ENGLISH

Anybus® Wireless Bolt 5G™

STARTUP GUIDE

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Important User Information

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1. Preface

1.1. About This Document

This document describes how to install Anybus® Wireless Bolt 5G™.

For additional documentation, software downloads and technical support, please visit www.hms-networks.com.

1.2. Document Conventions

Safety Symbols

DANGER
Instructions that must be followed to avoid an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Instructions that must be followed to avoid a potential hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION
Instruction that must be followed to avoid a potential hazardous situation that, if not avoided, could result in minor or moderate injury.

IMPORTANT
Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

Information Symbols

NOTE
Additional information which may facilitate installation and/or operation.

TIP
Helpful advice and suggestions.

1.3. Trademarks

Anybus® Wireless Bolt 5G™ is a trademarks of HMS Networks AB.

All other trademarks are the property of their respective holders.

2. Safety

2.1. General Safety

CAUTION
Ensure that the power supply is turned off before connecting it to the equipment.

CAUTION
To ensure proper functioning and electrical safety, connect the Bolt 5G Functional Earth (FE) connection to earth.

CAUTION
The supply circuit must be limited to PS2 or fulfill the requirements in IEC 62368-1:2023 standard Annex Q, equivalent to Limited Power Source (LPS).

The supply circuit transient voltages must not exceed 1500 V.

IMPORTANT
When powering the Bolt 5G, do not use PoE and DC power at the same time. Ensure to use only one source of power.

IMPORTANT
To prevent wires from overheating, use a power supply wire rated to carry the rated current of the Bolt 5G.

2.2. Intended Use

The intended use of this equipment is as a communication interface and router.

The equipment receives and transmits data over wired and cellular standard networks.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

3. Preparation

3.1. Support and Resources

For additional documentation, software downloads and technical support, please visit www.hms-networks.com.

3.2. Network Environment

Ensure that you have all the necessary information about the capabilities and restrictions of your local network environment before installation.

3.3. SIM Card

NOTE
The supported SIM card type is Nano SIM (4FF).

SIM Card Data Plan

Use a SIM card with a data plan suitable for the application and network.

3.4. Required Distance Between Devices

At least 20 cm separation distance between the device and the user's body must be maintained at all times.

3.5. Surface Heat Considerations

Mount the Bolt 5G on a surface with good thermal conductance to the surrounding air.

For optimal thermal performance, it is recommended that the heat transfer capacity of the surface corresponds to a square aluminum plate with a minimum side dimension of 300 mm and a thickness of 3 mm.

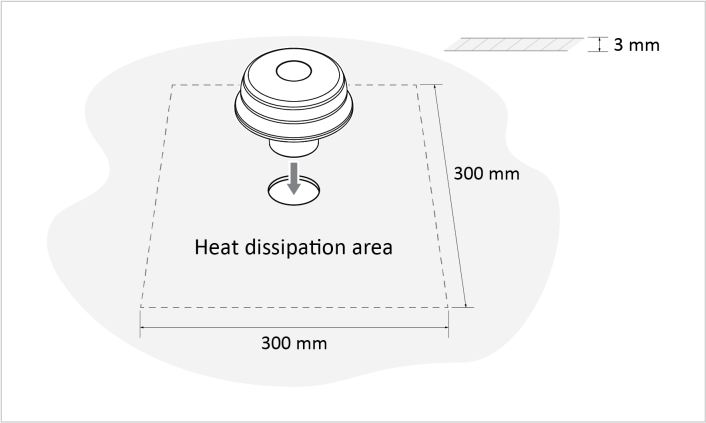


Figure 1. Mounting surface heat dissipation area

3.6. Firewall and Routing

There are routing options set for the system.

By default, the firewall allows routing of:

- Outgoing traffic for TCP, UDP and ICMP (for IPv4 only).
- Incoming traffic for already established connections only.

For other possible configurations, see the Bolt 5G User Manual.

3.7. HMS Software Applications

Download the software installation files and user documentation from www.hms-networks.com.

Supported Operating Systems

Operating System	Description
Windows 7 SP1, 32-bit	Windows 7 32-bit with Service Pack 1
Windows 7 SP1, 64-bit	Windows 7 64-bit with Service Pack 1
Windows 10 64-bit	Windows 10 64-bit
Windows 11 64-bit	Windows 11 64-bit

HMS IPconfig

Use the software application HMS IPconfig and scan your network to discover the Bolt 5G IP address and to access the Bolt 5G built-in web interface.

NOTE

HMS IPconfig is only available for Windows.

4. Installation

4.1. Install SIM Card

NOTE
The supported SIM card type is Nano SIM (4FF).

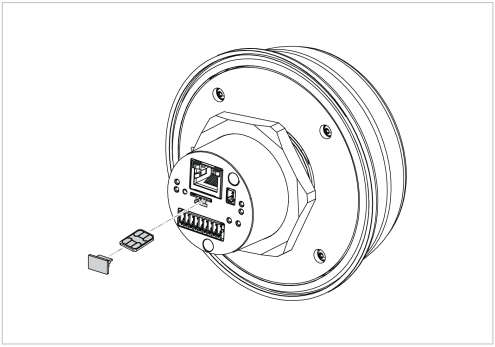


Figure 2. Insert SIM card

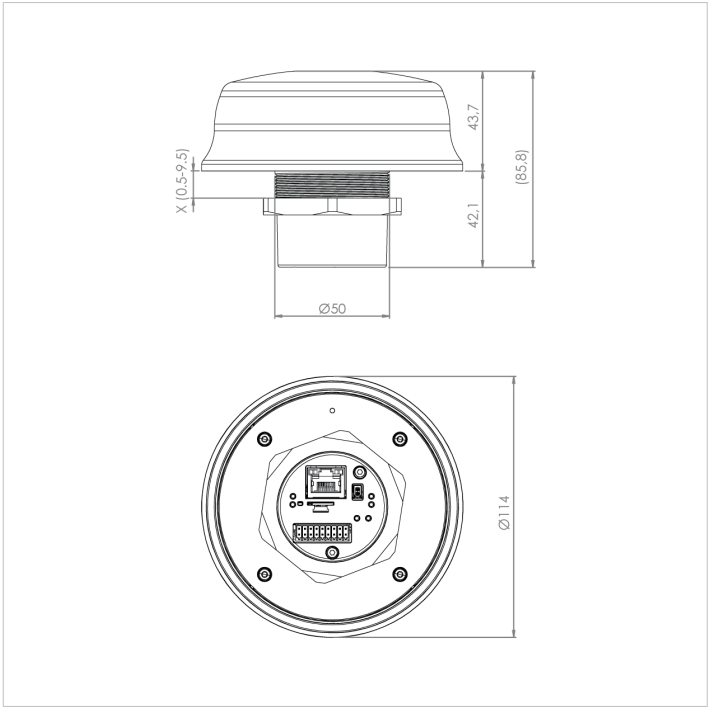
To connect Bolt 5G to a cellular data network, install a cellular SIM card:

1. Remove the SIM card holder plug.
2. Insert a SIM card into the push-push SIM card holder.

NOTE
Ensure that the SIM card contact surface is facing towards the Ethernet port.

3. Attach the SIM card holder plug.

4.2. Installation Drawing



All measurements are in mm.

Figure 3. Bolt 5G installation drawing

4.3. Surface Mounting

Before You Begin

Mounting Considerations

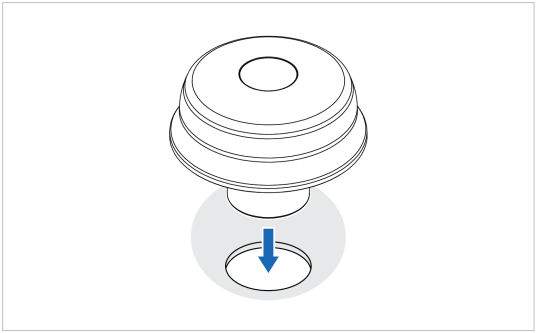
- Mount the Bolt 5G on a machine or cabinet.
- For information about surface heat considerations, see Surface Heat Considerations (page 6).
- Mounting hole diameter: M50 (50,5 mm).
- To fix the Bolt 5G position and prevent the Bolt 5G from being rotated, see To Lock the Bolt 5G Position (page 13).
- Bolt 5G lock nut tightening torque: 5 Nm ±10 %.
- Ensure to use the included housing sealing ring and lock nut.
- The top mounting surface, in contact with the sealing, must be:
  - flat with a finish equivalent to Ra 3.2 or finer.
  - cleaned and free from oils and greases.

Mounting Procedure

1. Unscrew and remove the Bolt 5G lock nut.

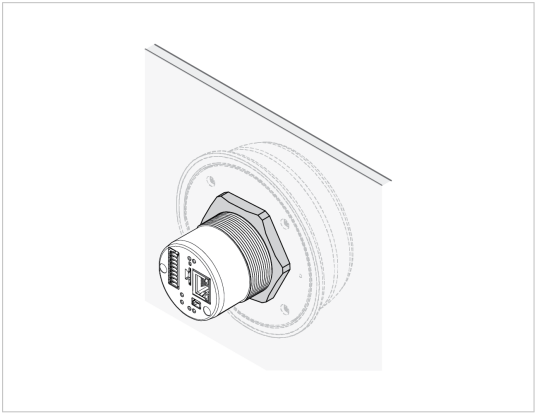
2. Place the Bolt 5G housing sealing ring in its groove.

3. In the mounting surface, drill a mounting hole with the size Ø M50 (50,5 mm).
   Option: To fix the Bolt 5G position, see To Lock the Bolt 5G Position (page 13).
4. Place the Bolt 5G in its mounting hole.



5. Screw the Bolt 5G lock nut into place and tighten it.
   Tightening torque: 5 Nm ±10 %

IMPORTANT
To keep the Bolt 5G sealed against dirt and moisture, make sure the housing sealing ring is properly seated in its groove before tightening the lock nut.



4.4. To Lock the Bolt 5G Position

The complete surface mounting procedure is described in, Surface Mounting (page 10).

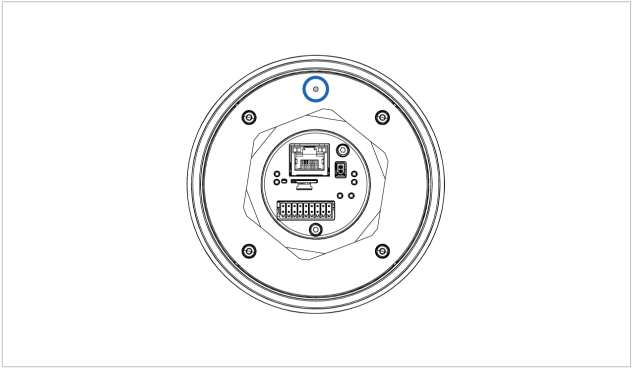


Figure 4. Bolt 5G steering hole for locking screw

To prevent the Bolt 5G from being rotated, use a screw and the Bolt 5G steering hole to fix the position.

Before You Begin

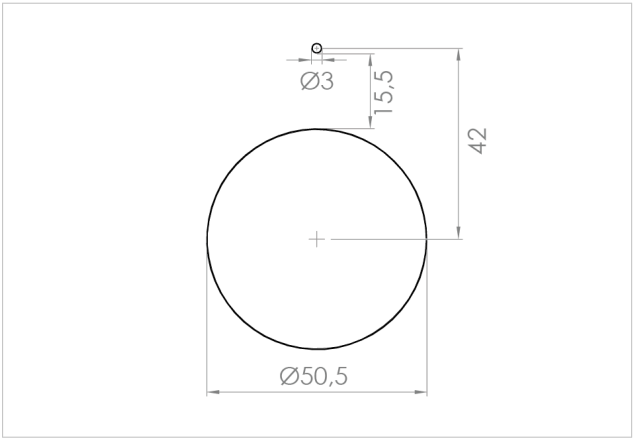
Locking screw dimension: M2.5 (2,5 mm)

NOTE

To avoid galvanic corrosion between the screw and the Bolt 5G product housing, do not use a stainless/acid proof steel screw.

Procedure

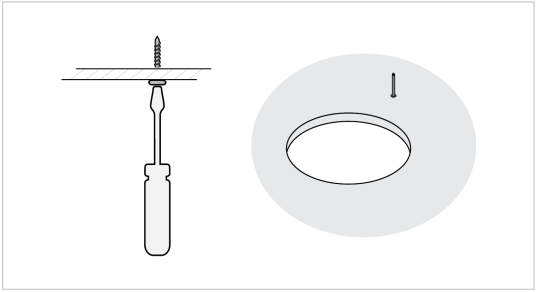
1. Drill a mounting hole with the size Ø M50 (50,5 mm) for the Bolt 5G and a hole with the size Ø 3 mm for the locking screw.



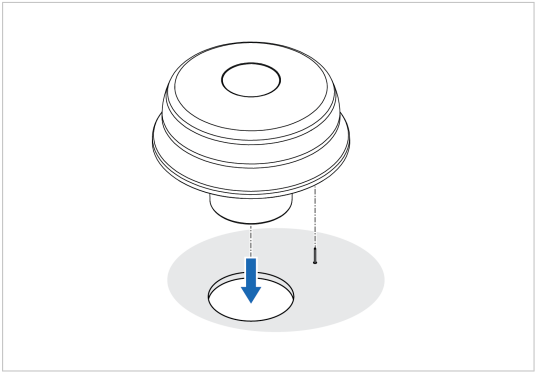
All measurements are in mm.

Figure 5. Mounting hole and locking screw hole dimensions

2. Fasten the locking screw in the Ø 3 mm hole.



3. Place the Bolt 5G in the surface mounting hole and fit the locking screw into the Bolt 5G steering hole.



4.5. Signal and Power Connector Cabling

4.5.1. Signal and Power Connector Pinout

An 18-pin connector cable assembly with individual wire leads is included with the product.

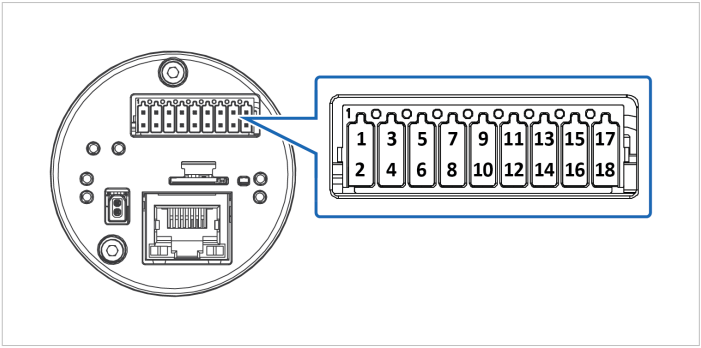


Table 1. 18-Pin Signal and Power Connector

Pin	Function	Color
1-14, 16	Not used	N/A
15	Power V+	Red
17	Power Ground (GND)	Black
18	Functional Earth (FE)	Green/Yellow

4.5.2. DC Power Interface

IMPORTANT

When powering the Bolt 5G, do not use PoE and DC power at the same time. Ensure to use only one source of power.

IMPORTANT
To prevent wires from overheating, use a power supply wire rated to carry the rated current of the Bolt 5G.

4.5.3. Connector Type

An 18-pin connector cable assembly with individual wire leads is included with the product.

Recommended Phoenix Contact PCB connector type:

- DFMC 0,5/ 9-ST-2,54
- DMCC 0,5/ 9-ST-2,54

4.6. Connect to DC Power

Option when you use DC Power. To use Power over Ethernet (PoE), see Connect to Power Over Ethernet (PoE).

Before You Begin

CAUTION
To ensure proper functioning and electrical safety, connect the Bolt 5G Functional Earth (FE) connection to earth.

IMPORTANT
When powering the Bolt 5G, do not use PoE and DC power at the same time. Ensure to use only one source of power.

NOTE
When Bolt 5G is installed in an environment with a high level of electrical noise, use a power/Functional Earth (FE) cable with a maximum length of 3 meters.

Power Supply Requirements

- Input voltage: 24 VDC (9 -30 VDC)
- Reverse polarity protect: Yes
- Input current: Max 625 mA @ 24 VDC
- Power consumption: Max 15 W

Functional Earth (FE) Wire Screw Placement

When Bolt 5G is mounted on a sheet metal plate, connect Functional Earth (FE) to the plate near Bolt 5G.

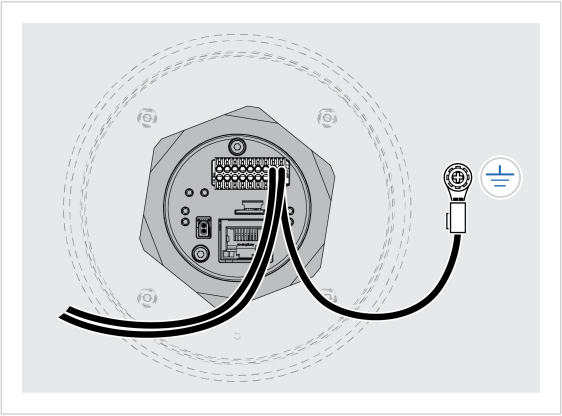


Figure 6. Functional earth wire screw placement, view from below

Procedure

Connect to DC Power and Functional Earth (FE)

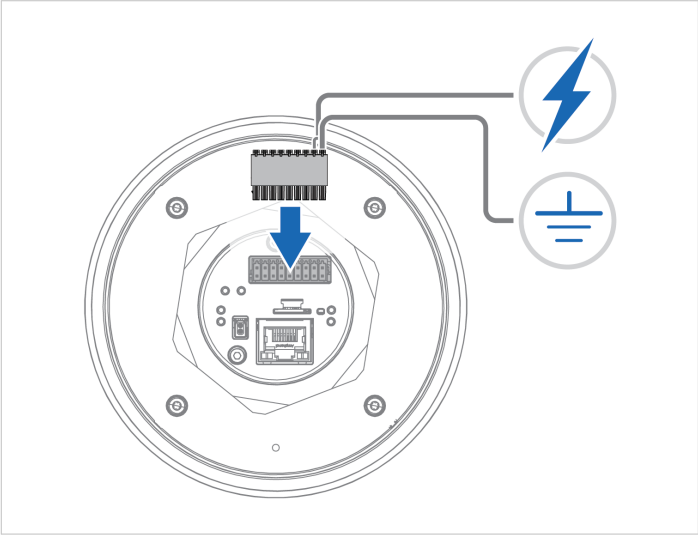


Figure 7. DC Power and Functional Earth (FE)

1. Connect Bolt 5G Power connector to Functional Earth (FE).
2. Connect Bolt 5G Power connector to a power supply.

4.7. Connect to Power Over Ethernet (PoE)

Option when you use Power over Ethernet (PoE). To use DC Power, see Connect to DC Power (page 18).

Before You Begin

CAUTION

To ensure proper functioning and electrical safety, connect the Bolt 5G Functional Earth (FE) connection to earth.

IMPORTANT

When powering the Bolt 5G, do not use PoE and DC power at the same time. Ensure to use only one source of power.

Power Supply Requirements

- RJ45 Power over Ethernet (PoE)
- IEEE 802.3at compliant, Type 2, Class 0
- Input voltage: 37-57 VDC
- Power consumption: Max 12.95 W

Functional Earth (FE) Wire Screw Placement

When Bolt 5G is mounted on a sheet metal plate, connect Functional Earth (FE) to the plate near Bolt 5G.

Place one of the functional earth wire screws in the Bolt 5G steering hole.

For information about hole dimension and screw size, see To Lock the Bolt 5G Position (page 13).

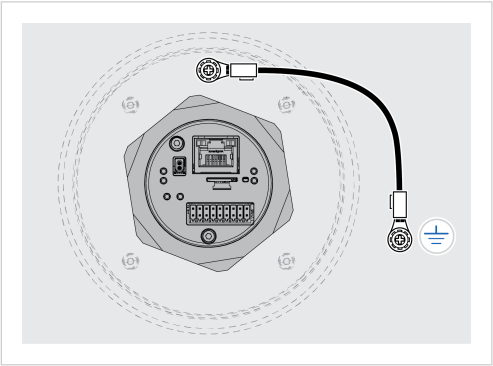


Figure 8. Functional earth wire screw placement, view from below

Procedure

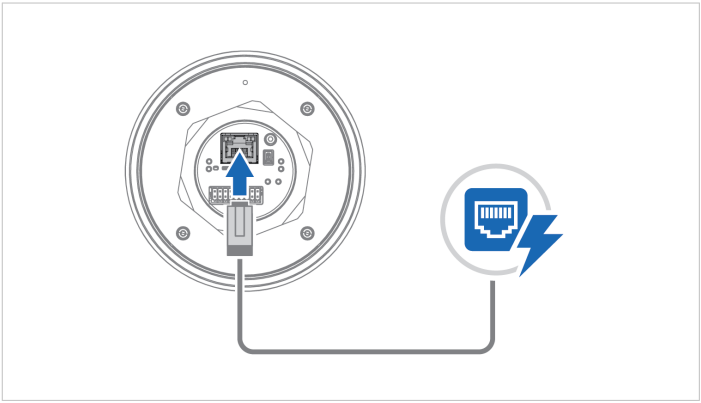
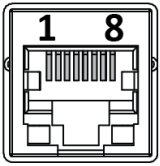


Figure 9. Connect to Power Over Ethernet (PoE)

1. Connect the Bolt 5G to Functional Earth (FE).
   Use the Bolt 5G steering hole to connect the functional earth connection cable to the Bolt 5G.
   See Functional Earth (FE) Wire Screw Placement (page 21) and To Lock the Bolt 5G Position (page 13).
2. Connect the Bolt 5G Ethernet port to Ethernet/PoE.

Ethernet RJ45 PoE Connector Pinout

RJ45 Ethernet PoE Connector	Pin	Data	PoE	
	1	TP0_P	A+	Positive power from alternative A PSE
	2	TP0_N		
	3	TP1_P	A-	Negative power from alternative A PSE (with pin 6)
	4	TP2_P	B+	Positive power from alternative B PSE
	5	TP2_N		
	6	TP1_N	A-	Negative power from alternative A PSE (with pin 3)
	7	TP3_P	B-	Negative power from alternative B PSE
	8	TP3_N		
	Housing	Shield	Functional Earth (FE), via 1 nF capacitor and 1 MΩ bleeder resistor	

4.8. Connect to Ethernet

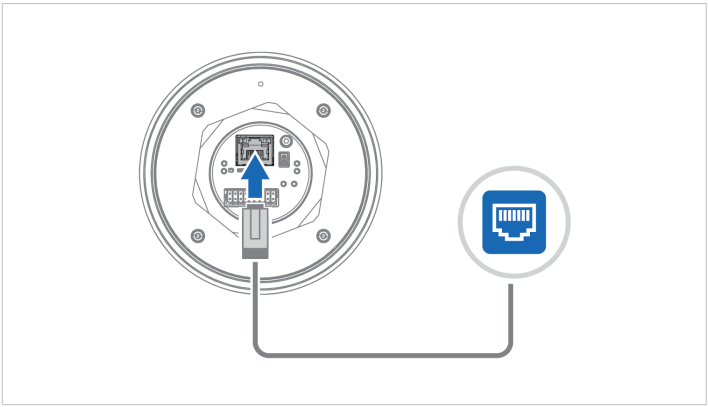


Figure 10. Connect to Ethernet

Connect the Bolt 5G to Ethernet network.

4.9. Frequency Bands and Power Level

Standard	Mode	Bands	Frequency (MHz)	Transmit Power
UMTS (Universal Mobile Telecommunications System)	Wideband Code Division Multiple Access (WCDMA)	B1	1920 – 1980	25 dBm
		B2	1850 – 1910	
		B4	1710 – 1755	
		B5	824 – 849	
		B8	880 – 915	
		B19	830 – 845	
LTE (Long Term Evolution)	Frequency Division Duplexing (FDD)	B1	1920 – 1980	25 dBm
		B2	1850 – 1910	
		B3	1710 – 1785	
		B4	1710 – 1755	
		B5	824 – 849	
		B7	2500 – 2570	
		B8	880 – 915	
		B12	699 – 716	
		B13	777 – 787	
		B14	788 – 798	
		B17	704 – 716	
		B18	815 – 830	
		B19	830 – 845	
		B20	832 – 862	
		B25	1850 – 1915	
		B26	814 – 849	
		B28	703 – 748	
		B30	2305 – 2315	
		B66	1710 – 1780	
		B71	663 – 698	
	Time Division Duplex (TDD)	B34	2010 – 2025	25 dBm
		B39	1880 – 1920	

Standard	Mode	Bands	Frequency (MHz)	Transmit Power
		B40	2300 – 2400	
		B46	5150 – 5925	
		B48	3550 – 3700	
		B38	2570 – 2620	28 dBm
		B41	2496 – 2690	
		B42	3400 – 3600	
		B43	3600 – 3800	
5G NR (New Radio)	Non-standalone (NSA) Standalone (SA)	n1	1920 – 1980	25 dBm
		n2	1850 – 1910	
		n3	1710 – 1785	
		n5	824 – 849	
		n7	2500 – 2570	
		n8	880 – 915	
		n12	699 – 716	
		n13	777 – 787	
		n14	788 – 798	
		n18	815 – 830	
		n20	832 – 862	
		n25	1850 – 1915	
		n26	814 – 849	
		n28	703 – 748	
		n30	2305 – 2315	
		n48	3550 – 3700	
		n66	1710 – 1780	
		n70	1695 – 1710	
		n71	663 – 698	
		n75	698 – 716	
		n38	2570 – 2620	28 dBm
		n40	2300 – 2400	

Standard	Mode	Bands	Frequency (MHz)	Transmit Power
		n41	2496 – 2690	
		n77	3300 – 4200	
		n78	3300 – 3800	
		n79	4400 – 5000	

5. Configuration

5.1. Connect to Configure

5.1.1. Connect to PC and DC Power

Option if you use DC Power.

When configuring Bolt 5G it must be connected to a PC.

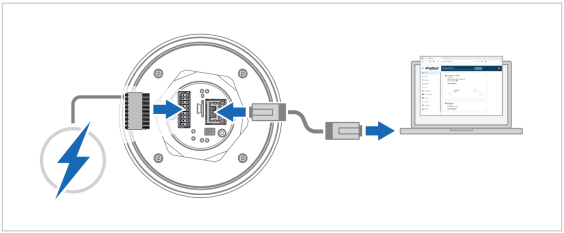


Figure 11. Connect to PC and Power

1. Connect the Bolt 5G Ethernet port to your PC.
2. Connect the Bolt 5G Power connector to a power supply.

5.1.2. Connect to PC and Power over Ethernet (PoE)

Option if you use Power over Ethernet (PoE).

When configuring Bolt 5G it must be connected to a PC.

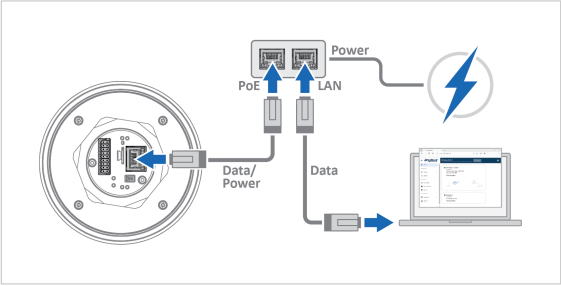


Figure 12. Connect to PC and PoE

1. Connect the Bolt 5G Ethernet port to the PoE injector **PoE** port.
2. Connect your PC to the PoE injector **LAN** port.
3. Connect the PoE injector to a power supply.

5.2. Required IP Address Settings

NOTE
The Bolt 5G default IP address is 192.168.0.1 and the subnet mask is 255.255.255.0.

On the PC accessing the Bolt 5G built-in web interface, set a static IP address within the same IP address range as the Bolt 5G IP address.

Result

NOTE
The Bolt 5G comes with a default password. You find the default password on the Bolt 5G product housing.

Now you can enter the Bolt 5G IP address in your web browser and search to access the built-in web interface login page.

5.3. Login to the Built-In Web Interface

The Bolt 5G built-in web interface can be accessed from a standard web browser.

Before You Begin

IMPORTANT
For cybersecurity reasons, you are prompted to change the password at first login using the Bolt 5G factory default password. You are redirected to the **Change password** page, see Change the Bolt 5G Password.

NOTE
The Bolt 5G comes with a default password. You find the default password on the Bolt 5G product housing.

NOTE
The Bolt 5G default IP address is 192.168.0.1 and the subnet mask is 255.255.255.0.

Procedure

Login to the Bolt 5G built-in web interface:

1. Open a web browser.
2. Click to select the **Address bar** and enter https:// and the Bolt 5G IP address.

Figure 13. Enter IP address in web browser

3. Press **Enter**.
   The Bolt 5G built-in web interface login screen appears.

4. Enter **Username** and **Password** and click **Login**.

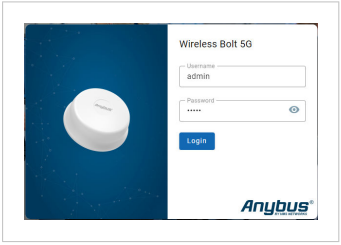


Figure 14. Built-in web interface login screen

Result

You are logged in to the Bolt 5G built-in web interface **Home** page.

5.4. Configure the Bolt 5G

Procedure

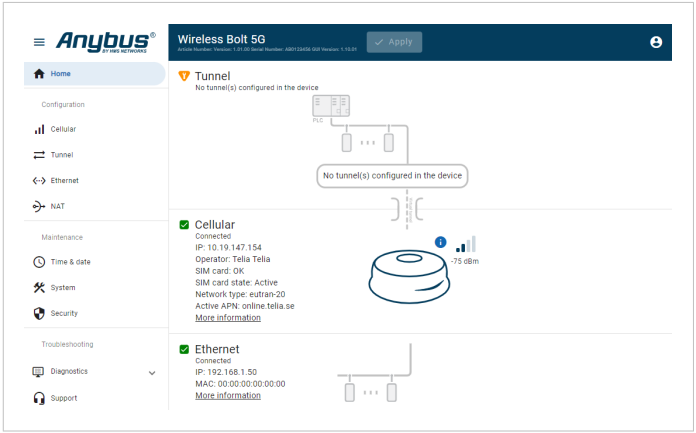


Figure 15. The Bolt 5G built-in web interface Home page

1. Open the Bolt 5G built-in web interface in HMS IPconfig or enter the Bolt 5G IP address in your web browser.
2. The built-in web interface takes you through the steps to configure the Bolt 5G.

Support and Resources

If you need more in-depth information about the configuration, please visit www.hms-networks.com and enter the product article number to search for the Bolt 5G support web page. You find the product article number on the product cover.

6. Technical Specifications

Additional technical data and information related to the installation and use of this product can be found at www.hms-networks.com.

Model identification	NV200
Communication connector	RJ45 Ethernet 10/100/1000 Mbit/s, PoE
Signal and power connector	18-Pin signal and power connector, Phoenix Contact PCB connector DFMC 0,5/ 9-ST-2,54
Power supply, PoE	RJ45 Power over Ethernet (PoE) Input voltage: 37-57 VDC
Power supply, DC power	Input voltage: 24 VDC (9-30 VDC) Reverse voltage protection Input current: Max 625 mA @ 24 VDC Reverse polarity protect: Yes IEEE 802.3at compliant, Type 2, Class 0
Single Pair Ethernet (SPE) connector	2P2C SPE, IEEE802.3bw 100BASE-T1 Ethernet
Power consumption, PoE	Max 12.95 W
Power consumption, DC power	Max 15 W
Power over Ethernet (PoE)	44-57 VDC DTE Type1 according to IEEE 802.3af
Antenna	4 internal antennas
Frequency bands	See Frequency Bands and Power Level (page 25).
Storage temperature	-40 to +85 °C
Operating temperature	-40 to +70 °C
Humidity	EN 600068-2-78: Damp heat, +40°C, 90% Non-condensing
Housing material	Plastic (see data sheet for details) Aluminum (see data sheet for details)
Protection class	Top (outside of host): IP66 Base (inside of host): IP32
Product weight	300 g
Dimensions	Height: 87 mm Diameter Bottom: 50 mm Top: 114 mm
Mounting	M50 screw and nut. 50.5 mm hole needed. Locking screw M2.5 (2,5 mm)

7. Ethernet RJ45 LED Status Indication

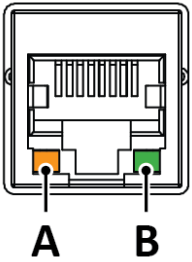


Figure 16. RJ45 Ethernet LED indicators

LED A – LINK/ACTIVITY	Function
Off	No Ethernet link
Yellow	Ethernet link established
Yellow, flashing	10/100/1000 Mbps Ethernet link activity

LED B – STATUS	Function
Off	No Ethernet link or 10/100 Mbps link
Green	1000 Mb/s Ethernet link established

8. Bolt 5G LED Status Indication

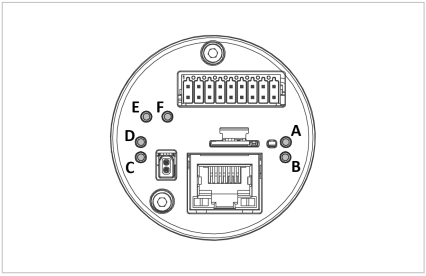


Figure 17. Bolt 5G LED Indicators

	LED A	LED B	LED C	LED D	LED E	LED F
LED Status	**Cellular Status**	**Power**	**SPE RX LED**	**SPE TX LED**	**IO-Link Activity LED**	**IO-Link Error LED**
Off	Cellular modem inactive	No power	No Single Pair Ethernet (SPE) Link	No Single Pair Ethernet (SPE) link	IO-Link is inactive or no data from IO_Link device is received	IO-Link is inactive, or no error is detected
Green, solid	Connected to cellular network	Power on	SPE link active	SPE link active	N/A	N/A
Green, flashing	N/A	N/A	SPE link active and RX activity	SPE link active and TX activity	Data from IO_Link device is received	IO_Link error is detected
Green, fast flashing (once per second)	SIM not found, or PIN is required	N/A	N/A	N/A	N/A	N/A
Green, slow flashing (once per two seconds)	Searching for cellular network and trying to connect.	N/A	N/A	N/A	N/A	N/A