

# FastMile 5G mmWave Receiver (5Gmm28-B/5Gmm29-B)

Release 24.02a

Operator Manual

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# 1 Preface

This preface provides general information about the Operator Manual for Model 5Gmm28-B/5Gmm29-B of the FastMile 5G mmWave Receiver.

## 1.1 Scope

This *FastMile 5GmmWave Receiver Operator Manual* provides an overview of the FastMile 5G mmWave Receiver Model 5Gmm28-B/5Gmm29-B, along with information about installing and configuring them.

Changes between document editions are cumulative. Therefore, the latest document edition contains all changes made to previous editions.

## 1.2 Acronyms and initialisms

The expansions and optional descriptions of most acronyms and initialisms used in this document appear in the glossary at the back of the document.

## 1.3 Assistance and ordering phone numbers

Nokia provides global technical support through regional call centers. Phone numbers for the regional call centers are available at the following URL: <https://customer.nokia.com/support/s/>.

For ordering information, contact your Nokia sales representative.

## 1.4 Nokia quality processes

Nokia's FastMile 5G mmWave Receiver quality practices are in compliance with TL 9000 requirements and are intended to adequately ensure that technical requirements and customer end-point requirements are met. The customer or its representatives may be allowed to perform on-site quality surveillance audits, as agreed upon during contract negotiations.

## 1.5 Safety information

For safety information, see the appropriate safety guidelines.

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## 3 ETSI and ANSI environmental guidelines

This chapter provides information about the North America environmental guidelines. This chapter also includes environmental operation parameters of general interest.

### 3.1 ETSI and ANSI environmental guidelines

Observe the following environmental requirements when handling the FastMile 5G mmWave Receiver.

#### 3.1.1 Material content compliance

Nokia has implemented a material/substance content management process. The process is described in the Nokia process for ensuring RoHS Compliance (1AA002660031ASZZA). This ensures compliance with the European Union Directive 2011/65/EU and as amended on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2). The equipment is assessed in accordance with the Harmonised Standard EN IEC 63000:2018 on Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

#### 3.1.2 End-of-life collection and treatment

Electronic products bearing or referencing the symbol shown in Figure 1, when put on the market within the European Union (EU), shall be collected and treated at the end of their useful life, in compliance with applicable EU and local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product, such as heavy metals or batteries, the environment and human health may be negatively impacted as a result of inappropriate disposal.



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*Figure 1 Recycling/take back/disposal of product symbol*

At the end of its life, the FastMile 5G mmWave Receiver is subject to the applicable local legislations that implement the European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

There can be different requirements for collection and treatment in different member states of the European Union.

In compliance with legal requirements and contractual agreements, where applicable, Nokia will offer to provide for the collection and treatment of Nokia products bearing the logo shown in Figure 1 at the end of their useful life, or products displaced by Nokia equipment offers. For information regarding take-back of equipment by Nokia, or for more information regarding the requirements for recycling/disposal of product, contact your Nokia account manager or Nokia take back support at [sustainability.global@nokia.com](mailto:sustainability.global@nokia.com).

## 4 ANSI Regulation guidelines

This chapter provides information about the mandatory regulations that govern the installation and operation of the FastMile 5G mmWave Receiver equipment in the North America.

### 4.1 Regulation instructions

This section describes the regulation instructions that are provided in the customer documentation and on the FastMile 5G mmWave Receiver.

#### 4.1.1 Labels

The FastMile 5G mmWave Receiver is labeled with specific safety and other compliance information and instructions that are related to a product, or product variant, of the equipment. Observe the instructions on the safety labels.

Table 2/3 provides examples of the various FastMile 5G mmWave Receiver labels.

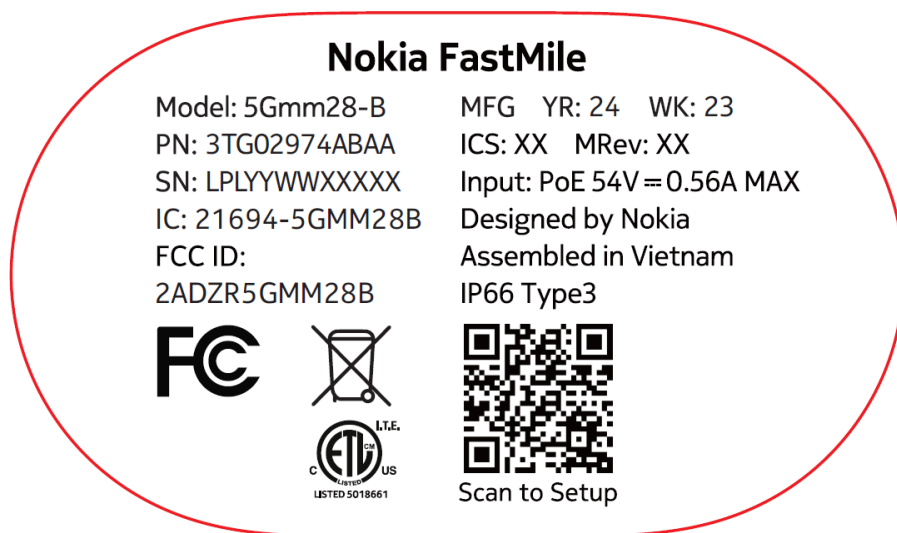


Figure 2 Label of 5Gmm28-B

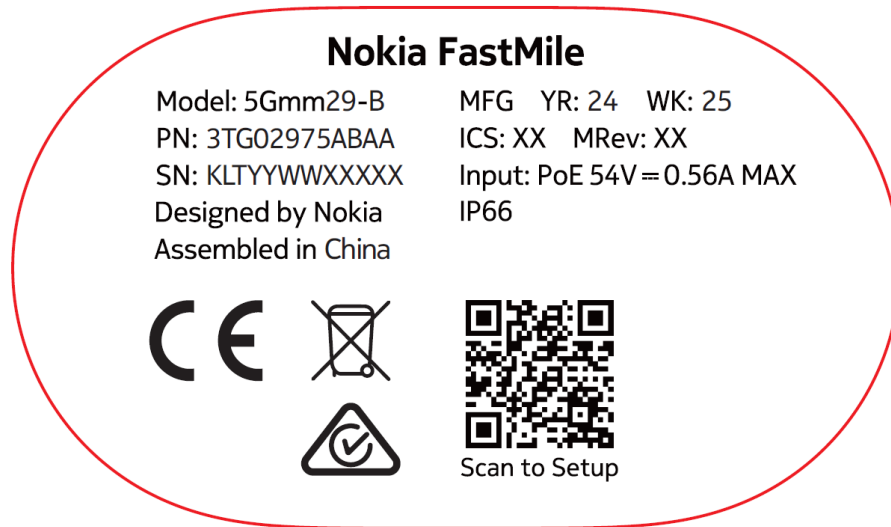


Figure 3 Label of 5Gmm29-B

### 4.1.2 Electrical Testing Labs (ETL\cETL)

5Gmm28-B has been tested by Intertek, which is the NRTL (National Recognized Testing Laboratory) lab in USA and also the ATO (Accredited Testing Organization) in Canada, 5Gmm28-B is in compliance with the following national standards across the US and Canada.

- UL 62368-1:2019 Ed3, Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
- CSA C22.2#62368-1:2019 Ed3, Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements

### 4.1.3 FCC Regulation

Table 3 provides the Federal Communications Commission ID for 5Gmm28-B.

Table 1 FCC identification

Model	FCC ID
5Gmm28-B	2ADZR5GMM28B

#### 4.2.2.1 EMC Compliance

The 5Gmm28-B complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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



This device 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 try to correct the interference by one or more of the following measures:

- re-orient or relocate the receiving antenna
- increase the separation between the equipment and receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help

#### **4.2.2.2 FCC RF exposure**

5Gmm28-B complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 51cm (20.1 in.) specified during normal operation. See your Nokia representative for more information.

### **4.1.4 ISED Notice**

5Gmm28-B complies with the Canadian ICES-003 Class B specifications. CAN ICES-003(B)/ NMB-003 (B), IC ID: 21694-5GMM28B.

#### **4.1.4.1 EMC compliance**

5Gmm28-B complies with Innovation, Science and Economic Development Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- 1 This device may not cause interference.
- 2 This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- 1 L'appareil ne doit pas produire de brouillage.
- 2 L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en.

#### **4.1.4.2 ISED RF exposure**

To satisfy IC RF exposure requirements, a separation distance of 20 cm (7.9 in) should be maintained between the antenna of 5Gmm28-B and persons during device operation. To ensure compliance, operations closer than the specified distance is not recommended. See your Nokia representative for more information.

Cet appareil est conforme aux limites d'exposition aux rayonnements de la CNR-102 définies pour un environnement non contrôlé. Afin d'éviter la possibilité de dépasser les limites d'exposition aux fréquences radio de la CNR-102, la proximité humaine à l'antenne ne doit pas être inférieure à 20 cm (7.9 in) pendant le fonctionnement normal.

### 4.1.5 CE Directive



5Gmm29-B is in compliance with Article 3.1a\3.1b\3.2 of Radio Equipment Directive 2014/53/EU; and Directive Eco-design 2009/125/EC.

#### EMC compliance

5Gmm29-B complies with the following EMC requirements:

- Electromagnetic compatibility of multimedia equipment - Emission requirements CISPR 32, EN 55032
- Electromagnetic compatibility of multimedia equipment - Immunity requirements CISPR 35, EN55035
- Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
- Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU EN 301489-17
- Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1.5 GHz band providing data communications and GNSS receivers operating in the RNSS band providing positioning, navigation, and timing data; Harmonized Standard for ElectroMagnetic Compatibility; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU EN 301489-19
- Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU EN301489-52

#### Specific precautions for EMC Warning

5Gmm29-B is compliant with Class B of EN 55032. The Products are tested to the requirements of EN 55032 (Emissions) and EN 55035 (immunity). There are no specific precautions which must be taken in order to comply with the requirements of Directive 2014/30/EU Essential Requirements in Section 1 of Annex I. In addition, the Products are further tested to ensure spurious emissions are within the specified limits, as well as meeting the requirements for adaptivity, which mitigates against problems caused by co-location with other wireless products. The Products are not subject to the requirements in Section 2 of Annex I of Directive 2014/30/EU for fixed installations.

### 4.1.6 RCM



5Gmm29-B is marked with the Regulatory Compliance Mark shown above. This device is compliant with:

- AS/NZS 62368 - 1:2018 – Information technology equipment – safety Part 1 : General requirements,

- AS/NZS CISPR32:2015 - Electromagnetic compatibility, AS/NZS 4268:2017 – Radio equipment and systems-short range devices-Limits and methods of measurement,
- AS/NZS 2772.2:2016, Radiofrequency fields Part 2: Principles and methods of measurement and computation—3 kHz to 300 GHz,
- AS/CA S042.1:2022, Requirements for connections to an air interface of a Telecommunications Network -Part 1: General,
- AS/CA S042.4:2022, Requirements for connections to an air interface of a Telecommunications Network -Part 4: IMT Customer Equipment,
- AS/CA S042.5:2022, Requirements for connection to an air interface of a Telecommunications Network—Part 5: IMT-2020 Customer Equipment.

The power adaptor for the device is certified and registered in the Electrical Equipment Safety System (EESS) national database that can be freely searched for and viewed by any member of the public at <https://equipment.erac.gov.au/Registration/>.

### **RF exposure**

5Gmm29-B meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Regulatory Compliance Mark (RCM) by the electrical regulator (Regulatory Authorities (RAs) and the Australian Communications Media Authority.

In order to avoid the possibility of exceeding the RCM radio frequency exposure limits, human proximity to the antenna shall not be less than 30 cm (12 inches) during normal operation.

## 5 Product description

### 5.1 Product overview

The FastMile 5G mmWave Receiver is designed to help operators capitalize on the growing 5G market. The device is elegant, blending well in residential environments, is easy to deploy, connects wirelessly to the mobile network, and supports 4G and 5G bands. Depending on the model and variant, the FastMile 5G mmWave Receiver can be easily mounted on an outside wall, balcony railing or a pole.

The FastMile 5G mmWave Receiver is a fully self-contained outdoor sub-6 GHz and mmWave 5G receiver that, depending on the model, connects a 4G/LTE or 5G mobile network to the end user's gateway over a supplied (or equivalent) PoE cable through a standard 10 Gbps Ethernet LAN interface.

The FastMile 5G mmWave Receiver is easy to deploy and addresses the higher bandwidth demands of residential and business customers by efficiently delivering ultra-fast speeds to areas that are unserved or under served by fiber. The FastMile 5G Receiver is gateway-agnostic, and improves performance and reliability by using the best available 4G/LTE and 5G signals. With extensive carrier aggregation between supported bands, the FastMile 5G mmWave Receiver improves performance and reliability by pooling all resources in the available 4G/LTE and 5G bands.

Table 4 provides identification and description of the FastMile 5G mmWave Receiver supported models and variants covered in this document. Additional variants may be available; contact your Nokia representative for details.

Table 2 Identification of FastMile 5G mmWave Receiver

Mnemonic	Description	Device part number on the product label (1)
5Gmm28-B	FastMile 5G mmWave High-Gain Receiver (ANSI)	3TG02974AB
5Gmm29-B	FastMile 5G mmWave High-Gain Receiver (ETSI)	3TG02975AB

Notes:

<sup>(1)</sup> The product label is located on the bottom of the device.

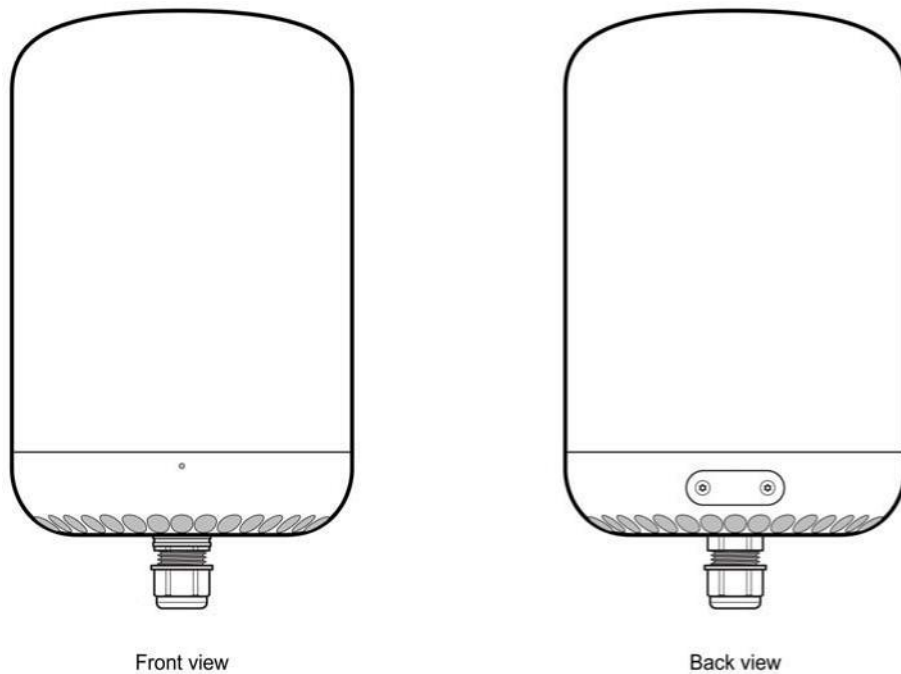
A point-of-sales tool through the Nokia Altiplano FastMile Controller helps with service fulfillment along with guided install and service assurance and optimization functions including selecting the side of the home or building with the best radio reception, and a smart phone application can be used to provide guidance through the installation process.

The FastMile 5G mmWave Receiver is compatible with any wire line gateway; paired with the in-home Nokia WiFi solution, the FastMile 5G mmWave Receiver ensures a seamless ultra-broadband experience in every corner of the home.

The PoE cable supplied with the FastMile 5G mmWave Receiver routes conveniently through a window seal or wall to provide connectivity to the supplied PoE injector that connects to AC power and to the end user's gateway. The PoE cable can connect to the PoE port on a Nokia Beacon (PoE+) rather than connecting to the supplied PoE injector.

Figure 4 shows the front and the back of the FastMile 5G mmWave Receiver.

The front of the FastMile 5G mmWave Receiver shows the tri-colored LED. The back of the FastMile 5G mmWave Receiver allows to insert the SIM card after removing the screws.



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*Figure 4 Front and rear views the FastMile 5G mmWave Receiver*

The FastMile 5G mmWave Receiver can be installed using a number of different methods:

- mounted on the exterior of an outside wall
- mounted on a pole that has a maximum diameter of 8 cm (approximately 3 in)
- mounted to a corner wall contact your Nokia representative for availability and how to order the bracket
- mounted to a balcony railing

Figure 4 shows an example of the FastMile 5G mmWave Receiver mounted on an outside wall with its PoE cable passing through the seal of a nearby window.

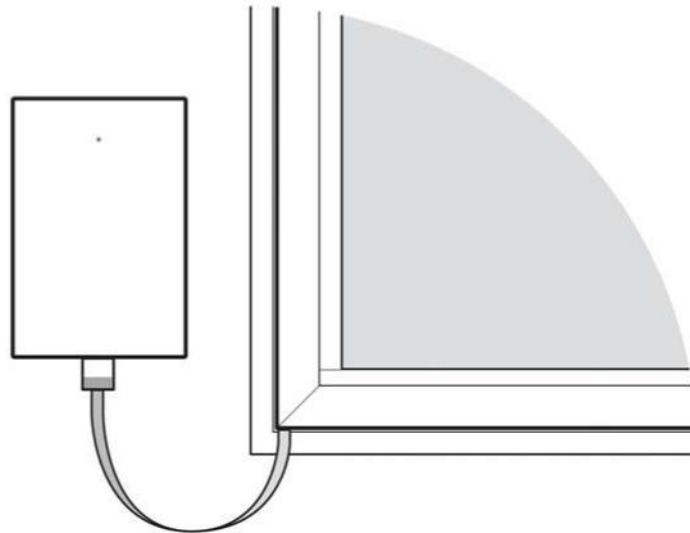


Figure 5 Example of a FastMile 5G mmWave Receiver mounted on an outside wall

The FastMile 5G mmWave Receiver is easily installed with the assistance of the Nokia Wireless Mobile App. The app can be installed on a smart phone to provide information that can help with FastMile 5G mmWave Receiver installation, such as finding the best location for the FastMile 5G mmWave Receiver, and providing guidance for tasks such as how to configure parameters.

The FastMile 5G mmWave Receiver requires a 4FF/nano-sized SIM card.

The FastMile 5G mmWave Receiver supports PIN-locked SIM cards so that a PIN code is required to unlock the SIM card for service; the PIN code for the SIM card is not required to unlock access to a FastMile 5G mmWave Receiver that has a PIN-locked SIM card.

The FastMile 5G mmWave Receiver has the following main features, benefits, and characteristics:

#### Main features and Benefits:

- 5G NR 3GPP Release 17 compliant with extensive carrier aggregation between 4G/LTE and 5G supports:
  - NSA: Option 3X and Option 3A
  - SA: Option 2
- 4G/LTE and 5G NR WAN connectivity

- High gain mmWave antenna
- 5G NR FR1 3CA and 4CA with up to 300 MHz bandwidth and 5G NR FR2 8CA with up to 800MHz bandwidth support in SA/NSA mode
- 5G (FR1 + FR2) and 4G LTE WAN connection
- High gain FR2 antenna with up to 26 dBi gain and auto antenna alignment solution
- PCB-ready for 8Rx, eSIM support; availability is subject to a business agreement
- GPS L1/L5
- Bluetooth 5.0
- Support for multiple APNs
- Uninterrupted 360° azimuthal view, eliminating the need for pointing
- -5° to 30° vertical field of view, without adjusting the bracket
- Delivers Gigabit home broadband services with 5G FR1 and 5G FR2
- Supports Bridge and routed mode configurations (L2 IP Passthrough (Bridge))
- 3-axis Accelerometer
- Size and gain optimized for urban and suburban densities

## 5.2 Supported RF modes

The FastMile 5G mmWave Receiver is designed to operate according to the 5G NSA/SA 3GPP Rel-17 standards.



**Note** — Contact your Nokia representative for LTE CA 5G NR EN-DC information for the FastMile 5G mmWave Receiver.

See section [5.11](#) for information about support for EN-DC/CA

### 5.2.1 5Gmm28-B

Radio	Band	3GPP TX Frequency (MHz)	3GPP DL Frequency (MHz)	Power Class for FCC\IC	MIMO	Bandwidths (MHz)	Antenna Type	FCC	ISED
4G LTE	B2	1850 - 1910	1930 - 1990	PC3	DL 4x4 UL: SISO	follow 3GPP	Monopole	Y	Y
	B4	1710 - 1755	2110 - 2155	PC3		follow 3GPP	Monopole	Y	Y
	B5	824 - 849	869 - 894	PC3	DL 2x2 UL: SISO	follow 3GPP	Monopole	Y	Y
	B7	2500 - 2570	2620 - 2690	PC3	DL 4x4 UL: SISO	follow 3GPP	Dipole	Y	Y
	B12	699 - 716	728 - 746	PC3	DL 2x2 UL: SISO	follow 3GPP	Monopole	Y	Y
	B13	777 - 787	746 - 756	PC3		follow 3GPP	Monopole	Y	Y
	B25	1850 - 1915	1930 - 1995	PC3	DL 4x4 UL: SISO	follow 3GPP	Monopole	Y	Y



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	B26	814 - 849	859 - 894	PC3	DL 2x2 UL: SISO	follow 3GPP	Monopole	Y	Y
	B66	1710 - 1780	2110 - 2200	PC3	DL 4x4 UL: SISO	follow 3GPP	Monopole	Y	Y
	B71	663 - 698	617 - 652	PC3	DL 2x2 UL: SISO	follow 3GPP	Monopole	Y	Y
	B38	2570 - 2620		PC3	DL 4x4 UL: SISO	follow 3GPP	Dipole	Y	Y
	B41	2496 - 2690		PC3		follow 3GPP	Dipole	Y	Y
	B42	3400 - 3600		PC3		follow 3GPP	Monopole	Y	Y
	B43	3600 - 3800		PC3		follow 3GPP	Monopole	N	Y
	B48	3550 - 3700		PC3(FCC 19)		follow 3GPP	Monopole	Y	Y
5G NR FR1	n2	1850 - 1910	1930 - 1990	PC3	DL 4x4 UL: SISO	5, 10, 15, 20,25, 30, 40	Monopole	Y	Y
	n5	824 - 849	869 - 894	PC3	DL 2x2 UL: SISO	5, 10, 15, 20	Monopole	Y	Y
	n7	2500 - 2570	2620 - 2690	PC3	DL 4x4 UL: SISO	5, 10, 15, 20, 25, 30,40	Dipole	Y	Y
	n12	699 - 716	728 - 746	PC3	DL 2x2 UL: SISO	5, 10, 15	Monopole	Y	Y
	n25	1850 - 1915	1930 - 1995	PC3	DL 4x4 UL: SISO	5, 10, 15, 20, 25, 30,40	Monopole	Y	Y
	n26	814 - 849	859 - 894	PC3	DL 2x2 UL: SISO	5, 10, 15, 20	Monopole	Y	Y
	n66	1710 - 1780	2110 - 2200	PC3	DL 4x4 UL: SISO	5, 10, 15, 20,25, 30,40	Monopole	Y	Y
	n71	663 - 698	617 - 652	PC3	DL 2x2 UL: SISO	5, 10, 15, 20	Monopole	Y	Y
	n38	2570 - 2620		PC3	DL: SA/NSA 4x4 UL SA:2x2; UL NSA:1X1	20,30, 40	Dipole	Y	Y
	n41	2496 - 2690		PC2/PC1.5[1]		20, 30, 40, 50, 60, 70, 80, 90, 100	Dipole	Y	Y
	n48	3550 - 3700		PC3(FCC 19)		20,30, 40,[50, 60, 70, 80, 90, 100]	Monopole	Y	Y
	n77	3300 - 4200		PC2		20, 30, 40, 50, 60, 70, 80, 90, 100	Monopole	Y	Y
	n78	3400 - 3800		PC2		20, 30, 40, 50, 60, 70, 80, 90, 100	Monopole	N	Y
5G NR FR2	n257	26500 - 29500		PC1	DL 2x2 UL: 2x2	50, 100	parabola	N	N
	n258	24250 - 27500		PC1		50,100,200	parabola	Y	N
	n260	37000 - 40000		PC1		50, 100	parabola	Y	N
	n261	27500 - 28350		PC1		50, 100	parabola	Y	N
GPS	L1\L5	1176/1575		NA	NA	NA	Monopole	Y	Y
BT		2400-2483.5		4	NA	2	Monopole	Y	Y

[1] support at UL MIMO

Other features:

LTE:

DL: Category 20, up to 256 QAM

UL: Category18, up to 64QAM

5G NR FR1:

Release 17

DL: up to 256 QAM

UL: up to 256 QAM

5G NR FR2:

Release 17

DL: up to 64QAM

UL: up to 64QAM

## **5.2.2 5Gmm29-B**

## **5.3 Antenna and modem information**

The FastMile 5G mmWave Receiver has been designed to have a FR2 high-gain antenna approach as well as providing a omni directional FR1 antenna approach.

Model 5Gmm28-B/5Gmm29-B has seven FR1 antennae; they are multi-band omni-directional and are designed to cover LTE L/M/H & NR FR1 band essentially.

Additionally, a separate Bluetooth and GPS(L1&L5) antenna are added.

A mmWave antenna and commercial module is co-designed to boost high gain for FR2 application.

The antennas are optimized for compact and discrete look and feel, and provide for ease of installation of the FastMile 5G mmWave Receiver, with no pointing required.

## 5.4 Environment

The FastMile 5G mmWave Receiver is intended for outdoor use.

### Storage

In accordance with ETS 300-019-1-1 - Class 1.1, storage of the FastMile 5G mmWave Receiver must be in Class 1.1, weather-protected, temperature-controlled locations.

The storage temperature (ambient) range must be from -40°C to 70°C (-40°F to 158°F).

### Transportation

In compliance with EN 300-019-1-2 - Class 2.3, the FastMile 5G mmWave Receiver is packed for public transportation, except during rain.

### Stationary use

In accordance with EN 300-019-1-3 - Class 3.1/3.2/3.E, stationary use of the FastMile 5G Receiver must be in a temperature-controlled location with no condensation allowed.

The FastMile 5G mmWave Receiver can be used in a temperature between -40°C and 50°C (-40°F and 122°F) with sun load, or -40°C and 60°C (-40°F and 140°F) without sun load, with an operating relative humidity from 5% to 93%, non-condensing

## 5.5 Physical dimensions

The FastMile 5G mmWave Receiver have the following dimensions without the PoE cable attached and without a mounting plate or any other attachment accessories:

- height: 266 mm (10.5 in)
- diameter: 172 mm (6.7 in)
- weight: 2200 g (4.8 lb)
- Ingress protection: IP66

## 5.6 Physical interfaces

Physical interfaces for the FastMile 5G mmWave Receiver are located on the front, back and bottom of the unit.

Figure 6 shows the interfaces located on the front of the unit:

- Ethernet RJ45 Socket interface on bottom side of receiver to support LAN ethernet connection and POE supply connection
- Reset button and a vent share a cover in bottom side
- LED to indicate status on front of receiver
- SIM card slot in sim door on backside of receiver
- Grounding point to connect grounding cable
- reset button
- RJ45 port for 10 Gigabit Ethernet LAN connectivity over PoE to the supplied PoE injector (or alternatively for Model 5G26-A, to the PoE port on a Nokia Beacon G6.2 (PoE+)) through the supplied (or equivalent) PoE cable
- slot for 4FF/nano-sized SIM card



Figure 6 Location of interfaces on the front of the FastMile 5G mmWave Receiver

Figure 7 shows the interfaces located on the back of the unit:



**Note** — The reset button, USB port, and the SIM card slot are only accessible through a cover on the bottom of the unit; the cover has been removed in the following figure to show all the interfaces, but note that the USB port is not identified in the figure. The reset button requires the use of a paper clip or similar.

Connection to the LAN port does not require that the bottom cover be removed.



Figure 7 Location of interfaces on the back of the FastMile 5G mmWave Receiver



**Note** — The Torx screws shown in the above figure are covered by a sticker that indicates that the warranty is void if the sticker is removed. The screws must not be loosened without support from a Nokia representative, otherwise the device warranty is considered void by Nokia.

The USB port shown in the above figure is for troubleshooting; it is for Nokia use only, or under Nokia staff guidance.

## 5.7 Management

The FastMile 5G mmWave Receiver supports local management using a web-based graphical user interface known as the WebUI. You access the WebUI through a PC, laptop, or tablet that connects to the FastMile 5G mmWave Receiver through the gateway. Chapter 7 describes how to access the WebUI and provides steps for configuration-related tasks for the FastMile 5G mmWave Receiver that use the WebUI.



**Note** — The WebUI screens are designed for 1920 \* 1080 pixels. Supported browsers for the WebUI include Chrome, Firefox, Edge, and Safari.

It is recommended to use the latest versions of supported browsers.

The FastMile 5G mmWave Receiver can also be managed through the Nokia Wireless Mobile App installed on a smart phone.

## 5.8 Power

The FastMile 5G mmWave Receiver is powered by a supplied indoor-use-only 30W PoE injector for non grounded and Class II PoE for grounded that connects to AC power and to a gateway. Connection of the PoE injector to the FastMile 5G mmWave Receiver is through a PoE cable supplied with (or provided for) the FastMile 5G mmWave Receiver.

The device side support both unshielded cable and shield cable connection, but POE injector side must match correct injector type:

Unshielded cable: injector type support float ground design

Shielded cable: injector type support grounded design

PoE input: 100-240~50-60Hz 0.75A MAX

FastMile 5G mmWave Receiver input: 54VDC  0.56A MAX

Maximum power consumption: 22W

Typical power consumption: 12W

## 5.9 Cabling

The following are the guidelines regarding cables used for the FastMile 5G mmWave Receiver:

All Cat 6A cables less than 80m must be approved by the relevant national electrical code.

If cabling is supplied with the FastMile 5G mmWave Receiver, the supplied cabling must be used with the equipment.

## 5.10 3-axis accelerometer

The FastMile 5G mmWave Receiver is equipped with an embedded 3-axis accelerometer. The accelerometer gives the device orientation for three axis (X,Y, and Z), which can detect vibration, shock and when over-preset threshold happens, interruptions are produced. The system responds to motor protection action and checks for alignment post vibration and shock.

## 5.11 Support for EN-DC/CA OTA upgrade

The FastMile 5G mmWave Receiver supports an extensive set of EN-DC/CA combinations. The RF front end of the FastMile 5G mmWave Receiver is calibrated to support LTE carrier aggregation, 5G NR NSA EN-DC, and 5G NR SA carrier aggregation among supported 4G/LTE and 5G bands. For details on supported combinations, contact your Nokia representative.



The FastMile 5G mmWave Receiver also supports the capability to add EN-DC/CA combinations through over-the-air (OTA) software upgrades. OTA upgrade is feasible for LTE CA, EN-DC or 5G NR CA band combinations that correspond to an existing RF Front End calibrated route. In practice this means that, for roadmap commitments for new band combinations, you are advised to contact your Nokia representative to review device capability. In case the RF Front End was not calibrated for a new band combination, OTA upgrade is still feasible, but 3GPP performance may not be guaranteed. For more detailed information about EN-DC/CA OTA upgrade, contact your Nokia representative.

## **5.12 Output power information**

5Gmm29-B

## 6 Installation

### 6.1 Installation overview

The FastMile 5G mmWave Receiver can be installed using a number of different methods:

- mounted on a exterior outside wall
- mounted on a pole that has a maximum diameter of 8 cm (approximately 3 in)
- mounted on the railing of a balcony that has a maximum diameter of 5 cm
- mounted to a corner of a wall

Mounting and attachment accessories are included as applicable in the kit provided for each model and variant of the FastMile 5G mmWave Receiver.

The FastMile 5G mmWave Receiver requires a SIM card for 4G/LTE or 5G service. You will need to insert an appropriate 4FF/nano-sized SIM card as described in section [6.5](#).

The Nokia Wireless Mobile App, which can be downloaded to a smart phone, can be used to guide you through the installation process, including how to determine the best location for mounting the FastMile 5G mmWave Receiver (described in section [6.6](#)).



**Warning 1** — Be careful not to drop the FastMile 5G Receiver, especially when mounting it.

If the FastMile 5G mmWave Receiver is dropped, especially on a hard surface, or in case of suspected damage, contact your Nokia representative to arrange an inspection of the equipment.

**Warning 2** — The FastMile 5G mmWave Receiver must be used with cables and accessories supplied with or for the equipment.



**Note** — Refer to the *FastMile 5G Customer Release Notes* before installing the FastMile 5G mmWave Receiver.

## 6.2 Safety information

Read the Safety and Regulatory information that is included with the FastMile 5G mmWave Receiver, and observe the following before installing the FastMile 5G mmWave Receiver.



**Danger 1** — Hazardous electrical voltages and currents can serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits.

**Danger 2** — Ensure that all sources of power are turned off and have not live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.



**Warning 1** — Be careful not to drop the FastMile 5G mmWave Receiver, especially when mounting it. If the FastMile 5G mmWave Receiver is dropped, especially on a hard surface, or in case of suspected damage, contact your Nokia representative.

**Warning 2** — The FastMile 5G mmWave Receiver must be used with cables and cable accessories supplied with or for the equipment.

**Warning 3** — Do not install the FastMile 5G mmWave Receiver in a way that would interfere with a door or window designated as an emergency exit.

**Warning 4** — Do not install the FastMile 5G mmWave Receiver above a doorway or above anywhere else where people could get injured by the device falling from overhead.

**Warning 5** — The FastMile 5G mmWave Receiver must be used with the supplied PoE cable (or equivalent) and PoE injector. The supplied PoE injector is intended for indoor use only. Note that a Nokia Beacon G6.2 (PoE+) can be used instead of the supplied PoE injector for PoE.



**Caution 1** — — Keep indoor devices out of direct sunlight. Prolonged exposure to direct sunlight can damage indoor devices.

**Caution 2** — Do not disassemble or open crush, bend or deform, puncture or shred.

**Caution 3** — Do not modify or re manufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, expose to fire, explosion or other hazard.

## 6.3 Kit contents

The contents of kits supplied for the FastMile 5G mmWave Receiver will vary, depending in part on the model and variant of the FastMile 5G mmWave Receiver and the supported mounting methods.



**Note** — Nokia supplies operator-specific kit contents as agreed with different operators. Operator-specific kit contents are not described in this document, but are agreed to separately with each operator. Operator-specific kit contents may be similar to the kit contents described in this document.

Contact your Nokia representative for information about kits not described

Table 7 lists the contents of the kits for the mounting methods supported by the models and variants of the FastMile 5G mmWave Receiver covered in this document.

Item	Model 5Gmm28-B/5Gmm29-B Primarily intended to be mounted on an outside wall, corner wall, pole, or balcony railing using the supplied kit contents
FastMile 5G mmWave Receiver, with built-in bracket on the back of the device	Included
PoE injector, with AC cable and plugs	Nokia 10 Gbps PoE 30 W Class II
10 m (approx 33 ft) flat PoE cable for connection between the FastMile 5G mmWave Receiver and the PoE injector	Included
The following connector accessories to create a waterproof seal between the PoE cable and the LAN port of the FastMile 5G mmWave Receiver: M20 rubber gasket suitable for 5 to 7 mm round cables M20 rubber gasket suitable for 6 to 8 mm round cables M2 rubber gasket suitable for a flat cable (AWG 30) M20 gland cage to hold the rubber gasket standard M20 connector cap to hold the gland cage The connector cap, gland cage, and a rubber gasket are provided within the FastMile 5G mmWave Receiver itself	Included

<p>Wall mounting:  wall/balcony mounting plate or wall/ plate that can be used when wall-mounting the FastMile 5G mmWave Receiver  screws to use with the wall/balcony mounting plate when mounting the FastMile 5G mmWave Receiver on the exterior of an outside wall</p>	<p>The wall/balcony mounting plate and four screws are supplied in the kit for Model 5Gmm28-B</p>
<p>Pole mounting:  anti-slip rubber sticker  two metal straps to use when mounting the FastMile 5G mmWave Receiver on a pole  No additional hardware is required when mounting the FastMile 5G mmWave Receiver on a pole</p>	<p>Included</p>
<p>Balcony railing mounting:  wall/balcony mounting plate that can be used when mounting the FastMile 5G mmWave Receiver on a balcony railing  anti-slip rubber sticker  zip ties to use with the wall/balcony mounting plate when mounting the FastMile 5G mmWave Receiver on the railing of a balcony</p>	<p>Included</p>

## 6.5 Inserting the SIM card

You will need to insert an appropriate 4FF/nano-sized SIM card.

You will need an M3 Phillips screwdriver to insert the SIM card in the FastMile 5G mmWave Receiver.

### Procedure 4 Inserting the SIM card in the FastMile 5G mmWave Receiver

- 1** Ensure that the FastMile 5G mmWave Receiver is not connected to the PoE injector or to any other source of power.
- 2** Use the screwdriver to remove the two screws that secure the SIM card cover of the FastMile 5G mmWave Receiver. Figure 9 shows the location of the screws.

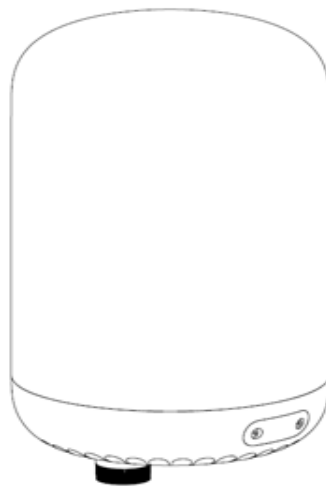


Figure 8 Location of the screws to access the SIM card slot

- 3** Remove the cover from the FastMile 5G mmWave Receiver, and slide the SIM card into the SIM card slot as shown in Figure 10.

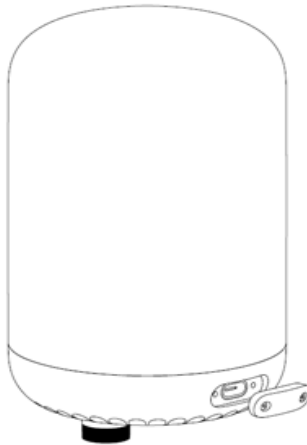


Figure 9 Sliding the SIM card into the SIM card slot

- 4** Place the cover back onto the FastMile 5G mmWave Receiver.
- 5** Use the screwdriver to secure the bottom cover.
- 6** STOP. This procedure is complete.

## 6.6 Connecting the FastMile 5G mmWave Receiver to power



**Danger** — Be careful do not insert AC plug to wall socket before all cable connect to Receiver and PoE injector.

You connect the FastMile 5G mmWave Receiver to an indoor electrical outlet through the PoE cable and PoE injector. Note that Model 5Gmm28-B/5Gmm29-B can be powered by PoE from a Nokia Beacon G10 (PoE+) instead of through the supplied PoE injector.

You will need to connect the FastMile 5G mmWave Receiver to power when:

- determining the best location for mounting the FastMile 5G mmWave Receiver
- confirming the final location
- making final connection to power as part of finishing off the installation of the FastMile 5G mmWave Receiver

Note that you may need to provide a longer PoE cable if the supplied 10 m (approx 33 ft) PoE cable is not long enough. The maximum supported cable length is 100 m (approx 330 ft).

The FastMile 5G mmWave Receiver starts up when it is connected to power.

Figure 32 shows the connections you will make when connecting the FastMile 5G mmWave Receiver to power.

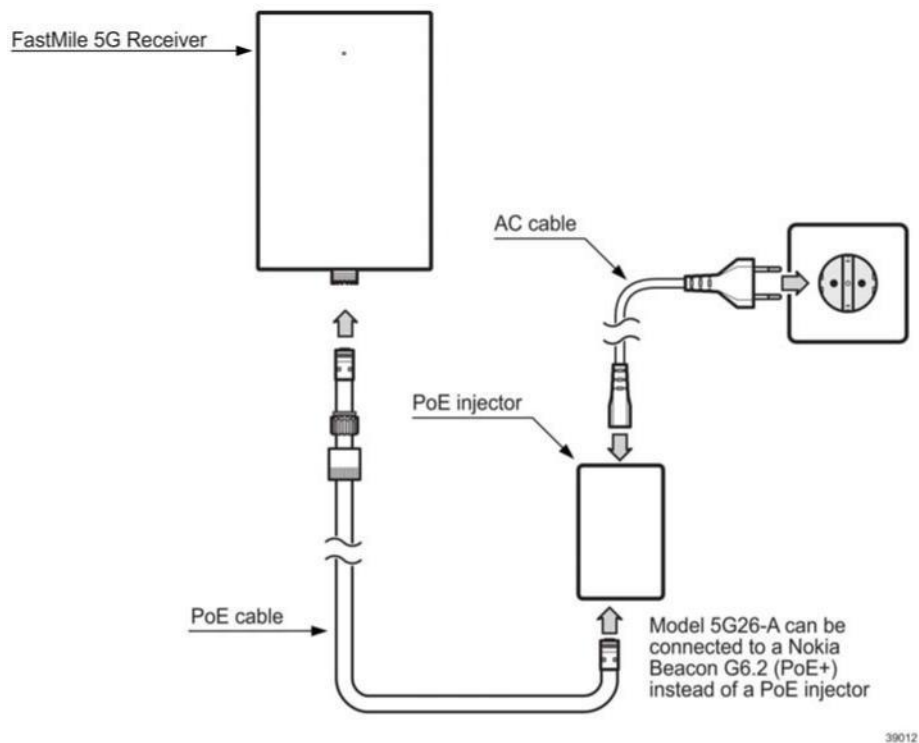


Figure 10 Power connections



## 6.7 Mounting the FastMile 5G mmWave Receiver

This section provides procedures that describe how to mount the FastMile 5G mmWave Receiver. Before you mount the FastMile 5G mmWave Receiver, be sure that you have determined the ideal final location for it, including considerations for routing the PoE cable from the outside to the inside through a window or wall, and placement of the supplied PoE injector (or Nokia Beacon G6.2 (PoE+ if applicable)



**Danger** — Be careful not to drop the FastMile 5G mmWave Receiver or tools when mounting the FastMile 5G mmWave Receiver in a location where there could be people below. To prevent injuries if accidentally dropped, try to use a mounting location that is not directly above where people could be present.

Table 9 lists the mounting methods supported for each model and variant of the FastMile 5G mmWave Receiver described in this guide.

Table 3 Mounting methods for the FastMile 5G mmWave Receiver

Mounting method	Model 5Gmm28-B/5Gmm29-B	See
On a corner wall	4 expansion screws not included in the kit	Procedure 8
On a pole	Yes, with the supplied kit	Procedure 9
On a wall	Clamps and screws are not included in the kit	Procedure 10
On a railing of a balcony	Yes, with the supplied kit	Procedure 11

Once you have mounted the FastMile 5G mmWave Receiver according to one of the above procedures, you can finish off the installation, including routing of the PoE cable to the supplied PoE injector (or Nokia Beacon G6.2 (PoE+) if applicable), along with making final connections, as described in section [6.12](#).

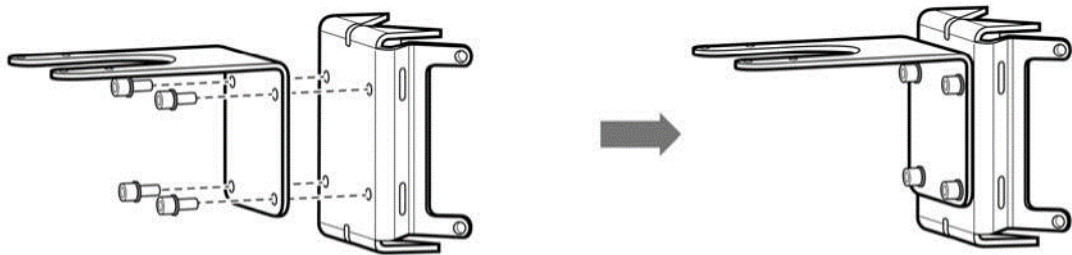
### Procedure 8 Mounting the FastMile 5G mmWave Receiver on the corner of a wall

This procedure describes how to mount Model 5Gmm28-B/5Gmm29-B on the corner of a wall. The kit provided for the model includes the mounting plate but does not include the screws needed to mount the FastMile 5G mmWave Receiver on a wall.

Note that the mounting plate provided in the kit varies, depending on the model or variant of the FastMile 5G mmWave Receiver:

You will need an M3 Phillips screwdriver, a pencil, and a drill with an appropriate size bit. You will need to provide appropriate plugs for a brick or concrete wall.

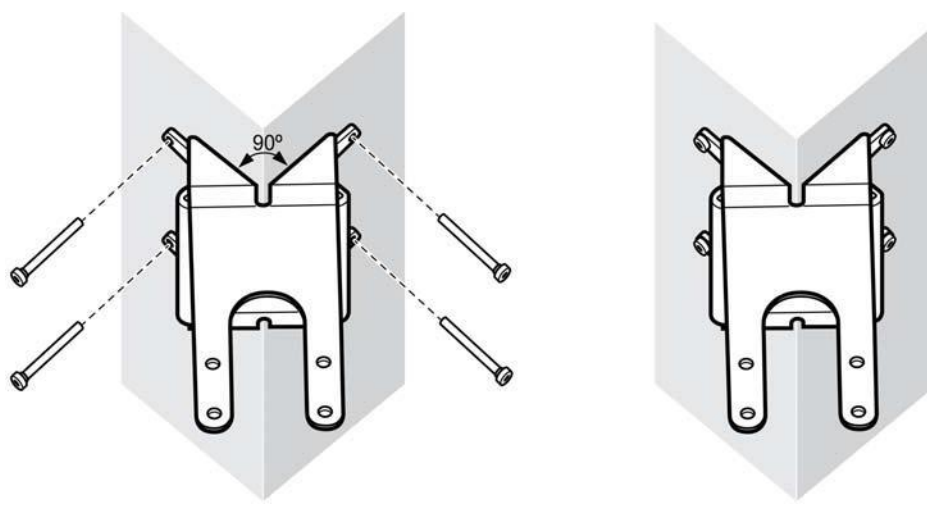
- 1 Secure the brackets with each other with the help of screws using a screwdriver, as shown in Figure [41](#). Be sure that the front of the FastMile 5G mmWave Receiver (Nokia logo) will face towards the mobile network base station to get the best performance.



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Figure 11 Securing the brackets to each other

- 2 Drill holes at the four marked positions, and use the four screws to attach the bracket plate to the corner of the wall. Ensure that the brackets are aligned as shown in the Figure 42.



**Figure 42** Attaching the bracket to the corner of the wall

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- 3 Place the FastMile 5G mmWave Receiver onto the horizontal part of the bracket and secure it with screws by using the screwdriver to tighten the screw as shown in Figure 43.

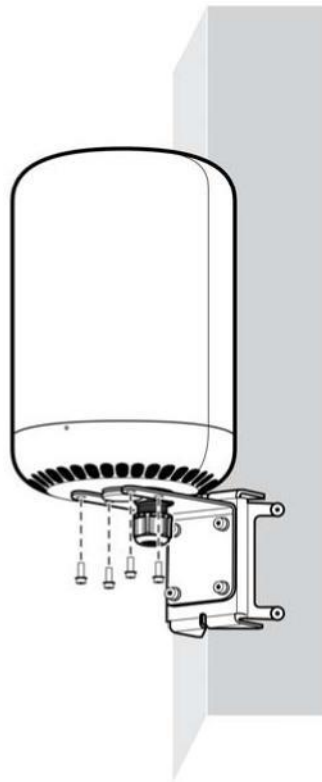


Figure 13 FastMile 5G mmWave Receiver in placed on the bracket

- 4 Make sure that mounting is secure and there is no risk of it coming loose.
- 5 STOP. This procedure is complete.

## 6.8 Finishing off the installation

This section describes how to finish of the installation, including finalizing the routing of the PoE cable to the PoE injector (or to a Nokia Beacon G6.2 (PoE+) if applicable), and making final connections.

As the best location for a gateway may vary, and considering the available cabling length, ensure that the gateway is set up at an appropriate location.



**Warning** — Correct cable routing ensures the safety of your installation.

Observe the following cabling installation safety practices when finishing off installation of the FastMile 5G mmWave Receiver:

- It is recommended to have some slack in the PoE cable outside whenever possible to allow water to run down from the cable.
- If the PoE cable will pass through a window seal, ensure that the window seal is properly placed and not damaged during the installation process.
- If the PoE cable will pass through a hole drilled through an outside wall, it is recommended that you drill the hole for the PoE cable at a slight angle so that any water that might enter the hole will run down towards the outside. It is recommended to consult an experienced professional before drilling if you are unsure, particularly for low energy houses.
- Whenever possible, it is recommended to install the PoE injector so that the port used for connecting the PoE injector to the FastMile 5G mmWave Receiver faces downwards.

### Procedure 12 Finishing off installation of the FastMile 5G Receiver

**1** Finalize routing of the PoE cable from the FastMile 5G mmWave Receiver to the final location for the supplied PoE injector (or Nokia Beacon G6.2 (PoE+) if applicable); this can include passing the PoE cable through a window seal or drilling a hole in an outside wall for passage of the PoE cable. If you will be passing the PoE cable through an outside wall, it is recommended that you use a waterproof sealant (not included) to seal the hole.

If possible, make sure that there is some slack in the PoE cable below the FastMile 5G mmWave Receiver so that any water will drip off the cable lower down. Having some slack in the cable will also help prevent the seal for the LAN port of the FastMile 5G mmWave Receiver from being broken if the cable is too tight.

**2** Make sure that the FastMile 5G mmWave Receiver has its final connection to power (through the supplied PoE injector or a Nokia Beacon G6.2 (PoE+) if applicable) as described in section [6.7](#).

**3** If using the PoE injector, secure it in place as appropriate. It is recommended to install the PoE injector so the PoE port used for connecting the PoE injector to the FastMile 5G mmWave Receiver faces downwards, as shown in Figure [52](#). Be sure to manage any excess length in the PoE cable.

**4** If using the PoE injector, connect an appropriate Ethernet LAN cable between it and the gateway as shown in Figure [53](#).

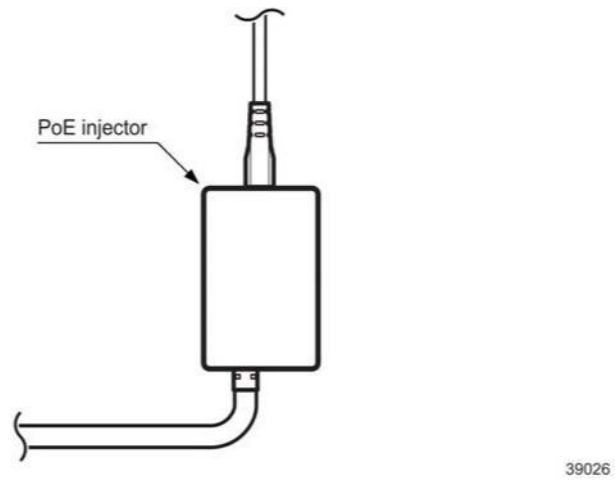


Figure 14 Installing the PoE injector so that the PoE port faces downwards

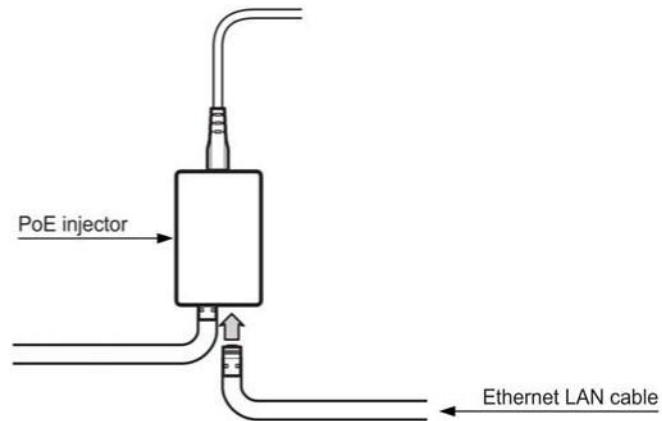


Figure 15 Connecting the Ethernet LAN cable to the PoE injector

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- 5 Make any other connections to the gateway, or to the Nokia Beacon G6.2 (PoE+) if applicable.
- 6 STOP. This procedure is complete.