



# Ensuring Wearables Can Always Connect

Integration of satellite connectivity into watches delivers peace of mind for outdoor enthusiasts

## Executive Summary

- Wearing a smartwatch is often more convenient than carrying a phone. But, until recently, wearable devices have depended on cellular coverage to get online because integrating satellite connectivity into small form factor devices was difficult.
- By optimising the link margin through its software-defined radio access network and leveraging standard cellular chipsets, Skylo Technologies says it has solved the power-to-performance ratio that previously locked satellite connectivity out of the wearables market.
- Now Google's Pixel Watch 4 and Garmin's fēnix 8 Pro and quatix 8 Pro smartwatches have direct, standalone access to Skylo's non-terrestrial network (NTN), giving users the ability to connect to emergency services and share their location straight from their wrist, even without a phone.
- Skylo says it has ensured that critical SOS and "I'm safe" messages are delivered reliably. As a result, Skylo claims to have helped save hundreds of lives, including those of injured hikers and stranded motorists.
- Skylo's software-defined network is designed to be compatible with current and future LEO and GEO satellite constellations, meaning it can integrate new capacity as it comes online without requiring users to change their devices or SIMs.

## The challenge - integrating satellite connectivity into compact wearable devices

People engaged in adventure sports and outdoor activities increasingly rely on smartwatches to track their location, heart rate and movement, as well as supporting communications and other online services. If a runner twists an ankle on a trail, for example, they can often use a smartwatch to call for help.

Up until recently, however, wearable devices would lose connectivity outside terrestrial cellular coverage, reducing their usefulness in remote or rural locations.

Ideally, smart watches, like smartphones, would connect to satellites, when beyond the reach of terrestrial cellular networks. Always-available connectivity would enable their wearers to send SOS or "I'm safe" messages in the event of an incident. Some 93% of respondents cited "peace of mind" as the primary driver for satellite connectivity in a consumer survey conducted by Skylo Technologies, which is working with satellite operators to enable smartphones and other devices to access non-terrestrial networks (NTNs).

But integrating satellite connectivity into smartwatches has been very difficult - communicating with satellites 36,000 km above the earth requires significant power and antenna gain. This meant bulky external antennas, specialised proprietary hardware and heavy battery drain — impossible constraints for a sleek, all-day smartwatch. "Delivering a reliable link budget and functional transmit power within the thermal and battery envelope of a consumer wearable, using only standard cellular protocols, has been a major challenge," notes Tarun Gupta, Co-founder and Chief Business Officer of Skylo Technologies.

Users also need a solution that works seamlessly across borders without swapping SIMs or devices, but the fragmentation of satellite spectrum has previously made global roaming impossible for small devices.

## The solution - using software and standards to optimise the power-to-performance ratio

Rather than asking device makers to build bigger watches, Skylo is building a smarter network. By optimising the link margin through its software-defined radio access network (RAN) and leveraging standard cellular chipsets, Skylo says it has solved the power-to-performance ratio that previously locked satellite connectivity out of the wearables market.

In August 2025, Google launched the Pixel Watch 4 - the world's first wearable to have direct, standalone access to Skylo's network, enabling users to connect to emergency services and share their location straight from their wrist, even without a phone. The Pixel Watch 4 uses Qualcomm's Snapdragon W5+ Gen 2 chipset, which is specifically designed to enable small form factor wearable devices to access satellite connectivity. Optimised for ultra-low power consumption, Snapdragon W5 Gen 2 supports longer battery life, without compromising performance or user experience, according to Skylo, which helped Qualcomm develop the solution.

"We have addressed the critical "battery anxiety" of wearables," says Tarun Gupta. "Skylo's specific optimisations of the discontinuous reception (eDRX) cycles allow these watches to maintain satellite standby without excessive draining of the battery. This balances the need for constant connectivity with the practical reality of wearable battery life. Overcoming immense power constraints, our network connects standard smartwatches directly to existing satellites without dongles or tethered phones." End-users can now use Skylo's direct-to-device satellite connectivity for messaging and texting, as well as emergency SOS capabilities, even in the absence of a smartphone.

Taking a device-agnostic, software-based approach to satellite connectivity, Skylo announced a collaboration with Garmin in September 2025. As a result, Garmin's new fēnix 8 Pro and quatix 8 Pro smartwatches enable



users in the non-contiguous US, Canada and Europe to send and receive text messages and share live GPS coordinates. The partnership extends Skylo's connectivity to devices outside the Android ecosystem and brings its "peace of mind" proposition to more consumers.

Skylo says its NTN service now supports nearly 13 million activated devices across 70 million square kilometres in 36 countries, spanning North America, Europe, Brazil and parts of Asia and Oceania. Skylo's software-defined, cloud-native NTN stack employs 3GPP protocols. As a result, Skylo says it looks exactly like a standard terrestrial roaming partner to a mobile operator's core network. In 2025, Skylo announced and expanded partnerships with several mobile operators, including Verizon, Orange, Tele2, KPN, Charter, Comcast, and O2 Telefónica.

To ensure compatibility with its NTN, Skylo runs a device certification programme. For the Pixel Watch 4 and the new Garmin watches, Skylo utilised this programme to work at the chipset firmware level with chipset partners (Snapdragon W5+ Gen 2 and Sony Altair ALT1250). "Our strict certification programme ensures that the modem has the right features needed to close the link and operate efficiently on satellite networks without impacting the device performance," explains Tarun Gupta. "Our rigorous over-the-air testing ensures every milliwatt of power and each hertz of spectrum is used effectively and efficiently." Skylo says it has now certified more than 80% of the world's leading cellular chipsets for its network, ensuring a pipeline of more than one billion capable devices annually.

For the Pixel Watch 4, Garmin fēnix 8 Pro and Garmin quatix 8 Pro, Skylo connectivity is embedded at the factory. Skylo's eSIMs are integrated natively into the devices during assembly, to ensure out-of-the-box connectivity without complex user provisioning. The device manages the handover: when terrestrial coverage is lost, the Skylo-certified modem scans for a satellite. The watch interface guides the user to align the device's face with the satellite — a process Skylo optimised to be intuitive on a small screen to enable a good customer experience.

Skylo places great emphasis on reliability through redundancy, as well as standards compliance. "We operate across several satellite partners, with

hundreds of individual 'cells' or spot beams, providing overlapping coverage layers across four continents." adds Tarun Gupta. Claiming to be the first global NTN operator built strictly on 3GPP standards, Skylo is harnessing the security architecture (SIM authentication, encryption, integrity protection) of the cellular world, meaning there is no need to change user behaviour.

## Impact - real-time messaging that can save lives

Skylo says it is consistently delivering an average message delivery latency of less than 15 seconds, and ensuring that critical SOS and "Checking in!" messages are delivered reliably. As a result, Skylo claims to consistently save lives, including those of injured hikers and stranded motorists.

"For emergency response, we have gone beyond basic messaging," explains Tarun Gupta. "Skylo has built deep integrations with Android and Garmin Response. This is not a simple text relay; it is a fully integrated, concierge eSOS experience." When a user triggers an SOS, data are instantly transmitted to Garmin for immediate action. "We are honoured that we have been able to help people in need for those times when they are outside of cellular coverage." adds Tarun Gupta.

Framing the integration of satellite connectivity into wearable devices as a new paradigm for the

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Tarun Gupta - Co-founder and Chief Business Officer of Skylo Technologies.

telecommunications and device industries, Skylo says it enables deeper relationships between device makers and mobile operators while unlocking new solutions for consumers. The company aims to open up new revenue streams and create stronger “retention drivers.”

By embedding a Skylo SIM profile at the assembly line, device makers can offer “universal coverage” features directly to consumers, bypassing the traditional carrier activation actions associated with emergency services. In this model, Skylo operates as the default carrier—or service provider of record—managing provisioning, regulatory compliance, licensing and service delivery.

At the same time, Skylo also supports carriers that prefer to use their own SIM profiles, giving consumers the flexibility to choose their network service provider.

## Next steps - scaling across constellations and devices

Having built a standards -based solution that is both multi-orbit and hardware-agnostic, Skylo’s technology is scaling globally. “Our scalability is defined by our software-defined architecture,” stresses Tarun Gupta. “Because our technology abstracts away all the complexity of disparate space-based networks from the OEMs, carriers and end users, we can integrate new capacity as it comes online without requiring users to change their service provider. ”

“By evolving with and beyond 3GPP standards, Skylo ensures that as 5G NTN evolves, our network, and the devices connected to it, will evolve as the industry and customer needs grow, ” adds Tarun Gupta. “We are building the global connectivity fabric for the next decade of mobile devices.”

In addition to NB-NTN, Skylo is developing a full 5G New Radio (NR) NTN stack aimed at delivering broadband-like speeds and lower latency for next-generation consumer and automotive applications, moving well beyond simple messaging into real-time data streaming.

“Skylo’s technology isn’t limited by form factor,” concludes Tarun Gupta. “It has now been demonstrated on phones, cars, industrial IoT solutions, and is now available through smartwatch wearables. We’ve built an integrated experience from the ground up, paving the way forward for the entire industry to embrace enhanced connectivity in their products and services.”

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## About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

For more information, please visit the GSMA corporate website at [gsma.com](https://gsma.com)

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## About the GSMA Foundry

The GSMA Foundry is the go-to place for cross-industry collaboration and making positive change happen, supported by leading technology organisations and companies. By bringing together members and key industry players, engaging, and unifying the end-to-end connectivity ecosystem, the GSMA is solving real-world industry challenges.

Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. This enables the mobile industry's mission: to connect everyone and everything to a better future.

Find out more, or submit a new project idea, at [gsma.com/Foundry](https://gsma.com/Foundry)

## About Skylo

Skylo Technologies is a global Non-Terrestrial Network service provider based in Mountain View, CA, offering a service that allows smartphones, wearables, vehicles, and IoT cellular devices to connect directly over existing satellites. Devices connected over satellite are managed and served by Skylo's commercial NTN vRAN, featuring a 3GPP standards-based cloud-native base station and core. Skylo works with existing satellite operators, network operators, and device makers to provide subscribers an anywhere, anytime connectivity solution between terrestrial and satellite networks. Skylo's focus is on enabling connected services for people outdoors and connected workflows for machines at work across critical industries such as agriculture, maritime, logistics, mining, and others, in addition to mass-market consumer devices.

For more information, visit: [www.skylo.tech](https://www.skylo.tech)

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