

# CLIENT: ECHOSTAR MOBILE

## Use cases



### CONNECTED ONE

Stay Connected, Stay Safe  
When Going Off-Grid

USE CASE

EchoStarMobile connected


### INTRODUCTION: EXPLORING THE COVERAGE GAP

Going out into isolated locations is always a risk. If you experience an issue, getting help is often not straightforward, with coverage for communication networks limited or non-existent.

However, connectivity technology is advancing, and now solutions are available to not only help you send a distress signal if an emergency occurs but also communicate with friends or family back home as needed.

Forward thinking IoT solutions provider **Connected One** was founded in 2023 to bridge the digital divide and provide easily accessible connectivity for everyone, everywhere, everywhen. Its team recently launched **Connected One**, an innovative IoT solution designed to address and mitigate the risks involved with going off-grid. This solution enables users to turn their everyday smartphone into a satellite-connected device that provides reliable connectivity in even the most remote locations.


In this use case, we explore the features and benefits of Connected One, the challenges it helps overcome and examples of the applications where it offers value. We also share how Connected One has partnered with EchoStar Mobile to integrate direct-to-satellite connectivity into its new IoT solution and ensure reliable connectivity in remote locations. Finally, the future is addressed, looking at how Connected One aims to evolve this technology and enhance its advantages.



Our IoT solution Connected One ensures reliable connectivity in remote locations.

### KEY BENEFITS: THE UNIQUE ADVANTAGES OF CONNECTED ONE

- An End-To-End Solution**  
Connected One provides everything you need to communicate reliably when traditional forms of connectivity fail. It comprises all the necessary software and technology to provide an end-to-end communication solution.  
For example, when writing a message on the app, it is transmitted via Bluetooth to Connected One, where the integrated antenna in the EM2050 sends it to the satellite. Leveraging EchoStar Mobile's network architecture, the message is delivered to Connected and then to your recipient.
- Lightweight, Resilient Design**  
At a size of just 90 mm x 50 mm x 30 mm and with a lightweight design of less than 100 grams, Connected One is perfect for putting in your backpack and heading off on your adventures.  
It is also water-resistant (IP65), meaning it will continue to operate in the rain or when subject to splashes from a boat. For complete waterproofing capability, you can easily place Connected One in a waterproof bag, and with its simple three-button operation, it continues to be easy to use.
- Affordability for the Everyday Adventurer**  
Connected designed Connected One as a consumer product, seeking to enhance safety for all via an accessible means of connectivity. With affordable subscription plans, Connected One fulfills that need and offers a valuable safety device for anyone venturing off-grid in remote locations.



### MARITIME ASSURANCE: ADVANCED VESSEL MONITORING THROUGH SATELLITE AND IOT INTEGRATION

USE CASE

EchoStarMobile CYRICIoT


### MARITIME ASSURANCE: ADVANCED VESSEL MONITORING THROUGH SATELLITE AND IOT INTEGRATION

Owning a yacht or private boat is often regarded as a symbol of luxury, freedom, and adventure across the sea. Yet, for many smaller yacht or boat owners, it's not all clear skies and smooth sailing.

Sailing on the open waters, boats and yachts are susceptible to a myriad of maintenance issues, such as wear and tear from harsh marine conditions, engine overheating, water ingress, and electrical and navigation system failures. All of these demand vigilant monitoring and timely intervention to ensure safe and enjoyable voyages.

During the off-season, more and more owners are choosing to leave their vessels docked in marinas, escalating the costs associated with maintaining their seacraft. Keeping yachts or boats in the water when not in regular use increases the risk of damage or deterioration. Employing a solution for remotely monitoring a docked vessel will minimise this deterioration and allow owners to tackle developing maintenance issues before they become too costly.

This use case shares how innovative IoT technology can collect and transmit data that determines the condition of owners' vessels while docked but also when navigating the open sea. As well as reviewing the terrestrial connectivity options that enable this data transfer, the use case also explores how advances in satellite solutions enhance this technology's capabilities and deliver added benefits for yacht and boat owners where no terrestrial connectivity exists.



### THE CONNECTIVITY BEHIND CYRIC'S MARITIME MONITORING PRODUCT

To overcome this challenge, **CYRIC IoT** has designed a product offering an integrated solution for all these sensors and any others required by vessel owners. As a pioneer in the deployment and operation of LoRaWAN® wireless networks and LoRaWAN®-based solutions, CYRIC has developed this product in response to the challenges faced by vessel owners wanting to monitor the safety and security of their vessels when docked and while sailing offshore.

As an end-to-end IoT solution, this compact yet powerful product streamlines the monitoring of multiple sensors, data logging all inputs to offer a comprehensive overview of the vessel's condition over time via a bespoke IoT platform. The product can be tailored to each owner's requirements, setting alerts based on levels appropriate to their unique needs. Such a consolidated approach to remote monitoring significantly enhances the ease of management for yacht and boat owners, ensuring their vessels remain in pristine condition.

CYRIC first developed its maritime monitoring product to leverage terrestrial LoRaWAN® (Long Range Wide Area Network) technology to facilitate remote monitoring.

The long range, low power capabilities of the LoRaWAN® protocol makes it a viable solution for monitoring docked vessels.

However, the innovation didn't stop there. Recognising that access to terrestrial networks can be limited or unavailable in many maritime locations, hindering the product's real-time data transfer, CYRIC evolved the product to utilise EchoStar Mobile's direct-to-satellite pan-European LoRa®-enabled networks.



- Door Sensor
- Smoke & Fire Sensor
- Temperature & Humidity
- GPS Location & Fencing
- Battery Monitoring
- Local Weather Reports
- Bilge Water Sensor
- Boat Heave & Roll
- Hull Impact Sensor

# CLIENT: ECHOSTAR MOBILE

## Use cases



### REMOTE MONITORING OF RENEWABLE ENERGY SITES A UTILITIES USE CASE

EchoStar Mobile

### HEADLINES

- Renewable energy generation is expected to expand by more than 8% this year, the fastest year-on-year growth in 30 years.
- To meet industry goals of safety, reliability, productivity and cost-efficiency, successful monitoring of all operations is required.
- Combining the expertise of its distribution partners and our satellite and hybrid communication capabilities, EchoStar Mobile's solution fulfils the highlighted industry goals, offering many benefits for the provider and its end customers.
- With many sites in hard-to-reach locations, remote monitoring, using IoT and video streaming technology supported by high-quality satellite coverage, is the optimal way to achieve these goals.
- Looking at the requirements of hydropower generation specifically, EchoStar Mobile has designed a use case to illustrate how effective remote monitoring can be achieved.

2 REMOTE MONITORING OF RENEWABLE ENERGY SITES - A UTILITIES USE CASE

EchoStar Mobile

### A USE CASE FOR REMOTE MONITORING

#### THE CHALLENGE

With many hydropower sites situated in remote locations across Europe, monitoring operations is challenging. These sites are often unmanned and in extremely remote areas. During the winter, weather conditions are often harsh, causing changes in water levels and fallen debris that can lead to blockages.

Historically, field technicians would need to attend the site regularly, particularly after winter storm activity, to review the operations, checking for blockages around the reservoir gates that would negatively affect activity. Travelling to these locations and completing these evaluations is dangerous, particularly after bad weather, with many potential hazards that could affect the safety of the field technicians. Furthermore, with no understanding of what conditions, hazard or issue is awaiting them, the field technician risks arriving without the necessary tools, equipment or even skills to tackle the problem, necessitating a return trip with further costs, complexity and pitfalls.

Remote monitoring provides the ideal solution, negating the need for onsite visits. Using satellite coverage and innovative hardware to support IoT applications and video technology, the obstacles presented by this challenging environment can be overcome.

5 REMOTE MONITORING OF RENEWABLE ENERGY SITES - A UTILITIES USE CASE

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### SMART WATER METERING USE CASE

EchoStar Mobile GALAXY

### DRIVING SCALABILITY AND EFFICIENCIES IN WATER METERING

At the beginning of this year, [Water UK](#) urged the public to add 'saving water' to their New Year's resolutions list. We're all well aware of the importance of water, yet Water UK explains that many of us don't know how much we use and waste.

Reporting on recent research, the organisation revealed that 94% of people underestimate the amount of water they use per day. Furthermore, when estimating water wastage, over half (61%) thought a faulty toilet flush wastes less than 50 litres when it actually wastes between 215 and 400 litres per day!

Saving water is critical not only to take better care of the environment but also to avoid the hefty financial costs of overestimated bills and fixing leaks.

Water meters are essential in managing water consumption, whether in individual households or large enterprises. Moving from conventional manual meter readings to automated sensors has enabled some significant strides forward in efficiency. However, there are still challenges that are hindering a wide-ranging roll-out.

In this use case, we explore how recent innovations in connectivity technology are offering another considerable step forward for water metering and supporting the drive to save our water.

94% of people underestimate the amount of water they use per day

2 DRIVING SCALABILITY AND EFFICIENCIES IN WATER METERING

### THE CHALLENGES OF A WIDESPREAD ROLL-OUT OF SMART WATER METERING

Smart water metering eliminates the requirement for manual readings. Instead, the smart system uses sensors and bi-directional communication to read data remotely and transmit it in real time for analysis. Automated readings can be set using appropriate parameters, e.g., hourly or daily. This technology enhances efficiency, reduces costs and improves leak detection.

Traditionally, several communication technologies have been involved in the data transmission process. These include the data logger that captures the data at the site and a connectivity solution to transmit the data to the cloud. A further communication solution may then be involved in sending the data to a server where the information is processed. And lastly that processed data must then be sent to yet another platform for billing.

Often, these different technologies leverage various networks to optimise data transfer. For example, wired connections offer reliable, highly available connectivity, but their installation is time- and cost-heavy. Furthermore, redundant wired solutions double the cost. Terrestrial wireless connectivity, such as cellular networks, provide more flexible options. However, coverage, latency, and power availability vary depending on location. Meanwhile, traditional satellite options can offer excellent resilience and coverage, but are often regarded as being expensive and requiring specialist expertise.

In reality, water meters often require a combination of several communication technologies to deliver the best possible solution. Solving this problem requires engineering expertise. This complexity increases costs further and hinders the efficiency and scalability of a widespread water metering roll-out.

Despite the benefits of smart water metering, adoption has been slowed due to the challenges around deployment, available network infrastructure and coverage, interoperability, costs and expertise.

#### Deployment

Deploying smart water meters can be costly, mainly due to the complexity of transmitting the data, as described above. New or upgrades to existing technologies are needed to obtain and process the data. These technologies must then be set up to connect to the appropriate networks. Deployment can be further hindered due to a lack of a simple installation that can be configured with automation.

#### Coverage

In rural areas, the deployment issue is further exacerbated by the lack of existing terrestrial networks. Cellular coverage may be limited or unavailable. Meters that are located underground struggle even more to obtain a strong signal.

#### Interoperability

With many locations working on systems that are years, if not decades, old, there is a lack of compatibility between systems or software to enable communication between them. Converting to more modern, standardised protocols is costly.

#### Expertise

Different vendors often manage the multiple stages involved in collecting data from a water meter, logging it and transmitting it via the cloud to a server where it can be populated into a designated dashboard. Each party will have expertise in their area of responsibility with little overlap. With multiple providers to manage when installing these systems or troubleshooting issues, timelines can become lengthy and projects expensive.

#### Scalability

Managing multiple technologies and carriers makes widespread adoption a challenge. This complexity hinders the scalability of the water metering roll-out.

Our partner, Galaxy L, works in the sub-metering market, supporting companies with the roll-out of water metering devices. They've seen first-hand how the challenges involved in deploying and implementing water wireless meters have slowed progress in making them more widely available.

4 DRIVING SCALABILITY AND EFFICIENCIES IN WATER METERING

# CLIENT: ECHOSTAR MOBILE

## Brochure



Introducing the  
EchoStar Mobile LoRaWAN®  
Satellite Relay EM-SR



### EchoStar Mobile LoRaWAN® Satellite Relay EM-SR

The EM-SR LoRaWAN® Satellite Relay from EchoStar Mobile is the most cost-efficient solution to fill the gaps in your LoRaWAN® network.

It's designed to be used in areas where there is no direct view of the sky for connecting to satellite, providing a solution for sensors and devices in those locations to be connected to the network. It works by receiving data from sensors via terrestrial wireless and pushing data forward to the satellite.



### How EM-SR works

The EM-SR is a device that forwards uplink LoRa® data received from trusted end-devices. Likewise, the relay receives downlink LoRa® frames from the network server and forwards them to the appropriate end-devices.



The EM-SR, a plug-and-play device, offers a practical, reliable and cost-effective way to fill the gap for sensors located at the edge of the RF coverage provided by conventional terrestrial gateways.

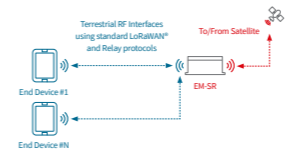
This could be the case for sensors located deep indoors, in basements or even inside metallic cabinets. A typical example is about smart metering use cases, where deploying an EM-SR eliminates the need for costly drive-by operations to collect meter readings in hard-to-reach spots.




The EM-SR is particularly useful in zones where, from a cost or operational standpoint, it is not cost effective to add terrestrial conventional gateways, either due to lack of power supply, visibility or backhaul options.

The EM-SR is battery-powered and can use energy-harvesting solutions for long term deployments.

End-devices served by the EM-SR use class A mode as recognized by the LoRaWAN® relay feature.

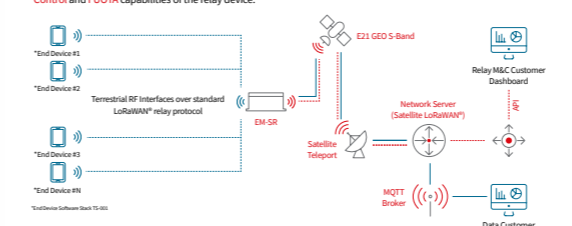


End-devices operating behind the EM-SR must support the relay stack in their software which allows them to use the standard radio protocol defined in LoRaWAN® TS011.



### Capabilities

The EchoStar Mobile LoRaWAN® Satellite Relay is an end-to-end network solution which includes Monitoring & Control and FUOTA capabilities of the relay device.



### Benefits

The EchoStar Mobile EM-SR LoRaWAN® Satellite Relay brings the following benefits.

Hybrid Network Deployment	Remote Areas Deep Penetration	Lower Deployment & Op. Cost	Firmware Update Over The Air	Long Battery Life	Easy to Scale	Standards Compliance
100% Coverage	Extended Range & Indoor	Low Total Cost of Ownership	Updates and Security Control	Long-Term Deployments	Enabling Additional Use Cases	LoRaWAN® TS011 Ecosystem

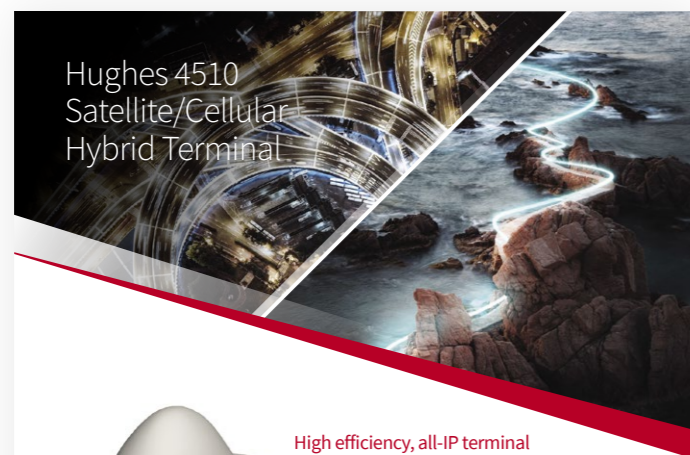


Want to know more?  
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About EchoStar: EchoStar Corporation (NASDAQ: SATS) is a premier global provider of satellite communication solutions. Headquartered in Englewood, Colo., and conducting business around the globe, EchoStar is a pioneer in secure communications technologies through its Hughes Network Systems and EchoStar Satellite Services business segments. For more information, visit EchoStar.com. Follow @EchoStar on Twitter.  
Specifications subject to change without notice.

# CLIENT: ECHOSTAR MOBILE

## Data Sheets



Hughes 4510  
Satellite/Cellular  
Hybrid Terminal



### High efficiency, all-IP terminal for satellite and cellular networks

The Hughes 4510 dual mode terminal provides reliable connectivity over satellite and cellular networks for mobile, land, and maritime packet data network applications.

The Hughes 4510 terminal delivers affordable, end-to-end IP data connectivity for industrial IoT applications in connected vehicle, industrial, fisheries, resource extraction, environmental monitoring, and Smart-Grid monitoring, among others. The Hughes 4510 dynamically routes IP traffic between the terrestrial and satellite networks based upon path availability, allowing for ubiquitous service for critical applications.

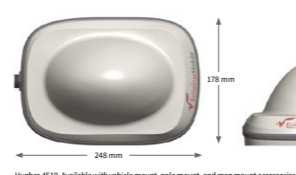
The low standby power consumption of the Hughes 4510 terminal makes it possible to provide end-to-end IP connectivity to sites that are otherwise off the grid. It is well suited for power-challenged locations that rely upon solar-battery arrays with limited power budgets.

The Hughes 4510 terminal is environmentally sealed for long-term outdoor installation or on a vehicle, fixed site, or boat. The installation consists of a single 4510 unit that can be placed at the end of a single cable carrying Ethernet and power. The SIM card is mounted securely under the SIM cover.

#### Features

- S-band satellite operation forward and 150 kbps
- Omnidirectional satellite communications with r
- Global LTE CAT-1 operat
- Integrated cellular ant
- Integrated connection
- Supports remote termi
- Auto-on/auto-context a
- Low power consumptic
- Receive: < 10 W
- Idle (SAT only): < 1.3 W
- Idle (SAT & CELL): < 3 W
- Off (Remote switch con
- Simple installation: no
- Terminal can be vehic
- Weatherproof (IP-67) er
- Built-in GNSS receiver

## Hughes 4510 Satellite/Cellular Hybrid Terminal



Hughes 4510. Available with vehicle mount, pole mount, and mag mount accessories

#### Interfaces

- Ethernet connection
- Nominal 12V power input voltage; power supply must be able to handle 3.5A peak current
- USB for connection to configuration PC
- SIM connectors under cover

#### Package Contents

- Hughes 4510 terminal
- Quick Start Guide

#### Accessories

- Connection cables
- Vehicular, pole, or mag mounting kits
- Extended warranty options

#### Technical Specifications

SAT Transmit Freq	1995-2010 MHz
SAT Receive Freq	2185-2200 MHz
LTE bands	1, 2, 3, 4, 5, 7, 8, 12, 18, 19, 20, 28
7-bands UMTS bands	800, 850, 900, 1700, 2100 (AWS), 1800, 1900 and 2100 MHz (bands 1, 2, 4, 5, 8, 9, 19)
GSM Bands	850, 900, 1800, 1900
Fallback support for	GPRS/EDGE/HSPA+
GNSS Support	GPS
Terminal Weight	1.5 kg
Terminal Dimensions (without connector)	248 x 178 x 115 mm
Operating Temp	-25 to +65 °C
Storage Temp	-40 to +80 °C
Humidity 95%	RH at 40 °C
Wind loading Survival	200 km/h
Water and Dust	IP-67
Input Voltage +12V	(vehicle)



Want to know more?

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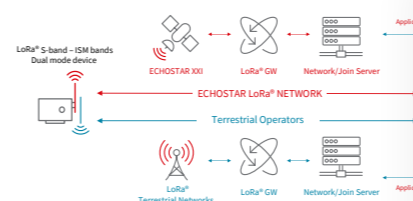
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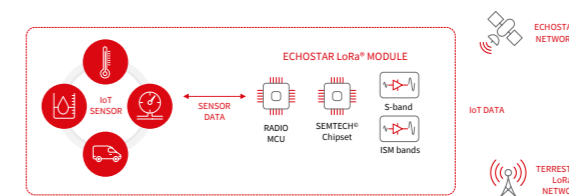
## LoRa® Network

Seamless Pan-European coverage for massive IoT

EchoStar Mobile has designed the first pan-European S-Band LoRa® network, providing bi-directional, real time, connectivity for LoRa® sensors across the coverage with no additional customer infrastructure required. Our seamless coverage and LoRa® network design eliminates both cumbersome roaming agreements and infrastructure requirements for users across Europe, the UK, and Scandinavia enabling ubiquitous and secure LoRa® service that is ideal for mobile/fixed applications or widely distributed sites.



Our dual-mode terrestrial and satellite module enables connection by terrestrial or satellite networks as required. As a member of the LoRa Alliance®, we provide a LoRa® V1.0.4 compliant network and satellite enabled LoRa module that works seamlessly with the existing LoRa® ecosystem, making it easy to integrate our network into existing LoRa® solutions and the ideal technology choice for deployments where lack of coverage and infrastructure make deploying LoRa® problematic.



EchoStar Mobile's LoRa® network is unique as it utilizes our dedicated licensed S-band spectrum eliminating ISM-band restrictions thereby providing reliable performance and enterprise-grade service levels.



Want to know more?

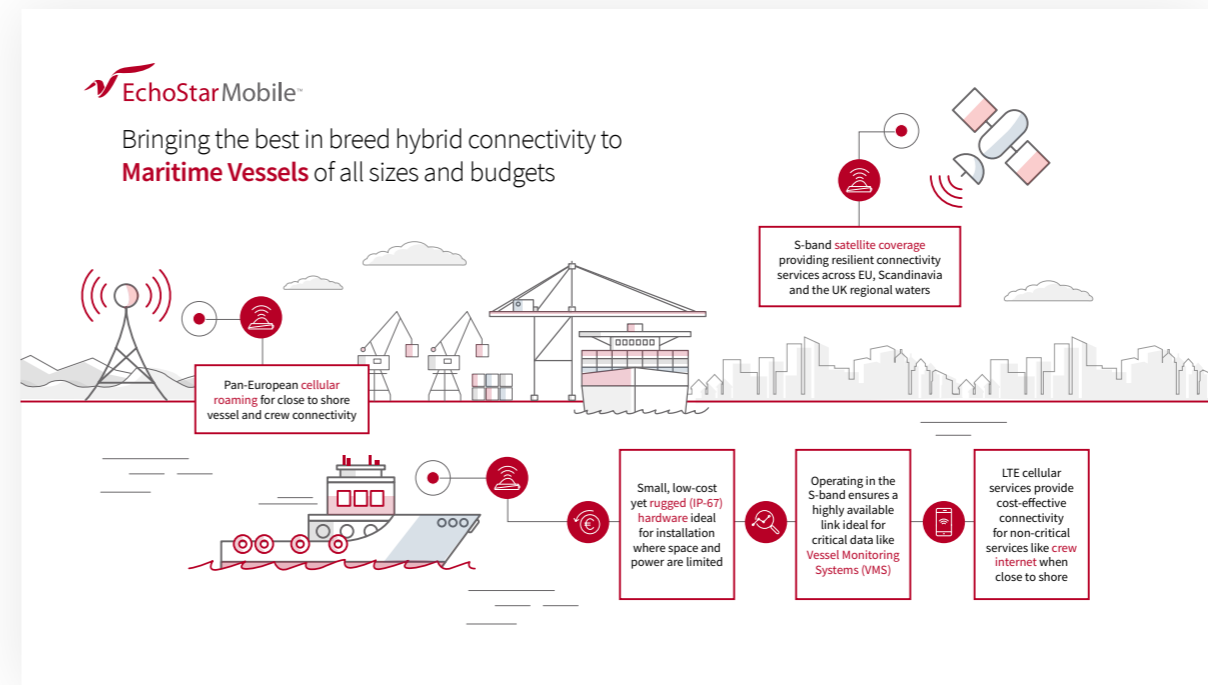
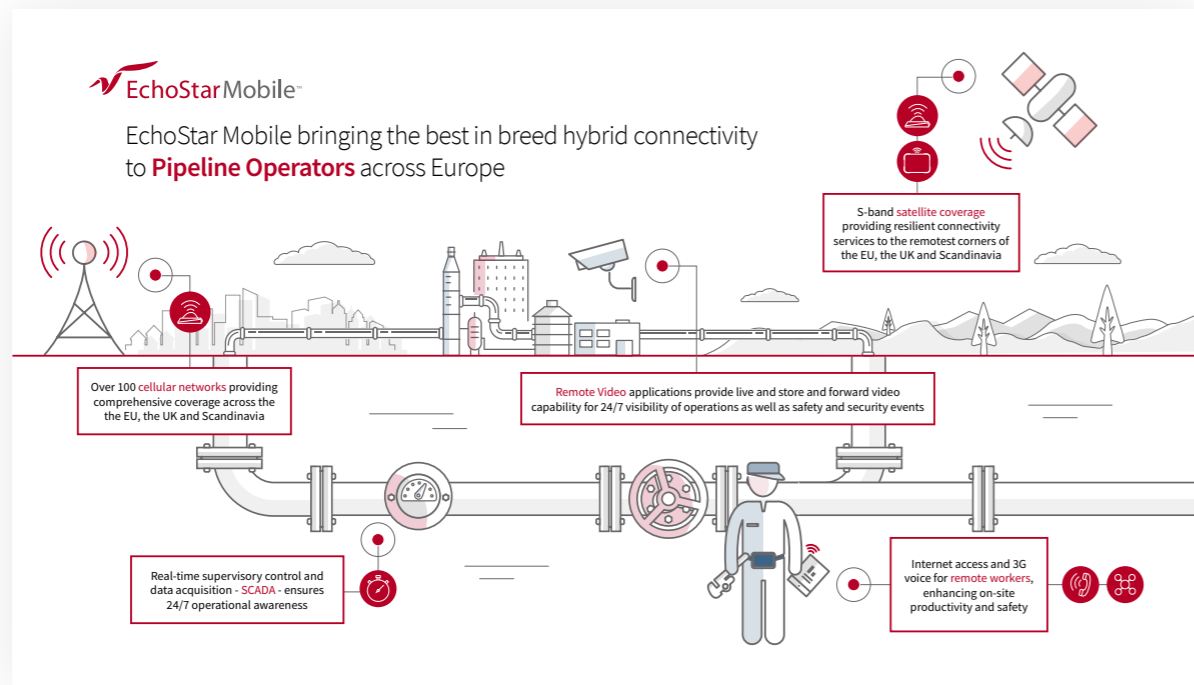
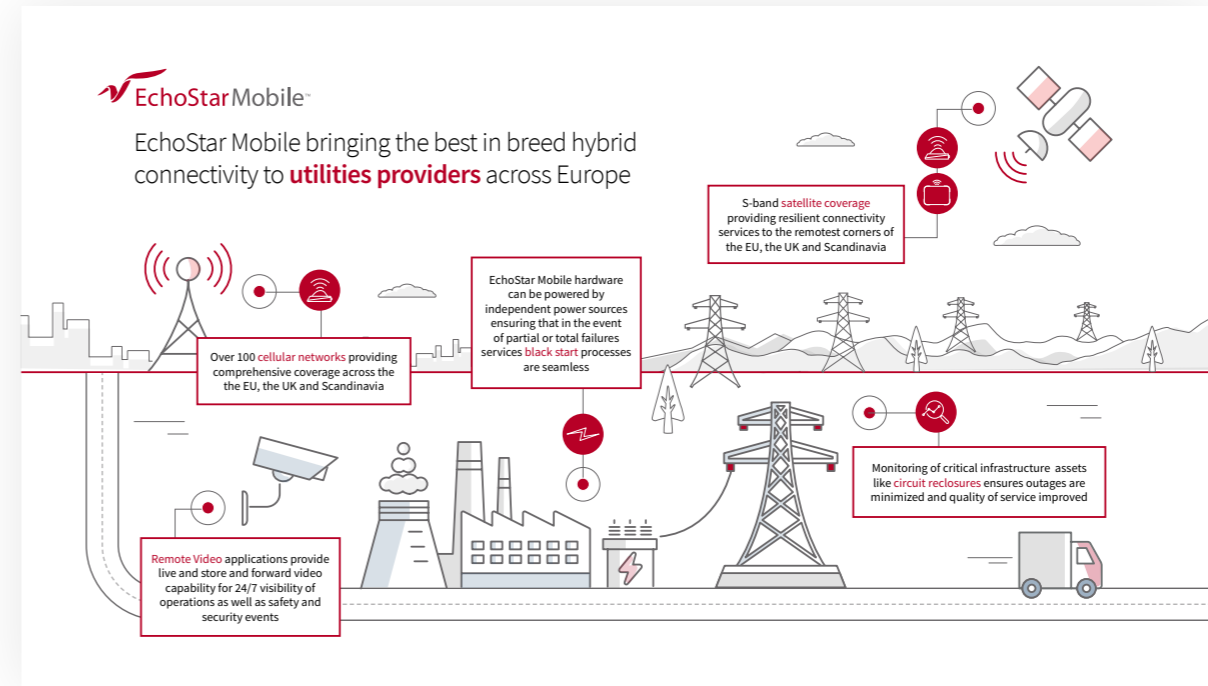
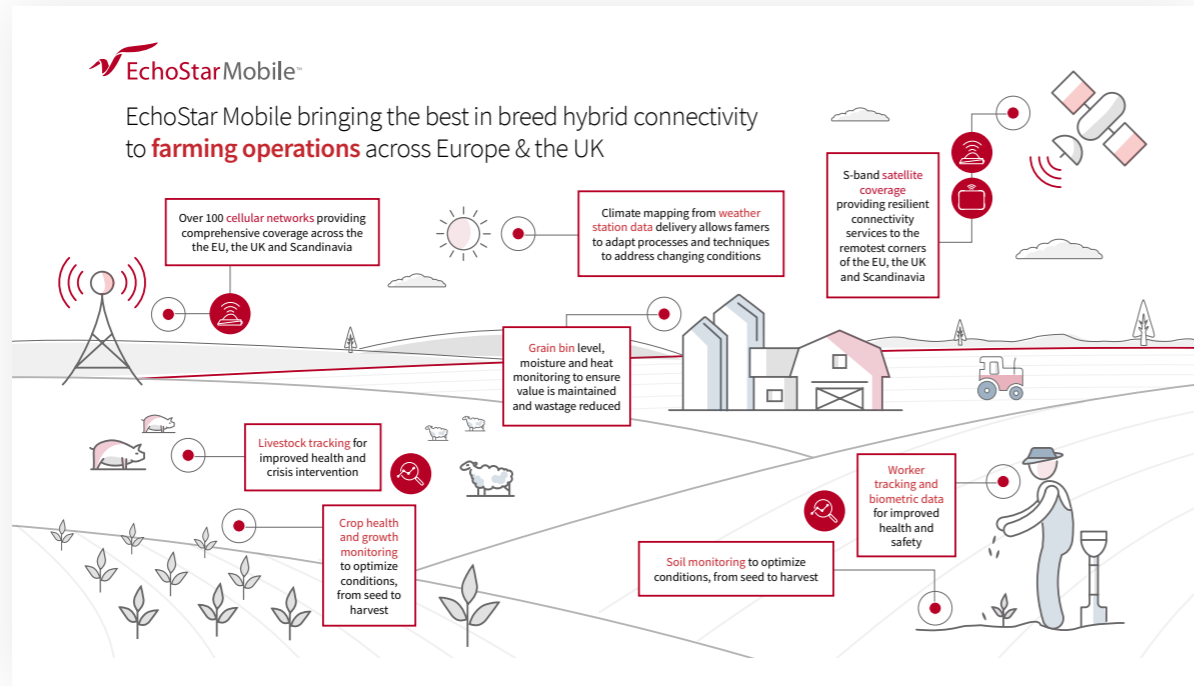
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## Infographics



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## Event Stands



The future is now...




Enabling your Upstream and Midstream operations with services and devices tailored for the Oil & Gas market.

 Always Best Connected


 Smart Remote Management

 Energy Efficient Devices


[www.echostarmobile.com](http://www.echostarmobile.com)



NTN LoRaWAN® Direct-To-Satellite IoT  
Unleashing Digital Transformation

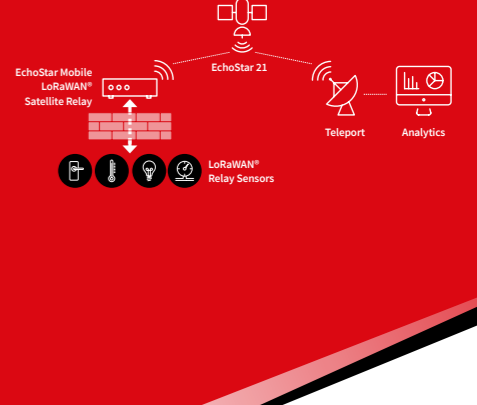


Scan to find out more





Connectivity Beyond Line of Sight

The New LoRaWAN® Relay Feature:  
A Powerful Tool for LoRaWAN® Satellite Networks



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 **CYRIC IoT**

MAXXIVE IoT Beyond Boundaries  
SAT IoT HUB Revolutionises Sensing Solutions



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 **mbs**

Amplify your connectivity reach



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Xmas e-Cards



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Merchandise

