UHF RFID Reader

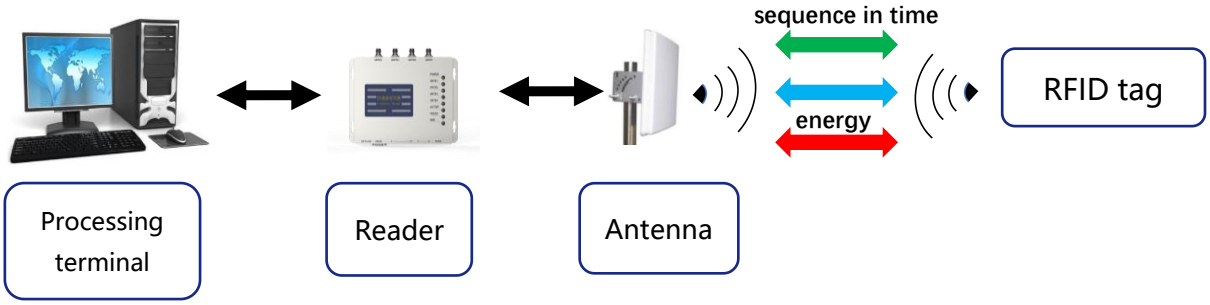
User

Manual

Version: 1.0

1. Introduction and Usage Precautions

This manual guides customers to quickly connect to and operate our UHF series products, enabling seamless integration with the provided demo software for testing. **Read this manual thoroughly before using the PC for tag reading operations.**



1.1 UHF RFID Basic Working Principle

UHF tags store electronic data in a predefined format. In practical applications, the tag is attached to the target object's surface. The reader identifies the stored data without physical contact, achieving automatic object recognition via radio frequency (RF) communication.

1.2 Usage Guidelines and Precautions

1. **Avoid RF Interference:** Do not place metal, liquids, human bodies, graphite, or other RF-blocking materials between the reader antenna and the tag. These materials may attenuate or block the RF signal, reducing the reader's working range or causing tag detection failure.
2. **Environmental Factors Affecting Tag Performance:**

   The following conditions may reduce the tag's reading distance or prevent

detection:

- The tag is placed near the human skin.
- Non-metallic tags are in direct contact with metallic surfaces.
- Tags are used in liquid environments or high-humidity areas.
- A thick wall or high-density object obstructs the line of sight between the reader and tag.

3. **Tag Selection:** Choose tags based on the target object's characteristics.

   For example:

   - Metal surfaces require metal-resistant tags.
   - Liquid-containing objects require liquid-resistant tags.
     Tag type and size directly impact the reading range. Select appropriate tags and antennas (with varying gains) according to the specific application scenario.

4. **Cable Placement:** Keep cables away from the antenna to prevent RF interference.
5. **EMI Protection:** Install the reader as far as possible from motors, power modules, and other devices that generate electromagnetic interference (EMI).
6. **EMI Shielding:** Implement appropriate shielding measures for devices prone to emitting EMI, as it may reduce the reader's sensitivity or cause read failures.
7. **Reader-Tag Alignment:** Position the tag facing the reader's antenna, center it, and keep both as horizontal as possible. Horizontal alignment provides optimal signal strength; other orientations may reduce performance.
8. **Tag Handling:** Tags contain a chip and an induction antenna. Avoid

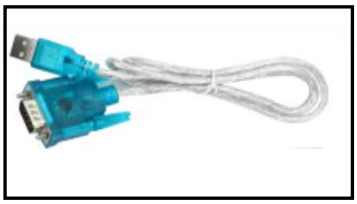
impacts or compression to ensure a long service life.

2. Reader Interface Overview

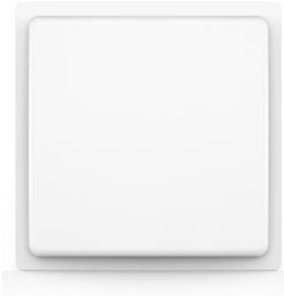
The reader supports standard interfaces: power, serial port, and network port. The following example uses the **9380** reader's interfaces.

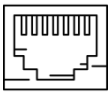
Connect the power supply to the device's DC12V power port. After powering on, the device's indicator light will illuminate, and the buzzer will beep twice, indicating that the device is functioning normally.

The device's network port interface can be accessed by connecting a network cable to the interface when network communication is



The device has an RS232 interface. To enable serial communication, simply connect the serial cable to the device's serial port interface.



Interface Diagram	Interface Name	Description
	RS-232 Interface	Serial communication
	TCP/IP Interface	Network communication

	Power Interface	DC12V power input (supports 9-36VDC)

Power	GND	485+	485-	Wiegand D0	Wiegand D1	Trigger T+	Trigger T-	RXD	TXD	GND
Red	Black	Brown	Orange	Yellow	Gray	Rose red	Black	Purple	White	Black
Relay 1(COM)	Relay 1 N0(open)	Relay 2(COM)	Relay 2 N0(open)							
Green	Green	Blue	Blue							

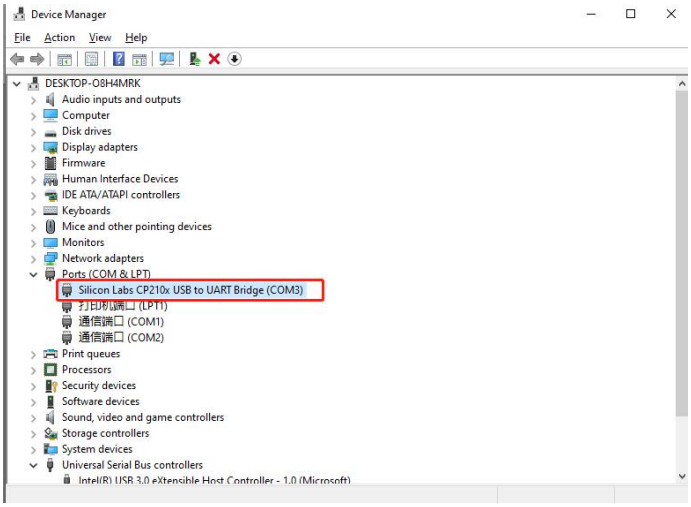
3. Serial Port Connection Test

Before establishing a serial connection, confirm the device's serial port number and parameters.

Steps:

1. On Windows, go to **Control Panel > Device Manager > Ports (COM and LPT)** to check the serial port number. If the port is missing, verify the serial driver installation and physical connection.
2. The device's default serial parameters:

- **Baud Rate:** 115200
- **Data Bits:** 8
- **Stop Bits:** 1



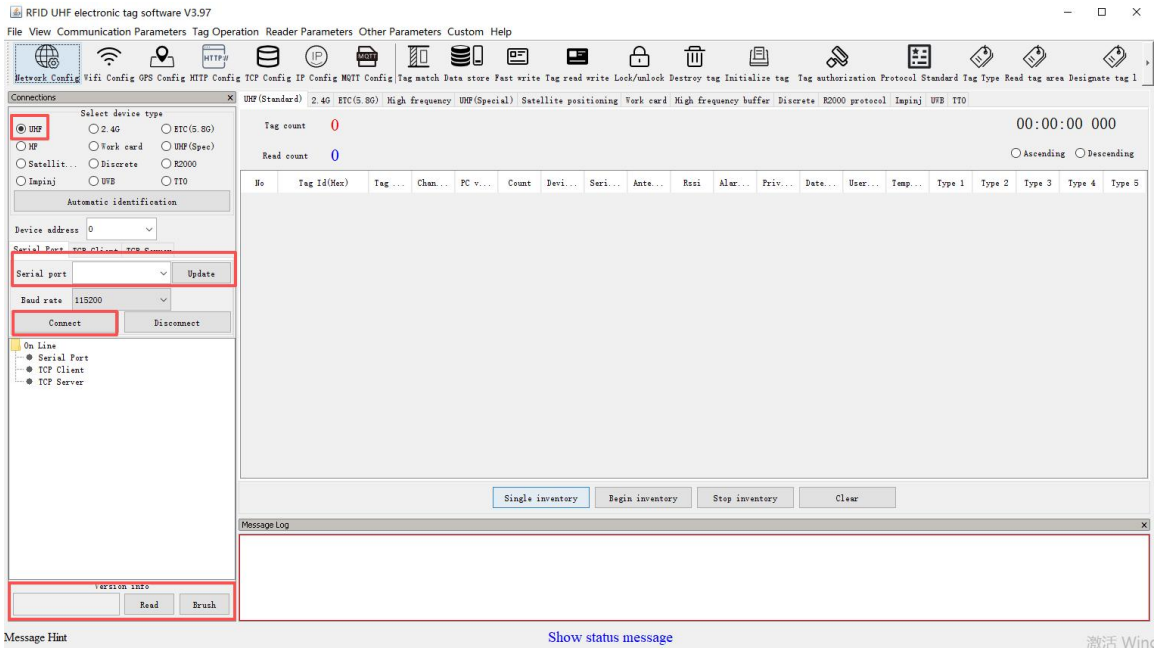
3. Open the **Demo Test Application**:

SDK and demo download link:

https://drive.google.com/file/d/1NEPp_RDq7ma3P3dhsalmdsPZZmmnU47J/view?usp=drive_link

- Select **UHF** from the device list.
- Navigate to the **Serial Port** tab.
- Click **Update** and select the detected COM port.
- Choose the default baud rate (115200) and click **Connect**.

4. After a successful connection, click the **Version Information** button in the lower-left corner. If the version details appear, the connection is established.

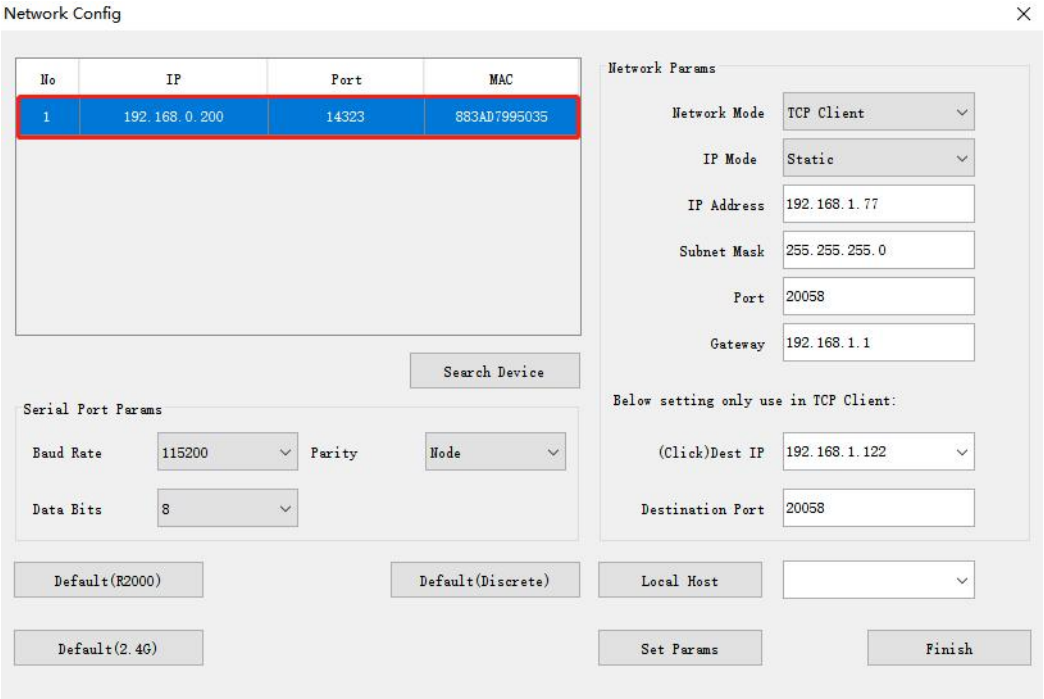


4. Network Port Connection Procedure

When connecting the device to a computer (host) via RJ45 (network communication), choose either **TCP Client** or **TCP Server** in the device selection menu.

Default Factory Settings:

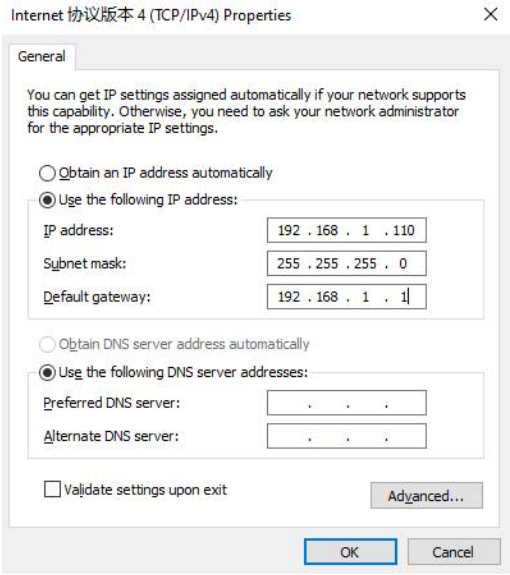
- **Reader IP Address:** 192.168.1.200
- **Port:** 20058
- **Network Mode:** TCP Client
- **Default Destination IP:** 192.168.1.100 (Port: 20058)



Steps:

1. Connect the power supply and network cable to the device. Plug the other end of the network cable into the computer's network port.
2. Change the computer's IP address to **192.168.1.100** and disable the computer's firewall.
3. In the demo application:
   - Click **Network Parameters** (or go to **Communication Parameter Settings > Network Parameters**).
   - Click **Search Devices** to automatically detect all devices on the local area network.
4. In the device list, select **UHF**, navigate to the **TCP Server** tab.
5. Click **Update**, select **Local IP: 192.168.1.100**, **Port: 20058**, and click **Start Listening**.
6. After a successful connection, click **Version Information** to verify. If the version details appear, the connection is established.

Note: When the reader's network mode is set to TCP Server, select **TCP Client** in the demo to connect. Tag data will display in the demo interface when a tag is within the reader's antenna range.



5. Basic Operations

5.1 Read Tag EPC Data

The software's main interface includes four key buttons: **Single Read**, **Continuous Read**, **Stop**, and **Clear**.

Operation Flow:

- Select the reader in the connection status bar.
- Click **Continuous Read** to start continuous tag reading. The demo sends periodic read commands. Successful reads display the tag's EPC and other details in the **Card Reading Demo** area. Click **Stop** to terminate the operation.

Interface Elements and Descriptions:

Element	Description
Single Read	Sends a one-time read command. Displays the tag's ID

	in the **Card Reading Demo** area if successful.
Continuous Read	Sends periodic read commands. Displays EPC data in the **Card Reading Demo** area.
Stop	Stops continuous reading. *Note:* Stop continuous reading before performing other functions.
Clear	Clears displayed data when the demo is not in reading mode.
EPC	Displays the tag's EPC data read by the device.
Number of Tags	Shows the total number of unique tags read (displayed in real time).
Number of Reads	Shows the total read attempts (displayed in real time).
Sorting	Sorts tag data (ascending or descending).
Sequence Number	Displays the sequence number of tags read by the software.
Tag Encoding (Hex)	Displays tag data (EPC, TID, User, and Reserved areas). Default: EPC code.
Tag Area	Specifies the tag area to read. Requires **Private Protocol** in **Output Format**.
PC Value	Displays the tag's PC value.
Count	Displays the total read count for a single tag.
Device Number	Displays the device ID for the current tag (requires checking in **Output Format**).

Serial Port/IP	Shows the data output address of the device that identified the tag.
Antenna id	For multi-channel readers; shows the active antenna channel (requires checking in **Card Reading Data Output Format**).
RSSI	Displays RSSI signal strength (requires checking in **Output Format**).
Alarm Status	Shows battery status alarms (special function for 2.4G active tags).
Private Data	Displays private tag data (used for positioning; special function for 2.4G active tags).
Date and Time	Shows the local time when the tag data was received.
User-defined Data	Displays user-defined data written to the tag (special function).

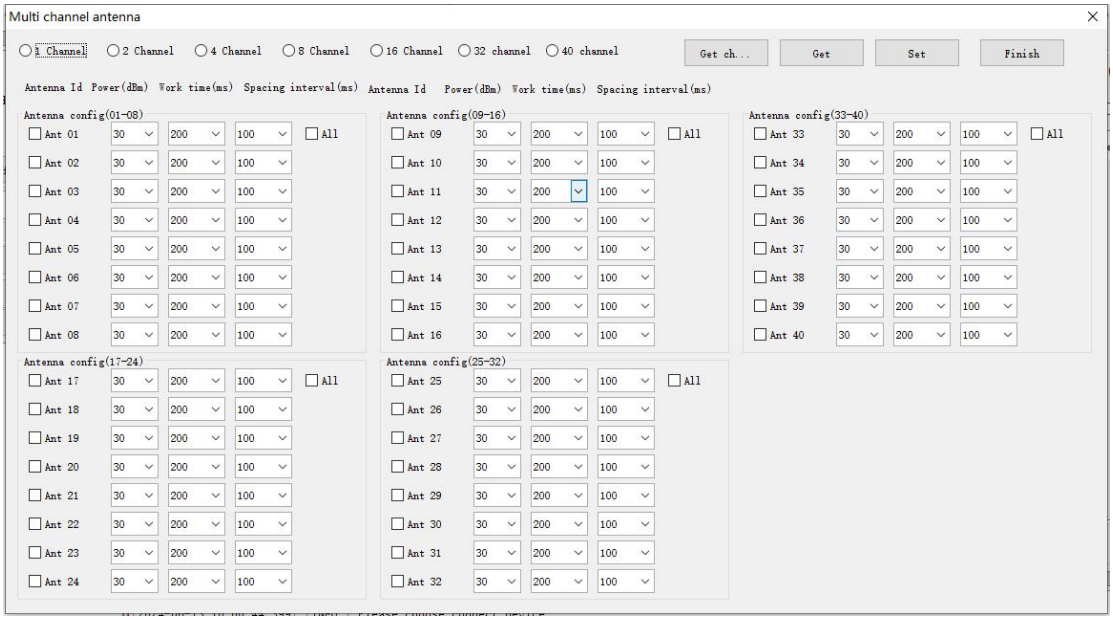
5.2 Working Modes

Access the working mode interface via **Reader Parameter Settings** in the menu bar or the **Working Mode** button in the shortcut bar.
The reader supports three operating modes (default: **Master-Slave Mode**):

Mode	Description
Master-Slave	The reader operates under a host computer/controller via RS232, RS485, or Ethernet. Supports all functions in the secondary development kit.
Timed Mode	The reader reads tags automatically after power-up. Set parameters, click **Set**, and confirm success via a prompt. Verify by switching to another mode and reading the settings.
Trigger Mode	Requires an external infrared, photoelectric switch, or similar ON/OFF switch. When a low-level signal is input to the trigger port, the reader starts reading periodically and stops after a set delay. Enter the delay time (1-255 seconds), click **Set**, and confirm success. *Note:* Restart the device after setting for changes to take effect.
Adjacent Discrimination	Sets a time window (1-255 seconds). Within this window, the same tag is uploaded only once, regardless of read frequency. *Note:* Restart the device after setting for changes to take effect.

5.3 Antenna Settings

- Access the **Antenna Configuration** interface to set the antenna's operating parameters and power (range:(TM200:13–33 dBm)(Impinj E710:1-33dBm); default: 30 dBm).
- **Important:** Stop tag reading before adjusting antenna parameters.



6. Troubleshooting Guide

Serial No.	Issue Description	Solutions
a	The device does not respond after power-up (no LED flashes or beeps).	1. Check if the power adapter is properly connected and powered. Replace if damaged. 2. If the adapter is intact, verify the power connection and connector. Contact technical support if issues persist.
b	Serial port connection fails to read data.	1. Verify the serial cable's integrity and driver installation. 2. Try connecting the cable to a different USB port. 3. Check if the antenna interface is connected and the tag is within the antenna's coverage.
c	Network connection fails to read data.	1. Verify the server IP and port settings via the network search interface in the demo. 2. Check the firewall settings; disable the firewall if it is in protected mode (may block device-

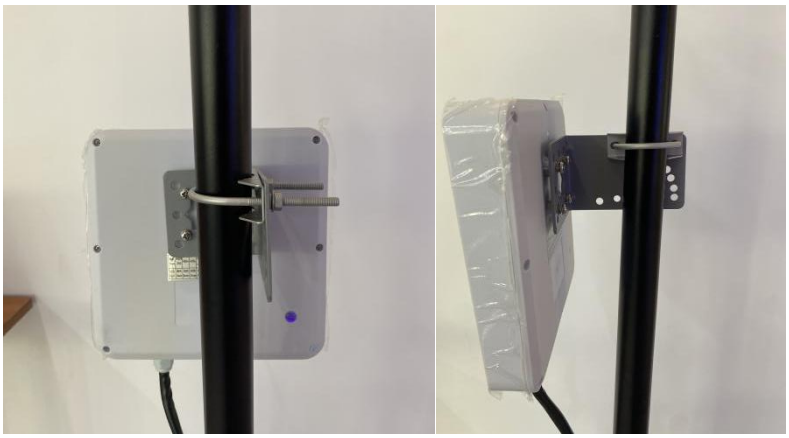
		server communication).

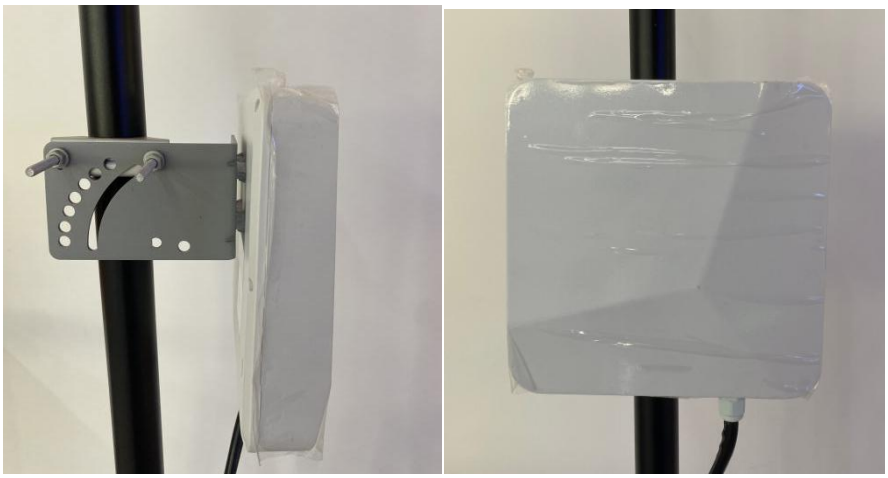
7. Installation Instructions

The reader comes with a mounting bracket. Install the device after determining the location. Different readers may include different brackets; below are instructions for two common types.

7.1 L-Shaped Bracket

1. Remove the mounting screws from the reader's back. Insert the L-shaped bracket into the reader's mounting holes.
2. Secure the bracket to a support pole (inner diameter: ⌀ 25–50 mm) using **M6 U-bolts, nuts, spring washers, and flat washers**.
3. Adjust the antenna angle using the holes on the L-plate.

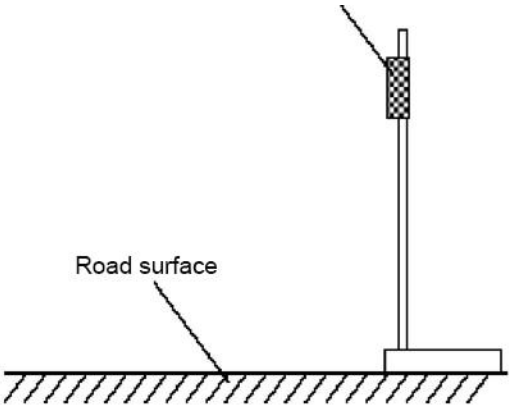


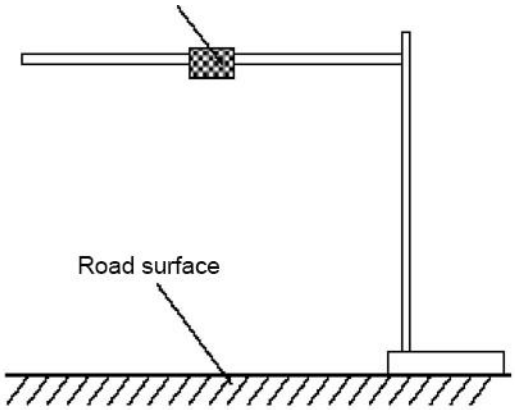


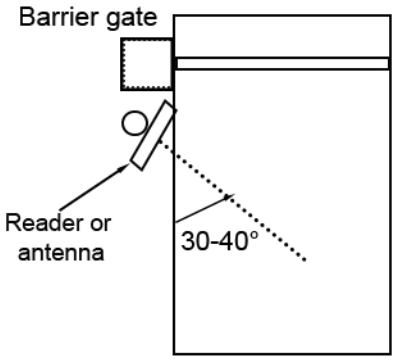
7.2 Square Bracket

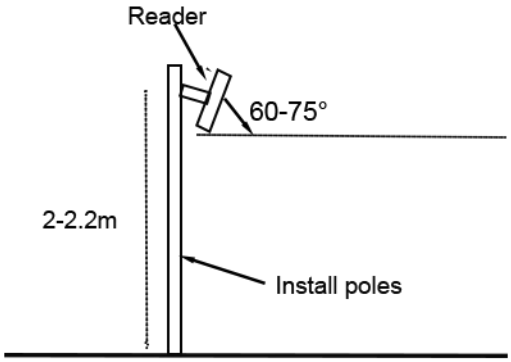
1. Unpack the reader and mounting bracket. Fix the bracket to the pole.
2. Ensure the reader’s transmitting surface is flush with the tag.
3. Secure the bracket to the pole using clips and tighten the screws.





Road surface


Road surface


Barrier gate
Reader or
antenna
30-40°


Reader
60-75°
2-2.2m
Install poles