Digi LR54

Hardware reference

Revision history—90002271

Revision	Date	Description
A	December 2017	Removed hardware information from the Digi WR Routers User Guide and released hardware reference information for the Digi LR54 in this new guide.

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Warranty

To view product warranty information, go to the following website:

www.digi.com/howtobuy/terms

Customer support

Gather support information: Before contacting Digi technical support for help, gather the following information:

- Product name and model
- Product serial number (s)
- Firmware version
- Operating system/browser (if applicable)
- Logs (from time of reported issue)
- Trace (if possible)
- Description of issue
- Steps to reproduce

Contact Digi technical support: Digi offers multiple technical support plans and service packages. Contact us at +1 952.912.3444 or visit us at www.digi.com/support.

Feedback

To provide feedback on this document, email your comments to

techcomm@digi.com

Include the document title and part number (Digi LR54 Hardware Reference, 90002271 A) in the subject line of your email.

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Digi LR54/LR54W

Digi LR54/LR54W key features

The Digi LR54 is an LTE-Advanced (LTE-A) router.
Key features include:

- High-speed CAT6 LTE
- Dual SIM cellular interfaces, providing redundancy
- Powerful 802.11ac Wi-Fi
- 4-port Gigabit Ethernet with LAN and WAN support
- Automated Wide-Area Network (WAN) failover/failback
- Extended operating temperature
- Local command-line and web interfaces
- Superior network performance management through Digi Remote Manager (DRM)
- Global deployment support

Digi LR54 front and back views

The following figures show front and back views of the Digi LR54.

1. Enclosure
2. Power
3. Ethernet connectors
4. SIM card slots
5. Cellular antennas
6. Wi-Fi antennas (Wi-Fi models only)
7. Serial port connector (Digi LR54/LR54W serial connector pinout)
8. LEDs (See Digi LR54 LEDs
9. Reset button (Reset the device to factory defaults)
10. Internal temperature sensor

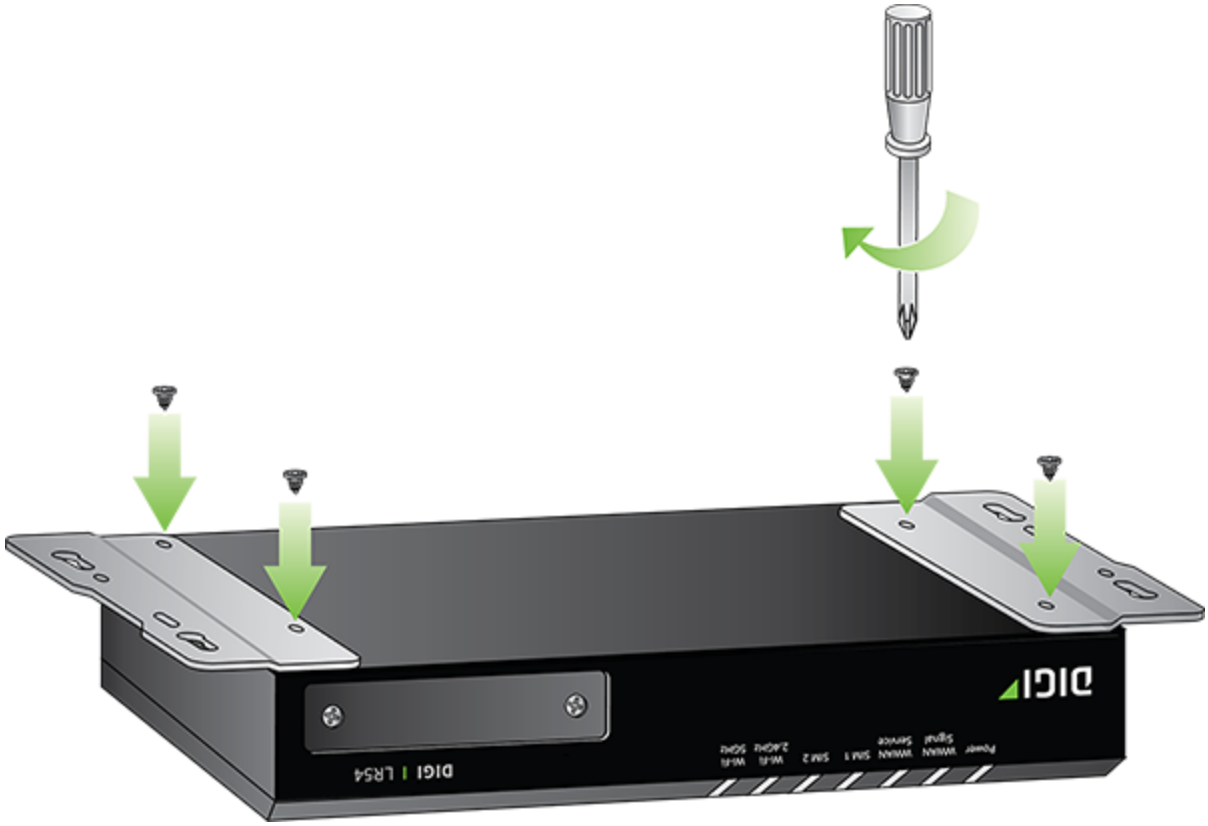
Digi LR54 Mounting options

The Digi LR54 Wall-Mount Kit (part number **78000001**) is available separately for wall-mounting. It contains two mounting brackets and four screws. You will need to supply additional self-tapping screws and sleeve anchors as needed.

Attach mounting brackets to the device

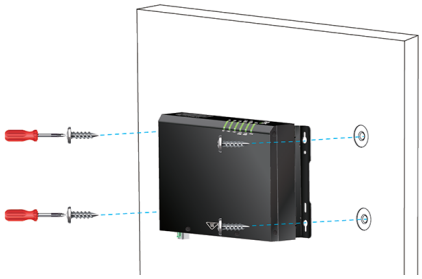
1. Remove the four rubber feet from the bottom of the Digi LR54.

2. Using the four supplied M3x6mm screws, attach the mounting brackets.



Mount the Digi LR54 on a wall

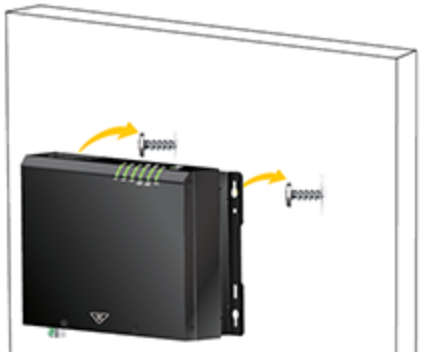
1. Align the Digi LR54 on wall.
2. Tighten self-tapping screws to wall through holes of mounting brackets. If mounting the device on a concrete wall, use sleeve anchors.



Hang the Digi LR54 on a wall

Tighten two self-tapping screws to wall, but leave a small part of screw protruding from the wall.

To hang the Digi LR54 on the wall, center the holes of the mounting brackets on the two wall-mounted screws.



Digi LR54/LR54W serial connector pinout

Digi LR54 products are DCE devices. The pinout for the DB9 serial connector is as follows:

Signal name	RS232 signal	DCE signal direction	DB9 pin number
Transmit Data	TxD	In	3
Receive Data	RxD	Out	2
Ready To Send	RTS	In	7
Clear to Send	CTS	Out	8
Data Set Ready	DSR	Out	6
Ground	GND	N/A	5
Data Carrier Detect	DCD	Out	1
Data Terminal Ready	DTR	In	4
Ring Indicate	RI	Out	Not connected

Digi LR54 LEDs

The Digi LR54 has LEDs on the top front panel. The number of LEDs varies by model. During bootup, the front-panel LEDs light up in sequence to indicate boot progress. For example, here are the LEDs for a Digi LR54 (Wi-Fi model):

There are also several LEDs on the rear WAN/LAN connectors that indicate network link and activity.

Power

- **Off**: No power.
- **Blue**: Unit has power.

WWAN Signal

Indicates strength of cellular signal.

- **Off**: No service.
- **Yellow**: Poor / Fair signal.
- **Green**: Good / Excellent signal.

WWAN Service

Indicates the presence and level of cellular service running on the device.

- **Off**: No service.
- **Blinking Green**: 2G/3G/4G connection is coming up.
- **Solid Yellow**: 2G or 3G connection is up.
- **Solid Green**: 4G connection is up.

SIM 1

Indicates use of the SIM card installed in SIM slot 1.

- **Off**: SIM 1 is not being used.
- **Solid green**: SIM 1 is being used or is coming up.

SIM 2

Indicates use of the SIM card installed in SIM slot 2.

- **Off**: SIM 2 is not being used.
- **Solid green**: SIM 2 is being used or is coming up.

Note SIM1 and SIM2 are never both on at the same time.

Wi-Fi 2.4 GHz LED (Wi-Fi models only)

Indicates state and activity on the Wi-Fi 2.4 GHz interface.

- **Off**: Wi-Fi 2.4 GHz interface is disabled.
- **Solid green**: Wi-Fi 2.4 GHz interface is enabled.

Wi-Fi 5 GHz LED (Wi-Fi models only)

Indicates state of and activity on the Wi-Fi 5 GHz interface.

- **Off**: Wi-Fi 5 GHz interface is disabled.
- **Solid green**: Wi-Fi 5 GHz interface is enabled.

Ethernet 1-4 Link and Activity (on rear panel)

The LEDs on the **WAN/ETH1**, **ETH2**, **ETH3**, and **ETH4** ports indicate that the Ethernet network interface is up and there is activity on the network interface.

- **Off**: No Ethernet link detected.
- **Solid green**: Ethernet link detected.
- **Blinking green**: Indicates Ethernet traffic.

Tips for improving cellular signal strength

If the signal strength LEDs or the signal quality for your device indicate **Poor** or **No service**, try the following things to improve signal strength:

- Move the device to another location.
- Try connecting a different set of antennas, if available.
- Purchase a Digi Antenna Extender Kit:
  - Antenna Extender Kit, 1m

Reset the device to factory defaults

Resetting the device to factory defaults performs the following actions:

- Clears all configuration settings. When the device boots up again, it uses the configuration in file **config.fac**. If the **config.fac** file has been deleted, the device regenerates the file with the default Digi configuration.
- Deletes all user files including Python scripts.
- Regenerates SSH keys.
- Clears event and system log files.
- Creates a new event in the event log indicating a factory reset.

To reset the device to factory defaults:

1. Locate the reset button on your device. For the Digi LR54, the **Reset** button is located beneath the SIM card slot cover on the front panel, to the right of SIM slot 2. Remove the SIM cover to access the **Reset** button.

2. Press and hold the **Reset** button for **5** seconds. The device reboots automatically.
The device reset to factory defaults. Follow the instructions in the *Digi LR54 Quick Start Guide* to reconfigure the device.

Digi LR54 regulatory and safety statements

RF exposure statement

In order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antenna or antennas and the user should not be less than **20 cm**.

Federal Communication (FCC) Part 15 Class B

Radio Frequency Interference (RFI) (FCC 15.105)

The Digi LR54 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet that is on a circuit different from the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

The Digi LR54 complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

If the FCC ID is not visible when installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module FCC ID.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Digi may void the user's authority to operate this equipment.

European Community - CE Mark Declaration of Conformity (DoC)

Digi has issued Declarations of Conformity for the Digi LR54 concerning emissions, EMC, and safety. For more information, see www.digi.com/resources/certifications.

Important note

Digi customers assume full responsibility for learning and meeting the required guidelines for each country in their distribution market. Refer to the radio regulatory agency in the desired countries of operation for more information.

CE mark (Europe)

The Digi LR54 is certified for use in several European countries. For information, visit www.digi.com/resources/certifications.

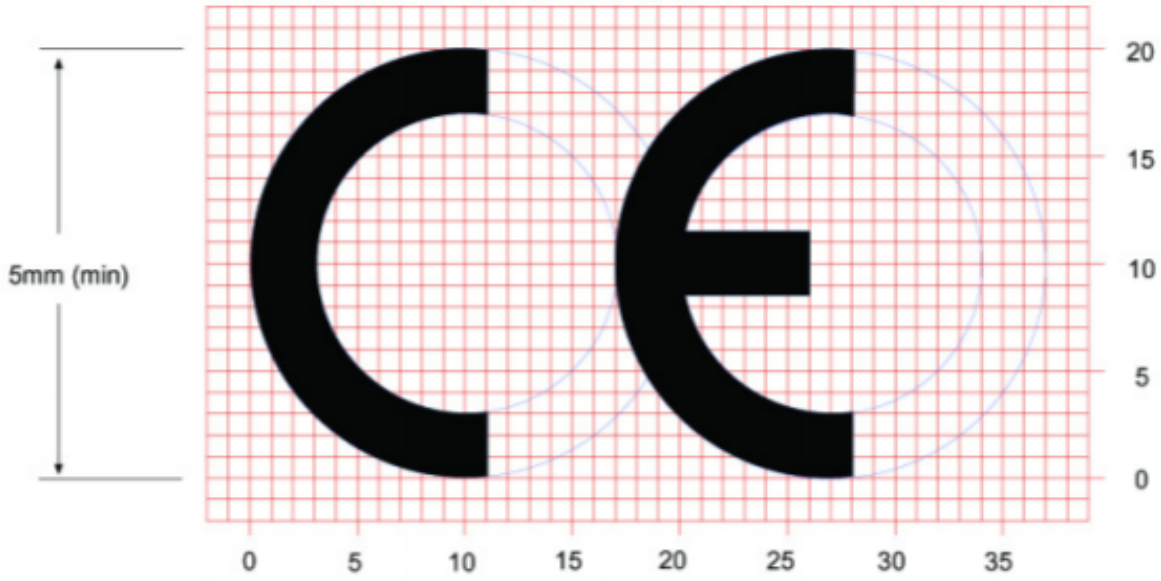
If the Digi LR54 is incorporated into a product, the manufacturer must ensure compliance of the final product with articles 3.1a and 3.1b of the RE Directive (Radio Equipment Directive). A Declaration of Conformity must be issued for each of these standards and kept on file as described in the RE

Directive (Radio Equipment Directive). Furthermore, the manufacturer must maintain a copy of the (product name) user manual documentation and ensure the final product does not exceed the specified power ratings, antenna specifications, and/or installation requirements as specified in the user manual.

OEM labeling requirements

The 'CE' marking must be affixed to a visible location on the OEM product.

CE labeling requirements



The CE mark shall consist of the initials “CE” taking the following form:

- If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
- The CE marking must have a height of at least 5mm except where this is not possible on account of the nature of the apparatus.
- The CE marking must be affixed visibly, legibly, and indelibly.

Maximum transmit power for radio frequencies

The following tables show the maximum transmit power for frequency bands.

Cellular frequency bands

Frequency bands	Maximum transmit power
Cellular LTE 700 MHz Cellular LTE 800 MHz Cellular LTE 850 MHz Cellular LTE 900 MHz Cellular LTE 1700 MHz Cellular LTE 1800 MHz	200 mW

Frequency bands	Maximum transmit power
Cellular LTE 1900 MHz Cellular LTE 2100 MHz	
Cellular LTE 2600 MHz Cellular LTE 2300 MHz Cellular LTE 2500 MHz	158.49 mW

Wi-Fi frequency bands

Frequency bands	Maximum transmit power
The LR54 device supports 11 overlapping channels (channels 1-11) at 22 MHz or 40 MHz wide spaced at 5 MHz. Centered at 2.412 MHz to 2.462 MHz.	79 mW
The LR54 device supports 4 overlapping channels (channels 36, 40, 44, and 48) at 22 MHz or 40 MHz or 80 MHz wide spaced at 5 MHz. Centered at 5180 MHz to 5240 MHz	63 mW

Innovation, Science, and Economic Development Canada (IC) certifications

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n’emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

RoHS compliance statement

All Digi International Inc. products that are compliant with the RoHS Directive (EU Directive 2002/95/EC and subsequent amendments) are marked as **RoHS COMPLIANT**. RoHS COMPLIANT means that the substances restricted by the EU Directive 2002/95/EC and subsequent amendments of the European Parliament are not contained in a finished product above threshold limits mandated by EU Directive 2002/95/EC and subsequent amendments, unless the restrictive substance is subject of an exemption contained in the RoHS Directive. Digi International Inc., cannot guarantee that inventory held by distributors or other third parties is RoHS compliant.

Safety statements

Important Safety Information

To avoid contact with electrical current:

- Never install electrical wiring during an electrical storm.
- Never install an Ethernet connection in wet locations unless that connector is specifically designed for wet locations.
- Use caution when installing or modifying lines.
- Use a screwdriver and other tools with insulated handles.
- Wear safety glasses or goggles.
- Do not place Ethernet wiring or connections in any conduit, outlet or junction box containing electrical wiring.
- Installation of inside wire may bring you close to electrical wire, conduit, terminals and other electrical facilities. Extreme caution must be used to avoid electrical shock from such facilities. Avoid contact with all such facilities.

- Ethernet wiring must be at least 6 feet from bare power wiring or lightning rods and associated wires, and at least 6 inches from other wire (antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.
- Do not place an Ethernet connection where it would allow a person to use an Ethernet device while in a bathtub, shower, swimming pool, or similar hazardous location.
- Protectors and grounding wire placed by the service provider must not be connected to, removed, or modified by the customer.
- Do not touch uninsulated Ethernet wiring if lightning is likely!
- External Wiring: Any external communications wiring installed needs to be constructed to all relevant electrical codes. In the United States this is the National Electrical Code Article 800. Contact a licensed electrician for details.

5.10 Ignition of Flammable Atmospheres

Warnings for Use of Wireless Devices

Observe all warning notices regarding use of wireless devices.

Potentially Hazardous Atmospheres

Observe restrictions on the use of radio devices in fuel depots, chemical plants, etc. and areas where the air contains chemicals or particles, such as grain, dust, or metal powders, and any other area where you would normally be advised to turn off your vehicle engine.

Safety in Aircraft

Switch off the wireless device when instructed to do so by airport or airline staff. If the device offers a 'flight mode' or similar feature, consult airline staff about its use in flight.

Safety in Hospitals

Wireless devices transmit radio frequency energy and may affect medical electrical equipment. Switch off wireless devices wherever requested to do so in hospitals, clinics, or health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.

Pacemakers

Pacemaker manufacturers recommended that a minimum of 15 cm (6 inches) be maintained between a handheld wireless device and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with independent research and recommendations by Wireless Technology Research.

Persons with Pacemakers:

- Should ALWAYS keep the device more than 15 cm (6 inches) from their pacemaker when turned ON.
- Should not carry the device in a breast pocket.
- If you have any reason to suspect that the interference is taking place, turn OFF your device.

Certifications

International EMC (Electromagnetic Compatibility) and safety standards

This product complies with the requirements of following Electromagnetic Compatibility standards.

There are no user-serviceable parts inside the product. Contact your Digi representative for repair information.

Certification category	Standards
Electromagnetic Compatibility (EMC) compliance standards	■ EN 300 328 v1.8.1 ■ EN 301 893 v1.7.2 ■ EN 301 489 ■ FCC Part 15 Subpart B Class B ■ FCC Part 15 Subpart C certification (Integrated Wi-Fi + Cellular Modules)
Safety compliance standards	EN 62368
E-UTRA CA, E-UTRA FDD, E-UTRA TDD, UMTS FDD	PTCRB
Cellular carriers	See the current list of carriers on the Digi LR54 datasheet, available on the LR54 Specifications page.