

Goodmill Systems w24h-S2 Managed Multichannel Router

Goodmill Systems' flagship multichannel router, the w24h-S2, is engineered to support demanding vehicle connectivity requirements. Proven in challenging field deployments worldwide, it delivers reliable performance for mission-critical communications. The router supports up to four simultaneous 5G/LTE broadband connections, providing high bandwidth capacity, link redundancy, and resilient connectivity in harsh and dynamic operating environments.

The Main Benefits

Best Broadband Connection Availability

- Combines up to four freely selected networks for broadband access
- Maximum network redundancy with Packet Duplication option

Optimize Your Multi-WAN Connectivity Select the Goodmill tunnelling mode that fits your needs:

- Scalability – best available single link
- Capacity – link aggregation or bonding
- Low latency – traffic duplication
- Ultra-reliability – duplicated traffic across links
- Option to separate mission-critical (MC) and non-MC data

Complete Security

- Connection is protected by up-to-date VPN techniques or organizations own end-to-end VPN
- Post-quantum secure tunnelling
- Onsite server installations (cloud is optional)
- All management traffic encrypted

Cost-Efficient

- Modular product design allows for updates to meet evolving needs
- Fast to install and operate with OTA approach
- Comprehensive OTA remote management, diagnostics, updates and configuration
- Perpetual licenses

Future-Proof

- Supports a wide variety of wireless network technologies (e.g. 5G, 5G-SA, 4G, 3G, LTE450, and Wi-Fi) with embedded mobile modules
- Easy upgrades for new network technologies with just an embedded mobile module change

Support and Maintenance Services

- Online support
- Software updates
- Product development meetings

The w24h-S2 is designed and manufactured in Finland for vehicle applications, ensuring high durability and reliability. **Field proven!**

The Goodmill w24h-S2 4th generation router delivers advanced wireless broadband connectivity for mobile Public Safety and Security (PSS) organizations, including police, military and defence forces, fire departments, and emergency medical services.

Designed for mission-critical operations, the router provides reliable, high-speed, and secure broadband connections between headquarters and mobile units. It supports the growing data demands of modern field operations, ensuring continuous communication and operational efficiency when it matters most.

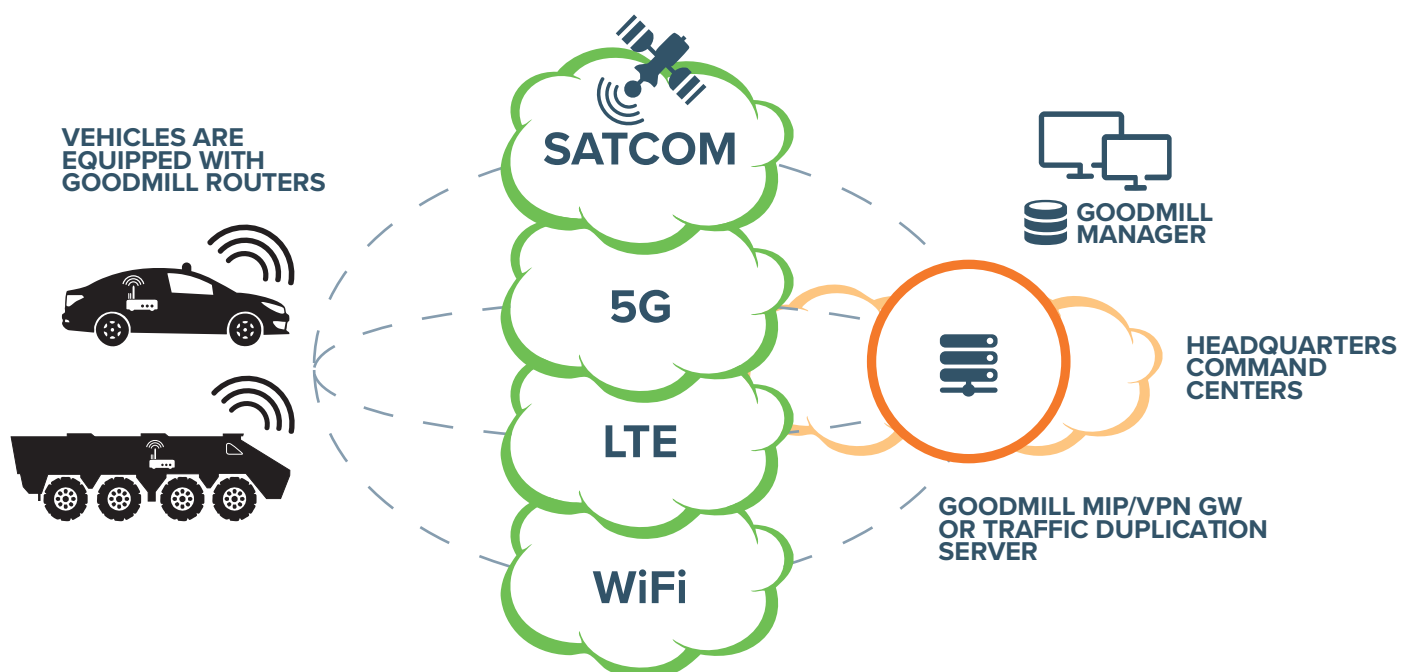
Goodmill routers are supported by the Goodmill Over-The-Air (OTA) Manager, a centralized remote management platform. It enables efficient configuration, monitoring, and maintenance of thousands of devices through a single, intuitive interface.



W24h-S2 PRODUCT FEATURES

Power supply	10-30V DC or optionally 100-240V AC Designed for vehicle use. Tolerates long start battery voltage drops	
Power Consumption	Max. 20W (Max 40W peak power)	
Temperature Range	-30°C to 60°C operative -40°C to 70°C storage	
LAN interface	Options to be used <ul style="list-style-type: none"> • 3 x GbE 10/100/1000 • 2 x Wi-Fi 6 <ul style="list-style-type: none"> • 802.11 a/b/g/n/ac/ax • 5 GHz or 2.4 GHz • Access point or station 	Connector RJ-45 SMA-F (x2) MIMO
Cellular WAN Interfaces	Up to 4 Cellular radio modules Options: <ul style="list-style-type: none"> • 5G NSA, 5G SA • LTE, LTE 450 • 5G HPUE Power Class 1.5 • LTE HPUE Power Class 2 	Connector SMA-F, 4x4 MIMO
Antenna connectors	14 SMA-F connectors to be flexible allocated to cellular and Wi-Fi modules 1 SMA-F connector for GNSS antenna	
SIM Cards	Four Mini-SIM card slots on the back plane Three eSIM (GSMA SGP.22)	
WAN Link Allocation	Options: <ul style="list-style-type: none"> • Active link selection • Traffic duplication • Mobile IP • Link Aggregation • Bonding 	<ul style="list-style-type: none"> • Tunnelling can bypass NAT and give fixed IP address (option)
Other interfaces	GPIO, 5 inputs + 5 outputs, using power supply voltage levels	
GNSS	Supported systems <ul style="list-style-type: none"> • GPS • Galileo • GLONASS • BeiDou Positioning information sent to a location system by using NMEA protocolActive/passive antenna connector SMA-F Dead Reckoning, Optional Dual-band (L1/L5) support	
IP addressing	Fixed or dynamic with DHCP, NAT, VLAN 802.1Q support, option for IPv4/v6 dual stack	
Security	802.1X RADIUS authentication on Wi-Fi and Ethernet ports MAC filtering VLAN 802.1Q support IPSEC VPN for WAN and LAN connections Firewall	
QoS	QCI support DSCP based classification QoS queuing QoS based WAN link allocation CoDel active queue management	

VPN functionality	Supported on all priority level WAN links <ul style="list-style-type: none"> • IPSec from fixed IP address • IPSec from dynamic IP Encryption and key interchange functions supported. (e.g.): <ul style="list-style-type: none"> • RSA, ECDSA • IKEv2 • HMAC SHA-2 up to 512 bits • AES-256, AES-GCM • DH groups 1,2,5,14,15,16, 22, 23 and 24 • DH elliptic curve groups 19, 20 and 21
Firewall	Independently working for all network Interfaces <ul style="list-style-type: none"> • Stateful inspection • SNAT, DNAT, Port forwarding
Firmware upgrade	Locally or remotely over-the-air online. Both router firmware and module firmware upgrades. Reversible (Revert to previous stored version). Rolls back to working version automatically on upgrade error.
Network Management	Configuration, monitoring and firmware management of routers <ul style="list-style-type: none"> • HTTPS protocol for safety and security • Runs always on the active WAN connection
Compliance	Safety: IEC 62368-1:2023. CB certificate FI-60416 EMC: EN 301 489-1 V2.2.3, EN 301 489-17 V3.2.4, EN 301 489-19 V2.1.1, EN 301 489-52 V1.2.1, ECE R10:06 Vibration: MIL-STD-810H
Dimensions	H x W x L: 70 x 210 x 246mm (2,7" x 8,3" x 9,7") Weight < 2kg (<4.4lbs)
Enclosure	Solid Aluminium



AS PART OF A GOODMILL SYSTEMS PRODUCTS

1. GOODMILL OTA MANAGER

Remote Management System for Managing the Goodmill w24 Multichannel Router Family

Goodmill OTA Manager is a robust backend server platform designed to manage and monitor fleets of Goodmill w24 routers. The system securely scales to thousands of devices, enabling efficient deployment and lifecycle management of router installations.

With Goodmill OTA Manager, administrators can easily monitor the status of all connected routers and collect operational logs for diagnostics and analysis. Router configuration changes and firmware updates can be performed securely over-the-air, significantly improving operational efficiency and reducing the need for on-site maintenance in vehicles.

The server software license is included at no additional cost, making Goodmill OTA Manager a cost-effective and scalable solution for centralized router management.

2. GOODMILL TUNNELLING GATEWAY

A reliable solution for practically lossless mobile connectivity

Goodmill Tunnelling Gateway is a powerful Linux-based backend server that terminates data duplication tunnels created by Goodmill routers. By duplicating data across all available network links at the router, the system ensures a practically lossless connection between the router and backend services.

This approach also minimizes latency while allowing the router to dynamically select the connection that best meets the application's requirements, whether prioritizing the lowest delay or the highest bandwidth.

Tunnels can be secured using standard encryption and security algorithms, ensuring reliable and secure data transmission. Option for quantum safe perfect forward secrecy is available.

2.1. GOODMILL MIP GATEWAY

Alternative Backend Server for Mobile-IP and VPN Connectivity

Alternatively, the Goodmill MIP Server can be used as the backend solution. It is a powerful Linux-based server that terminates Mobile-IP and IPsec VPN tunnels from the Goodmill router fleet.

The Mobile-IP component enables seamless link switching and session persistence for Goodmill multichannel routers, ensuring uninterrupted connectivity even when network links change. The VPN component provides strong encryption and secure communication between routers and backend systems.

Goodmill Tunnelling and MIP gateways are designed to scale efficiently to multi-gigabit traffic loads and supports various failover and redundancy configurations, ensuring robust, reliable, and high-availability operation.

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