Anybus® Wireless Bolt™

STARTUP GUIDE

SP2139 3.0 en-US ENGLISH

Important User Information

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1 Preparation

1.1 About This Document

This document describes how to install Anybus Wireless Bolt and set up a basic configuration.

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

1.2 Document Conventions

The following conventions are used to indicate safety information and other important content in this document:

WARNING
Instruction that must be followed to avoid a risk of death or serious injury.

Caution
Instruction that must be followed to avoid a risk of personal injury.

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.

Additional information which may facilitate installation and/or operation.

1.3 Trademarks

Anybus® is a registered trademark and Wireless Bolt™ is a trademark of HMS Industrial Networks AB. All other trademarks mentioned in this document are the property of their respective holders.

1.4 Intended Use

This equipment is intended to provide wireless communication over WLAN and Bluetooth® to wired networks.

Typical applications for this equipment:

- Adding wireless cloud connectivity to industrial devices
- Accessing devices from a laptop, smartphone or tablet
- Ethernet cable replacement between devices

Note:

Bluetooth PAN (Personal Area Network) may not work with some devices due to different implementations of Bluetooth by different manufacturers.

WLAN 5 GHz cannot be used at the same time as WLAN 2.4 GHz or Bluetooth.

2 Installation

2.1 General Safety Instructions

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
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.

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.

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

2.2 General Information

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

For optimal reception, wireless devices require a zone between them clear of objects that could otherwise obstruct or reflect the signal. A minimum distance of 50 cm between the devices should also be observed to avoid interference.

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

See the **Anybus Wireless Bolt User Manual** for more information.

2.3 Mechanical Installation

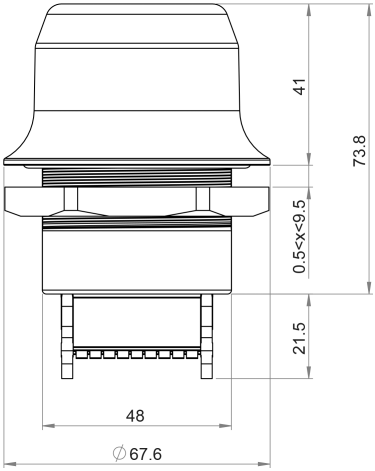
The device is intended to be mounted on top of a machine or cabinet through an M50 (50.5 mm) hole using the included sealing ring and nut.

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.

Tightening torque: 5 Nm ±10 %

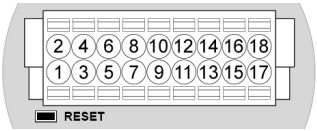
> **!** Make sure that the sealing ring is correctly placed in the circular groove in the top part of the housing before tightening the nut.

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



All measurements are in mm.

2.4 Connectors



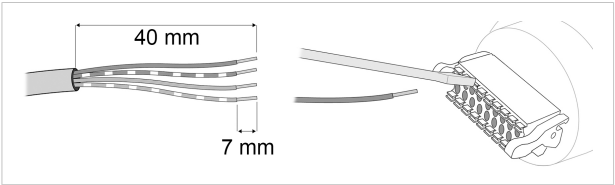
Note the location of the **RESET** button when the connector is attached to the Wireless Bolt. Pin 1 will be the pin closest to the button.

18–pin Connector		
Pin	**Name**	**Description**
1	VIN	Power 9–30 VDC
2	GND	Power Ground
3	DI	Digital input (9–30 VDC)
4	DI_GND	Digital input ground
5	ETN_RD+	Ethernet receive + (white/orange)
6	ETN_RD-	Ethernet receive - (orange)
7	ETN_TD-	Ethernet transmit - (green)
8	ETN_TD+	Ethernet transmit + (white/green)
9	RS485_B	RS-485 B Line
10	FE/Shield	Ethernet: Functional Earth Serial: Functional Earth and Shield
11	RS232_TXD	RS-232 Transmit
12	RS485_A/RS232_RXD	RS-485 A Line / RS-232 Receive
13	RS232_RTS	RS-232 Request To Send Not supported for Wireless Bolt.
14	RS232_CTS	RS-232 Clear To Send Not supported for Wireless Bolt.
15	ISO_5V	Isolated 5 V for serial interface
16	ISO_GND	Isolated Ground for serial interface
17	CAN_L	CAN Low
18	CAN_H	CAN High

- If using a shielded Ethernet cable the shield must be unconnected.
- RS-232 and RS-485 cannot be used at the same time.
- Use termination for RS-485 and CAN when required.

2.5 Ethernet Cabling

To make an Ethernet connector cable for Anybus Wireless Bolt:



1. Cut off one of the connectors on a standard Cat5e or Cat6 Ethernet cable.
2. Strip off about 40 mm (1½ inch) of the cable jacket and untwist the orange, orange/white, green and green/white wires. The other wires will not be used.
3. Strip off about 7 mm (¼ inch) of the isolation on each wire.
4. Push the pin spring release next to each socket on the connector and insert the correct wire end according to *18–pin Connector, p. 8*.

Connect the wires from the power supply to the connector in the same way as the Ethernet wiring. **Make sure that polarity is not reversed.**

RJ-45 Adapter

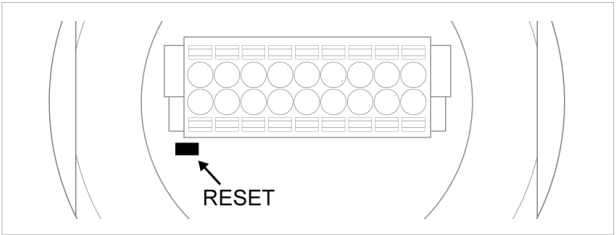
An Ethernet adapter with an RJ45 female connector can be ordered as an accessory. Please contact your sales representative for more information.

2.6 Digital Input

The digital input can be used to control roaming between Bluetooth access points (NAP). For more information, refer to the AT Reference Guide at www.anybus.com/support.

> **!** If voltage is applied to the digital input for more that 10 seconds the unit will be reset to factory defaults.

2.7 RESET Button



The **RESET** button is located on the bottom of the unit.

When the unit is powered on, press and hold **RESET** for >10 seconds and then release it to reset to the factory default settings.

Recovery Mode

If the web interface cannot be accessed, the unit can be reset by starting in *Recovery Mode* and reinstalling the firmware using Anybus Firmware Manager II, which can be downloaded from www.anybus.com/support.

To enter Recovery Mode, press and hold **RESET** during startup.

> **!** Firmware updates should normally be carried out through the web interface. Recovery Mode should only be used if the unit is unresponsive and the web interface cannot be accessed.

3 Configuration

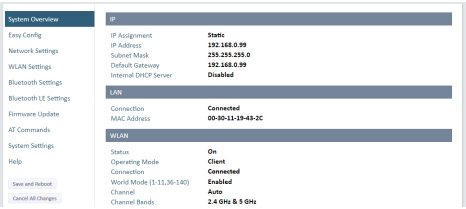
Anybus Wireless Bolt is configured via a web interface. Parameters can be set individually or using pre-configured **Easy Config** modes.

Advanced configuration can be carried out by issuing AT commands via the web interface or over a Telnet or RAW TCP connection to port 8080.

3.1 Web Interface

The web interface is accessed by pointing a web browser to the IP address of the unit. The default address is **192.168.0.99**.

The configuration settings are described in detail in the User Manual.



3.2 Easy Config Modes

By default Wireless Bolt starts in Easy Config mode 4, when:

- the Ethernet connection is not used
- connected to power
- factory default settings are used

EC	Role	Description
1	Bluetooth PANU	Configure as Bluetooth client and scan for another client (PANU to PANU).
2	–	Reset configuration to factory defaults.
3	–	Reset IP settings to factory defaults.
4	Client	Wait for automatic configuration. Configure units in mode 4 as clients. When mode 4 is used with mode 1, 6 or 7, Serial Settings TCP Mode Client is activated automatically.
5	WLAN AP	Configure units in mode 4 as clients. Restart as access point and connect clients.
6	Bluetooth NAP	
7	WLAN AP	Configure units in mode 4 as clients. Restart as access point and connect clients. Apply PROFINET optimization to all units.
8	Bluetooth NAP	
9	Bluetooth PANU	Configure as Bluetooth client and scan for another client (PANU to PANU). Apply PROFINET optimization to both units.
10	(any)	Apply PROFINET optimization and restart.
11	(any)	Enable PROFIsafe mode.

The Easy Config modes are also described when selected in the web interface.

3.3 I/O-Data Cycle Time

Based on recommendations from industrial equipment suppliers, such as Rockwell and Siemens, it is recommended to use the following minimum I/O-data cycle times for PROFINET and EtherNet/IP networks:

- Wireless link Point-to-Point with Bluetooth PANU-PANU or Wi-Fi Access Point to Station: 32 ms
- Wireless link with Access Point and up to 4 wireless clients/stations, Bluetooth or Wi-Fi: 64 ms

3.4 Factory Restore

Any one of these actions will restore the factory default settings:

- Clicking on **Factory Restore** on the **System Settings** page
- Executing **Easy Config Mode 2**
- Issuing the AT command **AT&F** and then restarting the unit
- Holding **RESET** pressed for >10 seconds and then releasing it
- Applying voltage to the digital input for >10 seconds

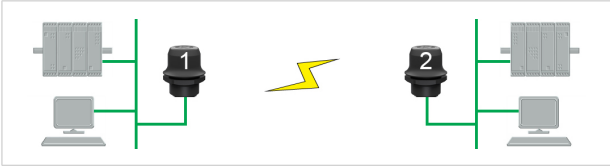
Default Network Settings	
IP Assignment	Static
IP Address	192.168.0.99
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.99
Internal DHCP Server	Disabled
DHCP Interfaces	All

Default WLAN Settings	
Operating Mode	Client
Channel Bands	2.4 GHz & 5 GHz
Authentication Mode	WPA/WPA2–PSK
Channel	Auto
Bridge Mode	Layer 3 IP forward

Default Bluetooth Settings	
Operating Mode	PANU (Client)
Local Name	[generated from MAC address]
Connectable	No
Discoverable	No
Security Mode	Just works
Bluetooth LE	Operating Mode: Disabled Connectable: No Discoverable: No

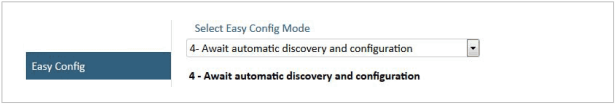
3.5 Configuration Examples

3.5.1 Ethernet Bridge via WLAN or Bluetooth® (Easy Config)

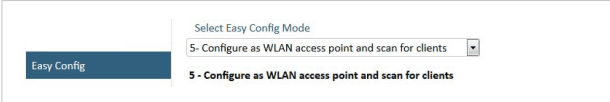


This example describes how to connect two Ethernet network segments via WLAN or Bluetooth using Easy Config.

1. In the web interface of unit 1, activate **Easy Config Mode 4**. This unit will now be discoverable and open for automatic configuration.



2. In the web interface of unit 2, activate **Easy Config Mode 5** for WLAN or **6** for Bluetooth. Unit 2 will now discover and configure unit 1 as a client and configure itself as an access point.



Unit 1 will be assigned the first free IP address in the same Ethernet subnet as unit 2.

Adding More Devices

Up to 6 additional clients can be added by repeating the procedure. Each new client will be assigned the next free IP address in the current subnet.

4 Technical Data

For complete technical specifications and regulatory compliance information please visit www.anybus.com/support.

4.1 Hardware Specifications

Order code	**AWB2000**	**AWB2001**
Color	Black	White top and black base
Wired interface type	Ethernet	
Connector	Included plug connector	
Antenna	Internal dual-band 2.4 GHz and 5 GHz antenna	
Maximum range	100 m (WLAN and Bluetooth)	
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	
Humidity	EN 600068-2-78: Damp heat, +40°C, 93% humidity for 4 days.	
Vibration	See datasheet	
Dimensions	Height: 75 mm (95 mm incl. connector, 41 mm outside) Diameter: 68 mm	
Weight	81 g	
Housing material	Plastic (see datasheet for details)	
Protection class	Top (outside of host): IP66 / IP67 / UL Type 4X Base (inside of host): IP21	
Mounting	M50 screw and nut (50.5 mm hole needed)	
Power supply	9–30 VDC (-5 % +20 %) Cranking 12 V (ISO 7637-2:2011 pulse 4) Reverse polarity protection	
Power consumption	0.7 W idle, 1.7 W max.	

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