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IBR900 Mobile Router Quick Start Guide

Feb 9, 2024 · Knowledge

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IBR900 Series Mobile and Ruggedized IoT Router Quick Start Guide



Introduction

This document provides a brief overview of the IBR900 Series Mobile and Ruggedized IoT Router, discusses what's inside the box, and provides basic setup and install instructions for the router.

NOTE: The Verify app includes many of the same instructions with an alternate order. This document supports the Verify app instructions. Use the Navigation section below to locate the topics most applicable to troubleshooting your setup issues. For additional setup support, contact a professional installer or Cradlepoint Support (<https://cradlepoint.com/support/>).

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IBR900 Mobile Router Models

This document applies to the following IBR900 Series models:

CRADLEPOINT IBR900-1200M-B	MODEL: S5A843A
CRADLEPOINT IBR950-1200M-B	MODEL: S5A848A
CRADLEPOINT IBR900-600M	MODEL: S5A749A
CRADLEPOINT IBR950-600M	MODEL: S5A754A
CRADLEPOINT IBR900LP6	MODEL: S5A643A
CRADLEPOINT IBR950LP6	MODEL: S5A648A
CRADLEPOINT IBR900LPE	MODEL: S5A715A
CRADLEPOINT IBR950NM	MODEL: S5A644A

Before You Begin

Read the following before setting up the IBR900 router.

Location Considerations

The IBR900 router is a semi-ruggedized LTE router for mobile and IoT connectivity. It may be mounted in a variety of environments, locations, and configurations. Therefore, it is recommended that a professional install the router. For assistance with installation or in locating a professional installer, contact [Cradlepoint Sales and Support \(https://cradlepoint.com/company/contact_us\)](https://cradlepoint.com/company/contact_us).

The following are recommended considerations for mounting best practices:

- Ensure that the mounting surface is flat and clear of any obstructions or objects that may interfere with the antennas, signal reception, or cables.
- Position the device for optimal cellular and Wi-Fi signal reception.
- Avoid mounting in direct sunlight or in locations where it may be exposed to extreme weather conditions.
- Ensure plenty of airflow for ventilation.
- Keep the device out of reach, and ensure restricted access. The IBR900 is designed to work in elevated ambient temperatures, which may cause the surface of the device to become too hot to safely touch.
- For more information refer to the Safety, Regulatory, and Warranty Guide insert that came with your device.
- For mobile installations, refer to the Vehicle Installation Guide for COR Series Mobile Routers.

SIM Card for Wireless Connectivity

A wireless broadband data plan must be added to your Cradlepoint IBR900 for wireless broadband connectivity. Wireless broadband data plans are available from wireless carriers. Each SIM must be provisioned by the carrier. Contact your carrier for details about selecting a data plan and about the process for provisioning your SIM. To configure the router for failover and failback functionality, refer to the article, [Effectively Utilizing 2-SIM Modems \(https://customer.cradlepoint.com/s/article/NCOS-Effectively-utilizing-2-SIM-modems\)](https://customer.cradlepoint.com/s/article/NCOS-Effectively-utilizing-2-SIM-modems).

Best Practice: Choosing SIMs for Adverse Environments

As a best practice, Cradlepoint recommends the use of ruggedized SIMs in environmentally adverse deployments in which the router will experience excessive shock and vibration. Different SIM card providers have varying degrees of consistency in meeting industry specifications. The use of ruggedized SIMs helps mitigate against future SIM issues caused by such environments.

Router Communication and Data Usage

The factory default configuration of the router is set to communicate with Cradlepoint and other resources at regular intervals to access the latest NetCloud OS and modem updates, clock synchronization (NTP), and NetCloud Manager. Such communication may result in data usage and applicable charges regardless of whether the router uses a wired or wireless Internet connect. To avoid such data usage and potential charges, refer to [Router Communication/Data Usage \(https://customer.cradlepoint.com/s/article/router-communication-data-usage\)](https://customer.cradlepoint.com/s/article/router-communication-data-usage) for more information.

Required Tools for Setup

- #0 Philips-head screwdriver (for SIM cover screws)
- Mounting tools - Depending on the location of installation, additional mounting tools may be necessary. These tools may include, but are not limited to:
 - Screwdrivers
 - Drill and drill bits
 - Additional screws
 - Zip ties

Setup

The following instructions walk you through basic setup of your Cradlepoint IBR900 Router. For more advanced setups, contact a professional installer.

STEP 1: Check box for content.

The contents of the box vary depending upon the Cradlepoint IBR900 Series model purchased.

Refer to the follow to ensure you received all items included with your hardware:

MOBILE

IBR900 Mobile Router

- [1] Cradlepoint IBR900 Router
- [1] 3-Meter Power and GPIO cable
- [2] SIM door screws
- [1] Getting Started reference sheet
- [1] Safety, Regulatory, and Warranty guide

IBR950

- [1] Cradlepoint COR IBR950 Router (no Wi-Fi capability)
- [1] 3-Meter Power and GPIO cable
- [2] SIM door screws
- [1] Getting Started reference sheet
- [1] Safety, Regulatory, and Warranty guide

NOTE: The IBR900 includes Wi-Fi connectivity and the IBR950 does not.

IOT

IBR900 Ruggedized IoT Router

- [1] Cradlepoint IBR900 router (for IoT)
- [2] LTE cellular antennas
- [2] Wi-Fi antennas
- [1] 4-Pin power supply
- [2] SIM door screws
- [1] Getting Started reference sheet
- [1] Safety, Regulatory, and Warranty guide

Accessories

To optimize the IBR900 Series router (for either IoT or mobile installations) for Wireless WAN or with failover configuration, you will need at least one activated 2FF-sized SIM card, with an active cellular data plan.

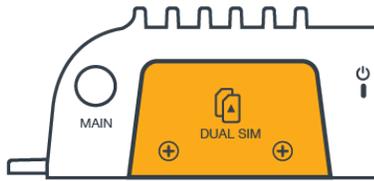
Additional accessories to enhance your router capabilities include, but are not limited to:

- [COR Extensibility Dock \(https://cradlepoint.com/product/accessories/cor-extensibility-dock-2/\)](https://cradlepoint.com/product/accessories/cor-extensibility-dock-2/)
- [COR Extensibility Cable \(https://cradlepoint.com/product/accessories/cor-extensibility-cable/\)](https://cradlepoint.com/product/accessories/cor-extensibility-cable/)
- [COR Power/GPIO Cable \(https://cradlepoint.com/product/accessories/9-wire-cor-power-gpio-cable/\)](https://cradlepoint.com/product/accessories/9-wire-cor-power-gpio-cable/)
- [9-Wire COR Power/GPIO Cable \(https://cradlepoint.com/products/9-wire-cor-power-gpio-cable/\)](https://cradlepoint.com/products/9-wire-cor-power-gpio-cable/)
- [Din Rail Mounting Bracket \(https://cradlepoint.com/product/accessories/din-rail-mounting-bracket/\)](https://cradlepoint.com/product/accessories/din-rail-mounting-bracket/)
- [Magnetic Mount Kit \(https://cradlepoint.com/product/accessories/cor-series-mag-mount-kit/\)](https://cradlepoint.com/product/accessories/cor-series-mag-mount-kit/)

Mobile installations will require purchasing third-party antennas. Refer to the Antenna webpage for assistance in locating a Cradlepoint Approved vendor. IBR900 series mobile routers are designed for installation in vehicles and therefore require additional accessories for optimal performance.

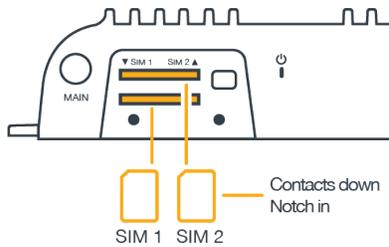
STEP 2: Remove the SIM door.

Unscrew and remove the SIM cover from the router.



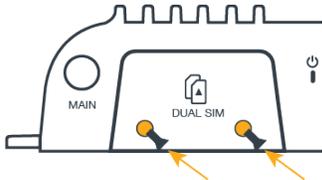
STEP 3: Insert a SIM card into SIM slot(s).

- Insert an activated 2FF SIM card into the SIM1 slot (contacts down, notch in). The SIM card will click into place.
- Optionally, insert an active SIM into the SIM2 slot with the same orientation.



STEP 4: Reinstall the SIM door.

- Replace the SIM cover and secure with the SIM door screws.

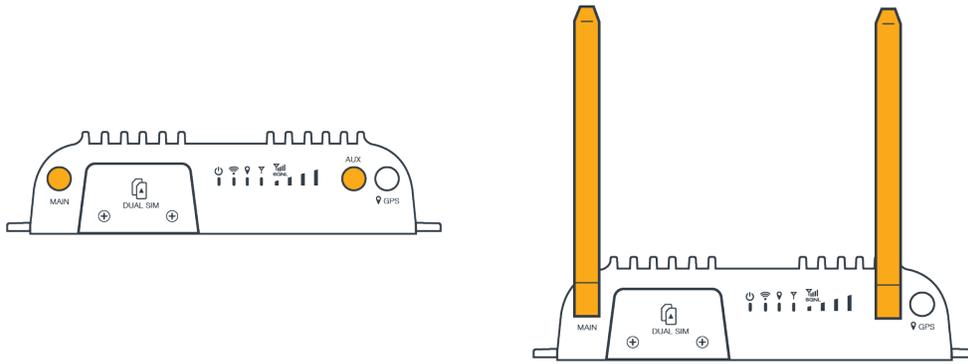


STEP 5: Attach LTE cellular antennas.

For IoT Setups:

The IBR900 Ruggedized IoT Router includes LTE cellular (paddle) antennas. Attach the antennas to the ports marked MAIN and AUX, as illustrated below.

- Hold the antenna straight and twist the base to thread onto the connector.
- Tighten with fingers only (maximum torque not to exceed 4 in-lbs).
 - Do not over-tighten.
- Once the router is mounted and powered on, angle the antennas for optimal signal reception.



For Mobile Setups:

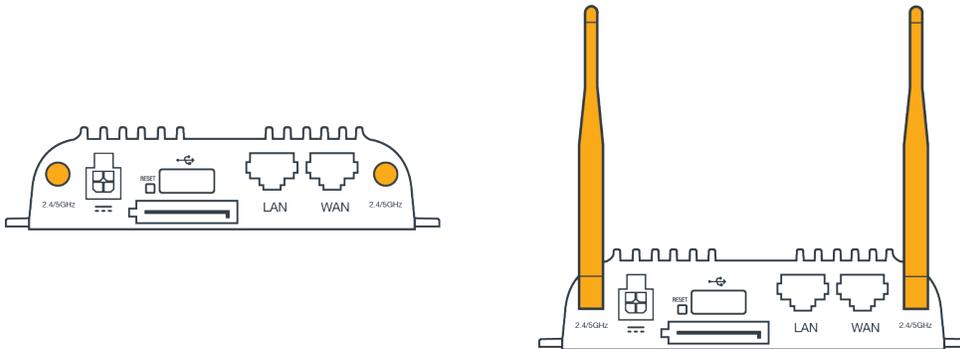
For mobile installations, refer to the [Vehicle Installation Guide for COR Series Mobile Routers \(https://customer.cradlepoint.com/s/article/Vehicle-Installation-Guide-for-COR-Series-Mobile-Routers\)](https://customer.cradlepoint.com/s/article/Vehicle-Installation-Guide-for-COR-Series-Mobile-Routers) for antenna setup best practices.

STEP 6: Attach the Wi-Fi antennas (IBR900 Models Only).

For IoT Setups:

The IBR900 Ruggedized IoT Router includes Wi-Fi (stick) antennas. Attach the antennas to the ports marked 2.4/5GHz, as illustrated below.

- Hold the antenna straight and twist the base to thread onto the connector.
- Tighten with fingers only (maximum torque not to exceed 4 in-lbs).
 - Do not over-tighten.
- Once the router is mounted and powered on, angle the antennas for optimal signal reception.



For Mobile Setups:

For mobile installations, refer to the [Vehicle Installation Guide for COR Series Mobile Routers \(https://customer.cradlepoint.com/s/article/Vehicle-Installation-Guide-for-COR-Series-Mobile-Routers\)](https://customer.cradlepoint.com/s/article/Vehicle-Installation-Guide-for-COR-Series-Mobile-Routers) for antenna setup best practices.

NOTE: IBR950 router models do not include internal Wi-Fi and do not include 2.4/5GHz ports for connecting Wi-Fi antennas.

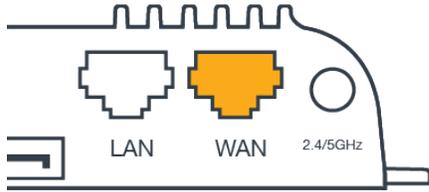
STEP 7: Mount the router.

The IBR900 Series router may be mounted in a number of ways and should be completed by a professional installer. Refer to the following for best practices:

- Mark the desired mounting location on the ceiling, wall, kiosk, or vehicle using a pen or marker prior to drilling holes or attaching the endpoint with screws.
- Ensure the mounting location is away from RF interfering materials and objects such as reflective surfaces, brick and concrete, microwaves, and so on.
- Pre-drill holes for the mounting screws.
- Use anchors and other screw-securing accessories to ensure the device is securely mounted in place.
- Refer to the Location Considerations section of this document

STEP 8 (Optional): Connect the Ethernet cable.

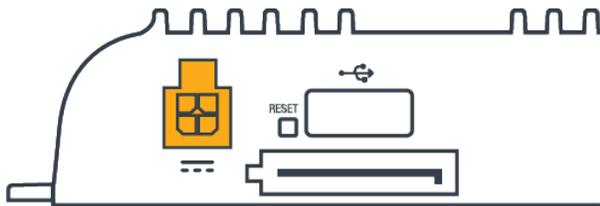
- If you are using a wired, Ethernet WAN connection, connect the Ethernet cable to the WAN port on the back of the IBR900. Connect the other end to your WAN source.
- If you are using a wireless WAN (using cellular connectivity), you will need to power up the router first, access your NetCloud Manager account, and then complete the setup.



STEP 9: Power up the router.

The power supply includes a 4-pin slot plugin to connect directly to the router. The purpose of this configuration is to allow for using a 4-wire/GPIO cable to hardwire power for DC connections or use GPIO. Refer to the image below for pin configuration.

NOTE: The rated power for the IBR900 router is 9-33 VDC.



GPIO Connector Pin Details

PIN	Wire Color	Definition	Details
1	Black	Ground	Ground to the vehicle chassis
2	Red	Power	VDC battery constant
3	Orange	Input	VDC ignition sensing accessory input
4	Blue	Output	General purpose I/O (GPIO)

1. Insert the 4-pin end of the power source into the four-pin port on the router, ensuring appropriate alignment of pins as illustrated above.
2. Plug the adapter into an electrical socket.
3. Allow 1 minute for the router to run through its bootup sequence.

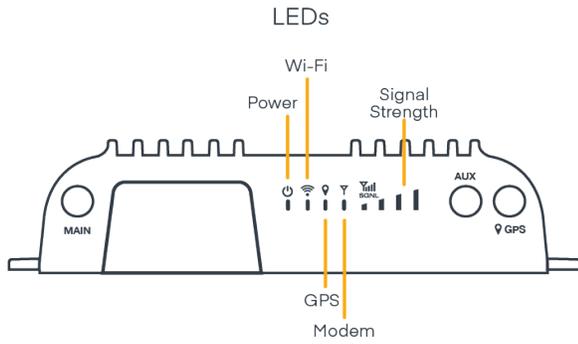
Refer to the [Understanding LEDs](#) section of the guide for more information about LED indicator status.

STEP 10: Activate the router through NetCloud Manager.

Activate your IBR900 Series Router through NetCloud Manager (NCM). Your router is packaged with NetCloud services and requires that you log into your NetCloud account to activate. Refer to [Getting Started with NetCloud Manager \(https://customer.cradlepoint.com/s/article/Getting-Started-with-NetCloud-Manager\)](https://customer.cradlepoint.com/s/article/Getting-Started-with-NetCloud-Manager) for more information.

Understanding LEDs

The IBR900 Series router uses LED lights to communicate various status conditions. Use the chart below to verify the status of your router after the boot up cycle.



INDICATOR	BEHAVIOR
	<p>POWER: The Cradlepoint IBR900 Series router must be powered using a 4-pin power source.</p>
    	<ul style="list-style-type: none"> • No Light = Not receiving power. Check the power switch and the power source connection. • Amber = Attention. Open the administration pages and check the router status. <ul style="list-style-type: none"> ◦ The LED will be amber during the bootup sequence of the endpoint. ◦ Can indicate dashboard alerts that must be addressed. Attending to these alerts may cause the LED to turn solid red. ◦ The status will remain amber until the default password is changed or the device license needs to be renewed. • Green = Powered on, no issues. • Flashing Green = Rapid cycling of device power. Check to insure any power supplied to device, particularly by vehicle battery, is fully charged and supplying the correct voltage. • Solid Red = Indicates the WAN profile priority in the Connection Manager needs adjustment. <ul style="list-style-type: none"> ◦ For example: If the Ethernet WAN is disconnected and the modem with the active SIM is connected, then the power LED is red until the modem with the active SIM is changed to have a higher priority in Connection Manager. Once that is changed the power LED will turn green. To change priority in Connection Manager, click and drag the entry to a new position in the table.
	<p>WI-FI BROADCAST: Indicates Wi-Fi activity (Does not apply to the IBR950).</p>
  	<ul style="list-style-type: none"> • No Light = Wi-Fi is not connected • Green = Wi-Fi is on and operating normally. • Yellow = Attention—Log into NCM to troubleshoot. <ul style="list-style-type: none"> ◦ NOTE: Upon initial installation, the light will be yellow until the device is registered in NetCloud Manager (NCM).
	<p>EMBEDDED MODEM: Indicates the status of the embedded LTE modem.</p>

INDICATOR	BEHAVIOR
	<ul style="list-style-type: none"> • No Light = Modem not connected
	<ul style="list-style-type: none"> • Solid Green = Modem has established an active connection
	<ul style="list-style-type: none"> • Flashing Green = Modem is connecting.
	<ul style="list-style-type: none"> • Solid Yellow = Modem is not active.
	<ul style="list-style-type: none"> • Flashing Yellow = Data connection error. No modem connection possible.
	<ul style="list-style-type: none"> • Flashing Red = Modem is in the process of resetting. <ul style="list-style-type: none"> ◦ Blinking Red with Signal Strength LEDs = SIM door is not installed, modem is off
	<p>SIGNAL STRENGTH: Blue LED bars indicate the active modem's signal strength.</p>
	<ul style="list-style-type: none"> • 4 Solid Bars = Strongest Signal.
	<ul style="list-style-type: none"> • 1 Blinking Bar = Weakest Signal.
	<p>GPS: Indicates the status of the GPS connection</p>
	<ul style="list-style-type: none"> • No Light = Off/no lock
	<ul style="list-style-type: none"> • Solid Blue = GPS on/locked
	<ul style="list-style-type: none"> • Flashing Blue = Obtaining lock
<p>OTHER</p>	<p>Additional LED Indications:</p>
	<ul style="list-style-type: none"> • Several LEDs blink when the factory reset button is detected. • Two modem LEDs blink red in unison for 10 seconds when there is an error during NCOS upgrade.

Troubleshooting

If the device takes longer than 5 minutes to connect to the Internet, you may need to log into the local UI of the device to make configuration changes or start the troubleshooting process. You must be physically co-located with the device to do this. If there is no Internet connection, refer to the following:

[No Internet or Connection Issues \(https://customer.cradlepoint.com/s/article/No-Internet-or-Connection-Issues\)](https://customer.cradlepoint.com/s/article/No-Internet-or-Connection-Issues)

[NCOS: How to Configure WAN Interfaces \(https://customer.cradlepoint.com/s/article/NCOS-How-to-configure-WAN-Interfaces\)](https://customer.cradlepoint.com/s/article/NCOS-How-to-configure-WAN-Interfaces)

Once the router connects to the Internet, ensure that desired functionality is working appropriately through NCM.

Unprompted Device Reboots

Cradlepoint IBR900 routers may experience unprompted reboots when they run low on memory. Crash logs are usually not generated during these types of unprompted reboots.

Features that significantly contribute to memory consumption are:

- Cradlepoint Secure Threat Management (IPS/IDS)
- Application Aware (Layer 7) Features (Traffic Analytics, Security Analytics, Application Aware Firewall, Application Aware Traffic Steering, Application Aware QoS)
- Tunneling protocols (IPSec, OpenVPN, etc.)
- Routing protocols (BGP, OSPF, etc.)
- Wi-Fi clients
- SDK

You can track memory utilization by entering the CLI command `free` at the router console, which shows memory statistics measured in kilobytes:

	total	used	free	available	buffers	cached
Mem:	937284	621468	315816	396016	18588	67572
-/+ buffers/cache:		535308	401976			

Generally, available memory in the 10-20 MB (10,000 to 20,000 KB) range or lower should be considered problematic.

Downloads Failing Over Wired Ethernet

If you experience failed downloads when using wired ethernet, temporarily disable generic receive offload (GRO) in the router's Local Management settings until the desired download is complete. See the article [Disabling Generic Receive Offload on the IBR900 \(https://customer.cradlepoint.com/s/article/Disabling-Generic-Receive-Offload-on-the-IBR900\)](https://customer.cradlepoint.com/s/article/Disabling-Generic-Receive-Offload-on-the-IBR900). Cradlepoint recommends disabling GRO only as a temporary measure, as it can have an impact on WAN throughput.

Resources

[IBR900 Webpage \(https://cradlepoint.com/product/endpoints/ibr900/\)](https://cradlepoint.com/product/endpoints/ibr900/)

[IBR900 Spec Sheet \(https://resources.cradlepoint.com/product-docs/spec-sheet-cor-ibr900\)](https://resources.cradlepoint.com/product-docs/spec-sheet-cor-ibr900)

[Getting Started with Ignition Sensing \(https://customer.cradlepoint.com/s/article/Getting-Started-With-Ignition-Sensing\)](https://customer.cradlepoint.com/s/article/Getting-Started-With-Ignition-Sensing)

For Mobile deployments, refer to [Getting Started with Ignition Sensing \(https://customer.cradlepoint.com/s/article/Getting-Started-With-Ignition-Sensing\)](https://customer.cradlepoint.com/s/article/Getting-Started-With-Ignition-Sensing).

The IBR900 router support 4G LTE. For a list of the frequency range of each supported band, refer to [Modem Carrier Aggregations \(https://customer.cradlepoint.com/s/article/Modem-Carrier-Aggregations\)](https://customer.cradlepoint.com/s/article/Modem-Carrier-Aggregations).

Help and Support

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[Cradlepoint Support Services \(https://cradlepoint.com/support/\)](https://cradlepoint.com/support/)

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[Privacy Policy \(https://cradlepoint.com/privacy-policy/\)](https://cradlepoint.com/privacy-policy/)

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