AY-U9xxBT

Long-Range UHF-RFID Reader with Bluetooth BLE-ID

Installation and User Manual

UHF
SMART™

Models:
AY-U915BT
AY-U920BT

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Notice and Disclaimer

This manual's sole purpose is to assist installers and/or users in the safe and efficient installation and usage of the system and/or product, and/or software described herein.

BEFORE ATTEMPTING TO INSTALL AND/OR USE THE SYSTEM, THE INSTALLER AND THE USER MUST READ THIS MANUAL AND BECOME FAMILIAR WITH ALL SAFETY REQUIREMENTS AND OPERATING PROCEDURES.

- The system must not be used for purposes other than those for which it was designed.
- The use of the software associated with the system and/or product, if applicable, is subject to the terms of the license provided as part of the purchase documents.
- ROSSLARE exclusive warranty and liability is limited to the warranty and liability statement provided in an appendix at the end of this document.
- This manual describes the maximum configuration of the system with the maximum number of functions, including future options. Therefore, not all functions described in this manual may be available in the specific system and/or product configuration you purchased.
- Incorrect operation or installation, or failure of the user to effectively maintain the system, relieves the manufacturer (and seller) from all or any responsibility for consequent noncompliance, damage, or injury.
- The text, images and graphics contained in the manual are for the purpose of illustration and reference only.
- All data contained herein subject to change without prior notice.
- In no event shall manufacturer be liable for any special, direct, indirect, incidental, consequential, exemplary or punitive damages (including, without limitation, any and all damages from business interruption, loss of profits or revenue, cost of capital or loss of use of any property or capital or injury).
- All wiring diagrams are intended for reference only, the photograph or graphic of the PCB(s) are intended for clearer illustration and understanding of the product and may differ from the actual PCB(s).

1.   Introduction

The AY-U9xxBT series of UHF and Bluetooth readers are available with versions in both UHF frequencies (865-868 and 902-928 MHz) and support Bluetooth BLE frequencies and protocols. Two associated apps for iOS and Android smartphones made by Rosslare can be used with the readers – BLE-ID credential app and BLE-Admin configuration app – for programming operational settings.

The readers are waterproof (IP65) and are suitable for use in a wide range of RFID applications, such as transport management, vehicle management, car parking, production process control, and access control.

The readers support the following functions:

- Reading UHF hard credential
- Reading BLE soft credential
- Transmitting credential ID to the controller
- Acting based on controller's input (allowing access or not)
- Self-update
- Reconfiguration provided by credential (soft or hard) or by PC SW

The AY-U9xxBT series includes the following models:

- AY-U9xxBT-US: 902–928 MHz (America)
- AY-U9xxBT-EU: 865–868 MHz (Europe)

1.1   Installation Kit

The package includes:

- 1 AY-U9xxBT reader with a 5 m (16.4 ft) 10-wire cable
- 1 100–240 VAC switching power supply: 15 VDC @ 4 A
- 1 installation bracket kit
- 1 installation and user manual

2.   Technical Specifications

Electrical Characteristics

Operating Voltage Range	Typical: 9 to 15 VDC (2 A) Max: 24 VDC
Input Current	Standby: 0.2 A max
	Read: 1.2 A max
Credential Read Distance*	AY-U915BT: 0.5 to 6 m (1.6 to 19.7 ft) (adjustable)
	AY-U920BT: 0.5 to 12 m (1.6 to 39.4 ft) (adjustable)
Transmission Protocol	Wiegand 26-Bit (default) Wiegand 32-Bit Wiegand 34-Bit Wiegand 40-Bit Wiegand 56-Bit Wiegand 64-Bit OSDP Custom
Maximum Cable Distance	150 m (492 ft) with 18″ AWG cable
Frequency	AY-U9xxBT-US: 902–928 MHz (America) AY-U9xxBT-EU: 865–868 MHz (Europe)
Modulation Type	ASK
Read Sensitivity	Dual polarization read mode
Cards and Tags	• EPC GEN2 (ISO18000-6C) Tags • BLE-ID soft credentials

* Measured using a Rosslare proximity card or equivalent.

Technical Specifications

Environmental Characteristics

Operating Temp. Range	-35°C to 60°C (-31°F to 140°F)
Operating Humidity Range	0 to 95% (non-condensing) Suitable for outdoor use (IP65)

Physical Characteristics

Height x Width x Depth	AY-U915BT: 29.5 x 29.5 x 3.2 cm (11.6 x 11.6 x 1.3 in.)
	AY-U920BT: 36.5 x 36.5 x 3.2 cm (14.4 x 14.4 x 1.3 in.)
Weight	AY-U915BT: 2.5 kg (5.5 lb)
	AY-U920BT: 2.8 kg (6.2 lb)

3. Mounting

	All RFID readers can be affected by Radio Frequency Interference (RFI). For optimal read range, RFID readers should be installed away from areas with RFI.
Important	

	Installing an RFID reader adjacent to metallic surfaces might alter the reader's specifications. To diminish this interference, use a plastic spacer when mounting the reader.
Note	

3.1 General

There are two methods that can be used when installing the reader.

- 1-Shaped Stand Bracket Side-Loaded
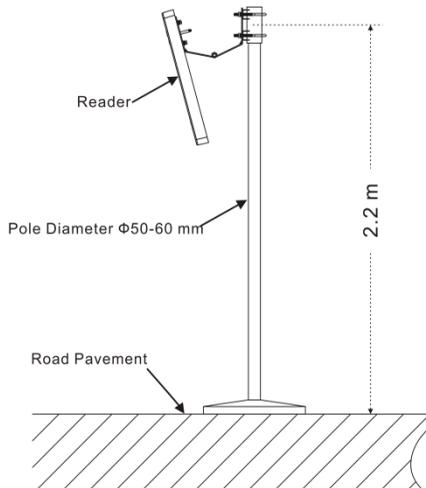- L-Shaped Stand Bracket Top-Loaded

Each installation method is selected based on application requirements and actual location.

3.1.1 1-Shaped Stand Bracket Side-Loaded

In this method, the stand pole should have a diameter of between 50 and 60 mm (2 to 2.4 in.) and a height of 2.2 m (7.2 ft). The pole should be made of stainless steel with a thickness of at least 1.2 mm (0.05 in.).

Use the bracket contained in the package box to mount the AY-U9xxBT reader to the top of the stand pole depending on actual vehicle type (mainly large car and small car) (Figure 1).

Figure 1: 1-shaped Stand Bracket Side-Loaded

Adjust the height from the center of AY-U9xxBT reader to lane level to be around 2.0 m (6.5 ft).

3.1.2   L-Shaped Stand Bracket Top-Loaded

In this method, the L-shaped stand pole should have a diameter of between 60 to 80 mm (2.4 to 3.1 in.) and a height of 4.2 m (13.8 ft). The pole should be made of stainless steel with the thickness of at least 1.2 mm (0.05 in.).

Use the bracket contained in package box to mount the AY-U9xxBT reader to the rail near the center of the lane (Figure 2).

Figure 2: L-shaped Stand Bracket Loaded
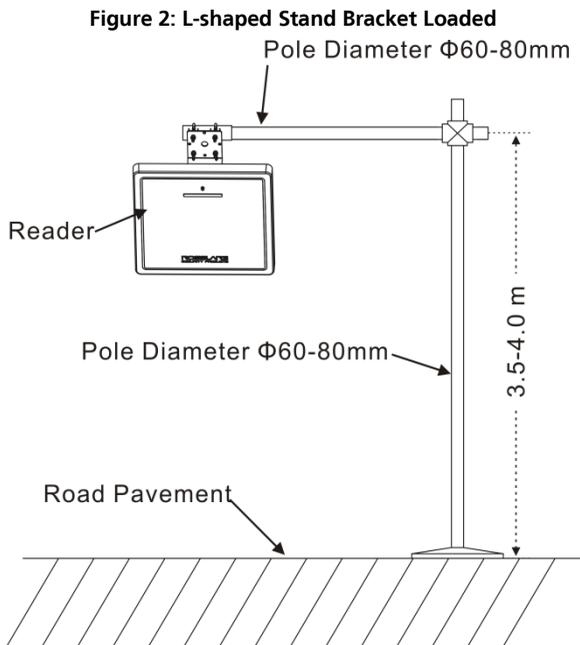
Adjust the height between the rail and the ground to between 3.5 to 4.0 m (11.5 to 13 ft), depending on the height of vehicle.

3.1.3   Adjusting the Azimuth Angle of Antenna

The angle of inclination with the ground plane of the antenna should be approximately 60° to 75° (Figure 3), while the deviation angle of the antenna should be biased towards the lane direction (Figure 4).
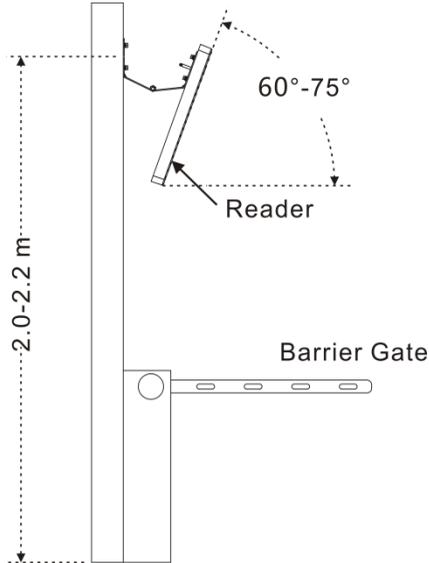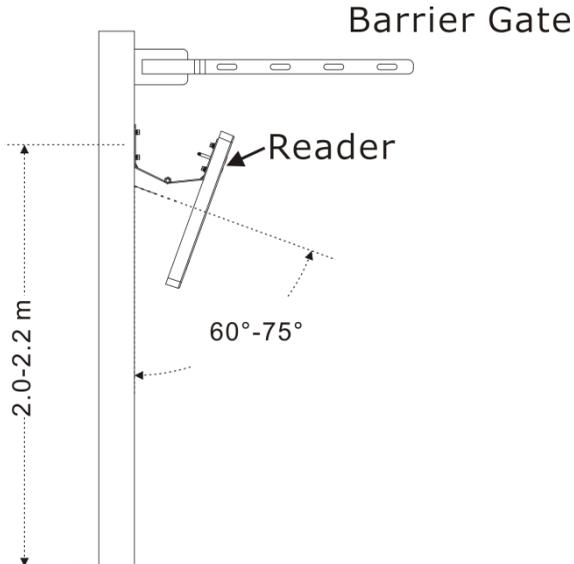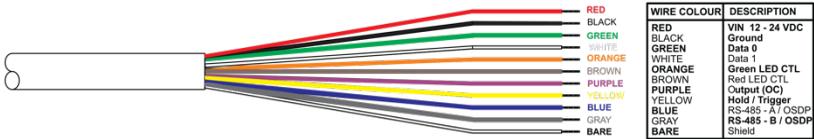
Figure 3: Antenna Angle Side View

Figure 4: Antenna Angle Top View

4.   Wiring

The units are supplied with a 5 m (16.4 ft) 10-conductor pigtail with exposed wires coated with solder (see Figure 5).

Figure 5: Wiring Colors

To connect the unit as a reader to an access control unit:

1. Select the appropriate connections according to Table 1.
2. Prepare the controller cable by cutting its jacket back about 3 cm (1¼") and strip the insulation from the wires about 1.3 cm (½").
3. Splice the reader's pigtail wires to the corresponding controller wires and cover each joint with insulating tape.

Table 1: Wiring the Unit as a Reader to a Control Panel

Wire Color	Output
Red	Power
Black	Ground
Green	Data 0 / Data / C2
White	Data 1 / Clock / C1
Orange	Green LED Control
Brown	Yellow LED Control
Purple	OC Output*
Yellow	Hold/Trigger Control
Blue	RS-485 - A / OSDP**
Gray	RS-485 - B / OSDP**

* for future use

** RS-485 is used for firmware update.

Wiring

4. Trim and insulate the ends of all unused conductors individually. Do not short any unused wires together.

Note	• The individual wires from the reader are color coded according the Wiegand standard. • When using a separate power supply for the reader, this supply and that of the controller must have a common ground. • The reader's cable shield wire should be preferably attached to an earth ground, or a signal ground connection at the panel, or the power supply end of the cable. This configuration is best for shielding the reader cable from external interference.

5.   Operation Instructions

After wiring the unit to a controller (POWER, GND, D0, D1), you should test the reader.

To test the reader:

1. Power up the reader. One beep is emitted and then it begins an auto-calibration procedure. After 2 seconds, the reader enters working mode.
2. Present the appropriate type of credential to the reader. A short beep is emitted, indicating that the credential is read properly.

6. APP-x421 Admin App

> Screenshots in the manual may differ slightly from the real view in the app.

The settings for the AY-U9xxBT reader can be configured using Rosslare's APP-x421 Admin app.
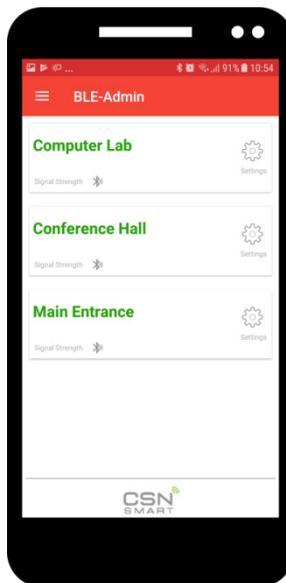
6.1 Opening the App

Download the APP-x421 Admin app for the AY-U9xxBT reader from Google Play or the Apple Store, depending on the model of your mobile device.

> An Android device should be v5.0 and above and an iOS device should be v8.0 and above.

All relevant readers are displayed.

6.2 Reader Settings

Tap the ID of the reader you wish to configure.

You are asked to enter your password.

The default password upon initial use is 12345678.
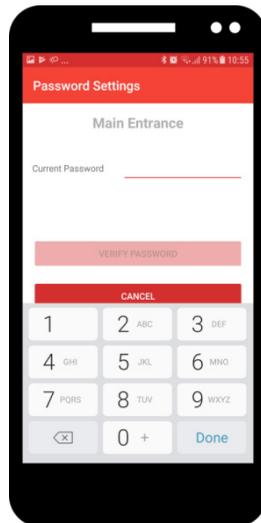
The Reader Settings screen opens.

Displays the reader's type and MAC address

Tap to rename the reader

Tap to make the reader beep so you can identify it

Tap to edit your password (must be 8 digits)

Tap to view/edit configuration

Tap to update the firmware

Tap to send the device ID to the reader to test access
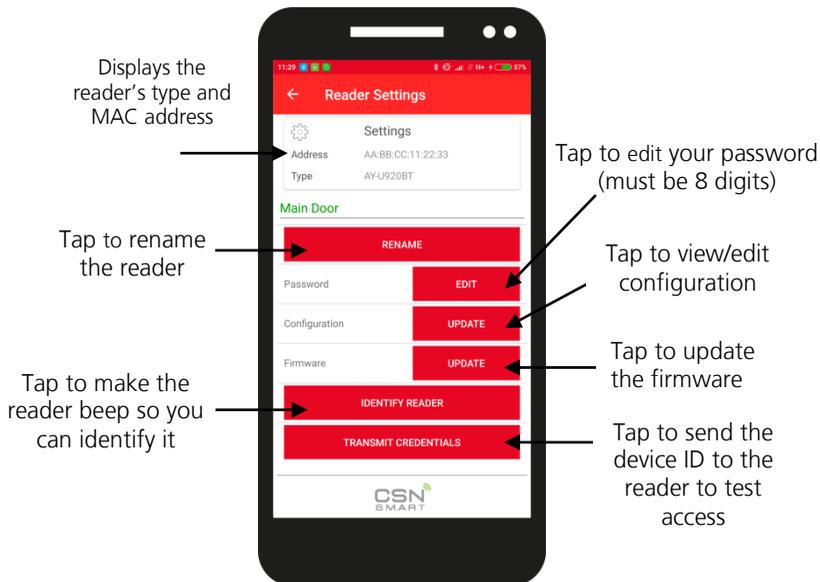
6.3   AY-U9xxBT Reader Configuration Settings

Set the configuration settings as described below.

LED Activation – Enable or disable LED activation

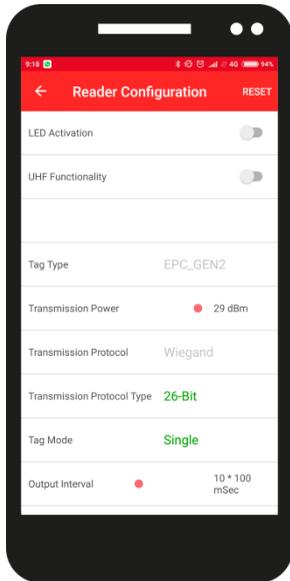UHF Functionality – Enable or disable UHF communication

Regulation – Select the transmitting frequency

Tag Type – Select the tag type you wish to read with the reader

Transition Power – Slide to select the signal power

Transmission Protocol – Select the protocol

Transmission Protocol Type – Select number of bits

Tag Mode – Select if reading one tag or multiple tags

Output Interval – Slide to select the interval of sending a credential from the reader
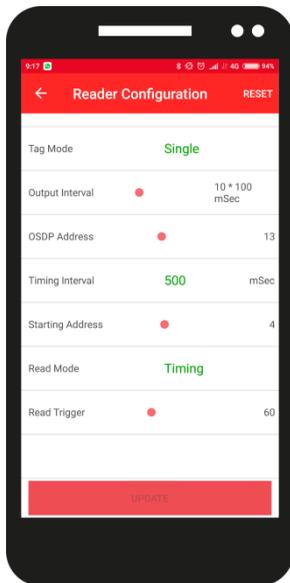
OSDP Address – Slide to select the address of the reader

Timing Interval – Enter the time between reads

Starting Address – Slide to select the initial ID bit

Read Mode – Select the read mode

Read Trigger – Slide to select the amount of time between reading of credentials in the surrounding

6.4   Additional Settings

If you tap on the 3 lines on the main screen, additional options are available.

Tap to display the BLE
soft credential

Tap to see the EULA

Tap to:
- Set the reader's read range
- Change the GUI language
- Set the automation, which allows the reader to support self checkups in specific chosen intervals
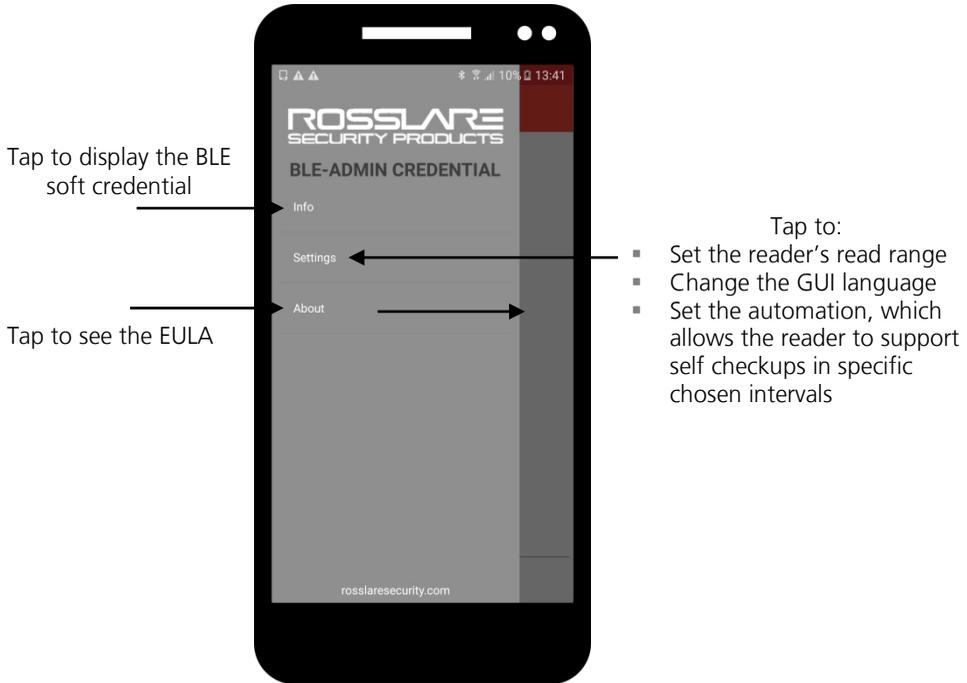
A.   Declaration of Conformity

FCC ID = GCD-AYU9XXBT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment 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:

- Reorient 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.

B.   Radio Equipment Directive (RED)

Under our sole responsibility that the following labeled AY-U9xxBT is tested to conform to the EU Radio Equipment Directive – RED 2014/53/EU – in electrical and electronic equipment.

C.   RoHS Directive

Under our sole responsibility that the following labeled AY-U9xxBT is tested to conform to the Restriction of Hazardous Substances (RoHS) directive – 2011/65/EU – in electrical and electronic equipment

D.   Limited Warranty

The full ROSSLARE Limited Warranty Statement is available in the Quick Links section on the ROSSLARE website at www.rosslaresecurity.com.

Rosslare considers any use of this product as agreement to the Warranty Terms even if you do not review them.

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