

# Connecting Remote Fixed Industrial Assets Using 5G and Other Wireless Technologies

Simplifying IT to accelerate digitization of distributed industrial operations at scale

If you're managing industrial operations for roadways and intersections, wind or solar farms, or pipelines, you need to connect many distributed industrial assets, as well as manage and maintain secure connectivity, remotely. But to digitize these environments, you must overcome significant challenges, including deploying and operating the network infrastructure at scale with limited resources.

Building on decades of industrial networking innovations, Cisco® offers a comprehensive solution to help you solve these challenges. It combines modular routers such as the Cisco [Catalyst IR1100 Rugged Series Routers](#) and the Cisco [Catalyst IR1800 Rugged Series Routers](#), supporting a wide range of private and public cellular technologies. Our integrated approach brings the power of IT to the industrial edge so operations teams can achieve more.

## Benefits



Easily connect distributed sites and remote industrial assets by leveraging 4G/5G cellular connectivity.



Build a future-proof infrastructure with modular routers that can be easily upgraded as your needs evolve or new cellular technologies become available. Currently available modules include: public and private LTE, 4G, 5G technologies 450MHz, LoRaWAN, and Wi-Fi 6.









Deploy anywhere, even where space or environmental constraints are an issue by using ultra-compact (IR1101), rugged industrial routers.



Simplify and secure operations by gaining visibility into connected assets and enabling secure remote access to manage them in a controlled manner.

## Examples of fixed use cases

Table 1. Fixed use cases for the Catalyst IR1100 and Catalyst IR1800 Rugged Series Routers

Industries	Requirements
 <p>Utilities</p>	<p>Utilities need to monitor thousands of miles of electric distribution lines or water infrastructure, often located in harsh environments over cellular networks to provide remote asset monitoring and secure, reliable backhauling. These are typically power-constrained and space-constrained environments that need to be monitored and configured remotely. Devices are expected to have a long lifetime to support massive scale of deployment.</p>
 <p>Renewable energy production</p>	<p>Wind and solar farms require network connectivity for asset operators to collect telemetry, monitor operations, detect incidents, easily gain remote access to control equipment, and ensure physical security through Closed-Circuit Television (CCTV) and fire detection systems. As they are generally deployed in remote locations and spread across large areas, leveraging cellular networks makes it simple to connect individual wind turbines and solar panels.</p>
 <p>EV chargers</p>	<p>As the number of EVs grows exponentially ensuring charging station uptime is key. With the risks of broken hardware, unexpected shutoffs, payment problems and more, you need reliable connectivity to your EV infrastructure to monitor and maintain equipment remotely, and at scale. Being able to quickly resolve issues remotely and reduce truck rolls is important in delivering a seamless customer experience and enabling a profitable business model.</p>
 <p>Roadways and intersections</p>	<p>Highways and transportation agencies require reliable networks to connect speed cameras, monitoring cameras, toll booths, traffic signal controllers, digital signage, and more. Cisco routers are designed for these harsh environments: They support extreme temperatures and have the ideal compact form factor to be installed in roadside cabinets where space is often very limited. They can connect using most existing backhaul technologies such as public and private LTE, 4G, 5G, along with remote access capabilities for contractors to remotely maintain roadside equipment.</p>
 <p>Oil and gas</p>	<p>Whether managing upstream or midstream operations, you need network connectivity to wellheads, pipeline compressors, valve controllers, and more. Being able to remotely monitor processes and manage assets is key to ensuring worker safety, improving efficiency, and reducing risks. Cellular networks are ideal for easily connecting dispersed assets. They also provide network redundancy to critical assets such as video surveillance cameras or environmental sensors.</p>
 <p>Connected machines</p>	<p>Whether you're dealing with heavy industrial machinery or remote systems such as ATMs, kiosks, and vending machines, you need connectivity for the machine to access business applications or just to troubleshoot issues and maintain uptimes. As you might not always control the environment they're installed in, it can be simpler to connect them using a small rugged cellular router offering always-on broadband connectivity anywhere, so that vendors and providers can securely deliver services to the equipment and schedule preventive maintenance.</p>

## Connecting remote sites with the Cisco Catalyst IR1100 and Cisco Catalyst IR1800 Rugged Series Routers

### Cybersecurity to keep you protected

Securing communications with your remote industrial sites is paramount to drive operations uptime. You need advanced security technologies without the complexity of deploying or managing them. With Cisco Trust Anchor Technology ensuring the device authenticity, hardware-accelerated next generation encryption, firewall and VPN services, and alerts enabling physical and cybersecurity, the Catalyst IR1100 and Catalyst IR1800 Rugged Series Routers offer multilayer security for mission-critical deployments. They also support the [Cyber Vision](#) sensor which enables inventorying of connected assets, detection of vulnerabilities and abnormal behaviors, and helps you protect your operations from cyber threats wherever your business may operate. With [Cisco Secure Equipment Access](#), the Catalyst IR1100 and IR1800 Rugged Series Routers will also help you adopt a Zero Trust Network Access (ZTNA) architecture to easily control remote access to OT assets while offering operations a simple workflow to manage and troubleshoot remote equipment.

### Application hosting at the edge

Leverage the Cisco application hosting framework to securely onboard and run applications on your industrial routers. Develop your own applications or choose from existing ones. Cisco Edge Intelligence lets you collect operational data at massive scale and create business value from it. Cisco Cyber Vision gives you detailed visibility into what's connected to help you detect cyber threats before it's too late. And with Cisco Secure Equipment Access, you can reduce the need for expensive on-site visits by enabling secure remote access to connected assets. Each of these applications can be hosted on Cisco industrial routers.



Figure 1. Cisco Catalyst IR1101 Rugged Router



Figure 2. Cisco Catalyst IR1800 Rugged Series Router

## The Cisco Advantage

For more than 20 years, Cisco has been helping industrial organizations around the globe digitize their operations, working with manufacturers, power and water utilities, energy companies, mines, ports, railways, roadways, and more. Today, Cisco offers a market-leading portfolio of industrial networking equipment plus a comprehensive suite of cybersecurity products, integrated tightly together with a deep understanding of OT requirements. It's a rare combination.

By designing, developing, and testing products together, Cisco enables IT and OT teams to achieve advanced outcomes while reducing the complexity, time, and gaps incurred by the need to make point products work together. Our solutions come with comprehensive design and implementation guides that will help you reduce risk, accelerate implementation, and make the most of your technology stack.

## Modular design to evolve with your needs

Wireless networking technologies are constantly evolving. Cisco industrial routers are highly modular routers that support a variety of backhaul technologies to meet your exact needs including public or private 4G/LTE and 5G, Wi-Fi 6, FirstNet Ready public safety LTE and more. Pluggable modules can be easily swapped in the field to adapt to changes, avoiding costly rip, and replace upgrades, especially as 2G and 3G services are being sunset.

The Cisco Catalyst IR1100 and Catalyst IR1800 Rugged Series Routers can host a second wireless cellular module, additional Ethernet and serial ports, as well as GPIO (General Purpose Input/Output) and data storage to handle the most advanced use cases. In addition, the Catalyst IR1101 supports a LoRaWAN module for long-range, low power connectivity, a 450MHz LTE module and the Catalyst IR1800 supports a Wi-Fi 6 module – so whatever your fixed deployment might require, Cisco has a connectivity option to support it.



Figure 3. FirstNet Ready Multi-carrier Category 4 LTE module



Figure 4. Wi-Fi 6 module (Cisco Catalyst IR1800 only)

Table 2. Product features of the Catalyst IR1101 Rugged Router and the Catalyst IR1800 Rugged Series Routers

Feature	Cisco Catalyst IR1101 Rugged Router	Cisco Catalyst IR1800 Rugged Series Routers
Modular design	✓	✓
Multiple cellular options: 5G, 4G, Private LTE and more	✓	✓
Cybersecurity features	✓	✓
Application hosting	✓	✓
Support on all management platforms: Catalyst SD-WAN Manager, IoT Field Network Director, and Cisco DNA-C	✓	✓
Additional storage	✓	✓
Compact, small-form factor	✓	
LoRaWAN and 450MHz LTE pluggable modules	✓	
Expansion modules	✓	
Wi-Fi 6 pluggable module		✓
Power over Ethernet (PoE)		✓*
Fastest edge compute		✓
Certified for mobile deployments		✓

\*These features are only available with the Cisco Catalyst IR8333 and IR8335 models.

To learn more about Cisco industrial routers, visit [cisco.com/go/ir1100](https://cisco.com/go/ir1100) or [cisco.com/go/ir1800](https://cisco.com/go/ir1800).

Table 3. Industrial network management solutions

Management platform	Hosting on-premises or in the cloud	Management description
<a href="#">SD-WAN Manager for Catalyst SD-WAN</a>	Hosting on-premises or in the cloud	<p>Manage and optimize your industrial fixed networks using SD-WAN with simplified management using common management tools for industrial routers.</p> <p>Extend the enterprise network to harsh industrial and outdoor environments with common security policies extended to the devices at your network edge. This scalable solution allows thousands of assets to operate simultaneously and automates application flexibility over multiple connectives such as the Internet, MPLS, and wireless 4G LTE.</p>
<a href="#">Cisco IoT Field Network Director</a>	Hosting on-premises	<p>The Cisco IoT Field Network Director (FND), the operating system for the multiservice Field Area Network (FAN), is a software platform that manages multiservice networks of Cisco industrial routers. IoT FND provides ease of deployment at scale with Zero-Touch Deployment (ZTD) of network devices as well as secure and scalable end-to-end enrollment and management of devices. With the ability to scale to manage up to tens of thousands of devices and a rich set of northbound APIs for third-party integration, IoT FND is designed to help operations teams manage large scale FAN lifecycles across changing conditions and constraints.</p>



Management platform	Hosting on-premises or in the cloud	Management description
<a href="#">Cisco DNA Center</a>	Hosting on-premises	Set up and monitor your core enterprise network to the edge, at scale—all from a single interface. Cisco DNA-Center offers a simple network management tool so that you can optimize resources, reduce spending, and enhance your organization's digital agility with a powerful management system that securely connects, and automate network operations. It delivers software-defined networking to extend the enterprise network to harsh industrial and outdoor environments.

## Connect your remote industrial sites today with Cisco

Talk to a Cisco sales representative or channel partner and visit [cisco.com/go/ir1100](https://cisco.com/go/ir1100) or [cisco.com/go/ir1800](https://cisco.com/go/ir1800) to learn more.