

Router CM-R 19

7 620 320 032
7 620 320 034 (NAFTA)



BOSCH

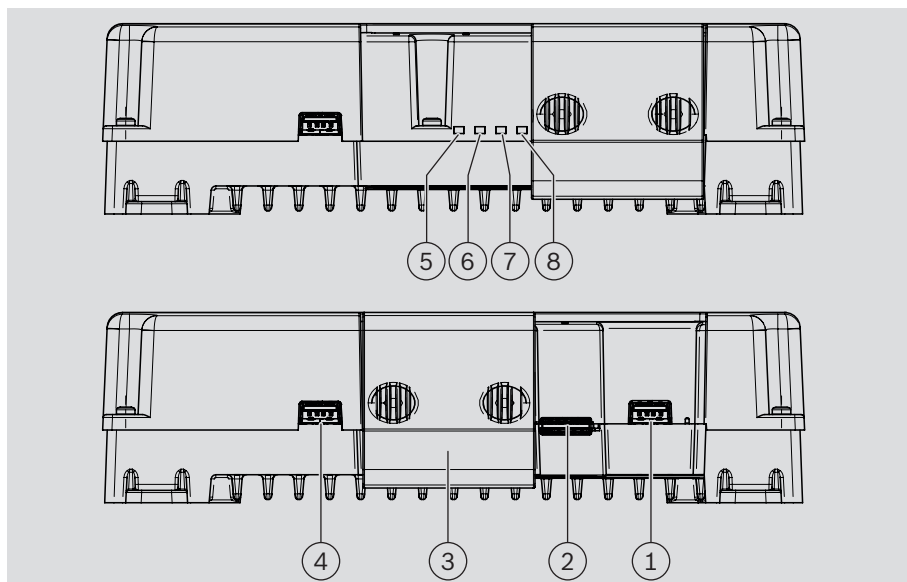
en Operating instructions

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Device overview

Controls



LED indicators

Function	LED	LED status	Device status
Power supply	LED (8)	Green	Pulsing and red LED permanently off if voltage is in normal range
		Flashing red	Green LED permanently off and red LED pulsing if voltage is too high or too low
		Steady red	Error in power supply
WLAN	LED (7)	Off	LEDs are switched off when module restarts
		Steady red	WLAN is set to off and WLAN error is set to on if WLAN access points did not start successfully
		Fast flashing yellow	WLAN is set to fast flashing (182 ms interval) when WLAN is started
		Fast flashing yellow	WLAN is set to fast flashing (66 ms interval) when WLAN is transferring data
		Slow flashing yellow	WLAN is set to slow flashing (1 s interval) when access points have started successfully and are idle
Mobile radio	LED (6)	Off	LEDs are switched off when module restarts or when modem power is switched off
		Steady red	LTE error
		Fast flashing blue	LTE is set to fast flashing (182 ms interval) when modem power is switched on
		Fast flashing blue	LTE is set to fast flashing (66 ms interval) when modem is connected and data is being transferred
		Slow flashing blue	LTE is set to slow flashing (1 s interval) when modem is connected to the internet and is idle
LAN	LED (5)	Slow flashing orange	LED is set to slow flashing (1.5 s interval) if AETH1 link is detected, otherwise it is switched off
		Steady red	LAN error

- 1 USB-A 3.0 port
- 2 SIM card reader (2x)
- 3 Sliding cover
- 4 USB-A 3.0 port
- 5 LAN LED
- 6 Mobile radio LED
- 7 WLAN LED
- 8 Power supply LED

Important instructions

Before you start using your device, read these instructions carefully and familiarise yourself with the device. Keep these instructions in the vehicle for reference purposes.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The Router CM-R 19 is a mobile WLAN access point for buses that allows passengers to connect their end devices to the internet and access audio/video content from other devices in the coach infotainment system (CIs).

Robert Bosch GmbH hereby declares that the radio equipment type Router CM-R 19 complies with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the internet address specified below.

The safety instructions applicable to the device can be found in the operating instructions for the device.

You can download the operating instructions and the declaration of conformity for the device from the internet at www.bosch-professional-systems.com

Intended Use

The device is designed for operation in a commercial vehicle with a 12 V or 24 V vehicle electrical system.

CE approval

The Router CM-R 19 has been tested according to the regulatory requirements of the European Union (EU) pursuant to Directive 2014/53/EU and meets all requirements for the CE label.

NAFTA variant

Supplier's declaration of conformity

47 CFR § 2.1077 compliance information

Unique identifier: Router CM-R 19

Responsible party – U.S. contact information

Robert Bosch LLC

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Plymouth, MI 48170

Telephone +1 734 979-3000

Email Russell.Strawsine@us.bosch.com

www.bosch.us

For the United States of America (FCC)

Model name: Router CM-R 19

**Contains FCC ID: XMR201906EM06A +
TK4WLE900VX**

This device complies with part 15 of the FCC rules.

Operation is subject to the following two conditions:

- (1) This device must not cause harmful interference.
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
- Any changes or modifications made to this equipment that are not expressly approved by Robert Bosch GmbH may void the FCC authorisation to operate this equipment.
- FCC caution:

- (1) Exposure to radio frequency radiation. This equipment must be installed and operated in accordance with the provided instructions, and the antenna(s) used for this transmitter must be installed such that a separation distance of at least 20 cm is maintained from all persons. Moreover, the equipment must not be collocated or operated in conjunction with any other antenna or transmitter.
 - (2) Any changes or modifications not expressly approved by the responsible party could void the user's authority to operate the equipment.
 - (3) This transmitter must not be collocated or operated in conjunction with any other antenna or transmitter.
 - (4) Any changes or modifications to this unit that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- RF exposure warning: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

For Mexico (NAFTA)

IFT: ROB0R022-24635

Marca: BOSCH

Modelo: Router CM-R 19

La operación de este equipo está sujeta a las siguientes dos condiciones:

- (1) este equipo no puede causar interferencias perjudiciales y
- (2) este equipo debe aceptar cualquier interferencia recibida, incluyendo las que puedan causar un funcionamiento no deseado.

For Canada (NAFTA)

Model name: Router CM-R 19

Contains IC: 10224A-201906EM06A + 7849A-WLE900VX

This device contains licence-exempt transmitter(s)/ receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device must not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

RF exposure information:

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

Déclaration d'exposition aux radiofréquences :

Cet équipement est conforme aux limites canadiennes d'exposition aux rayonnements établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance d'au moins 20 cm entre la source de rayonnement et votre corps.

For the United Kingdom

Robert Bosch GmbH hereby declares that the radio equipment type Router CM-R 19 is in compliance with the relevant statutory requirements. The full text of the declaration of conformity is available at the following internet address:

www.bosch-professional-systems.com



Road safety

- ▶ Road safety is the top priority. Operate the device only when the vehicle is stationary. If it becomes necessary to operate the device while driving, find a safe parking location and park the vehicle.
- ▶ Acoustic warning signals from the police, fire brigade, and rescue services must be clearly audible in the vehicle at all times. Therefore, ensure that media playback is at an appropriate volume.
- ▶ When driving the vehicle, make sure that you are not affected by the device, the connected antennas, or the cabling and that your view is not obstructed.



Radio interference

Do not operate the device in an area where medical equipment, life-saving equipment, or other equipment sensitive to radio signal interference is in use.



Note:

Mobile radio antennas must not be operated in the vicinity of other antennas.

Mobile radio antennas must be at least 2 cm away from metal objects and 20 cm away from any persons or pets.

The correct antenna position in the vehicle has a significant impact on the connection quality.



Note:

Establishing an internet connection requires a mobile phone tariff with an integrated data option. The transmission speed depends on the infrastructure of the respective network operator, the current signal strength, and the number of users in a radio cell. The device does not have a SIM lock and can therefore be operated with all SIM cards with a data plan.

Installation instructions

LTE modem module

1. To reduce the risk of accidents, full attention must be paid to driving at all times. Using a mobile phone while driving (even with a handsfree kit) causes distraction and can lead to accidents. Observe the laws and regulations restricting the use of wireless devices while driving.
2. To prevent interference with communication systems, operation of the device in an aircraft is forbidden.
3. Since wireless devices can cause interference with sensitive medical equipment, be aware of the restrictions on the use of wireless devices when in hospitals, clinics, or other healthcare facilities.
4. Mobile radio terminals or mobiles operating via radio signals and mobile radio networks may not be able to connect under certain conditions, such as in the case of an unpaid mobile bill or invalid (U)SIM card. If emergency help is needed in such conditions, use the emergency call function where supported by the device. To make or receive a call, the mobile radio terminal or mobile phone must be switched on in a service area with adequate mobile radio signal strength. In an emergency, the device with emergency

call function cannot be used as the only contact method since an active network connection cannot be guaranteed under all circumstances.

5. The device contains a transceiver. When it is on, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV sets, radios, computers, or other electrical equipment.
6. In locations with explosive or potentially explosive atmospheres, obey all posted signs and turn off wireless devices such as mobile phone or other mobile radio terminals. Areas with explosive or potentially explosive atmospheres include fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust, or metal powders.



Risk of short circuit or fire

Overloading the power cord of the device may result in a short circuit or fire. To prevent overloading, a fuse with a maximum rating of 3 A must be installed upstream of the power supply cables to both terminal 15 and terminal 30. We strongly recommend that the device be installed by a suitable specialist workshop.



Note:

According to ElektroStoffV §1 paragraph 2 point 3, the Router CM-R 19 is not subject to ElektroStoffV (German ordinance on the restriction of the use of hazardous substances in electrical and electronic equipment).

- ▶ The device must only be used in approved vehicles for passenger transport.
- ▶ The device must be installed inside the vehicle.
- ▶ The device must be installed outside the passenger area (cabin), e.g., in the driver's area (cockpit) or in a service area.
- ▶ The device must be installed at least 20 cm away from persons and pets.
- ▶ The device must be mounted on a solid, level surface.
- ▶ The mounting location of the device must not be exposed to heat, liquids, or vibrations.
- ▶ The installation location of the device must offer the necessary free space for the connection plugs.
- ▶ Following device installation, the connecting cables must be secured such that no forces act on the plugs.

- ▶ Note that the maximum length for connection cables with a cross-section of 0.75 mm² is 10 m.
- ▶ The device must only be used with the specified LTE/GPS antennas.
- ▶ The device must only be operated within the specified temperature and relative humidity ranges.

For more information about the assembly and connection of the device, refer to the "Installation drawings" chapter at the end of this manual.

System requirements

To access the device, you require a computer with the following:

- ▶ Internet browser (Internet Explorer 6.0 or higher, Firefox, Opera, or Safari)
- ▶ WLAN 802.11 a/b/g/n/ac.

Immediate start-up

1. Inserting a SIM card and starting the device

- ▶ Insert the SIM card(s) into the SIM card slot (2) with the contacts facing down and the recess pointing towards the device.
- ▶ Turn on the vehicle ignition.

The router is started. The power supply LED 8 lights up.



Note:

By using a second SIM card from a suitable network operator, you can reduce or avoid any roaming costs that may arise on international routes. Switching between the two SIM cards takes place automatically.

2. Establishing a connection to the device via WLAN



Note:

To establish a WLAN connection, you require the SSID (network name) and the WLAN key of the device. The SSID and WLAN key are preset in the factory. You will find both pieces of information on the device label.

- ▶ Using a WLAN connection application on your computer, identify the device's network via its SSID.
- ▶ Connect your computer to the network using the WLAN key.

3. Accessing the device's user interface and setting up mobile internet access

- ▶ Start the internet browser on your computer and enter this address:

<http://bosch.router.admin>

The device's own web server prompts you to enter the PIN for your SIM card.

- ▶ Enter the PIN for your SIM card and click **Save**.

The APN profile (APN = access point name) of your mobile network provider for mobile internet access is selected automatically.



Notes:

- ▶ The APN profile contains all the information required for establishing the mobile internet connection via your provider.
- ▶ You can also choose an APN profile from the drop-down menu.
- ▶ If the device does not know your provider or the desired APN profile, you can change this setting later under the menu item *Settings/Internet* (see chapter "Settings", section "Settings for the mobile internet connection", option *Access point name (APN)*). If necessary, ask your provider for the correct APN profile.

- ▶ Click **Apply**.

The start screen of the device's own web server is displayed.



Note:

You can change the APN profile later under the menu item *Settings/Internet* (see chapter "Settings", section "Settings for the mobile internet connection", option *Access point name (APN)*).

The device now has mobile internet access.

The mobile radio LED 6/7 lights up.



Notes:

- ▶ All configuration settings of the device are described in the "Settings" chapter.
- ▶ By default, roaming is disabled. You can activate roaming under the menu item *Settings/Internet* (see chapter "Settings", section "Settings for the mobile internet connection", option *Roaming*).

Internet router

To use the Router CM-R 19 as an internet router, simply connect your end device to the Router CM-R 19 via WLAN (see chapter "Immediate start-up", section "2. Establishing a connection to the device via WLAN").

Media server

The device can be used as a media server in the WLAN network in order to make media content available to end devices via WLAN.

Making media available from USB data carriers

- ▶ Connect a USB data carrier containing the desired media files to one of the two front USB sockets (1) or (4).



Note:

For content protected by digital rights management (DRM), use USB socket (1).

Access via the device's user interface

- ▶ If necessary, establish a WLAN connection from your end device to the Router CM-R 19 (see chapter "Immediate start-up", section "2. Establishing a connection to the device via WLAN").
- ▶ Start the internet browser on your device and enter this address:
<http://bosch.router>

The overview page is displayed.



Notes:

- ▶ If access to the complete user interface of the device is password-protected, you will be prompted to enter the password (see chapter "Settings", section "System settings", option *Password protection*).
- ▶ You can select the desired user interface language in the upper right corner of the main menu bar.

- ▶ Click the *Media Server* menu item.

The available media folders of the data medium are displayed.

- ▶ Click on a folder to open it.

The available media files are displayed.

**Note:**

You can change the sorting of the media files in the list by clicking on the relevant column heading, e.g., title or date.

- Click on a file name to play or view it.

**Note:**

The internet browser of your end device may require suitable extensions to display certain file formats.

- Control playback using the buttons:
[prev] Previous track
[next] Next track
[back] Back to the list
[aust] Activate/deactivate automatic playback of the next track (not for image files)
[aupl] Activate/deactivate automatic playback of a track when selected (not for image files)

Access via UPnP

- If necessary, establish a WLAN connection from your end device to the Router CM-R 19 (see chapter "Immediate start-up", section "2. Establishing a connection to the device via WLAN").
- Start a suitable UPnP-enabled app on your end device.
- Access its media files via the device's network name.

Text messages

You can receive and send SMS text messages using the currently selected SIM card.

Sending a text message

- Select the menu item *Messages*.
- In the *Send message* section, enter the recipient's phone number and the text you want to send.

**Note:**

When entering the telephone number, use only digits (e.g., "00" instead of "+" when specifying an international telephone number).

- Click *Send*.

Reading received text messages

- Select the menu item *Messages*.

The received text messages are displayed in the *Received messages* section.

Device status

To view the device status:

- Select the menu item *Status* and one of the following submenu items:
 - Modem status
 - WLAN status
 - Device status

The relevant information is displayed.

Settings

In the *Settings* menu, you can configure the device as well as its WLAN and mobile internet connections.

- If necessary, establish a WLAN connection from your end device to the Router CM-R 19 (see chapter "Immediate start-up", section "2. Establishing a connection to the device via WLAN").
- Start the internet browser on your device and enter this address:
<http://bosch.router.admin>

The *Settings* menu is password protected.

The default password is specified on the product sticker of the Router CM-R 19 (UI admin password).

- Enter the password and click **Login**.

**Notes:**

- For security reasons, you will be logged out automatically after a certain period of inactivity. You will then be asked to enter your password again.
- For security reasons, you should replace the default password with your own individual password. You can change the password under the *Settings/System* menu item.
- Under the *Settings/System* menu item, you can extend the password protection to all pages of the device's own web server and thus protect the complete user interface of the device against unauthorised access.

Language

You can select the desired user interface language in the upper right corner of the main menu bar.

WLAN settings

- Select the menu item *Settings/WLAN*.

In the *WLAN* settings menu, you will find the following settings:

- **Region**

Here you can select the region in which you will use the device.

For the settings of the admin or passenger interface:

- Select <admin site> or <passenger site> first.

You will see the following settings for the <admin site> and <passenger site> respectively:

- **Network name (SSID)**

The SSID (service set identifier) is the network name of the device in the WLAN network and is factory-set to "Router CM-R 19".

You can enter your own individual network name, which can be up to 32 characters in length.

- **Hide SSID**

If this option is activated, the device's WLAN network is invisible to other WLAN devices.

- **Encryption**

Here you can select the encryption method for the WLAN data traffic between the Router CM-R 19 and the end devices (*WPA*, *WPA2*, *WPA*, and *WPA2 mixed*) or switch the encryption off (*Open*). Encrypted data traffic prevents unauthorised access to the exchanged data.

- **Network key/re-enter key**

The WLAN data traffic (see previous point) is encrypted with this key. The key must be entered on the end device when establishing the WLAN connection. The factory-set key is specified on the underside of the device.

You can specify your own individual key, which can be up to 63 characters in length.

Mobile network settings

- Select the menu item *Settings/Mobile network*.

In the *Mobile network* menu, you will find the following settings:

SIM card selection

- **SIM card in use**

Display of the currently used SIM card.

- **Selected SIM**

Select the SIM card to be used here. With the automatic setting, the device automatically selects a suitable SIM card.

Modem preferences

The following settings can be made individually for both SIM cards:

- **Current PIN**

Display of the currently valid PIN for the SIM card.

- **Roaming**

Here you can set whether roaming should be activated or deactivated. When roaming is enabled, the device can connect to a foreign network outside of its home network (e.g., when abroad).

Attention: Roaming will incur additional charges.

- **Min. RAT generation**

Select the mobile radio standard that should be supported as a minimum.

- **Cnt pass ep**

(seconds).

- **Country list type**

Select the desired countries for the country list here. Note the set country list type.

- Blacklist: no internet connection is established in the selected countries.
- Whitelist: an internet connection is established only in the selected countries.

- **Country list**

Select the desired countries for the country list here. Note the set country list type.

- **Network profile candidates**

Select the desired network profile here.

- **SIM profile name**

The settings for your SIM card are managed under the name of your provider by default. You can change the connection name.

- **Access point name (APN)**

Enter the name of your provider's APN profile here. The APN profile contains the necessary information for the mobile internet connection and allows the device to connect automatically. You only have to enter the PIN of your SIM card when necessary (e.g., when establishing the connection for the first time).

- **Authentication type**

If a user name and password are required, enter the authentication method (none, PAP, CHAP) here.

► **User name/password**

If required by your provider, enter the user name and password for the mobile internet connection here.

► **DNS1/2**

If DNS server names are not assigned automatically, you can enter them here.

► **Rename SIM slots**

Here you can change the names under which the device manages the two SIM slots.

► **Reset data counter (modem statistics)**

This setting will reset the uploaded/downloaded amount of modem data displayed on the overview and modem status page.

System settings

- Select the menu item *Settings/System*.

In the *System* settings menu, you will find the following settings:

Adjustment

► **Enable 'Premium content' link**

Here you can activate or deactivate the link to premium content.

► **Admin/passenger language**

Here you can set the default language for the admin and passenger interface.

► **Custom logo**

Here you can select an image file with an individual customer logo to be displayed on the interface instead of the Bosch logo.

System settings

► **Change admin password**

Enter the existing password followed by a new password for access to the Settings menu or the complete user interface (see next point). The default password is specified on the product sticker of the Router CM-R 19 (UI admin password).

► **Protected area**

Here you can set whether the password protection should apply only to the *Settings* menu (*Settings only* option) or to the complete user interface of the device (*All pages* option).

► **Theft protection**

Here you can activate or deactivate the theft protection via email or SMS. When the theft protection is activated, an email or text message

with the device location is sent each time the device is switched on and off.

When you turn on this function, enter the email address or phone number where you want the messages to be sent.

► **Device mode**

Set here whether the device is to be operated independently in standalone mode or as part of a coach infotainment system.

► **Voltage mode**

Set here whether the device is to be operated with a voltage of 12 V or 24 V.

► **Shutdown delay**

Enter here how long the device should remain switched on and active after turning off the vehicle ignition.

Backup/restore configuration

► **Backup**

This shows whether there is already a backup of the device configuration.

► **Backup status**

The status of a running backup is displayed here.

► **New backup request**

Here you can create a new backup of the device configuration.

► **Restore**

This shows whether the device configuration has already been restored.

► **Restore status**

The status of an ongoing restore operation is displayed here.

► **Start recovery**

Here you can start restoring the device configuration.

Domain filtering

You can restrict access to certain domains or exclude certain domains from access.

- Select the menu item *Settings/Domain filtering*.

In the *Domain filtering* menu you will find the following settings:

► **Enable filtering**

Here you can activate or deactivate the use of the filter.

► **Filtering mode**

Here you can select the type of filter:

- **Blacklist:** domains listed under blacklist domains cannot be accessed.

- ▶ Whitelist: only domains listed under whitelist domains can be accessed.

- ▶ **Blacklisted domains**

Enter domains that cannot be accessed here.

- ▶ **Whitelisted domains**

Enter the domains to which access is permitted here.

**Note:**

The *Settings* menu or the complete user interface of the device is locked automatically after an extended period of inactivity.

Factory reset:

A factory reset can be performed by inserting a small tool into the hole next to the USB port (1) for at least 40 seconds.

Device software update**Note:**

This option is only available when the device is operating in **standalone mode**.

In **Clis mode**, the software update of the Router CM-R 19 will be part of the Clis system update process.

Before starting the software update process, you should check which version is currently in use and compare it with the version on the download portal.

If the versions do not match, start the SW update process. Bosch provides software updates on the online portal (www.bosch-professional-systems.com) for the duration of the product update service life.

- ▶ Select the menu item *Settings/Update*.

- ▶ **Software version**

The current software version of the device is displayed here.

- ▶ **Firmware update**

If an update file is stored on a computer connected to the device, click **Choose file...** to select the update file and then click **Load** to install the new software.

Device information

- ▶ Select the menu item *Settings/Device information*.

Here you can see information about the device, e.g., the current software and hardware version as well as the serial number.

Logout

To lock the *Settings* menu or the complete user interface of the device:

- ▶ Select the menu item *Settings/Logout*.

The start screen or password entry screen is displayed.

Technical data

7 620 320 032

Power supply	12 V/24 V (8 V to 36 V)
Current consumption	
Max. current	12 V: 2 A 24 V: 1 A
Standby current	< 150 µA
Fuse	5 A
WLAN standards	IEEE 802.11a/b/g/n/ac
Mobile radio standards	UMTS/DC-HSPA+, WCDMA, LTE-FDD, LTE-TDD
LTE FDD	B1, B3, B7, B8, B20, B28, B32
LTE TDD	B38, B40
UMTS	B1, B3, B8
Positioning	GPS, Glonass, Galileo, Beidou
Antenna connectors	LTE (2x FAKRA D, claret violet), GPS (FAKRA C, blue)
WLAN antenna	Internal
WLAN frequency	2.4 GHz, 5 GHz
Encryption	WPA2 (AES)
Firmware update	Standalone mode: manually via USB stick Cls mode: via network
Reset function	Factory reset
Protection rating	DIN 40050-9 to IP40
Operating temperature	-20°C to +70°C
Storage temperature	-40°C to +85°C
Relative humidity	25% to 75%, non-condensing
Dimensions (W x H x D)	226.9 x 61.5 x 206.9 mm
Weight	Approx. 1,267 g
Certifications	CE, UKCA, UN ECE R10, UN ECE R118, Israel and Serbia

7 620 320 034

Power supply	12 V/24 V (8 V to 36 V)
Current consumption	
Max. current	12 V: 2 A 24 V: 1 A
Standby current	< 150 µA
Fuse	5 A
WLAN standards	IEEE 802.11a/b/g/n/ac
Mobile radio standards	LTE-FDD, LTE-TDD, WCDMA
LTE FDD	B2, B4, B5, B7, B12, B13, B25, B26, B29, B66
LTE TDD	B41
WCDMA	B2, B4, B5
Positioning	GPS, Galileo
Antenna connectors	LTE (2x FAKRA D, claret violet), GPS (FAKRA C, blue)
WLAN antenna	Internal
WLAN frequency	2.4 GHz, 5 GHz
Encryption	WPA2 (AES)
Firmware update	Standalone mode: manually via USB stick Cls mode: via network
Reset function	Factory reset
Protection rating	DIN 40050-9 to IP40
Operating temperature	-20°C to +70°C
Storage temperature	-40°C to +85°C
Relative humidity	25% to 75%, non-condensing
Dimensions (W x H x D)	226.9 x 61.5 x 206.9 mm
Weight	Approx. 1,267 g
Certifications	FCC/IC, NOM, IFT, FMVSS 302, PTCRB, AT&T

Technology	Product version	Frequency band	Radiated power
WLAN 2.4 GHz	7 620 320 032	2.400 GHz to 2.4835 GHz	20 dBm
	7 620 320 034	2.400 GHz to 2.4835 GHz	23 dBm
WLAN 5 GHz	7 620 320 032	5.150 GHz to 5.250 GHz	16 dBm
	7 620 320 034	5.150 GHz to 5.250 GHz	11.8 dBm
		5.250 GHz to 5.350 GHz	11.8 dBm
		5.470 GHz to 5.600 GHz	24.0 dBm
		5.650 GHz to 5.725 GHz	24.0 dBm
Mobile radio modem	7 620 320 032/034	LTE-FDD bands	23 dBm
		LTE-TDD bands	23 dBm
		WCDMA bands	24 dBm

LTE antenna		
Frequency range	Peak gain	Type
617 to 960 MHz	5 dBi	External
1,710 to 3,800 MHz	9 dBi	
4,900 to 6,000 MHz	10 dBi	

GPS/GNSS antenna		
Frequency range	Gain: LNA	Type
1,562 to 1,612 MHz	26 dB	External

WLAN antenna		
Frequency range	Peak gain	Type
2.400 to 2.485 GHz	3.6 dBi	Internal
5.150 to 5.825 GHz	5.1 dBi	