

Introduction

This document provides a brief overview of the Ericsson Cradlepoint S400 series semi-ruggedized router, discusses what's inside the box, and provides basic setup and install instructions.



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 [Ericsson Support](#).

Intended audience

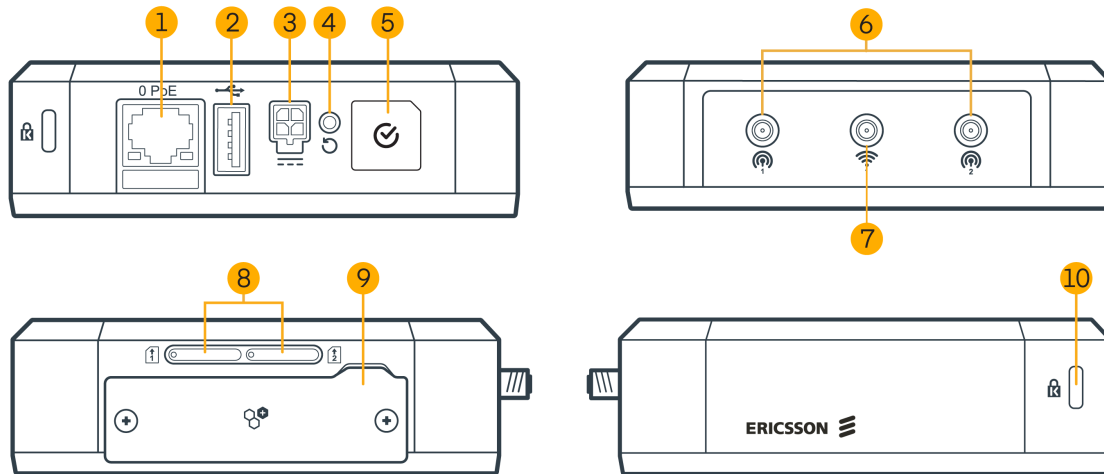
This guide is intended for professional networking hardware installers. It provides basic knowledge and should be used only as a reference guide for installing the hardware. Due to the unique nature of each product customers must have a professional install their hardware.

S400 Series Semi-Ruggedized Router Models

S400 Series	Model
S400-C6-NA	S5A440A
S450-C6-NA [†]	S5A445A
S400-C6-EA	S5A441A
S400-C6-LA	S5A442A

[†]This model does not include Wi-Fi capability.

External Device Components



1	WAN/LAN Switchable Port with PoE
2	USB 2.0 Host Port
3	DC Power and GPIO Port
4	Reset Button
5	LED
6	Cellular Antenna Connectors (Female SMA)
7	Wi-Fi Antenna Connector (Female RP-SMA) [†]
8	SIM Trays
9	Expansion Door
10	Kensington Lock Port

[†]Wi-Fi antenna is only available on the S400-C6-NA,EA, and LA models.

Before You Begin

Read the following before setting up the router.

Location Considerations

To ensure the router operates efficiently, following are best practices for determining the installation location:

- Ensure the device is positioned for optimal cellular and Wi-Fi signal reception.
- Ensure that the mounting surface is flat.
- Avoid positioning near concrete walls, metal or reflective surfaces, or any other objects that may interfere with the antennas, RF reception, or cables.

- Ensure plenty of airflow for ventilation. Avoid installing the device in narrowly enclosed spaces that may allow overheating.
- Do not install the device in direct sunlight or in locations where it may be exposed to the elements. Extreme heat or cold can impact the router's performance.
- Keep the device out of reach. Ericsson recommends that the endpoint be installed behind a locked or secure enclosure to restrict unauthorized access. The S400 router is designed to work in elevated ambient temperatures which may cause the surface of the device to become too hot to safely touch.
- Mount the device in a location compliant with the Safety, Regulatory, and Warranty Guide, included in the product shipping box.

SIM Card for Wireless Connectivity

A wireless broadband data plan must be added to the router for wireless broadband connectivity. Wireless broadband data plans are available from network operators. The SIM card must be activated and provisioned by the network operator. Contact your network operator for details about selecting a data plan and about the process for provisioning the SIM.

Router Communication and Data Usage

The factory default configuration of the router is set to communicate with Ericsson 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](#) for more information.

Setup

The following instructions walk you through basic setup of the router. For more advanced setups, contact a professional installer.

Check box contents

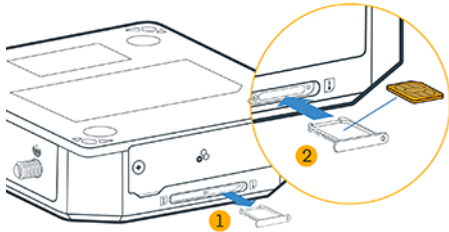
Prior to installing the S400 series router, open the box and ensure that all items are present based on your ordering choice:

Model	Orders include
S400-C6-NA	• [1] Ericsson Cradlepoint S400 series semi-ruggedized router • [1] Getting Started Insert Card • [1] Safety, Regulatory, and Warranty Guide • [1] Power Supply (with regionally appropriate plug) • [2] Cellular Antennas • [1] Wi-Fi Antenna (not included for S450-C6-NA) • [1] SIM Tray Ejection Tool
S450-C6-NA	
S400-C6-EA	
S400-C6-LA	

Install SIM

Follow these steps install SIMs:

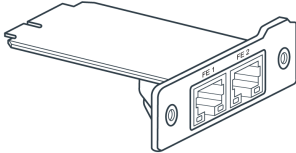
1. Place the router bottom-side up on a suitable work surface.
2. Press the SIM Tray Ejection Tool into the tray ejection hole for SIM1 and remove the tray.
3. Insert an activated 4FF-sized SIM card into the SIM1 tray. The SIM will fit into the tray in only one orientation.
4. Slide the tray and SIM card into the SIM1 bay on the router until it clicks into place.
5. (Optional) Insert a 4FF-sized SIM card into SIM2 bay using the same method.
6. When finished, turn the router over bottom down.



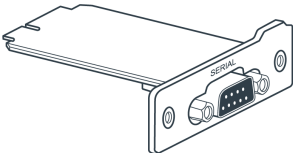
(Optional) Install an Expansion Module

Optional expansion modules are available for the Ericsson Cradlepoint S400 series semi-ruggedized router. These expansion modules are for use only with the Ericsson Cradlepoint S400 series semi-ruggedized router:

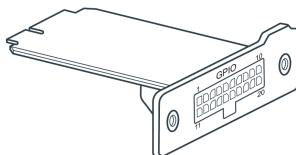
- Dual Ethernet Expansion Module (MC20-ETH)



- DB9/Serial Expansion Module (MC20-SRL), DCE with hardware flow control



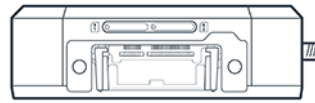
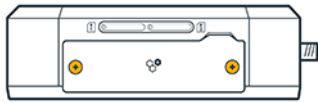
- GPIO Expansion Module (MC20-GPO)



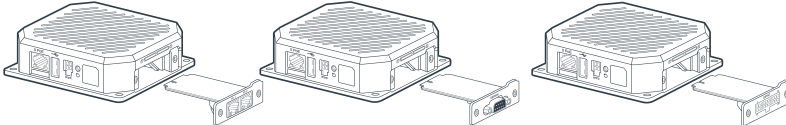
CAUTION: Electrostatic Sensitive Devices

Observe precautions for handling electrostatic discharge sensitive devices. Use a properly secured grounding wrist strap or other safe static discharge method when handling any expansion module.

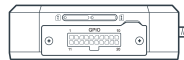
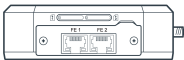
1. Remove the screws on the Expansion Door and store the door in a safe place. Save the screws to secure your selected expansion module.



2. Align the expansion module with the slots on the router, noting the tab on the module should be at the top right.



3. Slide the expansion module into the router. Slots inside the router will guide the module into place. Push the module until you feel it connect with the expansion module port inside the router, and the module is seated with the faceplate flush with the router.



4. Insert and tighten the screws to secure the module into place.



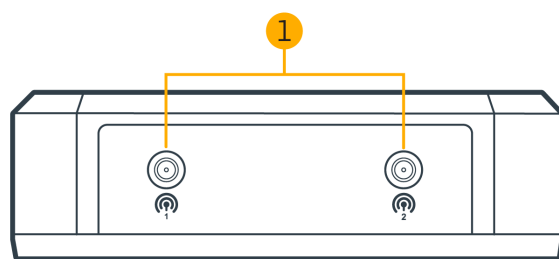
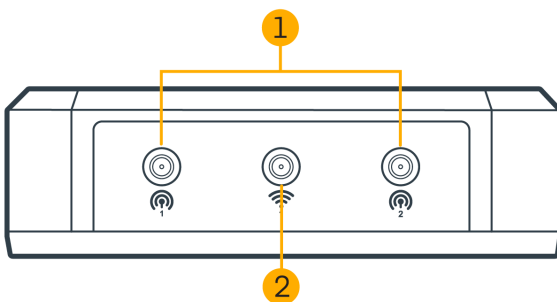
NOTE

If lost, replace screws with machine threaded Phillips head M2.5 x 6 mm countersunk screws.

Attach Antennas

When attaching antennas:

- Hold each antenna straight and twist the base to thread onto the connector.
- Tighten the connections with fingers only (maximum torque not to exceed 4 in-lbs). Do not over-tighten.



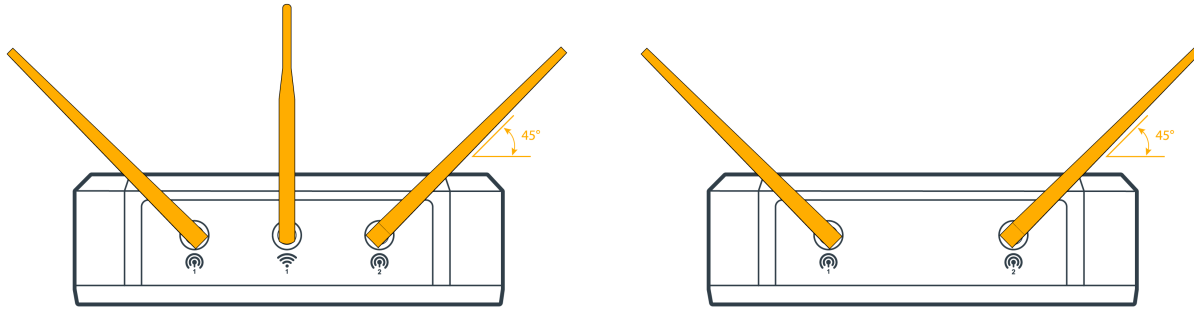
1. Attach cellular antennas to the Cellular Antenna Connectors (Female SMA).
2. S400 only: Attach the Wi-Fi antenna to the Wi-Fi Antenna Connector (Female RP-SMA).

Optimal Antenna Position

The optimal antenna position for the antennas are:

- Cellular antennas upright and angled at 45 degrees away from midline of the router.

- On the S400, position the Wi-Fi antenna pointing vertically.



Mount the Router

The 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, using a pen or marker.
- 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 M3 size wall anchors and screws or other screw-securing accessories to ensure the device is securely mounted in place. Refer to the [Location Considerations](#) section of this document. Avoid over-tightening the mounting screws to prevent damaging the router's mount points.

Additional Mounting Options

An optional DIN rail mounting bracket is available (ordered separately) for the router. The DIN rail mounting bracket holds the router vertically such that the Expansion Modules are facing up. The mounting bracket not only enhances your mounting options, it also saves space inside of racks or cabinets.

Product	Part number	Compatibility
DIN Rail Mounting Bracket	170904-000	S400 Series Router S700 Series Semi-Ruggedized Router R920 Series Ruggedized Router R980 Series Ruggedized Router

An optional ceiling mount bracket is also available (ordered separately) for the S400 and S450 router. The ceiling mounting bracket enables easy installation, typically to office ceiling T-bars.

Product	Part number	Compatibility
Ceiling Mounting Bracket	170920-000	S400 Series Router

Connecting Power and Signal Cables

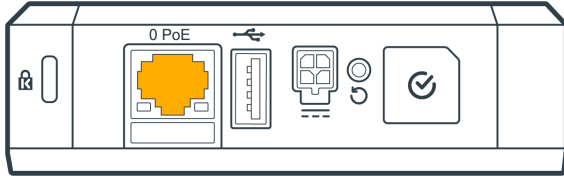
Perform the following steps based on the cables you want to connect.

Ethernet/PoE

If you are using a wired Ethernet WAN connection, connect the Ethernet cable to the 0PoE port on the S400 router. Connect the other end to your WAN source or an IEEE 802.3af compatible PoE injector.

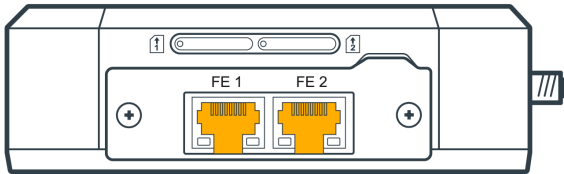
**NOTE**

Depending on your connection, the PoE cable can send both data and power over the wire.



When using PoE, the router will automatically power up. Allow a short time for the router to run through the bootup sequence. Once powered up, you can [activate the router using NetCloud Manager \[9\]](#).

If you have installed the Ethernet Expansion Module (MC20-ETH), connect Ethernet cables as needed:

**DC Power and GPIO Port**

1. If you are not using PoE power, connect the power supply to the router and then plug the other end into an electrical outlet.
2. The router will automatically power up. Allow a short time for the router to run through the bootup sequence. Once powered up, you can [activate the router using NetCloud Manager \[9\]](#).

The 4-pin DC power/GPIO cable socket is configured to allow for using a 4-wire/GPIO cable to hardwire power for DC connections, or for using GPIO. Refer to the following for pin configuration when making a custom cable. The recommended connector is a 4-pin 2x2 Molex micro-fit.

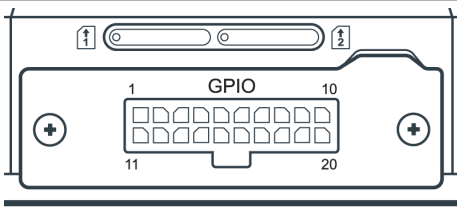
Socket	Pin	Wire Color	Definition	Details
	1	Black	Ground	Ground
	2	Red	Power	9-33 VDC, >13 W
	3	Orange	GPIO_1	• LVTTL Input • LVTTL Output • Open Drain (500 mA sink, 33 VDC max.)
	4	Blue	GPIO_2	• LVTTL Input • LVTTL Output • Open Drain (500 mA sink, 33 VDC max.)

**NOTE**

The table diagram shows the view looking into the socket on the router. Be sure to take this into account when building a custom cable.

GPIO Expansion Module (MC20-GPO)

Requires the GPIO Expansion Module (MC20-GPO) to be installed. The 3.3VDC and 9-33VDC current-limited outputs may be used to power application logic or sensors.

Socket	P i n	Details	Optional GPIO cable colors [†]
	1	Ground	Black
	2	ADC CH1 analog input (selectable ranges of 0-5 V and 0-36 V)	Green + White
	3	ADC CH2 analog input (selectable range of 0-36 V only)	Red + White
	4	Ground	Black
	5	GPIO_2 and Open Drain	Green
	6	GPIO_4	Brown
	7	GPIO_6	Purple
	8	Ground	Black
	9	GPIO_8	Blue
	10	GPIO_10	Yellow
	11	3.3 VDC Output (200 mA max)	Orange
	12	Ground	Black
	13	Ground	Black
	14	9-33VDC Output (100mA max) (Sourced from the DC Power Port)	Red
	15	GPIO_1 and Open Drain	White
	16	GPIO_3	Pink
	17	GPIO_5	Blue + White
	18	Ground	Black
	19	GPIO_7	Grey
	20	GPIO_9	Orange + White

When building a custom cable for use with this expansion module, the following Molex parts are recommended for electrical and mechanical compatibility:

- Micro-Fit connector housing: Molex 43025-2000
- Micro-Fit Reduced Mating Force (RMF) crimp terminals: Molex 46235-0001

For a compatible GPIO cable, see below.

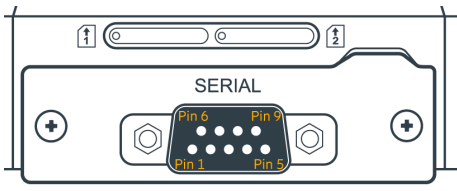
[†]Optional Accessory: GPIO Cable

A mating 2x10 optional GPIO cable is available for order separately.

Optional Accessory	PART NUMBER
2x10 GPIO Cable	170919-000

Serial Expansion Module

Requires the MC20-SRL Serial Expansion Module to be installed. Connect a serial cable to the Serial Expansion Module and tighten the screws on either side of the plug to secure it. When building your own serial cable, use the following table:

Socket	P i n	Function	Details
	1	Carrier Detector (DCD)	NC
	2	Receive (Rx)	Input
	3	Transmit (Tx)	Output
	4	Data Terminal Ready (DTR)	Output
	5	Signal Ground/Common (SG)	Ground
	6	Data Set Ready (DSR)	Input
	7	Request to Send (RTS)	Output
	8	Clear to Send (CTS)	Input
	9	Ring Indicator	NC

Supported USB Devices

USB Device	Chipset
Fast Ethernet (10/100) [†]	ASIX AX88772
1-Gbit Ethernet [†]	ASIX AX88178
Serial (RS-232)	FTDI

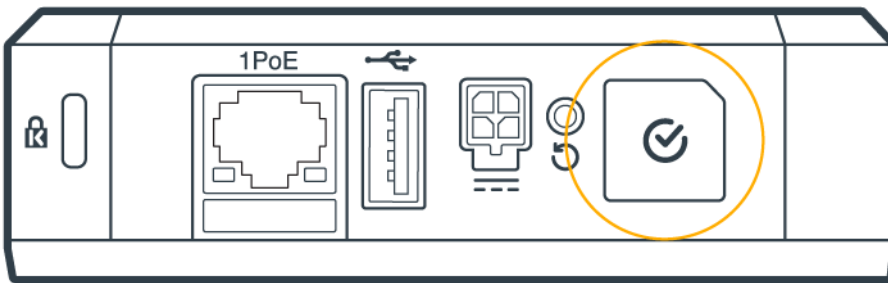
[†]USB-to-Ethernet devices default to WAN. This feature can help when connecting the router to NetCloud Manager when a SIM card is unavailable or malfunctioning.

Activate the Router Through NetCloud Manager

Activate the Ericsson Cradlepoint S400 series semi-ruggedized router through NetCloud Manager. The router is packaged with NetCloud services and requires that you log into your NetCloud account to activate it. See [Getting Started with NetCloud Manager](#) for more information.

Understanding the LED

Refer to the following table for information about the LED.



LED	BEHAVIOR	
		No Light = Powered off.
		Blinking White = WAN online and not connected to NetCloud Manager.
		Solid White = Connected to NetCloud Manager.
		Blinking Green = Modem is connecting.
		Blinking Yellow = Modem is in the process of resetting.
		Solid Red = Offline.
		Blinking Red = Data connection error. No modem connection possible.
		Solid Blue = Carrier reject.
		Blinking Cyan = Factory reset.

Troubleshooting

If the device takes longer than five minutes to connect to the Internet, log into the local UI of the device to make configuration changes or to start the troubleshooting process. You must be physically co-located with the device to do this. Refer to [No Internet or Connection Issues](#) for more information.

Once the device connects to the Internet, it should then connect to your NetCloud Manager account and start its configuration download.

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