



UHF Long Range Reader User Manual

902-928MHz



Model: BU-900R-K

American Standard

Please read this manual carefully, before starting to operate the reader.

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1. INTRODUCTION

1.1. Introduction

BU-900R-K UHF Long Range RFID product is one of the significant RFID products designed by BlueCard. It is a reader compliant with EPC Gen2 standard, which is widely used in the fields such as Vehicle Parking Management System, Time & Attendance System, Personnel Access Control Management, and Stock Management System.

Advantages:

- Reading distance is up to 10 meters with passive card..
- Integrated antenna
- Wiegand output specialized for Access Control Management System.
- GOIP for external device control

1.2. Audience

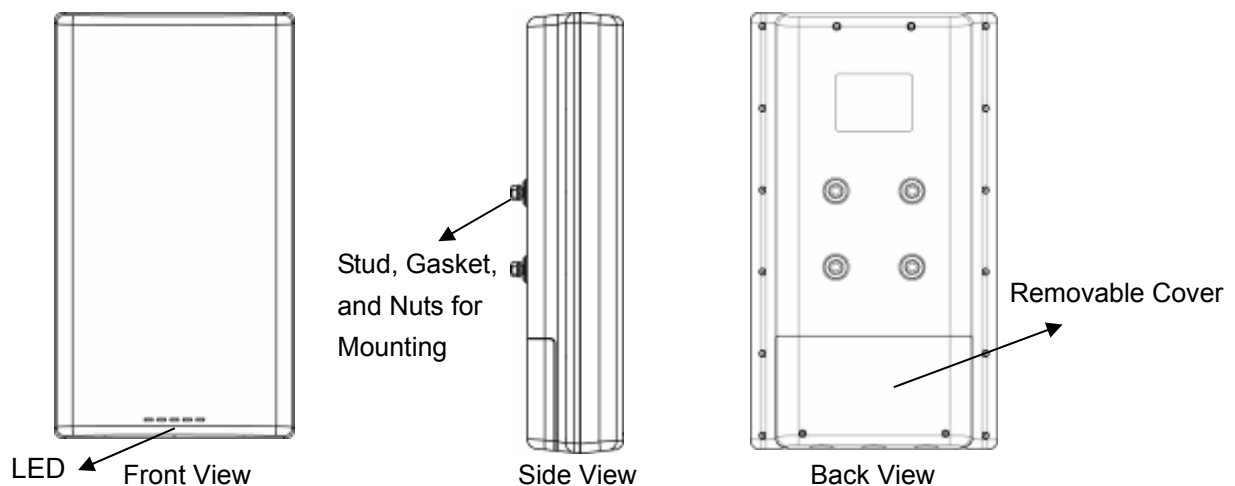
This document is used only by authorized BU-900R-K distributors, installation engineers. This manual provides you the instructions of testing, setting, installing of BU-900R-K, please read the manual carefully before start to use the reader.

1.3. Reading Guide

This document is a detail instruction on BU-900R-K, which includes hardware description, tag instructions, power supply, host computer instruction, how to test and install the reader, troubleshooting, reader's specifications and definition for the pins.

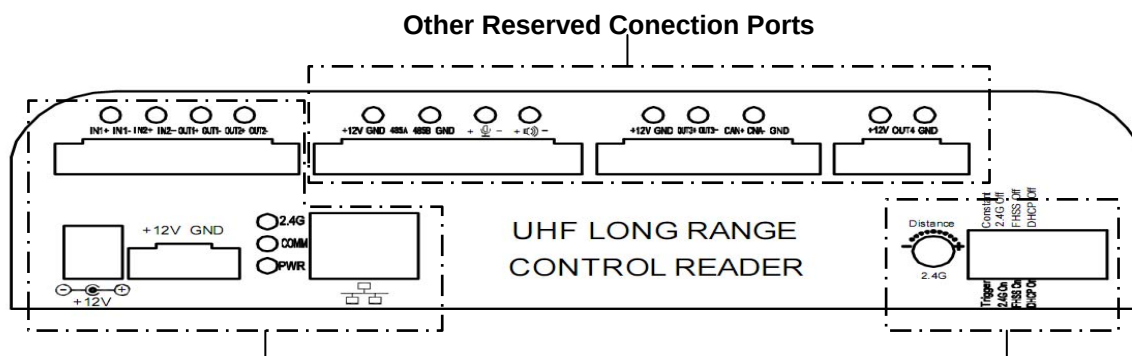
1.4. Reader Description

Bluecard BU-900R-K UHF reader is long reading distance UHF RFID reader with attached antenna. BU-900R-K has five LED light to indicate the reader status. Please refer to the following figure for the BU-900R-K detail appearance.



Color	Definition
BLUE	◆ Flash once: the power has been turned on
	◆ Flash & Beep once for each reading
	◆ Four Blue LED stays on means the environment is very bad situations
RED	◆ Constant On: reader standby with power supply

2. CONTROL PANEL



2.1. Power Supply

BU-900R-K needs a dedicated power supply at the site in all the time. The acceptable power supply is 12V DC. Please use the AC-DV adapter supplied by the manufacturer.

INPUT		OUTPUT	
Voltage/V	Power/Hz	Voltage/V	Ampere/A
100~240	47~63	12	5

2.2. Indicator

Indicator	Definitions
INPUT	Under trigger mode, the LED is flashing when reader receive signal from extra devices.
COMM	The LED is flashing when communicate with host computer
PWR	The LED is constant on when switch power on

2.3. Communications

2.3.1. General Input / Output

The function allows you to receive extra devices' signal, such as loop detector and optical sensors (for more details please refer to page 6 **Trigger Reading**).

INPUT	when the external device sends 5~48V will trigger the reader make readings
OUTPUT	can only driver the device less than AC110V / DC60V, less than 1A

2.3.2. Ethernet Data Transfer

Communicate between reader to software via Ethernet RJ45 cable (it is based on TCP/IP protocols).

2.4. Adjust Reading Ranges

This function is for active tag only. A standard BU-900R-K reader can work with both ECOMPUTER G2 C1 passive tags and active tags. With a passive tag, its reading range can be up to 10m, depending on tags and/or change the output power of the antenna. Its reading distances are more flexible on active tags. As there are more tag models selectable.

Each of our major active tag models has several sub-models, shown by suffix e.g. -12, -40 and -70. These sub-models enable a reader to have variable minimum and maximum adjustable ranges. For example, to present both BGC-S-12 and BGC-S-70 tags in front of a BU-900R-K, the min. adjustable range for BGC-S-12, should be around 3-5m, while the min. adjustable range for BGC-S-40 can reach 20-30m. The maximum adjustable range on a -12 tag can be 12m, while on a -40 tag, it can make 40m and more.

On the same tag, clients can still set different reading ranges by rotating the embedded potentiometer in the reader.



Clients can use a small screwdriver to rotate the potentiometer clockwise or counter clockwise, accordingly the reading range becomes longer or shorter. At the adjustable extreme, you can hear a low spring-like sound, after that, further rotation in the same direction would not change the reading range any more. There are around five valid rounds between the minimum and maximum adjustable position.

2.5. Switch Board

BU-900R-K can work on three reading modes. By factory default, when a BU-900R-K is connected to the appropriate power supply, it will begin to read tags continuously. Also the reader can be triggered to read by a loop detector or infrared detector.



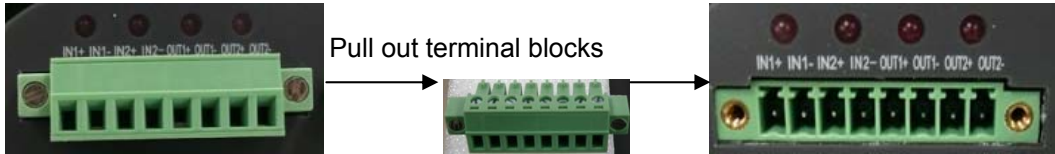
Users can switch between constant and trigger mode easily on the reader's panel.

Notes: after switching the reading mode, the reader should restart to make the change takes effect.

2.5.1. Trigger Reading

To enable this mode, the reader needs to be wired to a trigger (typically a loop detector or infrared detector) via its general input. For testing purposes, you may short IN+ with IN-, which will generate a valid trigger signal. Notes: when trigger signals received, BU-900R-K will continue to make reading for 2 seconds.

Users can pull out the terminal block on the reader's interfaces for easy wiring with external devices, and then put it back to complete connection with the reader (shown below).



2.5.2. Command Mode

In this mode, BU-900R-K will remain on standby until it receives a command from COMPUTER. For example, the reader will start to make readings when the COMPUTER sent a read command to a BU-900R-K, meanwhile, the reader will return a confirm data to computer as confirmation. The command mode is to facilitate clients to integrate the reader.

When a reader is working, it should emit LED and audio signals according to its operation status.

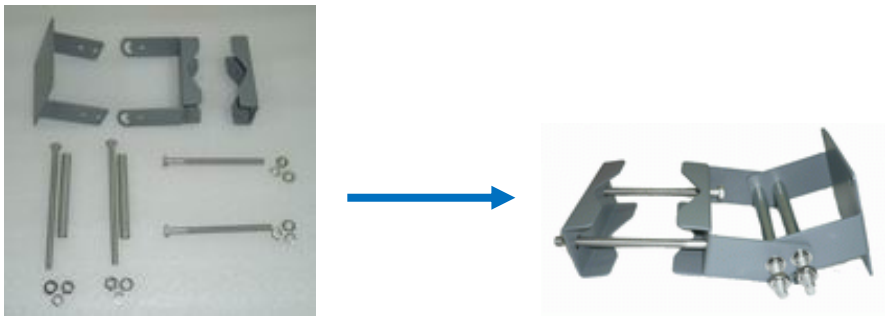
Reader Operation Status	LED Signals	Audio Signals
Standby	Red Light Constant On	No
Reading	Blue Light Keeps Flash	Beep Once for Each Read

Turn On/Off

Notes: after the switch, please restart the reader.

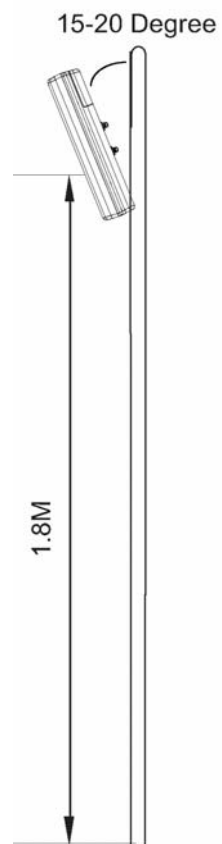
3. READING INSTALLTAION

A BU-900R-K can be fixed in sites in any way they see fit. Installers are recommended to order a standard pole mounted bracket from the manufacturer to install the reader. Below is our mounted bracket.



The reader can be mounted on either a pole or wall. The reader is equipped with a linear horizontal antenna with limited readable angle. It should be installed at a suitable height and angle towards the ground, so as to give the optimal performance.

A series of factors can affect the reader installation height and angles, including the reading distance, width of the lane, types of vehicles, etc. The figure below shows a typical installation for your reference.



4. CHOOSING & INSTALLING TAGS

4.1. Tag Model

Passive Card (EPC Standard)



BMC-G2C-01



BMC-G2C-04

Active Tags



BGC-S



BGC-04



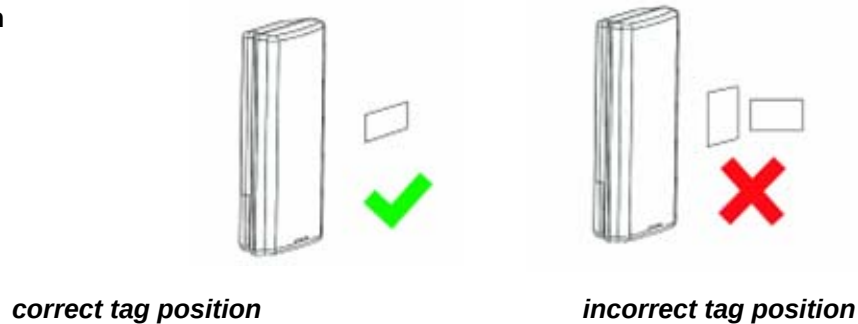
BGC-K

4.2. Reader & EPC Card Alignment

The following criteria must be satisfied to achieve the optimum read reliability:

- ◆ Polarization of the tag and BU-900R-K must be aligned in the same direction.
- ◆ The installed tag must be in a direct, unobstructed line of sight to BU-900R-K. All the materials reduce the RF signal. **Metal and water can cause the significant problem by reflect and absorb single.**

Polarization



5. TROUBLESHOOTING AND MAINTENANCE

5.1. Troubleshooting

Q: Why the blue LED on my reader never flash and the reader cannot read tags?

A: Please check with its reading mode settings. Only at the constant mode, the reader will read tags automatically. At the trigger mode, however, the reader should receive a triggering signal to start reading.

Q: My reader can hardly read a tag or the distance shorter than expected, what is the reason?

A: The reader is equipped with a linear horizontal polarization antenna. So tags should be placed in a way where its polarization direction is in line with that of the reader's antenna. If you consider the reading ranges not so well on a tag, please rotate the tag by 90° and try again.

Also in one of following situations, the reading distance can be shortened even there is no problem on the reader: tags are close to or have direct contact with human body, metal screen, or liquid obstruct between reader and tags.

Q: Why the reading distance of my reader on windshield tags is so short in the open air?

A: Windshield tags, as the name suggested, should be attached on window so as to get optimal reading effects. For simulation, you can fix a tag on a piece of glass with crystal tapes, and try again with the reader.

5.2. Maintenance

There are a few tips to get the optimal performance out of the reader.

1. Always use the power adaptor provided by the manufacturer, or consult the supplier for a compliant power adaptor from a third source.
2. DO NOT disassemble the reader. If there is any problem on the device, please return the supplier for repairing.

6. TECHNICAL SPECIFICATIONS

Reader Specifications

Power Supply	12V/ DC,5A (current)
Communication Interface	Wiegand (26/34); RS232
Serial Port Maximum Data Rate	4800bps, 9600bps, 57600bps, 115200bps
Wiegand Data Rate	Pulse width time is 100us, pulse intervals time is 1.0ms
GPIO	1 photo coupler input and output
Dimension	460×260×110mm
Weight	3 Kg
Operating Temperature	-20 °C ~+65 °C
Storage Temperature	-40 °C ~+85 °C
Humidity	10-95%
Environmental Sealing	IP65, DC ground lightening proof
Housing	FRP + stain resistant aluminum

RFID Specifications

Frequency Range	902-928MHz
Operating Mode	FHSS or Fixed Frequency
Reading Range	Passive tag: up to 10m Active Tag: depending on tags & adjustment
Operation Mode	Constant, trigger, command
Moving Tag Detection	≤40Km/h
Number of Antenna	1 integrated, linear horizontal

FCC Statement:

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

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

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: 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.

RF Exposure Statements:

To comply with RF exposure requirements, antennas that are operating near users at stand-alone desktop of similar configurations must operate with a minimum separation distance of 20cm from all persons.



RFID devices for use through the EEA have the following restrictions:

- Maximum radiated transmit power of 2W ERP.

Statement of Compliance:

Bluecard software Technology Co., Ltd. hereby, declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.