

**RF loss prevention antenna**

**CA35L**

**USER MANUAL**

## Notes

|                                                                                                                                                  |                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | Attention: There is a risk of electric shock - do not open it                                                                                                    |
| Attention: To prevent the risk of electric shock, please do not open the front or back cover There are no user available accessories internally. |                                                                                                                                                                  |
|                                                                 | There is a lightning bolt with an arrow inside the closed triangle, reminding you that uninsulated voltage points may cause serious electric shock.              |
|                                                                | The exclamation mark on the triangle reminds you that there are important operation and maintenance instructions in the documentation provided in this product.  |
|                                                               | The RF dual system(T/R) will cause continuous interference to this system, and it should be kept at least 10 meters away from such equipment during on-site use. |
| WARNING! To avoid the risk of fire or electric shock, do not expose the product to water or high humidity environments for operation.            |                                                                                                                                                                  |

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# 1. Overviews

Century CA35L RF system uses the intelligent CAB09F5 main board, which is a new generation of Century RF mono family, it adopts the principle of radar and is a spontaneously self collecting RF system. When there is a label within the detection range, the system will give an alarm prompt and output alarm information. CA35L has wider and more accurate detection, and the false alarm rate is low. When multiple devices are installed, there is no need for synchronization.

## 1.1 Highlights

- ✧ Supports Android/IOS app debugging
- ✧ Supports remote debugging on cloud platform(Ongiong)
- ✧ Compatible with metal detection
- ✧ With slaver board, realizing single side detection

## 1.2 Specifications

Input voltage: 100~240VAC @50/60Hz

Power adapter: 24VDC

Power consumption: <30W

Work frequency: 7.9MHz~8.5MHz

Temperature: -5°C~55°C

Humidity: 0~85%

## 2. Installation

### 2.1 Input power requirement

- ✧ Use independent power supply

All anti-theft devices using 220VAC must have the same circuit of electricity from the distribution box, and meet the safety grounding requirements

- ✧ Power adapter

The power adapter along with main board is the standard one, and **one adapter can only support one board.**

- ✧ Power wires

The mains power cord is never allowed to be tied to the output DC line, nor is it allowed to wrap the output DC line around the adapter body.

### 2.2 Installation position

- ✧ Ensure that the antenna is installed in a well ventilated area.
- ✧ Ensure a clean and dry environment.
- ✧ Pay attention to the installation height of the antenna to prevent water from entering the antenna base.
- ✧ Ensure that there are no large metal objects around the antenna, such as metal door frames, cabinets, shopping carts, etc.
- ✧ Ensure that there are no labels stored around the antenna.
- ✧ Confirm that the power supply of the equipment is independent (not shared with other electromechanical equipment).
- ✧ Confirm that the power supply voltage of the host is normal.
- ✧ The anti-theft label must be kept 3 meters away from the antenna system.
- ✧ Check if there are metal frames, coiled cables, etc. around the anti-theft device.

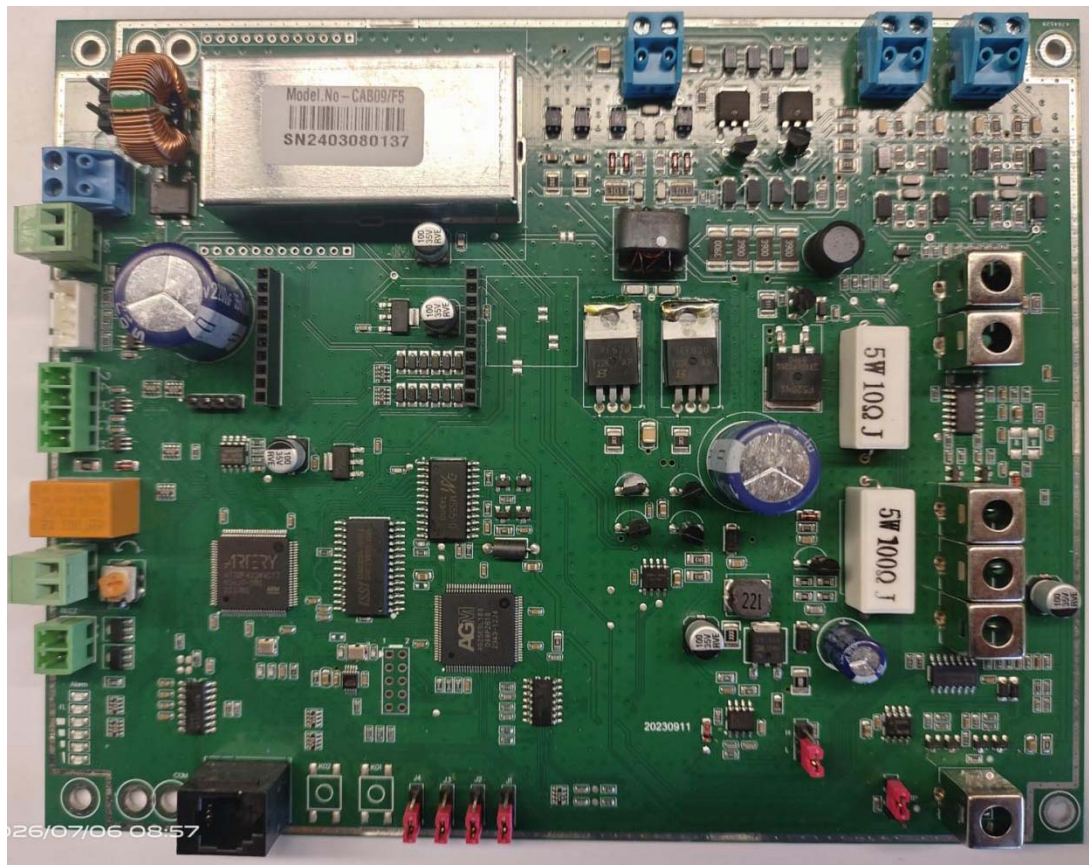
### 2.3 Installation steps

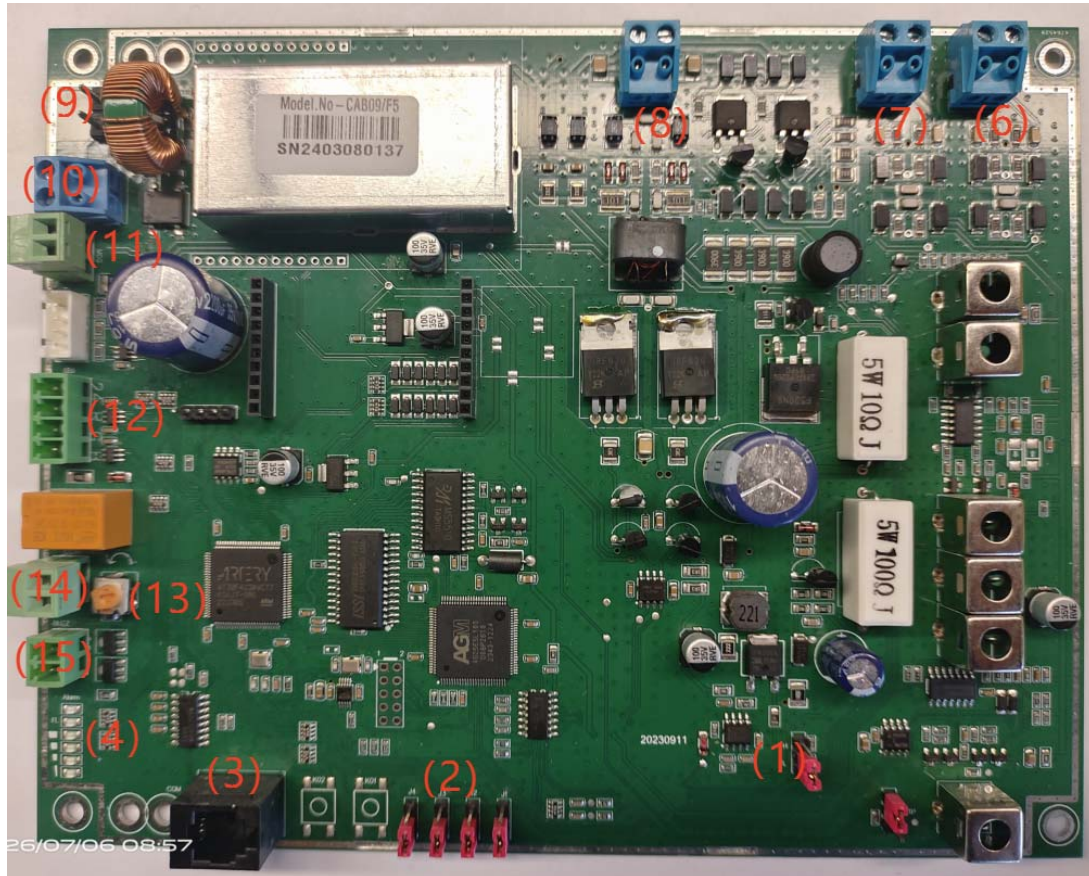
1. Prepare construction and debugging tools
2. Check the power reserve and installation position, and try to keep the device adapter and cables as far away from other high-power devices as possible.

3. Check if there are other equipment around the site, such as spotlights, LED screens, elevators, and other high-power equipment, and try to avoid installing such equipment as much as possible
4. Before fixing the antenna, connect the antenna power supply, conduct a test first, and then fix it after meeting the installation requirements
5. After installation is completed, test again to confirm if the equipment can meet customer needs.

## 3. Hardware

### 3.1 Main board introduction





① Emission energy regulation: **H is high, L is medium, and air is low.** The higher the emission energy, the farther the detection distance

② Anti-noise tuning:

--All OFF:Default. No background noise cancellation by hardware.

--J4 ON: Background noise cancellation is enabled by hardware--J4+J1 ON: Highest level of anti-noise capability when noise is very strong.

--J4+J2 ON: Second level of anti-noise capability when noise is moderate.

--J4+J3 ON: Lowest level of anti-noise capability when noise is not too much.

Once J4 is ON, only one of J2, J3 or J4 can be set to ON at the same time.

If any of J1-J4 is ON, software configuration will be INVALID

③ COM: local software tuning port

④Noise light: when one LED is on, it indicates that the environment is good, and the more noise LEDs are on, the higher the environmental noise, the worse the performance

⑥ RX LOOP2

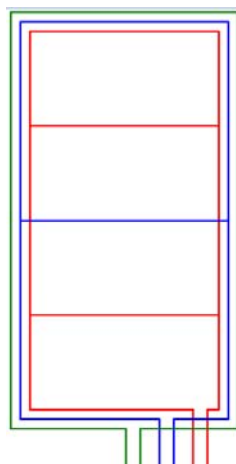
⑦ RX LOOP1

⑧ TX LOOP

- ⑨ IN: Power in, input voltage should be 24V
- ⑩ OUT: Power out, output voltage should be 24V
- ⑪ External port: output voltage is 5VDC
- ⑫ LED: Connect to the LED wire
- ⑬ GAIN: The gain adjustment knob decreases clockwise and increases counterclockwise. When the knob is adjusted counterclockwise, the received signal gain increases, the detection distance increases, but the anti-interference ability decreases
- ⑭ CCTV: Alarm output port, which can be connected to visitor flow or monitoring, etc
- ⑮ BUZZ: buzzer port,
  - + : buzzer "+"
  - : buzzer "-"

## 3.2 Wire going in frame

Place the main board in the antenna frame, connect the antenna coils to the main board in sequence, wire the buzzer and alarm light according to the positive and negative levels indicated by the main board, check the wire connections are all correct, and then power on.



the green coil 0 is the O-shaped coil in the antenna frame, serving as the transmitting coil;

The blue coil 8 is an 8-shaped coil in the antenna frame, serving as the receiving coil 1;

The red coil 88 is an  -shaped coil in the antenna frame, serving as the receiving coil 2

3.3 Main board status

LED displays static noise in the current environment

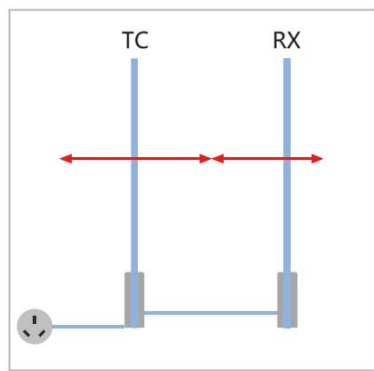
| LED in the main board                                                             |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |  |
| Low noise                                                                         | Normal noise                                                                      | Interference                                                                      | Strong interference                                                               |

■——LED light; □——LED off

3.4 Slaver board

There are 2 RX loops on main board, we can use a 2-core wire to connect loop 1 or loop 2 to the slaver board on corresponding port. 1 main board can connects 2 slaver boards at most. The antenna which equipped with slaver board can only detect the inner side of the aisle, and outside can only detect 10-20cm. The slaver board can be used for end antenna which suffers strong interference from the wall.

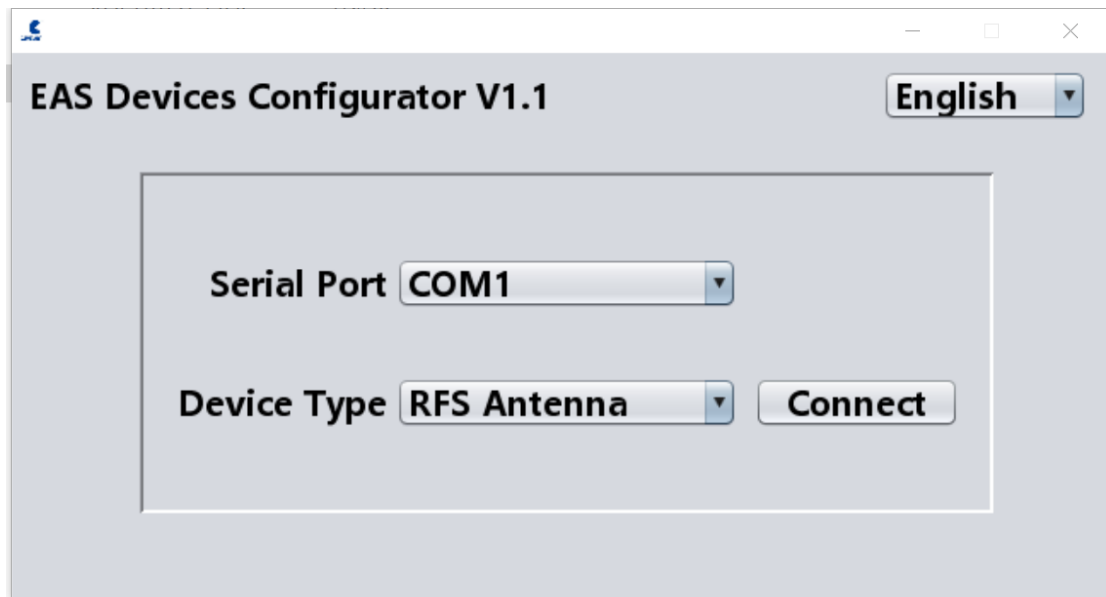




TC\_RX mode



## 4. Software tuning

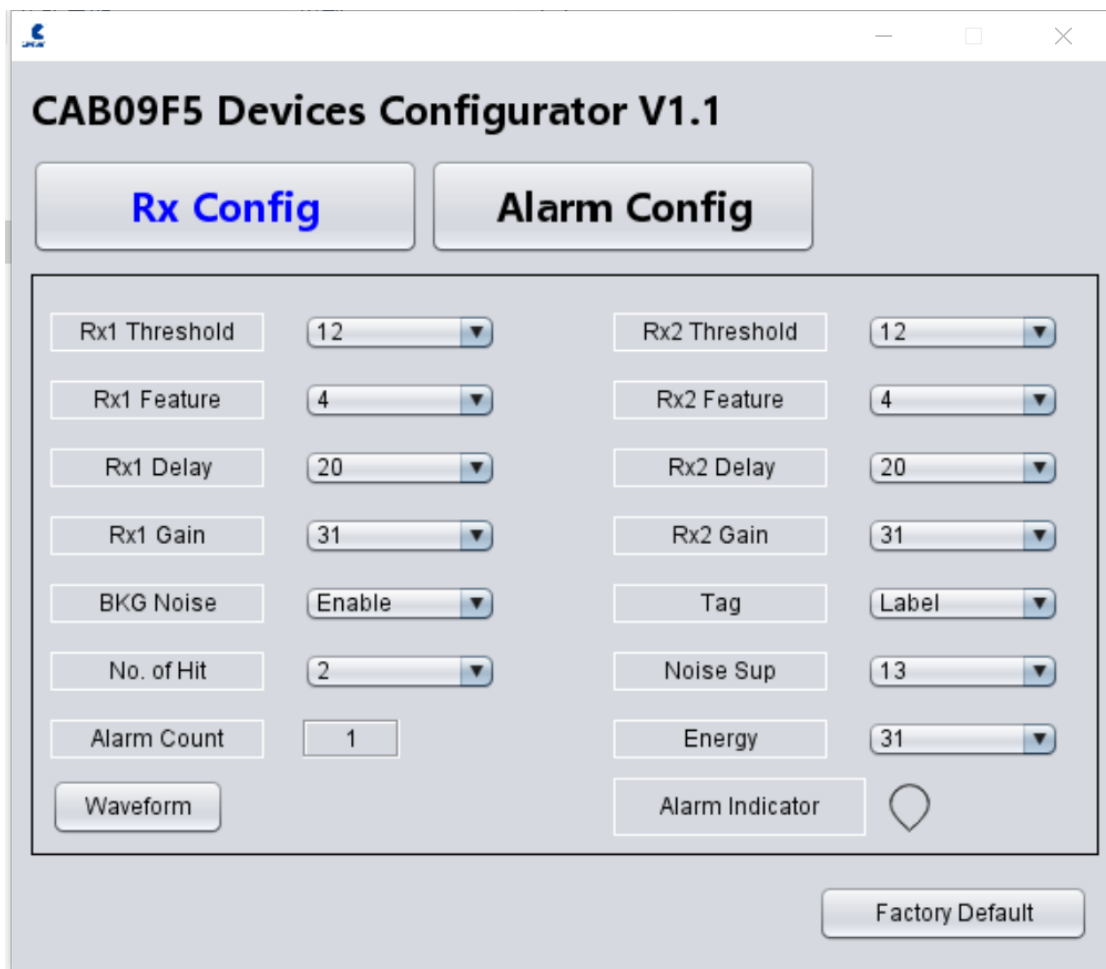


The screenshot shows the 'EAS Devices Configurator V1.1' window. It has a title bar with a logo and standard window controls. The main area contains two dropdown menus: 'Serial Port' set to 'COM1' and 'Device Type' set to 'RFS Antenna'. A 'Connect' button is located to the right of the 'Device Type' dropdown. In the top right corner, there is a language dropdown menu currently set to 'English'.

**EAS Devices Configurator V1.1** English

Serial Port **COM1**

Device Type **RFS Antenna** **Connect**



The screenshot shows the 'CAB09F5 Devices Configurator V1.1' window. It features two tabs: 'Rx Config' (selected) and 'Alarm Config'. The 'Rx Config' tab displays a grid of settings for two receivers. Each receiver has settings for Threshold, Feature, Delay, Gain, BKG Noise, No. of Hit, and Alarm Count. The 'Alarm Config' tab is currently empty. A 'Factory Default' button is located at the bottom right.

**CAB09F5 Devices Configurator V1.1**

**Rx Config** **Alarm Config**

| Rx1               | Rx2                     |
|-------------------|-------------------------|
| Rx1 Threshold: 12 | Rx2 Threshold: 12       |
| Rx1 Feature: 4    | Rx2 Feature: 4          |
| Rx1 Delay: 20     | Rx2 Delay: 20           |
| Rx1 Gain: 31      | Rx2 Gain: 31            |
| BKG Noise: Enable | Tag: Label              |
| No. of Hit: 2     | Noise Sup: 13           |
| Alarm Count: 1    | Energy: 31              |
| Waveform          | Alarm Indicator: [Icon] |

**Factory Default**

## 4.1 APP tuning

- (1) Rx Threshold: Default 12, scope 1--15. There are two different parameters for Rx1 and Rx2. They should be set independently. The higher, the detection range will be shorter. And the anti-noise performance will be better. On the contrary, the lower the value is, the detection range will be longer. And the anti-noise performance will be lower.
- (2) Rx Feature: Default 4. Scope 1--15. There are two different parameters for Rx1 and Rx2. They should be set independently. The higher, the detection range will be shorter. And the anti-noise performance will be better. On the contrary, the lower the value is, the detection range will be longer. And the anti-noise performance will be lower.
- (3) Rx Delay: There are two different parameters for Rx1 and Rx2. They should be set independently. The higher, the detection range will be shorter. And the anti-noise performance will be better. On the contrary, the lower the value is, the detection range will be longer. And the anti-noise performance will be lower.
- (4) BKG Noise: Background noise. Default "Disable". Parameters: "Disable" and "Enable". When a stable passive tag-similar noise is within the detection range of the device, this tag-similar noise will trigger continuous false alarm of the device. In this case, set the parameter as "Enable", the device will study the characteristics of the noise automatically and eliminate the false alarm very soon. But the false alarm elimination will not interfere the normal detection of a new tag which enters the detection range of the device. Meaning that the device will detection EAS tags as usual with or without the mentioned stable tag-similar noise.
- (5) No. of Hit: Default 12. Scope: 1--15. The more, the less false alarm. And at the same time, the reaction of the detection will be slower. On the contrary, the less, the more false alarm. And at the same time, the reaction of the detection will be faster.
- (6) Tag: Selection of type of tags. When "Label" is selected, label will not be deactivated when it is close to the antennas. And the detection range will be a little bit shorter than when "Hard Tag" is selected. When "Hard Tag" is

selected, label will be deactivated when it is close to the antennas. And the detection range will be a little bit longer than when "Label" is selected. The difference on the detection range when selecting "Label" or "Hard Tag" is actually minor, which is even difficult to feel.

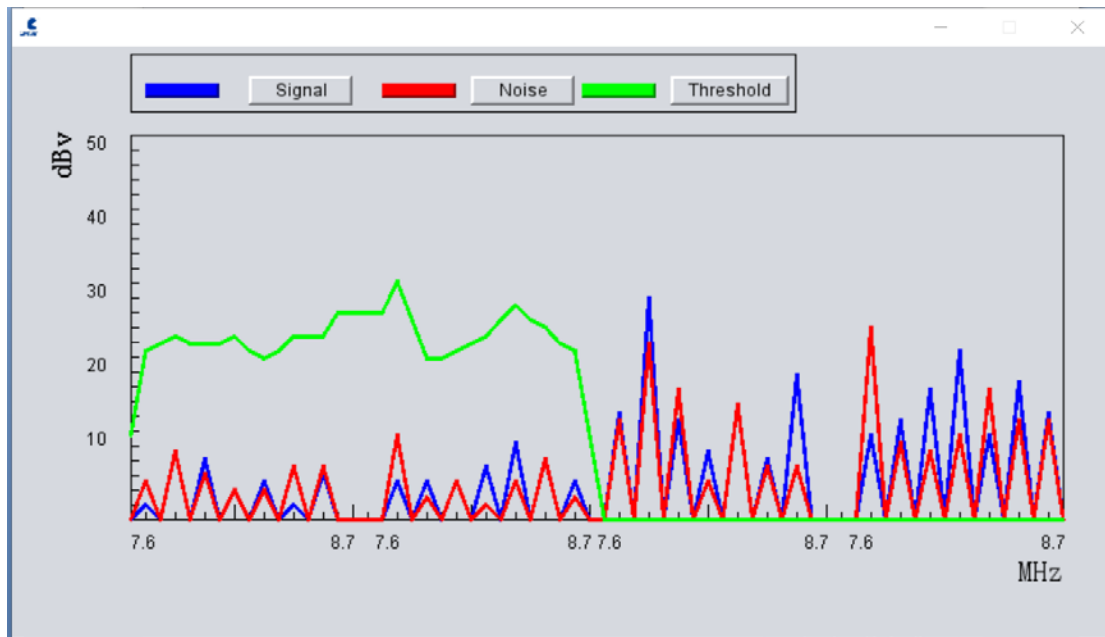
- (7) Noise Sup: Noise Suppression. Default 13, scope 1--15. The higher, the less false alarm. And the detection range will be shorter. The lower, the higher possibility of false alarm. But the detection range will be longer. When environmental noise level varies a lot, this Noise Sup shall be set higher in order to increase the stability of the device.
- (8) Alarm Count: Count of alarms of the device which really happened.
- (9) Alarm Indicator: When alarm happens, the sign will flash. This is very useful in two occasions.
- (10) Avoid disturbing peoples (staff & customers) inside a store when tuning the devices during working time of the store.
- (11) Confirm which device has been selected to be tuned when doing network-configuration (tuning devices in a network) or remote service.
- (12) Waveform Analysis: Click "Waveform", a popup window will be displayed to show levels of Signal, Noise and Threshold.
- (13) Data Update: When you finish configuration of one antenna and connect your laptop to another antenna to configure, you can click "Data Update" to upload all the parameters you set on the previous antenna to the new antenna.
- (14) Factory Default: Click and all parameters will return to default parameters.

### 4.1.1 Alarm Configuration

The screenshot shows a software window titled "CAB09F5 Devices Configurator V1.1". It has two tabs: "Rx Config" and "Alarm Config", with "Alarm Config" being the active tab. The configuration area contains four sections: "BKG/L Color" with seven radio buttons and color swatches (Red, Green, Blue, Yellow, Cyan, Magenta, Black), where the Black option is selected; "ALM/L Color" with seven radio buttons and color swatches (Red, Green, Blue, Yellow, Cyan, Magenta, White), where the Red option is selected; "Buzzer Freq" with three radio buttons and labels (Fast, Medium, Slow), where the Medium option is selected; and "Buzzer Dura" with three radio buttons and labels (Short, Medium, Long), where the Short option is selected. There is an "Alarm Test" button in the bottom right of the configuration area and a "Factory Default" button at the very bottom of the window.

- (1) BKG/L Color: No Background Light option for essential Mono RF antenna.
- (2) ALM/L Color: Only one Alarm Light Color. No more option.
- (3) Buzzer Freq: Buzzer Frequency. Default "Medium". Scope: Fast, Medium, Slow.
- (4) Buzzer Dura: Buzzer Duration. Default "Short". Scope: Short, Medium, Long.

### 4.1.2 Waveform Analysis



Waveform Analysis on System Configuration interface helps technician on installation site to judge the environmental situation. Click Waveform to open. When the Waveform is opened, transmission will stop. The antenna will only receive environmental noise and display the noise in the window.

Attention: When Waveform is opened, the antennas will enter into "Check" status and transmission will stop. At this moment, the antennas will not be able to detect tags. Press close the Waveform window to start the normal detection of the antennas.

The horizontal axis of the coordinate system represents the receiving bandwidth (7.9--8.5MHz). From left to right, the four segments represent different parameters - Rx1 Threshold, Rx1 Feature, Rx2 Threshold, Rx2 Feature.

### 4.1.3 Share of Experience

#### **Rx Parameters**

When adjusting threshold and feature values, better to open the Waveform. Based on the Waveform displays, preset threshold and feature values to be higher than the actual noise level. Then the false alarm possibility of the device will be very low. Cooperating with settings of “Noise Suppression” and “No. of Hit”, the noise immunity will be increased a lot.

If there was big metal frame, big metal object, cable in roll and other objects, which might create passive tag-similar signal, closing to the device antennas and the LC circuit formed by the objects could not be destroyed (cut or short-circuited), Rx Delay shall be adjusted to longer to increase stability and reduce false alarm risk.

#### **Background Noise**

If there was stable passive tag-similar noise, which source could not be found or was found but could not be eliminated, select “Enable” in BKG Noise. Then the device would start to “learn” the characteristics of the noise and remember it. After learning 30-50s, the false alarm will stop automatically. When there is a new tag entering the detection range, the device will be triggered as usual as without the tag-similar noise.

## 4.2 Software tuning

Local software is hardly used, as it needs a special tuning cable. Like below



Connect the RJ 11 port on RF main board and run the local software, the parameters and tuning method is same as APP tuning.

## 5 Q&A

Any technical questions, please contact with Century technical team, the team leader is Charles, [chenbin@century-cn.com](mailto:chenbin@century-cn.com)

### **FCC Warning Statement**

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.

### **FCC Radiation Exposure Statement**

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located for operating in conjunction with any other antenna or transmitter.

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.