integration into many types of portable products, such as belt packs, dongles, and headsets for use in a variety of markets.

Secure and robust
Secure communications using AES-256 encryption complemented by a solution designed to perform in extremely challenging RF environments, such as large stadiums.

Last mile coverage with low RF footprint
Uses intelligent multi-hop technology where each Talker Node can relay communications across the network. This extends voice coverage up to 2 km without fixed infrastructure - while maintaining a low RF footprint for minimal interference and efficient spectrum use.

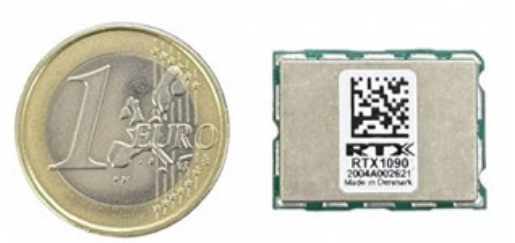
These advantages collectively contribute to a reliable, scalable, and secure wireless intercom solution for mobile teams.

Small form factor radio modules

TeamEngage® Mesh solution is available as a software application that runs on the RTX1090/R1 radio modules, providing a simple API interface for easy integration into customer products.

RTX1090/R1 are low-power and efficient radio modules with an incredibly small form factor that can easily be integrated into products, such as headsets to provide wireless connectivity.

RTX1090R1 radio module is a variant with an extended temperature and vibration range which makes it ideal for solutions used in outdoor and harsh environments.



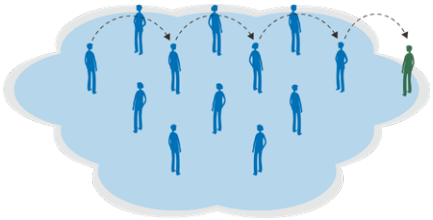
Providing communications for teams on the move

TeamEngage® Mesh requires no fixed infrastructure, e.g. when integrated directly into headsets, the TeamEngage® Mesh solution can communicate directly headset to headset without the need for a base station. By using multi-hop retransmissions, the effective range of the mesh system is extended without increasing RF power. The mesh system is also inherently robust since audio transmissions take multiple redundant paths resulting in less audio dropouts.

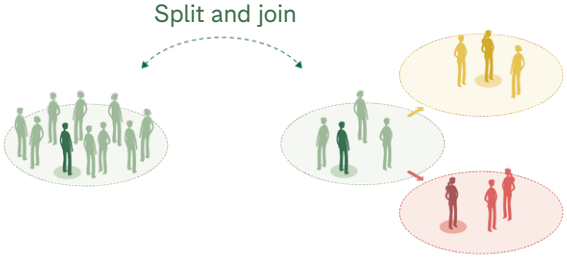
TeamEngage® Mesh provides an intelligent, autonomous self-configuring and self-healing network for mobile teams. Members of a team can split up into smaller groups, roam to perform their respective tasks and rejoin ad hoc as they move in and out of radio range of each group. All team members can communicate easily and freely with other members of their group at the same time.

To solve the change in operational needs when moving from a vehicle (mounted) to on foot (dismounted), TeamEngage® also offers dual mode. This allows users to switch between TeamEngage® Single- and Multicell solution, typically used in fixed installations in vehicles, and TeamEngage® Mesh as the team dismounts, so the team can hit the ground running.

Multi-hop retransmission



Split and join



Secure and robust communications

Secure voice communication is provided by incorporating AES-256 encryption ensuring that audio transmitted between Nodes is protected from unauthorized access. Additionally, TeamEngage® Mesh minimizes the chance of radio interference by automatically sensing the radio spectrum for clear radio channels in which to transmit.

To ensure a robust and reliable radio link, TeamEngage® Mesh incorporates both antenna diversity and RF equalization in the receiver. Antenna diversity allows TeamEngage® Mesh to select the strongest radio signal from two antennas, reducing audio dropouts in places where radio signals are likely to fade. Teams also often encounter poor wireless reception in certain environments, such as indoor, urban, and large stadiums and arenas where wireless signals bounce off buildings, walls, or complex terrain. These multipath signals arrive at the receiver from several directions at slightly different times causing interference and ultimately distorted audio. TeamEngage® Mesh helps solve multipath problems with the patented SheerWave™ radio equalizer, which “cleans up” the distorted multipath signals, delivering clear audio when it is needed the most.

Key features and benefits:

Wireless mesh
- Extended low-power RF range with Talker Nodes that retransmit communications forming a secure mesh
- Flooding protocol that includes inbuilt redundancy for resilient communications

Team split and join
- Allows teams to split up, roam independently, and rejoin
- Autonomous and seamless – no user intervention needed

SheerWave™ radio equalizer
- Combats radio signal distortion from multipath environments, such as large stadiums and buildings
- Improves robustness of communications with less dropouts

AES-256 encryption
- Security with AES-256 encryption
- Ensures that transmitted voice remains confidential

Dual mode
- Switch between TeamEngage® solutions for mounted and dismounted operations
- Optimal communications for different operational scenarios

Technical specifications

Supported radio compliance	
EU, US, Japan	• Please refer to the datasheet on RTX1090/RTX1090R1 communication modules
Features	
Operation range (node-to-node)*	• Indoor: 20-50 meters • Outdoor: Up to 500 meters
Operation range (mesh)*	• Indoor: 80-200 meters • Outdoor: Up to 2000 meters • Based on initial transmission and 3 retransmissions (hops)
Number of Nodes	• 16 talker nodes that can relay communications. No limit on listener nodes.
Number of simultaneous talkers	• 4
Operation time	• Average power consumption of RTX1090/R1 radio modules in TeamEngage Mesh operation: ~80mA
STD digital input/output (module)	• Wideband, 16kHz sample rate
Audio codec	• Wideband audio. Duplex audio communication
Audio frequency range	• 50-7000Hz
Environmental Noise Cancellation (ENC)	• Optional
Echo cancellation	• Optional
QoS	• Flooded Mesh (multiple redundant paths)
Latency (system)	• 50ms + (20ms x number of hops)
Initial synchronization	• Audio open within ~ 10s after power-up
Dual mode	• Switch between TeamEngage® Single/Multicell, when in transit (mounted), and TeamEngage® Mesh when on foot (dismounted)
RTX1090/R1 modules	
Radio	• License-free 1880MHz to 1930MHz • With radio bandpass filtering for enhanced resilience.
Operating temperature	• RTX1090: -20°C to 60°C • RTX1090R1: -40°C to 75°C
Humidity	• 30 - 95%, non-condensing
Environmental stress (RTX1090R1)	• IEC 60945 section 8.7 • MIL-STD-810 H, Method 516.8, Transit Drop & Option 1: Procedure I, Functional Shock or Crash Hazard Shock Test • MIL-STD-810 H, Methods 514.8, Vibration, Proc. I, General Vibration • MIL-STD-167-1A, 5.1.2.4.2 Exploratory vibration test
RF diversity	• Dual antenna and selects the antenna with the best signal
Frequency diversity	• Dynamic, selects RF channels for best signals
SheerWave® radio equalizer	• Combats multipath interference
Ordering details	
TeamEngage® Mesh Product Solution	• Contact RTX for more details at sales@rtx.dk

* Range depends on actual product design and environment

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