



Spectrum D3.1 eMTA DOCSIS 3.1 Advanced Voice Modem

User Guide - Version 8

October 15, 2024



Understanding Device Connections

Rear Panel:

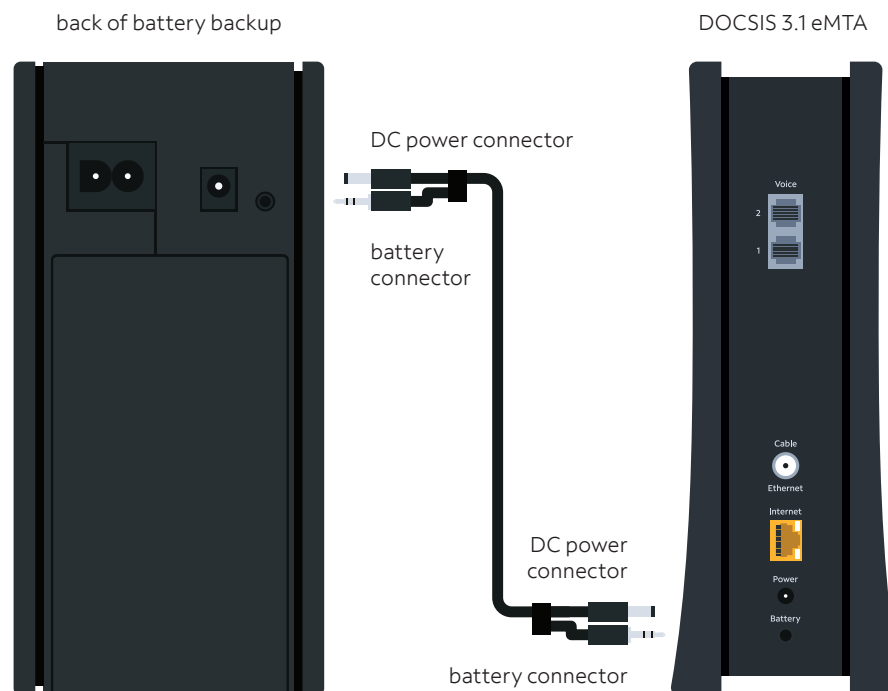
Voice 1-2: Use to connect analog telephones to the device. Telephone service must be enabled by the service provider.

Cable: Use to connect to the coaxial cable from your Internet service provider.

Ethernet (Internet): Connects to an Ethernet-enabled device such as a wireless router using an RJ45 Ethernet cable.

Power: Connects to the power adapter. Plug the other end into the wall power outlet.

Battery: Use to connect to an optional external battery. The battery connection is for voice services.



Installing Modem

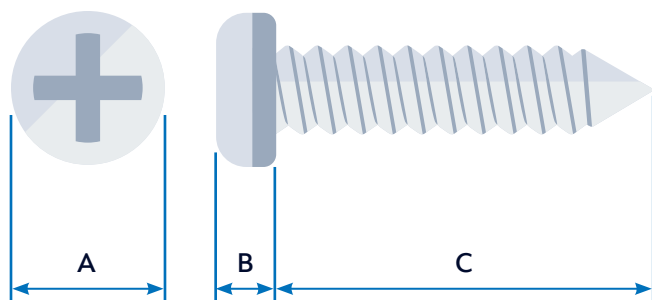
1. Connect the coaxial cable (not supplied) to the Cable connector on the rear panel of the eMTA and connect the other end to the cable wall outlet. Do not bend or over tighten the cables, as this may strain the connector and cause damage. To connect an eMTA and a television to the same wall outlet, you must use a cable line splitter (not included).
2. Connect the Ethernet cable (supplied) to the Ethernet (Internet) port on the back panel of the eMTA and connect the other end to an Ethernet port on a wireless router (or other Ethernet-enabled device).
3. Connect an RJ-11 phone cable (not supplied) to the Voice 1 or 2 port on the modem (when provisioned for voice service as specified by the service provider), and connect the other end to the phone port of the telephone. If voice service is not provisioned through the service provider, telephone service is not available.
4. Connect the power adapter (supplied) to the Power port on the modem. Connect the other end to a power outlet.

Installation Diagram



Device Wall Mount Instructions

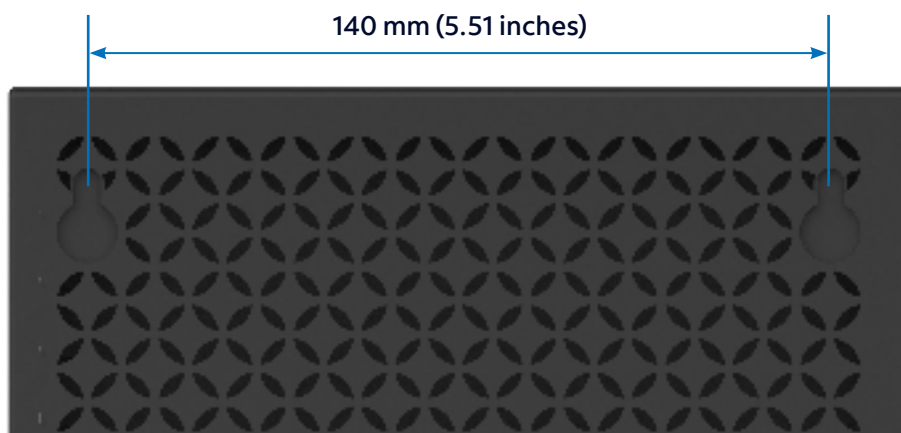
You can mount the modem on a wall using the 2 mounting brackets on the side of the device. Two round or pan head screws are recommended. See the figure below for measurements.



Label	Size in Millimeters (mm)
A	9.5 +/- 0.2
B	3.7 +/- 0.1
C	34.5 +/- 0.2

To mount the device on a wall:

1. Install the 2 screws horizontally on the wall 140 mm (5.51 inches) apart.



Note: The screws should protrude from the wall so you can fit the device between the head of the screws and the wall. If you install the screws in drywall, use hollow wall anchors to ensure the unit does not pull away from the wall due to prolonged strain from the cable and power connectors.

2. Mount the device on the wall.

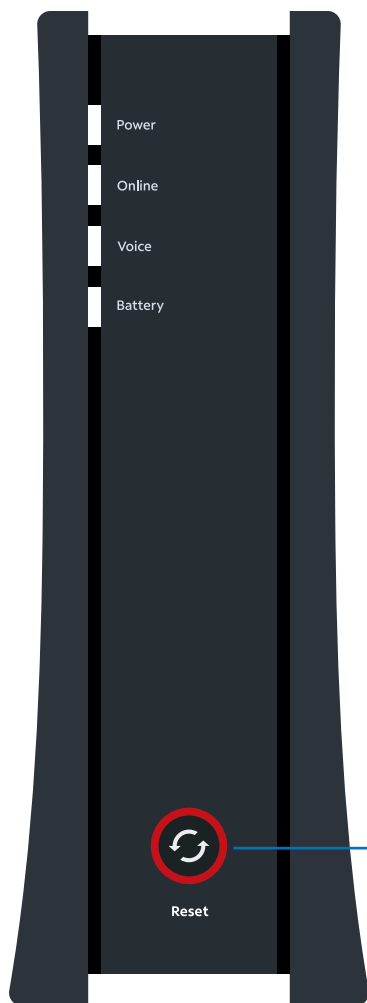
Note to CATV System Installer:

This reminder is provided to call the CATV systems installer's attention to section 820-93 of the National Electric Code, which provides guidelines for proper grounding and in particular, specify that the Coaxial cable shield shall be connected to grounding system of the building, as close to the point of cable entry as practical.

Resetting the Modem

Front Panel:

Reset: Use the reset button to either reboot (power cycle) the modem or reset the device to factory default settings. When the reset button is pressed and held for 4 to 10 seconds, the device will reboot (power cycle). If the reset button is pressed and held for 10 seconds or more, the Spectrum eMTA will reset to factory default settings. Refer to the LED Behavior table on page 5 for the reset button LED behavior.



Reset LED Behavior

Red Ring

Device is waiting to be Power Cycled:
Easing between **On Red** and **Off**

Reset - Press and hold for 5 seconds to reset modem.

Factory reset - Press and hold for more than 10 seconds to reset modem to factory default settings.

Note: You will see the ring and text illuminate when you press the button.

Note: When the device is in a state that suggests a power cycle (the button icon and the surrounding ring are lit), a factory reset cannot be performed. The user must power cycle the device, then perform a factory reset.

LED Behavior

LEDs	Color	Description
Power Status Light	Blue	<ul style="list-style-type: none"> Powering Up: Flashing between On Blue and Off Normal Operation: On Blue
Online Status Light	Blue White	<ul style="list-style-type: none"> Determining Connection: Easing between On Blue and On White Device has entered DOCSIS 3.0 Bonded State: On White Device has entered DOCSIS 3.1 Bonded State: On Blue Network Access Denied: Off
Voice Status Light	Blue	<ul style="list-style-type: none"> Voice Service Not Provisioned: Off Voice Service Active: On Blue Phone Cable Connected to Voice Port: On Blue Phone Cable Not Connected to Voice Port: On Blue Phone Off-Hook: Easing between On Blue and Off Phone Off-Hook and the modem is connected to an optional external battery: Flashing between On Blue and Off Unable to Establish Phone Connection: Off
Battery Status Light (<i>NOTE: external battery is optional</i>)	BLUE RED	<ul style="list-style-type: none"> Battery at 21% (of usable charge) or Higher: On Blue Battery at 20% (of usable charge) or Lower: On Red Battery at 10% (of usable charge) or Lower: Flashing between On Red and Off No Battery Installed: Off Battery Charging: Easing between On Blue and Off
Ethernet (Internet) Left Status Light	Green Amber	<ul style="list-style-type: none"> On Green - An Ethernet Device is Connected at 1000Mbps (1G) On Amber - An Ethernet Device is Connected at 2500 Mbps (2.5G) Off - An Ethernet Device is Connected at 100 Mbps
Ethernet (Internet) Right Status Light	Amber	<ul style="list-style-type: none"> On Amber - Data is Being Passed Between the modem and the Connected Device Off - No link is established

Basic Modem Info

Example of Cable RF MAC Address	00:71:CC:8E:54:C7
Firmware Version Example	GA-EU2251-P20-01.03.00-BAN.000
Compatibility	<ul style="list-style-type: none">• DOCSIS 3.1/3.0/2.0/1.1/1.0 certified• Ethernet 100/1000/2500 Mbps• PacketCable 1.5 and 2.0

Product Specifications

Interfaces & Standards

- Cable: F-Connector, female
- Models: E31N2V1, E31T2V1, E31U2V1
- LAN: One 10/100/1000 Mbps RJ-45 port
- Models: EN2251, ET2251, EU2251, ES2251
- LAN: One 10/100/2.5 Gbps RJ-45 port
- Telephony: 2 RJ-11 ports
- PacketCable 1.5 (NCS) or 2.0 (IMS/SIP) compatible
- DOCSIS 3.1 certified

Downstream*

- Frequency Range: 258MHz-1218MHz
- Capture Bandwidth: 1.218GHz
- Modulation: 64 or 256 QAM and OFDM: up to 4096 QAM
- Maximum DOCSIS 3.1 Data Rate: 2 x 192MHz OFDM channels provide capacity up to 5Gbps
- Maximum DOCSIS 3.0 Data Rate: 32 downstream channels provide speeds up to 1372Mbps
- Symbol Rate: 5361 Ksps
- RF (cable) Input Power:
 - -15 to +15dBmV (64/256 QAM)
 - -6 to +15dBmV (4096 QAM)
- Input Impedance: 75 Ω

* Actual speeds may vary based on factors including network configuration, and connected devices.

Product Specifications (con't)

Upstream*

- Frequency Range: 5MHz ~ 42MHz/85MHz switchable
- Modulation: QPSK or 8/16/32/64/128 QAM and OFDMA: up to 4096 QAM
- Maximum DOCSIS 3.1 Data Rate: 2 x 96MHz OFDMA channels provide capacity up to 2Gbps
- Maximum DOCSIS 3.0 Data Rate: 8 upstream channels provide speeds up to 246Mbps
- Symbol Rate: 160, 320, 640, 1280, 2560, 5120 Ksps
- RF (cable) Output Power:
- A-TDMA/S-CDMA (one channel): +65dBmV
- OFDMA: +65dBmV

Security

- DOS (denial of service) attack protection

Regulatory

- UL/FCC Class B, Energy Star Certified

Voice

- PacketCable 1.5 (NCS) or 2.0 (IMS/SIP) compatible
- Line Voltage On-hook: -48 Volts, Loop Current: 20mA/41mA, Ring Capability: 2K ft., 5REN, Hook State: Signaling Loop Start
- DTMF Tone Detection, T.38 Fax Relay (G.711), Echo Cancellation (G.168) / Silence Suppression, Voice Active Detection and Comfort Noise Generation
- G.722 codec, WB SLIC

Physical and Environmental

- Dimensions: 70.8mm, 2.8 inches (W), 215mm, 8.46 inches (H), 170mm, 6.7 inches (D)
- Weight: 632.6g (1.4 lbs), unit only
- Power: 12V 1.5A (output), 100-240VAC, 50-60Hz, 1A Max (input), external PSU
- Operating Temperature: 0°C ~ 40°C (32°F ~ 104°F)
- Humidity: 5 ~ 95% (non-condensing)
- Optional External Battery