ENGLISH

Anybus® Wireless Bridge II CAN™

STARTUP GUIDE

SP2965
Version 1.4
Publication date 2022-02-23

Important User Information

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1. Preface

1.1. About This Document

This document describes how to install Anybus® Wireless Bridge II CAN™.

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 Bridge II CAN™ 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
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. External Antenna Restrictions

For models with external antenna, only use antennas that are certified for use with this equipment.

Using external antennas that are not certified for use with this equipment will invalidate its certifications and make it non-compliant with the regulations for radio equipment.

A list of certified antennas can be found at www.anybus.com/support.

2.3. Intended Use

The intended use of this equipment is as a communication interface and gateway. The equipment receives and transmits data on various physical levels and connection types.

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 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. Optional Equipment

Bridge II CAN can be mounted on a standard DIN rail using the optional DIN mounting kit.

The DIN mounting kit is not included with the Bridge II CAN. For information about ordering the DIN mounting kit, please visit www.anybus.com.

3.3. Network Environment

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

3.4. Placement

Antenna Considerations

For models with internal antenna the characteristics of the antenna should be considered when choosing the placement and orientation of the Bridge II CAN.

Required Distance Between Devices

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

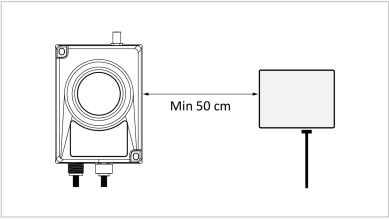


Figure 1. Required minimum distance between devices

3.5. When to Use Bluetooth or WLAN

Use Bluetooth when:

- The wireless link has an Anybus Wireless Bolt or Anybus Wireless Bridge II at both ends.
- An interruption-free connection is more important than data throughput speed.
- Interference robustness is important, e.g. in an industrial environment.

Use WLAN when:

- Connecting to other types of wireless devices or a WLAN infrastructure.
- High data throughput speed is more important than connection reliability.
- Large file transfers are expected.
- WLAN channel frequency planning is possible.

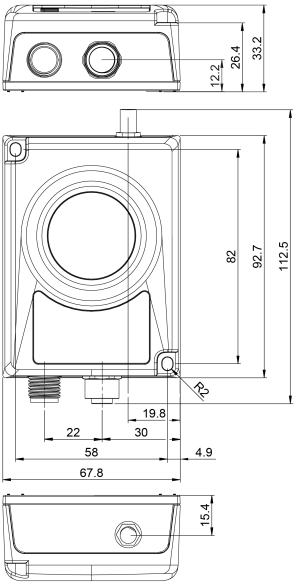
3.6. Bluetooth Limitations

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

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

4. Installation

4.1. Installation Drawing



All measurements are in mm.

Figure 2. Bridge II CAN Installation drawing

4.2. Surface Mounting

Bridge II CAN can be screw-mounted directly onto a flat surface.

Before You Begin

NOTE
To avoid signal interference, a minimum distance of 50 cm between the devices should be observed. See also Wireless Technology Basics.

Procedure

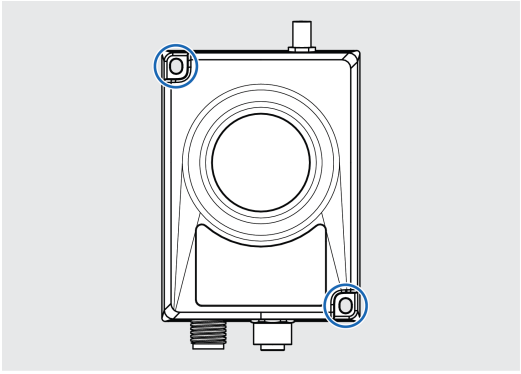


Figure 3. Surface mounting holes

- To screw-mount the Bridge II CAN on a surface, use the two holes (Ø 4 mm) at the corners of the Bridge II CAN.

4.3. DIN Rail Mounting

Using the optional DIN mounting kit, Bridge II CAN can be mounted on a standard DIN rail. See Optional Equipment (page 5).

Before You Begin

NOTE
To avoid signal interference, a minimum distance of 50 cm between the devices should be observed. See also Wireless Technology Basics.

Procedure

To attach the Bridge II CAN on the DIN rail

1. Fasten the DIN clip with the 2 included screws on the rear side of the Bridge II CAN.

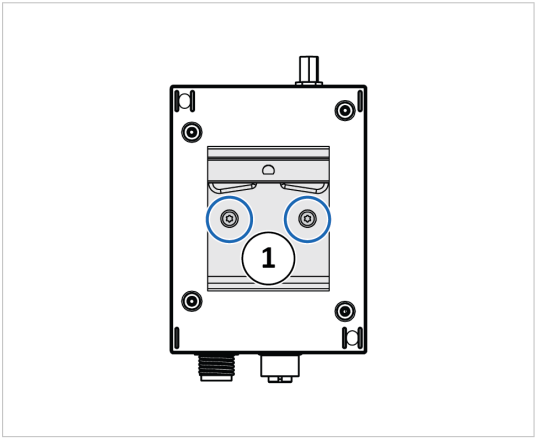


Figure 4. DIN clip on Bridge II CAN

2. Insert the upper end of the DIN rail clip into the DIN rail.

3. Push the bottom of the DIN rail clip into the DIN rail.

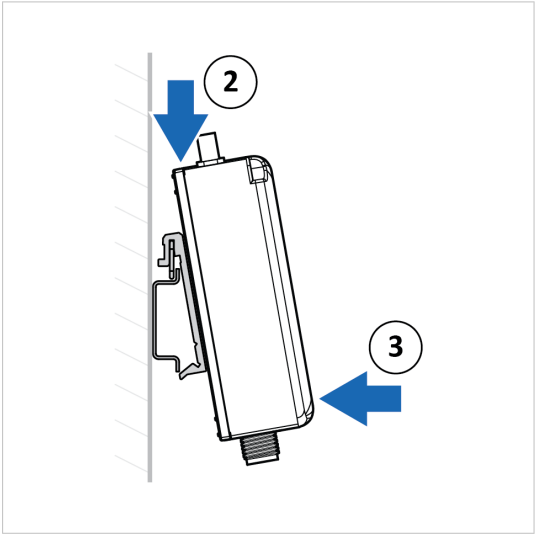


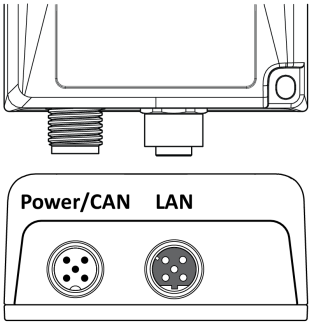
Figure 5. Attach Bridge II CANon DIN rail

4.4. Connect to LAN, CAN and Power

Before You Begin

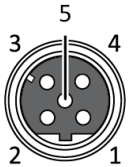
CAUTION
This equipment is recommended for use in both industrial and domestic environments. For industrial environments it is mandatory to use the functional earth connection to comply with immunity requirements. For domestic environments the functional earth must be used if a shielded Ethernet cable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

Procedure



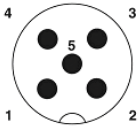
1. Connect the Bridge II CAN to LAN network.

Table 1. LAN connector pinout

LAN Connector	Pin	Function
	1	Transmit +
	2	Receive +
	3	Transmit -
	4	Receive -
	5	N/C

2. Connect the Bridge II CAN to a CAN network and Power.

Table 2. Shielded 5-pos A-coded M12 male connector

CAN/CANopen/DeviceNet Connector	Pin	Wire Color	Function
	1	N/A	Drain Connected to shield
	2	RD (Red)	V+ 24 V Power in
	3	BK (Black)	V- Power and signal GND
	4	WH (White)	CAN_H
	5	BU (Blue)	CAN_L
	Housing	N/A	Shield Act as product FE (Functional Earth) when the cable shield is connected to FE.

5. Configuration

5.1. Required IP Address Settings

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

The Bridge II CAN default IP address is 192.168.0.99.

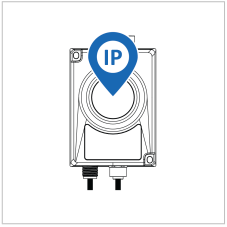
Option 1 - Set a Static IP Address on Your PC

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

To access the Bridge II CAN built-in web interface, ensure that Port 80 TCP is open in your PC Windows Firewall.

Note that when you change to a static IP address on your PC, internet access is lost.

Option 2 - Change the IP Address on the Bridge II CAN Ethernet port



Use the software application HMS IPconfig to find and change the IP address on the Bridge II CAN Ethernet port, to one within the same IP address range as the PC accessing the Bridge II CAN built-in web interface.

To download the installation files, please visit www.anybus.com/support and enter the product article number to search for the Bridge II CAN support web page. You find the product article number on the product cover.

Result

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

5.2. Bridge II CAN Built-In Web Interface

The Bridge II CAN built-in web interface is used to configure, maintain and troubleshoot the Bridge II CAN. Parameters can be set individually or using pre-configured Easy Config modes.

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.

See also Required IP Address Settings (page 14).

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

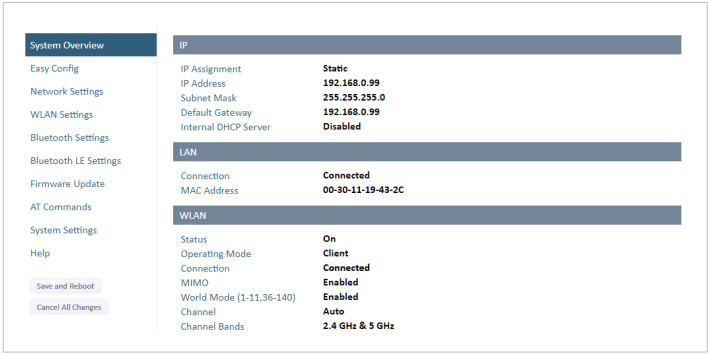


Figure 6. System Overview page example

5.3. Configuration Methods

There are different methods available for configuring the Bridge II CAN.

Built-In Web Interface Settings

Bridge II CAN can be configured via the settings in the built-in web interface.

Easy Config Modes

Bridge II CAN can be configured using one of the pre-configured Easy Config modes.

AT Commands

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

For more information about how to use the AT commands, navigate to the built-in web interface **Help** page or see the AT Commands Reference Guide.

5.4. Easy Config Using the MODE Button

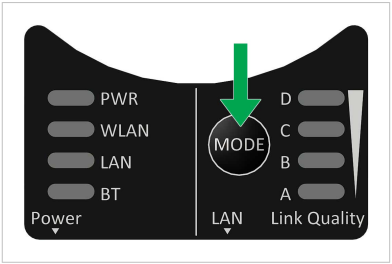


Figure 7. Easy Config Using the MODE Button

1. Power on the unit and wait for the **Link Quality** LEDs to light up and go out again, then immediately press and release the **MODE** button.
2. Press **MODE** repeatedly to cycle through the Easy Config modes until the desired mode is indicated by the **A-B-C-D** LEDs.
3. Within 20 seconds of step 2, press and hold **MODE** for 2 seconds. When the button is released the unit will restart in the selected mode.

See also Available Easy Config Modes (page 19).

5.5. Available Easy Config Modes

Bridge II CAN may be configured using one of the pre-configured Easy Config modes.

NOTE

By default, the unit starts in **Easy Config Mode 4**. The unit awaits automatic configuration during 120 seconds or until receiving a configuration.

NOTE

To cancel Easy Config mode 11, the unit must be reset to factory default settings. See Reset to Factory Default (page 20)

Table 3. Easy Config modes

EC	Active LED					Role	Description
1	A					Bluetooth PANU	Used for setting up point-to-point communication. The unit scans for another unit in Config Mode 4. The unit listens for 40 seconds or until a configuration is established. When a unit in mode 4 is detected: The scanning unit configures itself as a Bluetooth PANU Client, sends a connection configuration to the detected unit, and restarts. The detected unit restarts and attempt to connect to the first unit as a PANU Client.
2		B				N/A	Reset configuration to factory defaults.
3	A	B				N/A	Reset IP settings to factory defaults.
4			C			Client	Configure units in mode 4 as Clients. Wait for automatic configuration. The unit listens for 120 seconds or until receiving a configuration. When mode 4 is used with mode 1, 5 or 6, CAN Settings TCP Mode Client is activated automatically.
5	A		C			WLAN AP	The unit scans for other units in Config Mode 4 and configure them as Clients. Timeout occur after 120 seconds. Restart as Access Point and connect Clients.
6		B	C			Bluetooth NAP	
11	A	B		D		(any)	Enable PROFIsafe mode. The unit is locked in PROFIsafe mode. No other configuration settings are changed.

5.6. Reset to Factory Default

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

- On the **System Settings** page, click **Factory Restore**.
- Execute **Easy Config Mode 2**.
- Issue the AT command AT&F and then restarting the unit.
- Press and hold **MODE** during >10 seconds, then releasing it.

5.7. Recovery Mode

If the built-in web interface cannot be accessed, the unit can be reset by starting in Recovery Mode and reinstalling the firmware.

Before You Begin

IMPORTANT
Use Recovery Mode only when the unit is unresponsive and the built-in web interface cannot be accessed. Firmware updates should normally be carried out through the built-in web interface.

Procedure

To enter Recovery Mode

1. Press and hold **MODE** button during startup.

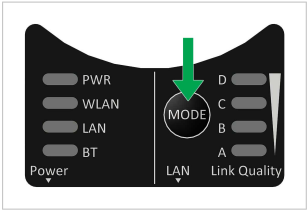


Figure 8. **MODE** button

2. Bridge II CAN enters Recovery Mode.

Table 4. In Recovery Mode the Status LEDs indicate the firmware update status

LED	Indication	Description
PWR	Green	Firmware update in progress
	Green, blinking	Waiting for valid firmware
WLAN + **BT**	Alternating red/blue	Firmware update in progress

To Reinstalling the Firmware

1. To reinstalling the firmware, you need Anybus Firmware Manager II.
   Download Anybus Firmware Manager II from www.anybus.com/support.
2. Install Anybus Firmware Manager II on your PC.
3. Launch Anybus Firmware Manager II and follow the instructions to reinstall the firmware.

6. Factory Default Settings

The Bridge II CAN comes with the following factory default settings.

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 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

Default CAN Settings	
Operating Mode	On
Bitrate	250 kbps
Ethernet Protocol	Optimized
Automatic Bus-off	Off
TCP Mode	Server
TCP Port	5005
RX Filter	Standard, ID 0x0, Mask 0x0 + Extended, ID 0x0, Mask 0x0

7. LED Indicators

Status Indicators

Figure 9. Status LED indicators

LED Indication		Description
PWR	Off	No power
	Green	Normal operation
WLAN	Off	WLAN disabled or no power
	Blue, blinking	Access Point: No clients, awaiting connections
	Blue	Access Point: Connected to at least one Client Client: Connected to Access Point
	Blue, flickering	WLAN data activity (when connected)
	Purple, blinking	Client: Scanning for access points
	Purple	Client: Connecting to a detected Access Point
	Red	Unrecoverable error
LAN	Off	No Ethernet connection
	Yellow	Ethernet link present
	Yellow, flickering	Ethernet data activity (when connected)
BT	Off	Bluetooth disabled or no power
	Blue, blinking	NAP: No clients, awaiting connections
	Blue	NAP: Connected to at least one PANU Client PANU: Connected to NAP
	Blue, flickering	Bluetooth data activity (when connected)
	Purple	PANU: Trying to connect to NAP
	Red	Unrecoverable error

Link Quality/Mode Indicators

The Link Quality/Mode Indicators are used to indicate Bluetooth quality, selected Easy Config mode and update status in Recovery Mode.

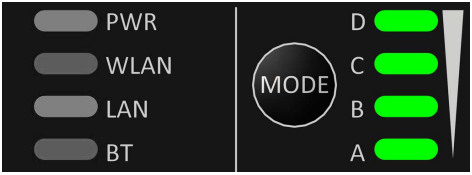


Figure 10. Link Quality/Mode indicators

Table 5. RSSI (WLAN Client) / Link Quality (Bluetooth PANU)

LED				Description
LED is off	LED is off	LED is off	LED is off	No connection
A, Green	LED is off	LED is off	LED is off	RSSI/Link Quality < 25 %
A, Green	**B**, Green	LED is off	LED is off	RSSI/Link Quality 25–50 %
A, Green	**B**, Green	**C**, Green	LED is off	RSSI/Link Quality 50–75 %
A, Green	**B**, Green	**C**, Green	**D**, Green	RSSI/Link Quality > 75 %

Recovery Mode LED Indications

Table 6. In Recovery Mode the Status LEDs indicate the firmware update status

LED	Indication	Description
PWR	Green	Firmware update in progress
	Green, blinking	Waiting for valid firmware
WLAN + **BT**	Alternating red/blue	Firmware update in progress

8. Technical Specifications

Order Code	AWB3006	AWB3016
Serial interface	CAN 2.0A/B (11/29 bit identifier). CAN Bitrate 10 kbps to 1000 kbps freely selectable. Up to 28 freely customizable CAN receive pass-through filters. Advanced settings for Prescaler, Time Seg 1+2, SJW. Transparent transfer of any CAN based protocol including e.g. J1939 and CANopen.	
Ethernet interface	Ethernet: 10/100BASE-T with automatic MDI/MDIX auto cross-over detection. For configuration only.	
WiFi interface	Wireless standards: IEEE 802.11 a, b, g, n, d. Operation modes: Access Point or Client Wireless LAN bands: 2.4 GHz and 5 GHz RF output power: 18 dBm EIRP (including antenna gain 3 dBi) Max number of Clients for Access Point: 7 Power consumption: 54mA@24VDC Net data throughput: 20 Mbps. Link speed: max 65 Mbps (802.11n SISO) Security: WEP 64/128, WPA, WPA-PSK and WPA2, TKIP and AES/CCMP, LEAP, PEAP including MS-CHAP.	
Bluetooth interface	Wireless standards (profiles): PANU & NAP Operation modes: Access Point or Client RF output power: 14 dBm EIRP (including antenna gain 3 dBi) Bluetooth conducted sensitivity: -90 dBm Max number of slaves for Access Point: 7 Power consumption: 36 mA@24VDC Net data throughput: ~1 Mbps Bluetooth version support: Classic Bluetooth v2.1 Security: Authentication & Authorization, Encryption & Data Protection, Privacy & Confidentiality, NIST Compliant, FIPS Approved	
Dimensions	93 x 68 x 33 mm (H•W•D)	
Weight	120 g or 0,26 lbs	
Temperature	Operating: -30 to +65 °C (-22 to +149 °F) Storage: -40 to +85 °C (-40 to +185°F)	
Output power	WiFi 18 dBm EIRP - Bluetooth 14 dBm EIRP - Bluetooth Low Energy 10 dBm EIRP All including antenna gain 3dBi	

Order Code	AWB3006	AWB3016
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 (54mA@24VDC with Wireless LAN and 36mA@24VDC with Bluetooth)	
Enclosure material	Plastic PC/ABS (Bayblend FR3010)	
Mechanical rating	IP65	
Mounting	Two screws (Ø 4 mm) on flat surface. DIN rail mount option available (optional accessory).	
Max range	400 meters	
Antennas	Three internal antennas: 1. 2.4 GHz 2. 2,4 GHz MIMO 3. 5 GHz	One external antenna: 1. 2,4/5 GHz dual band
	The external antenna does not provide better range but allows connectivity if the Wireless Bridge needs to be placed inside a radio-secure environment such as a steel cabinet. When mounting inside a steel cabinet antenna cables with magnetic foot or screw mount should also be considered.	
Connectors	1x M12 for Ethernet (4-pin, D-coded) 1x M12 for Power + CAN 5-pin, A-coded	1x M12 for Ethernet (4-pin, D-coded) 1x M12 for Power + CAN 5-pin, A-coded RP-SMA antenna connector for external antenna variant
Vibration compatibility	Sinusoidal vibration test according to IEC 60068-2-6:2007 and with extra severities; Number of axes: 3 mutually perpendicular (X:Y:Z), Duration: 10 sweep cycles in each axis, Velocity: 1 oct/min, Mode: in operation, Frequency: 5-500 Hz. 5-8,4Hz=±3.5mm; 8,4-40,7Hz=1g; 40,7-57Hz=±0,15mm;57-500Hz=2g. Shock test according to IEC 60068-2-27:2008 and with extra severities; Wave shape: half sine, Number of shocks: ±3 in each axis, Mode: In operation, Axes ± X,Y,Z, Acceleration: 30 m/s2 , Duration: 11 ms.	

Region	Certifications
Europe	CE, 2014/53/EU Radio Equipment Directive (RED)
USA	FCC 47 CFR part 15, subpart B. UL: Ind. Cont. Eq. UL file: E214107
Canada	ICES-003
Japan	MIC

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

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