# USER′S MANUAL

# IDTECK RF245

## 2.45GHz Long Range Reader



**IDTECK**
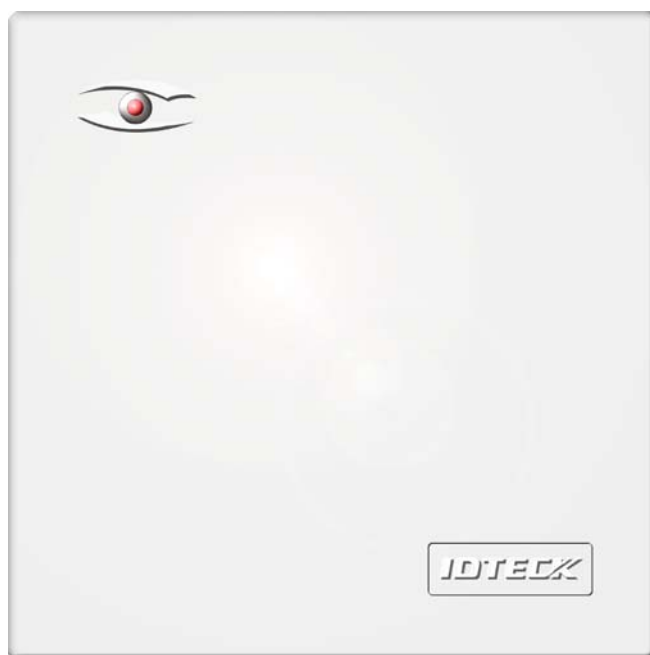
# Table of Contents

# 1. <u>Important Safety Instructions</u>

When using RF245, basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons. In addition, the following safety guides should also be followed:

1. Fully read and understand all instructions and follow them completely.
2. Follow all warnings and instructions marked on the product.
3. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning. If necessary, use mild soap.
4. Do not use this product near water.
5. Only operate this product using the type of power source indicated.
   If you are not sure of the type of power supplied to your installation site, consult your dealer of local power company.
6. Never insert objects of any kind into the product or through the cabinet slots as they may touch voltage points and/or short circuit parts possibly resulting in fire or electric shock. Never spill liquid of any kind on the product.
7. Never disassemble this product by yourself; take the unit to a qualified service center whenever service or repair is required. Opening or removing the covers may expose you to dangerous voltages or other risks. Also, incorrect reassembly can cause electric shock when the unit is subsequently used.
8. Unplug this product from the Direct Current (DC) power source and refer to qualified service personnel under these conditions:

   a. When the power supply cord or plug is damaged or frayed.
   b. If liquid has been spilled on the product.
   c. If the product does not operate normally after following the operating instructions in this manual. Adjust only those controls that are covered by the operating instructions in this manual. Improper adjustment of other controls that are not covered by this manual may damage the unit and will often require extensive work by a qualified technician to restore normal operation.
   d. If the product exhibits a distinct change in performance.

# 2. <u>General</u>

The RF245 is a 2.45GHz Long Range Reader for outdoor use and the maximum read range is 6.5feet(2 meters,RF245-2), 10feet(3 meters, RF245-3), 16feet (5 meters, RF245-5) and 32feet (10 meters, RF245-10) with IDA245/IDA245H2 active tag. The RF245 can be used for various applications such as Hands Free Access Control, Parking Control, Personal Tracking and Factory Automation. The RF245 supports various output formats, 26bit Wiegand output, RS232 serial output and BARGATE output. There are optional Mounting Bracket and Reader Hood for easy installation. The RF245 has automatic setup for Channel setting and Site Code setting when it powered up. Red color LED and built-in Beeper assures its accurate and reliable system operation.

## 3. Features

- Long Range Reader (RF245-2 / RF245-3 / RF245-5 / RF245-10 with IDA245/IDA245H2)
- 2.45GHz Frequency
- Encrypted Tag ID and Secure Protocols between Reader and Tags
- Multiple Tags Reading (30 Tags / Sec.)
- 90° One Directional Antenna (Option: 360° Omni Directional Antenna)
- 26bit Wiegand and RS232 Output Format
- Direct Bargate Output (Open Collector: 100mA/1s)
- OTR and Hold Control Input for Parking Control

## 4. Specification

| Model | RF245 |
|---|---|
| CPU | 8bit Microprocessor and ISM Band Receiver |
| Read Range | RF245-2/-3/-5/-10, 2meters, 3meters, 5meters, 10 meters |
| Multiple Reading | 30 Tags / second |
| Frequency | 2.45GHz |
| Receiving Site Code | 256 Site Code |
| Modulation | Encrypted GFSK |
| Directivity | 90° One Directional Antenna (Option: 360° Omni Directional Antenna) |
| Receiver Gain | Better than -80dBm |
| Output Format | 26bit Wiegand and RS232 |
| RS232 Format | 9600bps, Parity None, 8 Data bits, 1 Stop bit |
| Bargate Output | Max. 100mA (Open Collector Output: 1s) |
| OTR Control Input | One Time Reading Control Input |
| HOLD Control Input | Hold Control Input (NC contacts) |
| LED / Beeper | Red Color LED / Piezo Buzzer |
| Power / Current | DC12V / Max. 50mA |
| Operating Temperature | -35° to +65°C (-31°F to +149°F) |
| Operating Humidity | 10% to 90% relative humidity, non-condensing |
| Color / Material | Ivory / Polycarbonate / Aluminum (Anodized) |
| Weight / Dimension | 1.36Kg / 200mm x 200mm x 45mm (W x H x D) |

## 5. Identifying Supplied Parts
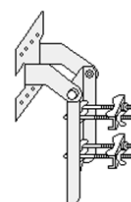
Please unpack and check the contents of the box:
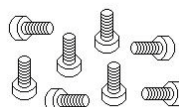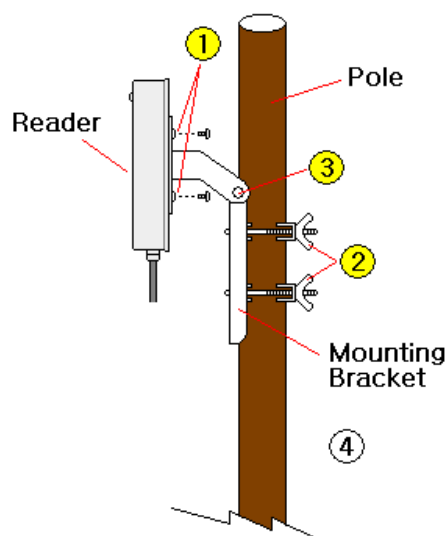


| RF245 | User's Manual | Mounting Bolts (8 pcs) | Mounting Braket |

# 6. Installation of the Product

Installation with Mounting Bracket

① Tighten 8 x mounting bolts to the reader

② Insert Mounting Bracket to the pole and tighten the V-bolts

③ Setting the reading angle and tighten bolts/nuts

Reader — Pole — ① ③ ② — Mounting Bracket — ④

Installation with Mounting Bracket and Reader Hood

① Insert Reader Hood in between the reader and the Mounting Bracket and tighten 8 x mounting bolts to the reader

② Insert Mounting Bracket to the pole and tighten the V-bolts
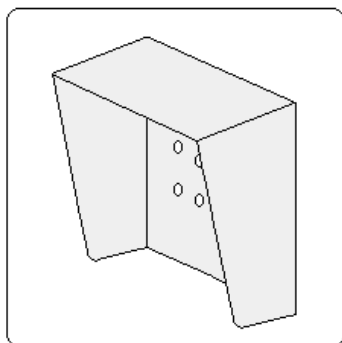
③ Setting the reading angle and tighten bolts/nuts

Reader inside — Pole — ① ③ ② — Reader Hood — Mounting Bracket — ④
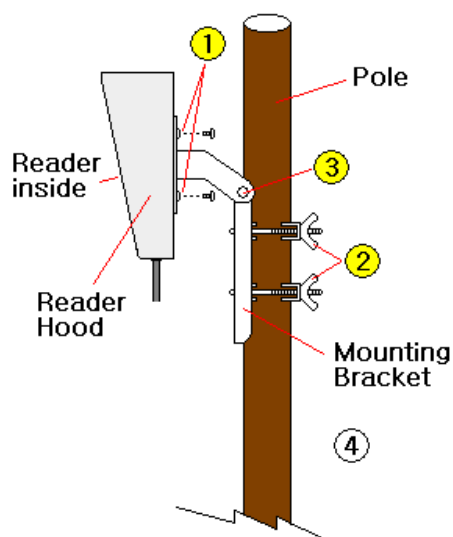
Extra Purchase

Reader Hood

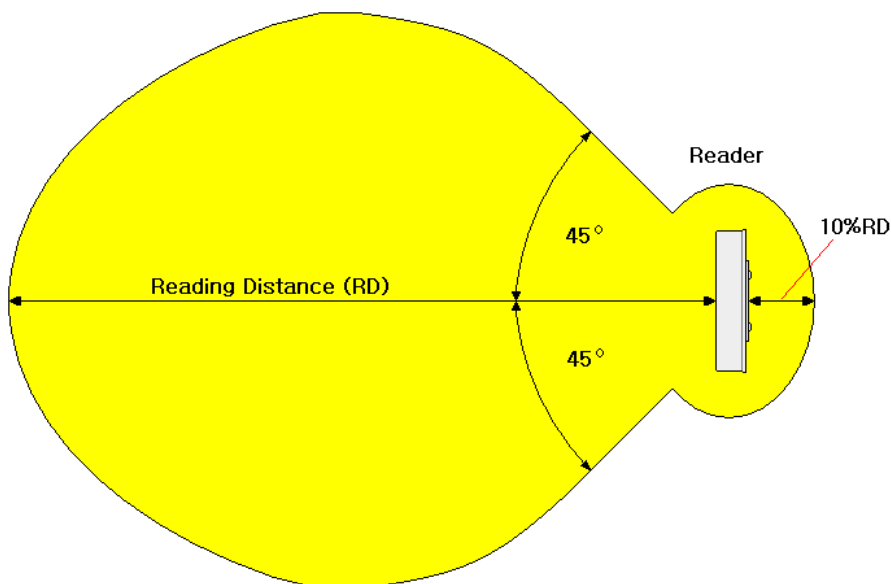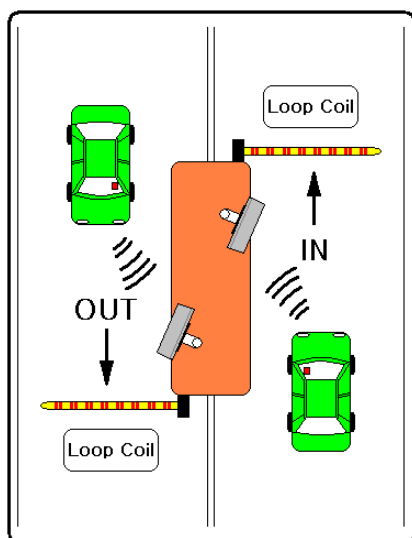Readerhood , bargate, loop coil and speed bump are extra purchase.(IDTECK doesn't offer these contents)
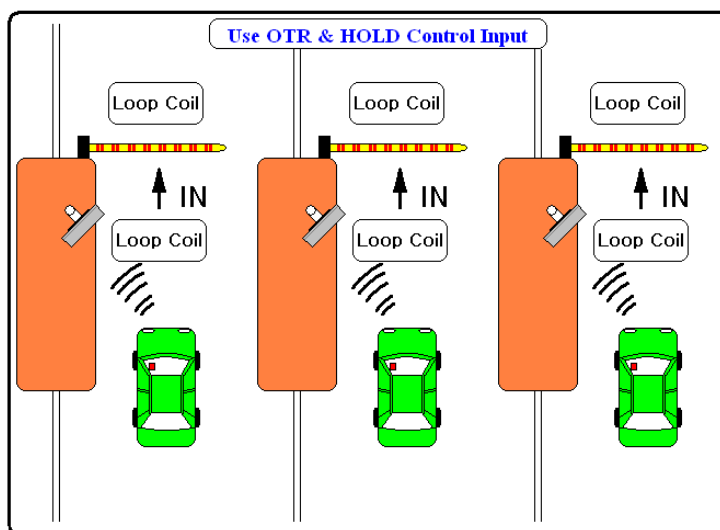
## Reading Angle of RF245

**The reading angle of RF245 is approximately 90 degree at the front side of the reader. However the reader has about 10% of the maximum reading distance at the rear side of the reader.**



## Applications



**Parking Control (Island)**        **Multiple Gates with OTR & HOLD Control**

# 7. Color Coded & Wiring Table

**Power**
| | | |
|---|---|---|
| **Power (DC +12V)** | **DC(+)** | **Red wire** |
| **Power (DC Ground)** | **GND** | **Black wire** |

**26bit Wiegand Output**
| | | |
|---|---|---|
| **Wiegand Data-0** | **Data-0** | **Green wire** |
| **Wiegand Data-1** | **Data-1** | **White wire** |

**RS232 Output**
| | | |
|---|---|---|
| **RS232 Output** | **RS232** | **Violet wire** |

**BARGATE Output**
| | | |
|---|---|---|
| **BARGATE Output[1]** | **BARGATE** | **Gray wire** |

**Control Input**
| | | |
|---|---|---|
| **HOLD[2] Control Input** | **HOLD** | **Blue wire** |
| **OTR[3] Control Input** | **OTR** | **Yellow wire** |

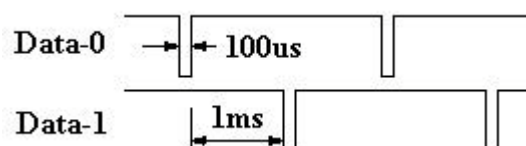**[1] BARGATE Output is an open collector output. (TR output)**
   **Max. 100mA current drain, 1 second low active pulse.**
**[2] HOLD Input is low active input, NC contacts required. Put GND for HOLD.**
**[3] OTR is One Time Reading.**

# 8. Output Format and Timing

### 8-1. 26bit Wiegand Output Timing
**Data bit: 100us low active pulse**
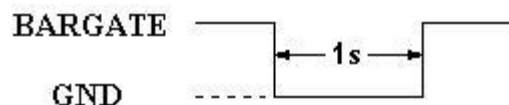**Interval between bits: 1ms**



### 8-2. RS232 Output Format
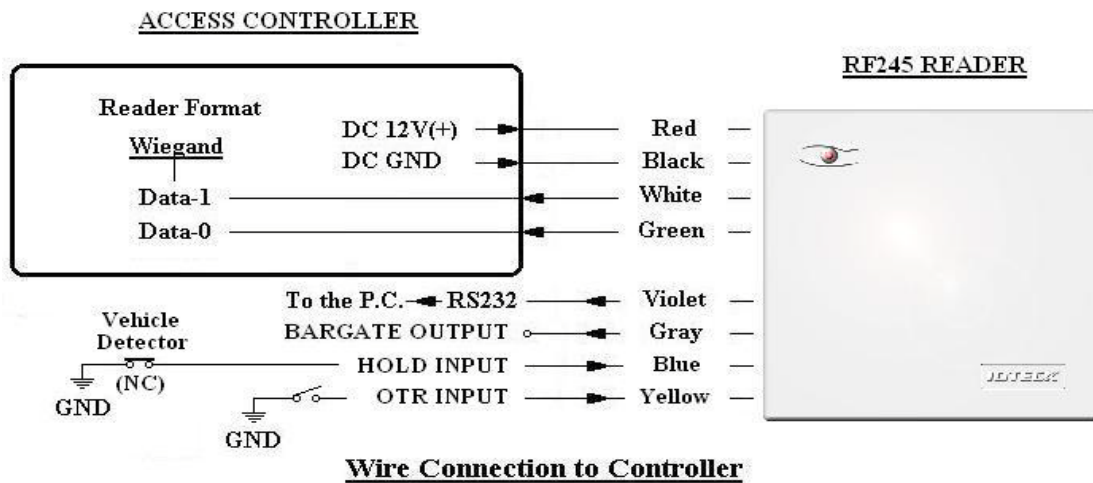**Baud Rate: 9600bps, Parity: None, Data bit: 8, Stop bit: 1**
**LRC: Exclusive OR (XOR) from Start(0x02h) to End(0x03h)**

| Start(0x02h) | Card ID (8 ASCII char.) | End(0x03h) | LRC(XOR) | Total 11 bytes |
|---|---|---|---|---|

### 8-3. BARGATE Output Timing
**Low active pulse: 1s duration**
**Transistor (open collector) output**

## 9. Wire Connection to Controller



## 10. Operation

**10-1.** Apply the power to the reader. The RF245 reader will setup receiving frequency and Site Code automatically. Then the Reader will get into standby mode and turn red LED on after a successful initialization and diagnostics.

**10-2.** If a tag approaches the reader, the reader makes a beep sound and the red LED blinks off and on. The reader will send the 26bit Wiegand output, RS232 output and BARGATE output to the controller on the same time.

**10-3.** BARGATE Output:
When the reader detects the tag, the reader also generates 1s BARGATE control output through the Gray wire. The BARGATE output is a Transistor (open collector) output, maximum current drain 100mA.

**10-4.** One Time Reading (OTR) Control Input:
When you setup the reader to One Time Reading Mode (Put OTR Control Input, Yellow wire to GND), the reader only generates output when the tag is detected first time. The output for same tag is only generated when the tag is away from the read range of the reader for 5 seconds and approach to the reader again.
*(Up to 12 tags are able to OTR operation at the same time then cards from the 13rd are become 'Continuous Reading', because number of OTR operation memories are 12.)*

**10-5.** HOLD Control Input: (NC contacts required)
When the HOLD Control Input (Blue wire) puts to GND, the Reader will not read the tag. The Reader will read the tag while this wire opens. Use this input to vehicle detector such as Loop Coil Sensor. When you use Hold Input with OTR function (Put Yellow wire to GND), only one tag ID will be detected during the HOLD Input is open circuit. Please refer to the following figure for HOLD & OTR function.
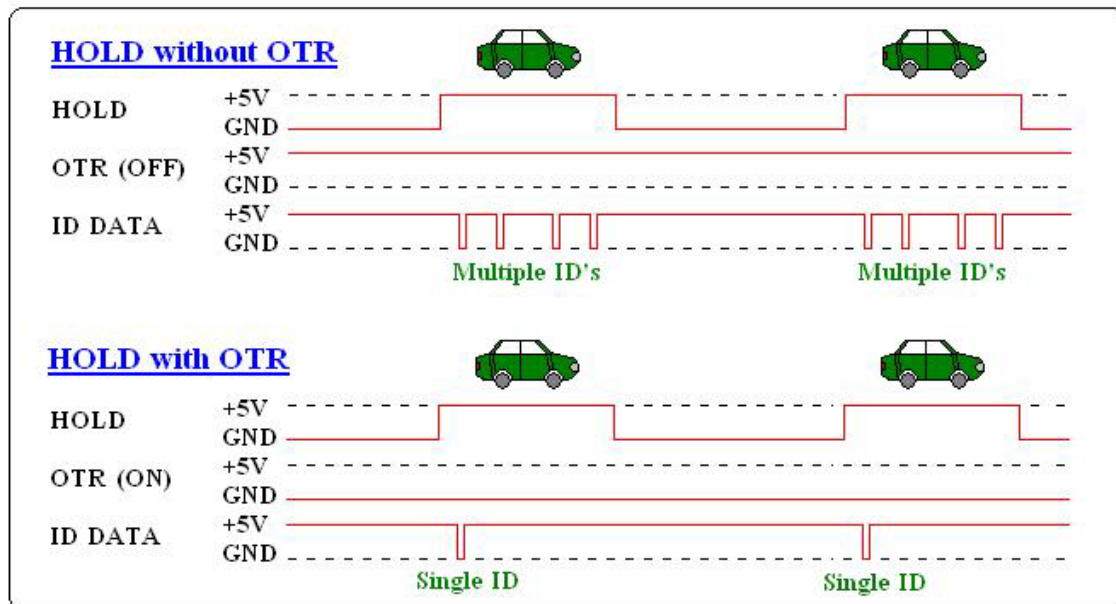
## 11. <u>FCC Registration Information</u>

**FCC REQUIREMENTS PART 15**

**Caution:** Any changes or modifications in construction of this device, which are not expressly approved by the manufacturer for compliance, could void the user's authority to operate the equipment.

**NOTE: 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.**

**This equipment has been tested and found to comply with the limits for a Class A Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to 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 radio or television off and on, the user is encouraged to try to correct interference by one or more of the following measures.**

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on another circuit.
4. Consult the dealer or an experienced radio/TV technician for help.

# 12. Warranty Policy and Limitation of Liability

IDTECK warrants this product against defects in material and workmanship for the period specified in the table below from the date of purchase under normal customer use. This Warranty doesn't apply: 1) to any product which has been dismantled without authorization of IDTECK or/and has a damaged or detached QC label on its back side; 2) to any losses, defects, or damages caused by improper testing, operation, installation, maintenance, modification, alteration, or adjustment; 3) to any product with a damaged or faded serial number on it; or 4) to any losses, defects, or damages caused by lightning or other electrical discharge, natural disaster, misuse, accident or neglect.

This Limited Warranty is in lieu of all other warranties, obligations, or liabilities on the part of IDTECK, and IDTECK DISCLAIMS ANY AND ALL WARRANTY, WHETHER EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.IDTECK does not, and cannot, know who is present, what property is located, where this product will be used; it would be extremely difficult to determine the actual damages that may result from a failure of the product to perform as anticipated; and the low price of this product is based upon the nature of the product provided and the limited liability that IDTECK assumes. IDTECK IS NOT RESPONSIBLE FOR ANY PERSONAL INJURY, PROPERTY DAMAGE OR LOSS, DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR OTHER LOSS, AND IDTECK'S MAXIMUM LIABILITY SHALL NOT IN ANY CASE EXCEED THE PURCHASE PRICE OF THE PRODUCT.

To obtain repair or replacement under the terms of this warranty, visit IDTECK's Website (http://www.idteck.com) and place an online RMA request. After an RMA code is issued, return the product along with the authorization RMA code.

**>> Warranty Period**

| | Product Category | Warranty Period |
|---|---|---|
| 1 | RF CARDS (ACTIVE TYPE) | 1 year |
| | FINGERPRINT MODULE / SENSOR | |
| 2 | RF READERS (WITHOUT EPOXY POTTING) | 2 years |
| 3 | STANDALONE CONTROLLERS | |
| 4 | CONTROL PANELS | |
| 5 | FINGERPRINT READERS | |
| 6 | RF READERS (WITH EPOXY POTTING) | Lifetime |
| 7 | RF CARDS (PASSIVE TYPE) | |

## 13. Frequently Asked Question

**Q: Why the RF245 Reader can not read some tags ?**
**A: The RF245 Reader has a Site Code programmed when it powered up and the Reader only reads the tag has same Site Code. It is to prevent reading the tags from other site. To change the Site Code of the Reader, power off for 5 seconds and power on again then read a tag. The Reader will re-program the Site Code from the first reading tag.**

**Q: The tag is attached on the windshield of the car, Why the tag in some car have short read range ?**
**A: The windshield of some car is metallic coated for Electro Static Discharge (ESD) and the microwave (RF) from the tag is reflected on this conductive layer therefore the read range of the tag is reduced. In this case, you may use IDA245H2 card which has higher TX power than IDA245 card.**

**Q: Why the tag does not read through the human body ?**
**A: IDA245 tag is using 2.45GHz microwave frequency, very high directivity and only communicates at the line of sight distance. The microwave frequency can not pass through the human body.**

**Q: Is the Reader weatherproof ? Can we install the Reader outdoor ?**
**A: The RF245 Reader is designed for outdoor use and all electronics are epoxy potted. The Reader is weatherproof.**

**Q: We want to get a ID output when the car is detected on the loop coil sensor. How can we use Hold Input and OTR Input ?**
**A: The RF245 Reader has Hold Input and OTR Input. If you want to detect a tag only when the car is detected on the loop coil sensor, Connect NC contact of loop coil to Blue wire (HOLD INPUT) and COM contact of loop coil to GND so that the Reader only reads a tag when the car is located on the loop coil sensor. If OTR Input also puts to GND (OTR enabled), then the Reader generates only single ID data output while the car is located on the loop coil sensor, open circuit of the Hold control input.**

**The contents of this manual are subject to change without notice at any time.**

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