ENGLISH

Anybus® Wireless Bolt LTE™

STARTUP GUIDE

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Important User Information

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Contact Information

Postal address:
Box 4126
300 04 Halmstad, Sweden

E-Mail: info@hms.se

1. Preface

1.1. About This Document

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

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.anybus.com/support.

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® is a registered trademark and Wireless Bolt LTE™ is a trademark of HMS Networks AB.

All other trademarks are the property of their respective holders.

2. Safety

2.1. General Safety

CAUTION
This equipment emits RF energy in the ISM (Industrial, Scientific, Medical) band. Make sure that all medical devices used in proximity to this equipment meet appropriate susceptibility specifications for this type of RF energy.

CAUTION
This equipment contains parts that can be damaged by electrostatic discharge (ESD). Use ESD prevention measures to avoid damage.

CAUTION
Minimum temperature rating of the cable to be connected to the field wiring terminals, 90 °C.

CAUTION
Use copper wire only for field wiring terminals.

CAUTION
This equipment is recommended for use in both industrial and domestic environments. For industrial environments it is mandatory to use the functional earth connection to comply with immunity requirements. For domestic environments the functional earth must be used if a shielded Ethernet cable is used, in order to meet emission requirements.

2.2. Intended Use

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

The equipment receives and transmits data over Ethernet and Cellular standard networks.

3. Preparation

3.1. Support and Resources

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.anybus.com/support.

TIP

Have the product article number available, to search for the product specific support web page. You find the product article number on the product cover.

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. Placement for Optimal Reception

Antenna Considerations

The characteristics of the internal antenna should be considered when choosing the placement and orientation of the unit.

Required Distance Between Devices

For optimal reception, cellular devices should not be confined in buildings made of concrete or metal, without windows.

To avoid interference, a minimum distance of 50 cm between cellular devices should be observed.

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

3.4. SIM Card

Prepaid Data Plan

If a prepaid data plan is used, ensure that:

- the data amount is sufficient
- that any SMS notifications are sent to a monitored number

3.5. Network Operator Certified Firmware

You may need to install a firmware certified for the operator you are going to use, it is not possible to connect the Bolt LTE to the operator network otherwise.

Before you start to configure the Bolt LTE settings:

- Ensure that the current firmware installed on the Bolt LTE is valid for the network operator you are going to use.
- You find the firmware version number in the Bolt LTE built-in web interface Overview page. See Bolt LTE Built-In Web Interface (page 19).
- If you need to install a firmware version certified for your network operator: Download the firmware update file, specific for your network operator, from www.anybus.com/support.
- For information on how to update the firmware, see the Bolt LTE User Manual.

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 LTE User Manual.

4. Installation

4.1. Install SIM Card

NOTE
Supported SIM card types are Nano SIM for IoT and M2M, for data communication, as well as standard mobile phone Nano SIM.

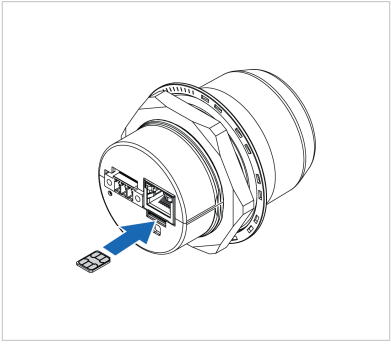


Figure 1. Insert SIM card

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

1. Insert a SIM card into the Bolt LTE SIM card holder.

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

4.2. Mechanical Installation

Placement

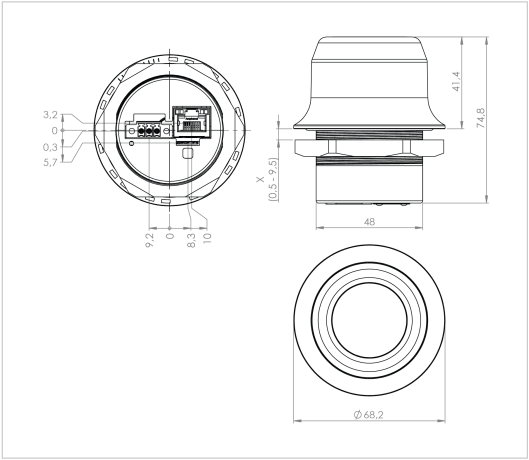
- The device is intended to be mounted on top of a machine or cabinet through an M50 (50.5mm) hole using the included sealing ring and nut.
- The top mounting surface, in contact with the sealing, must be flat with a finish equivalent to Ra 3.2 or finer and cleaned and free from oils and greases.
- For optimal reception, cellular devices require a zone around them clear of objects that could obstruct or reflect the signal.
  To avoid interference, a minimum distance of 50 cm between Bolt LTE and other cellular devices should be observed.

Installation

IMPORTANT
Make sure that the sealing ring is correctly placed in the circular groove in the top part of the housing before tightening the nut.

IMPORTANT
Always hold the BOTTOM part of the unit when untightening the nut, not the top part (the cap).

Tightening torque: 5 Nm ±10 %



All measurements are in mm.

Figure 2. Installation drawing

4.3. Connect to Power Over Ethernet (PoE)

Before You Begin

IMPORTANT
Connecting the Bolt LTE to PoE and DC power simultaneously may result in a current loop that could damage both the power sources and the Bolt LTE. Ensure to use only one of the power connections at a time.

NOTE
Both shielded and unshielded Ethernet cables may be used.

NOTE
Bolt LTE is designed to comply with PoE, IEEE 802.3at Type 1 (Class 0, 37-57 VDC, max 12.95 W).

Procedure

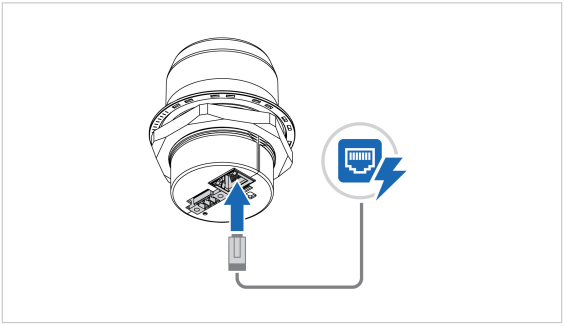


Figure 3. Connect to Power Over Ethernet (PoE)

RJ45 Ethernet PoE Connector

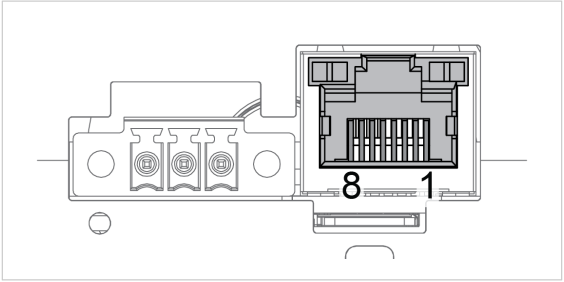


Table 1. RJ45 Ethernet PoE Connector pinning

Pin	Data	PoE	
1	TD+	A+	Positive power from alt. A PSE
2	TD-		
3	RD+	A-	Negative power from alt. A PSE (with pin 6)
4	N/A	B+	Positive power from alt. B PSE
5			
6	RD-	A-	Negative power from alt. A PSE (with pin 3)
7	N/A	B-	Negative power from alt. B PSE
8			
Housing	Shield	Functional Earth (FE), via 1 nF capacitor and 1 MΩ bleeder resistor	

4.4. Connect to Power and Ethernet

Before You Begin

CAUTION
Connecting power with reverse polarity or using the wrong type of power supply may damage the equipment. Make sure that the power supply is connected correctly and of the recommended type.

IMPORTANT
Connecting the Bolt LTE to PoE and DC power simultaneously may result in a current loop that could damage both the power sources and the Bolt LTE. Ensure to use only one of the power connections at a time.

IMPORTANT
When Bolt LTE is powered via the power connector, Functional Earth (FE) must be connected.

NOTE
When Bolt LTE 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.

See also Technical Data (page 25) regarding power supply requirements.

Functional Earth (FE) Wire Screw Placement

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

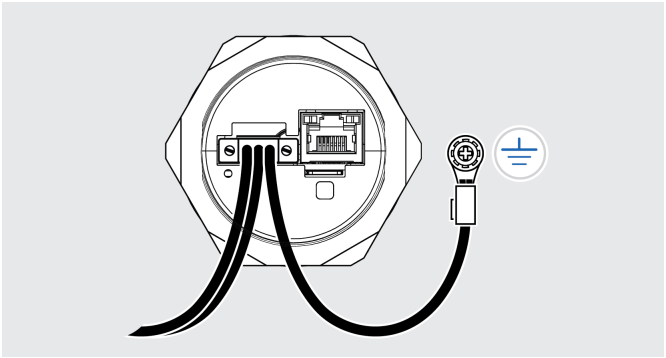


Figure 4. Functional earth wire screw placement, view from below

Procedure

Connect to power and Functional Earth (FE)

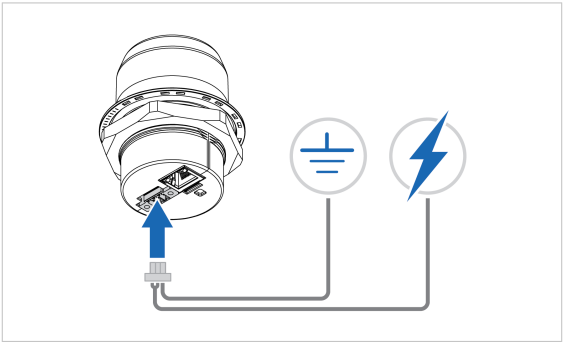


Figure 5. Power and Functional Earth (FE)

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

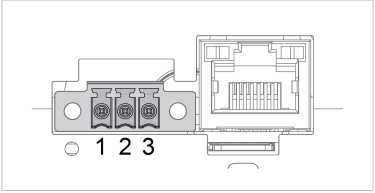


Table 2. Power connector, 3-pin terminal block

Pin	Function	
1	+	11-33 VDC
2	-	
3	Functional Earth (FE)	

Connect to Ethernet

3. Connect the Bolt LTE to Ethernet.

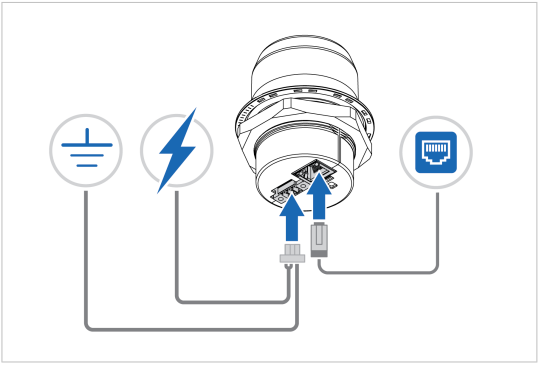


Figure 6. Connect to Ethernet

5. Configuration

5.1. Connect to PC and Power

When configuring Bolt LTE it must be connected to a PC.

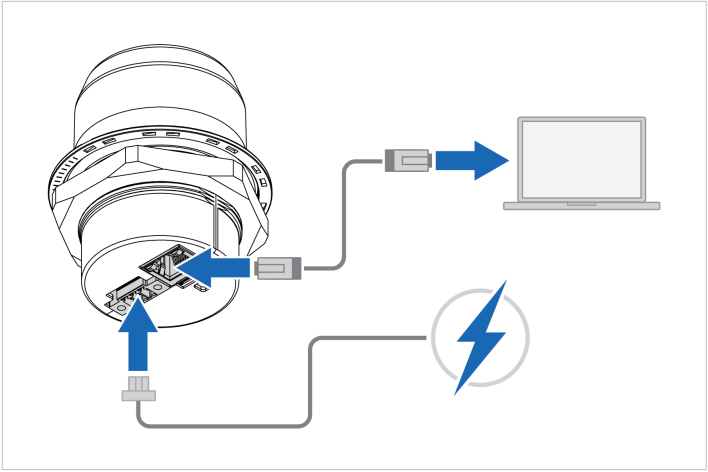


Figure 7. Connect to PC and Power

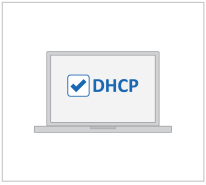
1. Connect the Bolt LTE Ethernet port to your PC.
2. Connect the Bolt LTE Power connector to a power supply.

5.2. Required IP Address Settings

To be able to access the Bolt LTE built-in web interface you may need to adjust the IP settings, choose one of the following methods.

NOTE
The Bolt LTE default IP address is 192.168.0.98 and the subnet mask is 255.255.255.0.

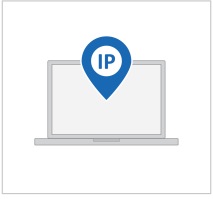
Option 1 - Enable DHCP on Your PC



When DHCP is enabled on the PC accessing the Bolt LTE, you do not need to change the IP address settings for the Bolt LTE to be able to access the Bolt LTE built-in web interface.

Option 2 - Set a Static IP Address on Your PC

NOTE
When you change to a static IP address on your PC, internet access is lost.



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

Result

NOTE

The Bolt LTE comes with a default username and password. The default username is admin, written in lowercase letters. You find the default password on the Bolt LTE product housing.

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

5.3. Bolt LTE Built-In Web Interface

The Bolt LTE built-in web interface is used to configure the Bolt LTE system settings as well as for diagnostics and maintenance.

The **System Overview** page shows the current settings and network connection status.

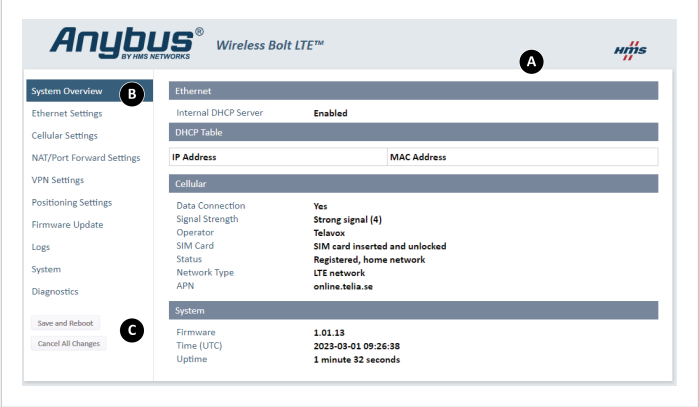


Figure 8. N/A built-in web interface, example

A. **System Overview**
   Shows the current settings and network connection status
B. **Left sidebar menu**
C. **Save and Reboot** button and **Cancel All Changes** button

5.4. Setting Up Bolt LTE with Automatic APN Assignment

Before You Begin

By default, the Bolt LTE APN Assignment is set to automatically search for the SIM card APN setting and assign it to the Bolt LTE.

IMPORTANT

An APN automatically derived from SIM card identification may not give full access to the cellular network. Follow your network operator's guidelines.

IMPORTANT

By default, Bolt LTE is set to automatically search for the SIM card APN setting.

If a general APN string is available for the network operator, it will be set as the APN Assignment.

Ensure that the general APN string is recommended by the network operator and in accordance with the SIM card IoT data plan.

Procedure

In cases where no additional configuration of the settings in the Bolt LTE built-in web interface is required, continue with this procedure.

When additional configuration is needed, see the Bolt LTE User Manual.

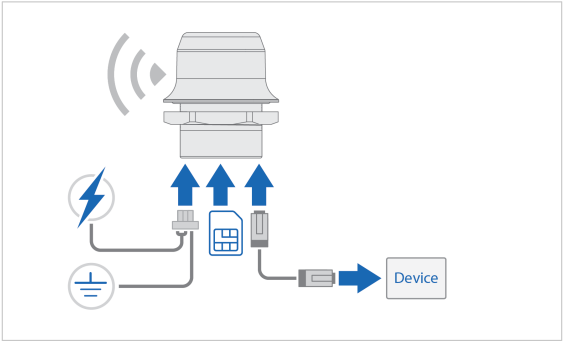


Figure 9. Connect your device to internet

1. Insert a cellular SIM card in the Bolt LTE SIM card holder.

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

2. Connect the Bolt LTE to a power supply and to Functional Earth (FE).
   See Connect to Power and Ethernet (page 12)
3. To verify the connection status, check the Bolt LTE RJ45 LED indicators.
   See LED Status Indication (page 24)
4. Connect an Ethernet cable between the Bolt LTE and the device to be connected to the internet.
5. Verify that the device is connected to the internet.

5.5. Configuration with REST Commands

How To Use REST Commands

For information about the supported REST commands and how to use them, refer to the REST Commands Reference Guide at www.anybus.com/support.

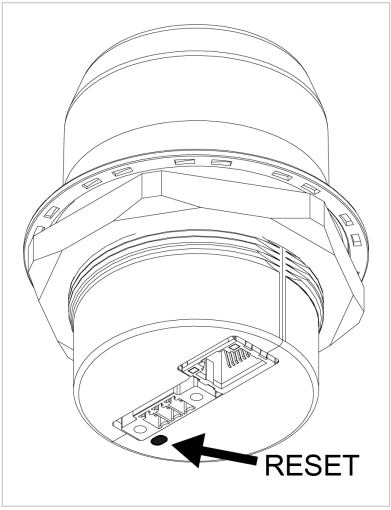
6. Troubleshooting

6.1. Reset to Factory Default

IMPORTANT
If there is no Ethernet connection available after a factory reset, the Bolt LTE starts in the default Easy Config Mode 4.

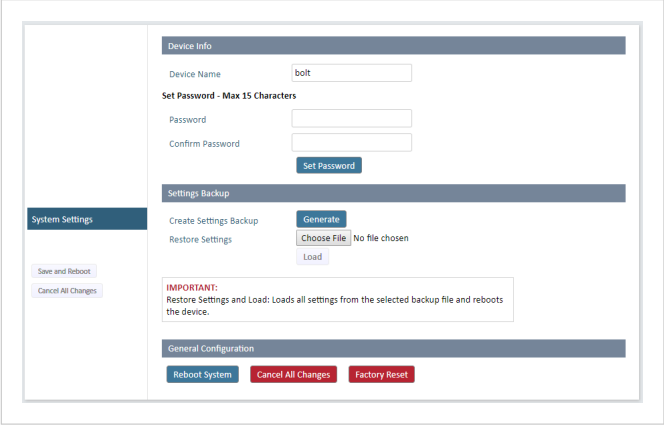
Any one of these actions will restore the unit to factory default settings.

Reset Using the RESET Button



Press and hold **RESET** for >10 seconds and then release it.

Reset Via the Built-In Web Interface



Launch the built-in web interface > On the **System Settings** page, click **Factory Restore**.

Reset Using Digital Input

To reset Bolt LTE to factory default, apply voltage to the digital input for >10 seconds.

7. LED Status Indication

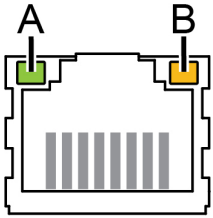


Figure 10. RJ45 LED indicators

LED A – LINK/ACTIVITY	Function
Off	No Ethernet link
Yellow	10 Mb/s Ethernet link established
Yellow, flashing	10 Mb/s Ethernet activity
Green	100 Mb/s Ethernet link established
Green, flashing	100 Mb/s Ethernet activity

LED B – STATUS	Function
Off	No power
Blue	Connected on LTE
Alternating blue/purple	Trying to connect
Purple	Connected on UMTS
Red	Recoverable/unrecoverable fault
Red, slow blink	No configured cellular interface/no SIM card/no valid configuration
Yellow	Booting or sleep

8. Technical Data

8.1. Technical Specifications

Order code	EMEA: AWB1500 Americas: AWB1502	EMEA: AWB1501 Americas: AWB1503
Color	Black	White top and black base
Operating temperature	Shadow: -40 to +65 °C Direct sunlight: -40 to +45 °C	Shadow: -40 to +65 °C Direct sunlight: -40 to +65 °C
Storage temperature	-40 to +85 °C	
Host interface	RJ45 Ethernet 10/100 Mbit/s, PoE	
Humidity	EN 600068-2-78: Damp heat, +40 °C, 90% (non-condensing)	
Vibration	Refer to datasheet at www.anybus.com/support.	
Power	3-pin screw connector and PoE (Power over Ethernet) 11-33 VDC through Power connector, PoE, IEEE 802.3at Type 1 (Class 0, 37-57 VDC, max 12.95 W) Redundant or separate operation of PoE and DC connectors Power Consumption: • Sleep Mode: Power connector 0.1 W. PoE 0.3 W • Idle Mode: Power connector 0.6 W. PoE 0.8 W • Worst Case average power: Power connector 3.2 W. PoE 3.6 W. • Worst case peak current: 1.2A@11VDC	
Dimensions	Diameter: 68 mm Height: 75 mm without power connector, 84 mm incl. power connector Height above mounting surface: 41 mm	
Weight	100 g	
Housing material	Plastic (see data sheet for details)	
Protection class	Top (outside of host): IP66 and IP67 / UL Type 4X Base (inside of host): IP21	
Mounting	M50 screw and nut (50.5 mm hole needed)	
Maximum data speeds	Max download speed: 100 Mbit/s Max upload speed: 50 Mbit/s	
Cellular standards	EMEA: LTE B1, B3, B7, B8, B20, B28, Fallback 3G	

Order code	EMEA: AWB1500 Americas: AWB1502	EMEA: AWB1501 Americas: AWB1503
	Americas: LTE B2, B4, B5, B12, B13, B14, B25, B26, B66, Fallback 3G	
Ethernet protocols	Transparent transfer of any TCP/UDP based protocol, Built-in firewall, NAT and DHCP server	
Positioning standards and functions	Positioning services: Satellite Systems - GNSS (GPS, Galileo, Glonass, BeiDou)	
Certifications	Refer to datasheet at www.anybus.com/support.	

Additional technical data and information related to the installation and use of this product can be found at www.anybus.com/support.

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