Electronic Detonator

Initiation System

Instruction Manual

2025-07

Directory

Chapter 1 Introduction

1.1 Product Overview

The general-purpose initiator is an information tool that takes industrial explosion-proof materials as the main body to realize the initiation control of electronic detonators. On the basis of realizing the function of traditional electronic detonator initiator, it has a great competitive advantage in information processing, safety control and product generality due to its IoT and intelligent attributes and detachable general attributes of the detonating board card.

1.2 Detonator Appearance

The general-purpose initiator breaks the traditional design of the initiator and gradually evolves into an integrated equipment according to market demand, that is, it retains the characteristics of the traditional initiator, such as shock resistance and wear-resistance, simplicity and practicality. At the same time, it meets the regulatory needs and the versatility of the product.

Figure 1.1 Schematic diagram of the appearance and buttons of the initiator

The design of the universal initiator is to take into account the extremely harsh conditions on the construction site, and it is impossible to reach out and use the touch screen operation, and the original physical button design is retained, and the initiation operation can be completed by pressing the button.

1.3 Button operation

In addition to being operated by touch screen, the universal initiator also supports the exclusive detonation keyboard under the fuselage and can

be operated by pressing buttons. In the case of some bad links, the operator can flexibly use two different ways to operate according to the scene to achieve the same effect;

serial number	The name of the key	Key description
1	Return key	Exit virtual keyboard input; Exit from the current interface to the previous interface;
2	Menu key	
3	Confirm key	• Confirm the gray cursor selection box content or buttons Confirm the input content;
4	[Enter/+] key	Confirm the contents of the current input box and move to the next input box;
5	Edit key	Adjust the position of the cursor box on the page in the specified order;
6	Backspace/-] key	Delete the entered content;
7	[Left/Right Detonation Button].	Press at the same time on the initiation interface to send the initiation command;
8	Scan key	Start the scanning head to read the barcode information on the pages of [Authorized Download], [Detonator

		Registration], [Data Transmission], etc.;
9	[Safety Switch] button	Open the safety switch in the networking initiation interface to charge;
10	Numeric key	Enter numerical information;
11	F1 key	In the [Detonator Registration] interface, you can quickly add rows;
12	F2 key	In the [Detonator Registration] interface, you can quickly add holes;
13	[Power on/off] button	Long press to power off/long press to power on; Short press to enter standby/short press to wake up the machine;

1.4 Product Parameters and Specifications

The name of the device	Industrial electronic detonator universal detonator
The temperature at which the device is stored	-30℃～60℃
The operating temperature of the device	-20℃～55℃
It can carry a number of detonators	≤400
Maximum number of on-board detonators	12,000 rounds
Reliable communication distance	1000m (blasting network loop resistance is not more than 200и).

Detonator communication voltage	10V
Detonator charge voltage	18V (adjustable)
Detonator battery charge voltage	DC8.7V
Continuous working hours	≥8 hours
Networking detection time	90-100 seconds / 400 rounds
Detonator charging time	35-40 seconds/400 rounds
Ingress protection	IP65
Battery capacity	Removable lithium-ion polymer battery 3500mAh/8.7V
weight	523 grams

Chapter 2 Explosives

2.1 Initiation Equipment

The blasting operation adopts the M900 industrial electronic detonator

universal detonator, as shown in the figure below;

Figure 2.1 Universal initiator

2.2 Blasting busbar

The blasting net route is made of pure copper wire, and the specific

wire diameter can be determined according to the size of the detonator line

card, as shown in the following figure:

Figure 2.2 Blasting network cable

2.3 Insulating tape

The insulating tape can prevent the grounding of the blasting bus joint

from leakage or short circuit, and has an insulating effect, as shown in the

following figure:

Figure 2.4 Insulating tape

Chapter 3 Construction process

3.1 Construction process

3.1.1 Logger---Registration

Register the detonator into the Logger

3.1.2 Logger---Bluetooth & Blaster—Bluetooth

Click the BlueTooth button in the Logger and Blaster respectively, and follow the prompts to use the Blaster to scan the QR code displayed on the Logger screen to transfer the data of the detonator registered in the Logger to the Blaster.

3.1.3 Blaster—Detonation

After the detonator registration is completed, click Group Detonation, and in this process, the blasting network will be networked for detection, detonator timing, verification of the initiation password, high-voltage charging, and after the charging is completed, press the detonation double button to initiate the detonation.

Chapter4 Operational Guidelines

4.1 Logger

LOGGER

Power Switch
Battery Light
Front Camera
Logger
Wire V3.02
1.Projects
2.Tools
3.Registration
4.Net Check
F1 Abort
F2 Settings
F1 F2 Main Scan
Return Menu OK
Edit
1 2▲ 3
◄4 5 6▶
7 8▼ 9
+ 0 −
Left Scan
485/Type-C Port
Right Scan Safety Switch
Scaner
Rope Hook
Flash Light
NFC
Back Camera
Speaker
Battery Cover Switch
Rope Hole

4G │ GPS Position │ Bluetooth / WIFI │ CAN Bus Cascade

Operating Temperature: -25℃-85℃	
Maximum annotation capacity≤50000	
Operating System：Android	
Network Mode：SIM,2G/3G/4G	
Protection Grade：IP67	
Battery Capacity：3900mAH	

4.1.1 Introduction to the Logger homepage

Registration → 雷管注册
（用于注册雷管，设置延期时间）

Bluetooth → 蓝牙连接
（用于通过蓝牙向起爆器传输注册的雷管数据）
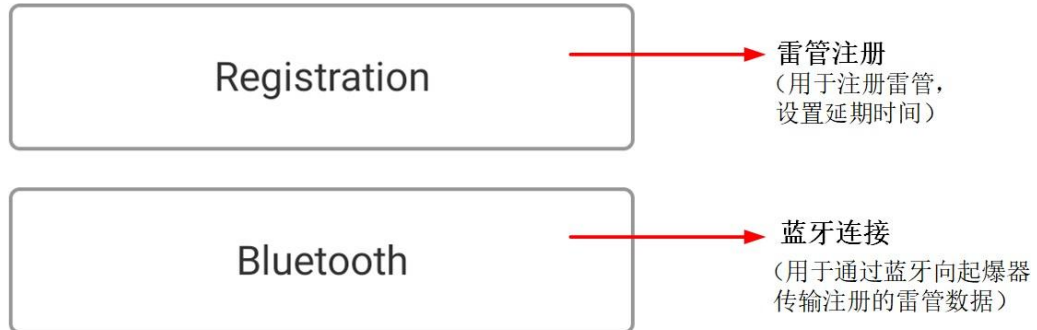
Version Name:1.0.0.20240520180324

Figure 4.1 Introduction to the Logger homepage

4.1.2 Registration

The registration list contains information such as "row, hole, bit, group", etc., which can be searched/troubled intuitively, orderly and quickly, and the specific schematic diagram is as follows:

Platoon: a virtual concept, that is, the physical meaning of the formation of a row or rows of shape after the generation of multiple blast holes, we call it "platoon"; The significance of the platoon is that many blast holes can be divided into several rows in an orderly manner during the construction process, and the blast holes can be quickly and accurately located when looking for the blast holes.

Hole: refers to the real existence of the excavated cannon hole, which we call "hole"; The significance of holes is to number each hole so that it is easy to find and understand.

Bits: refers to the number of preset detonators in each blast hole, which we call "bits"; When there are multiple detonators in the hole, these detonators can be numbered, so that the delay between the detonators in the hole can be set.

4.1.2.1 Preset delay scheme

After entering the [registration] page for the first time, the prompt box of "Set Delay for 1 Row" will automatically pop up, the user can set the delay scheme of the detonator detonation of this row in the input box, click

the input box to modify the delay with the pop-up keyboard, click

"Confirm" to save, and establish the registration list of the detonator of the

row. The detonator detonator registration list collected and registered in

this row will automatically generate the detonator detonation delay

according to the set delay scheme (each row can be set with a different

delay scheme to achieve different detonation effects.)
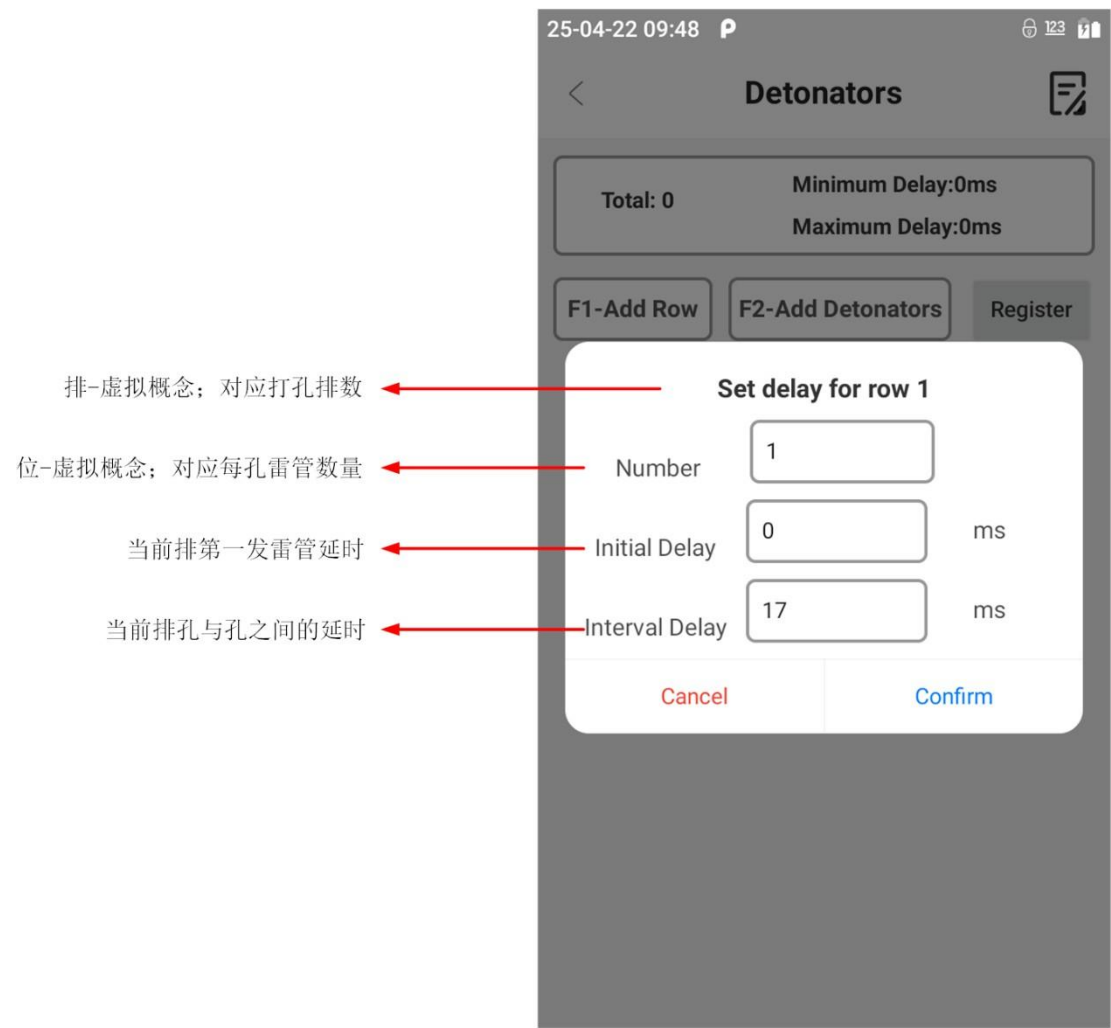
4.1.2.2 Detonator registration method

4.1.2.2.1 Scan the QR code to register

The universal detonator has its own scanning and identification function, which can scan the barcode for multiple times in a row to achieve the purpose of rapid registration of the detonator. Press the scan button on the fuselage and align the red light indicator of the scanning head above the fuselage with the QR code of the detonator shell on the footline clip, the detonator will automatically identify and parse the QR code and convert it into the detonator shell code (pay attention to the current cursor position when registering, and the detonator will be registered at the last hole of the row where the cursor is located by default).

4.1.2.2.2 Manual input registration

When using the detonator shell code segment, manual entry registration can be used. Click the "F2- Add Detonators" button in the middle of the screen, enter the starting and ending shell code numbers in the pop-up input box, and click "Confirm" to automatically add the shell codes to the row where the current cursor is located.

Note: When you enter the 13-digit shell code in "Start", the last digit in "End" will be automatically changed to [9].
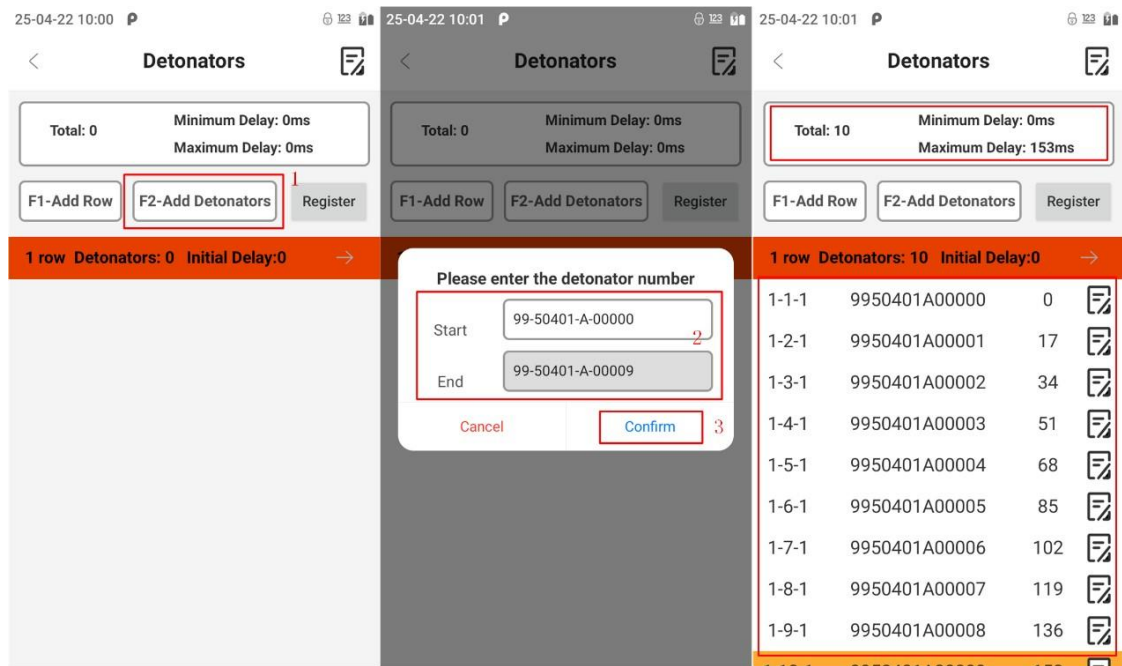
Figure 4.3 Manually adding shell codes

4.1.2.2.3 Wiring registration

After the delay scheme is successfully set, the initiator can beregistered with the detonator by wiring registration. Clamp the detonator wiring card and the bus bar of the terminal post of the initiator (you don't need to pay attention to the positive or negative when connecting, you can connect it directly), and then click "Logger", the detonator will automatically start to read the detonator information, and after the detonator obtains the detonator successfully, it will automatically give it a preset detonation delay, that is, complete the registration of the detonator (pay attention to the current cursor position when registering, and the detonator will be registered at the last hole of the cursor row by default). After the detonator registration is completed, the detonator needs to be disconnected from the

detonator, and then connect the next detonator, and repeat the above operation.
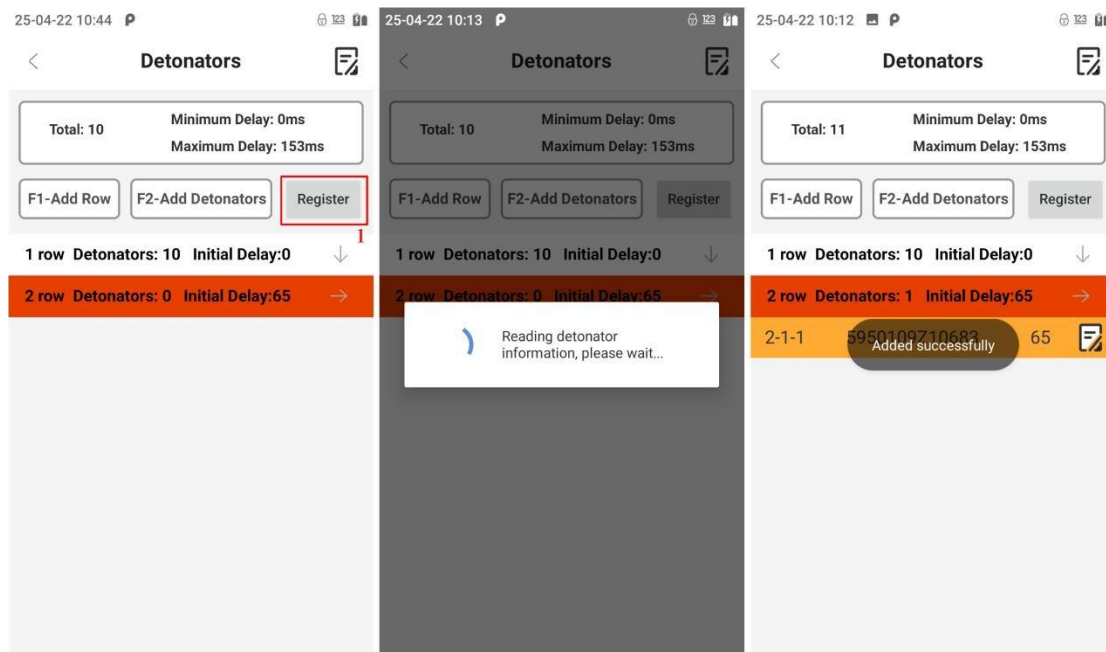
Figure 4.4 Wiring Registration

4.1.2.2.4 Advantages of various registration methods

Scan QR code registration: It is suitable for single-time, continuous identification of barcode information, and the registration of detonators can be completed before the detonator enters the hole at the construction site.

Manual Input Registration: When detonators are used continuously and sequentially in a single row, detonator shell codes can be imported in batches to achieve fast registration.

Wiring Registration: A single-shot detonator is used to connect to the detonator, which can identify the detonator shell code with a damaged

barcode.

4.1.2.3 Add a pattern

When registering a detonator, it is inevitable that there will be insufficient rows, holes, and bits, so you can use adding the corresponding rows, holes, and bits to establish different delay schemes.

4.1.2.3.1 Add rows

Click the "F1-Add Row" button at the top of the screen or press the [F1] button in the keyboard area to determine the delay scheme, add a row below this row, and the preset for the new row scheme will pop up.
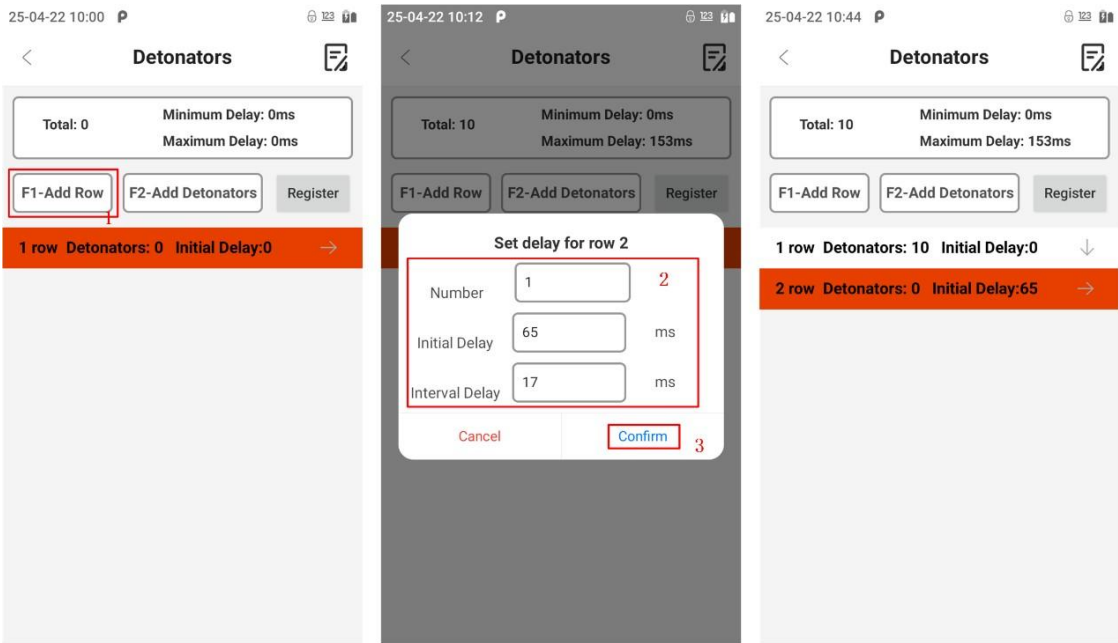
Figure 4.5 Adding a platoon

4.1.2.4 Modifying the Mode

After the detonator detonator is registered, the design scheme of each row and the delay of each detonator can be modified as needed.

4.1.2.4.1 Modify the overall delay scheme of the platoon

Click the "Edit" graphic button in the upper right corner of the page to redesign the detonator delay scheme for the row where the cursor is currently located; On the pop-up page, modify the delay plan, click Confirm to complete the modification.

Note: If the detonator has been registered in the platoon, the detonator delay of the original scheme will be automatically replaced after the overall delay scheme is modified.
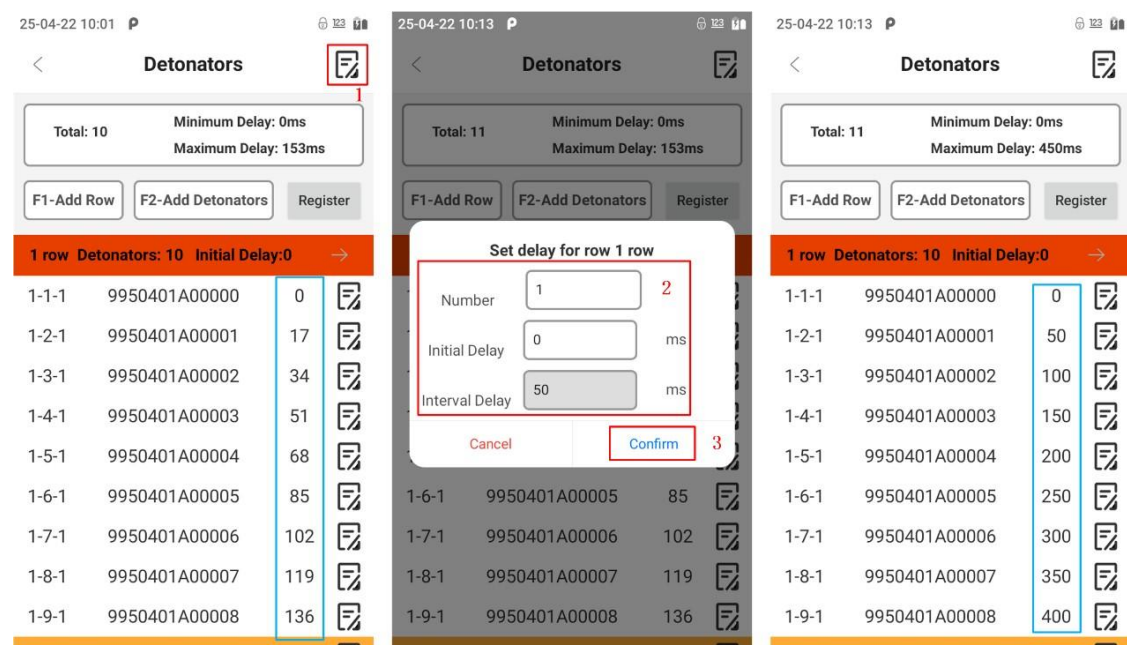
Figure 4.27 Modifying the delay scheduling scheme

4.1.2.4.2 Modify the detonator delay

Modify the local range of single or multiple detonators in the platoon; Clicking the "Edit" graphic button behind the detonator delay will pop up a delay modification pop-up window. In the prompt pop-up window, you can click the input box, use the pop-up keyboard to modify the delay in the input box, and then click the "Confirm" key.

Figure 4.6 Modifying the delay scheme of a single-shot detonator

4.1.2.5 Deletion Mode

The detonator can delete the registered detonator, and the deleted content can be divided into;

Delete Platoon: Deletes all data in the selected detonator registry for that platoon.

Delete Hole Location: Deletes the registered location and registration data of the selected hole location.

Batch deletion: Delete part of the detonator position and registration data in a single row or multiple rows.

4.1.2.5.2 Delete rows

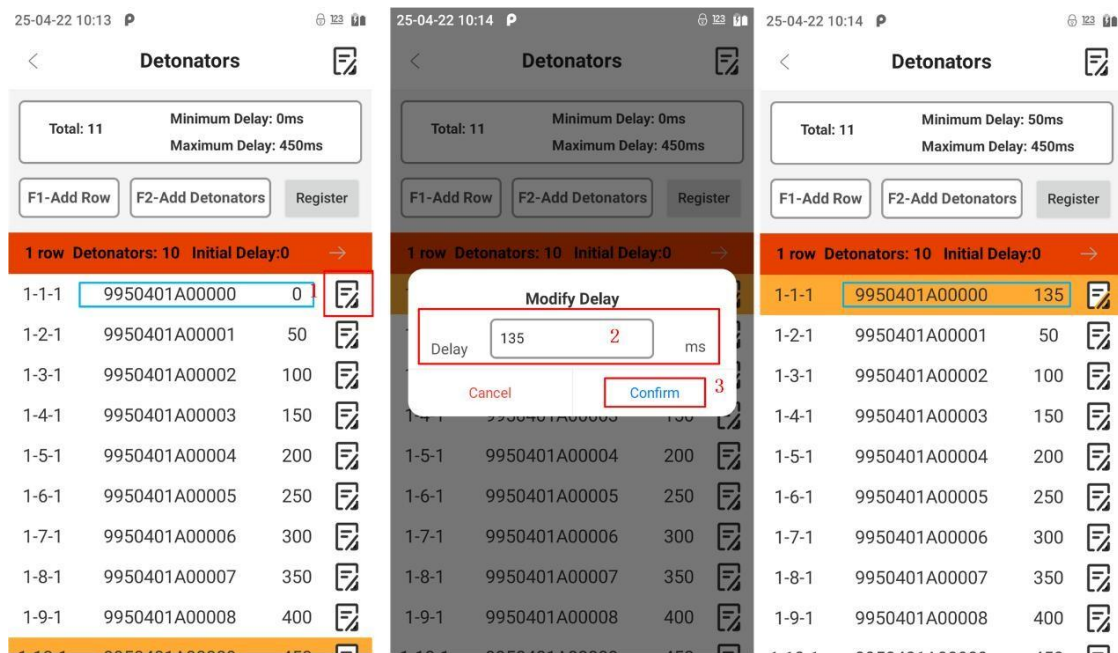In the state of row folding, press and hold the position of the screen row, select the row (one or more rows) you want to delete, click "Delete", and after the warning prompt is completed, click "OK" to delete the selected row data. If you click Cancel, you will exit the deletion mode.

The number below the deleted row automatically subtracts the number of deleted rows. For example, if there are N rows, delete the X rows, and the undeleted row numbers below the deleted rows will automatically change to N-X rows, and the preset data in the undeleted rows will not change.

Note: By default, all rows can be deleted, and after all rows are deleted, detonators can only be added after clicking the "Add Row" button to preset the presentation scheme.
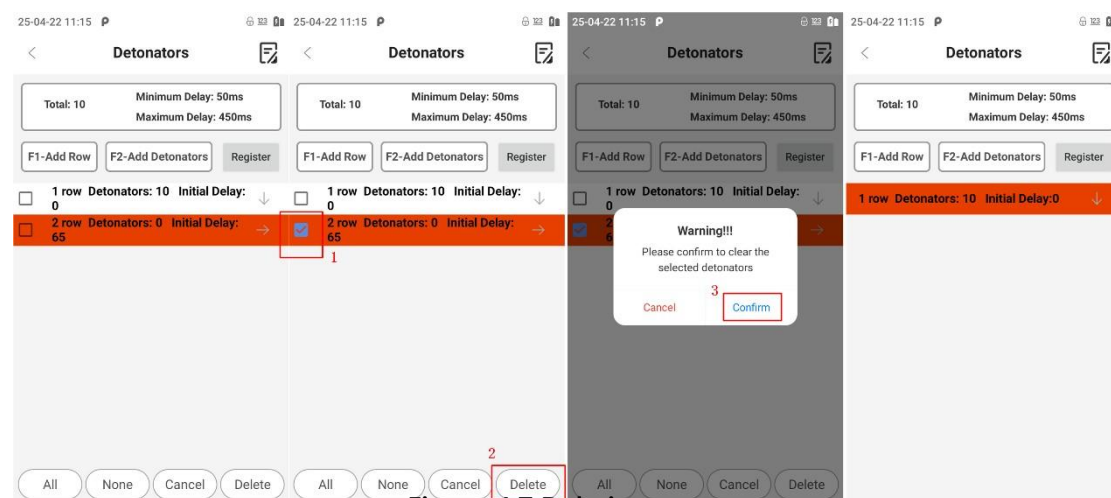
Figure 4.7 Deleting a row

4.1.2.5.3 Delete the holes

In the non-folded state, press and hold the screen, select the detonator you want to delete (one or more shots), click "Delete", and after the warning prompt is completed, click "confirm" to delete the selected detonator data. If you click "Cancel", you will exit the deletion mode.

When the detonator is removed, the hole position does not change.
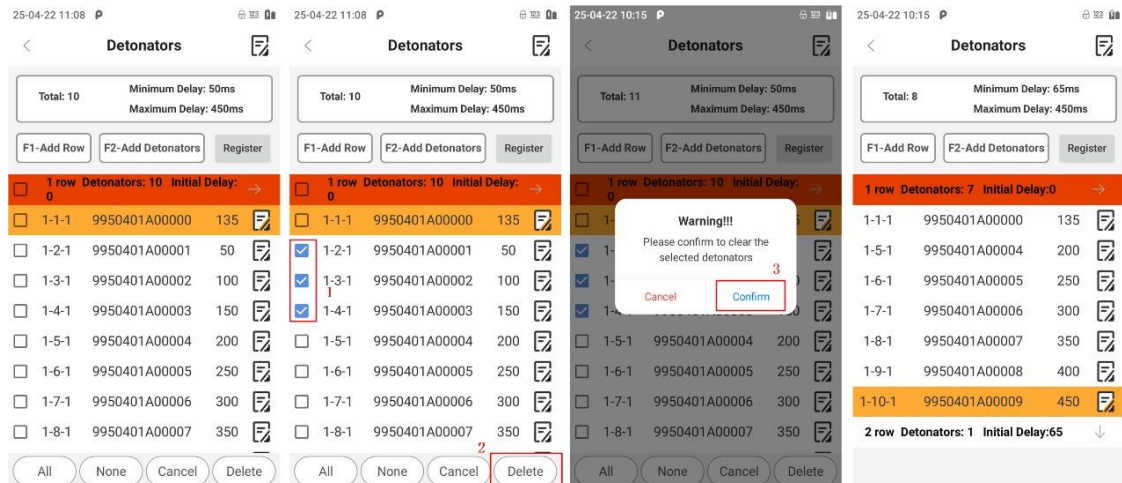
Figure 4.8 Deleting a hole

4.1.3:Bluetooth

Click the "Bluetooth" button on the home page, and a QR code will be displayed on the screen, which can be scanned with the initiator to transmit the data of the detonator registered in the keygen to the initiator.

Note: The two machines are connected via Bluetooth, please keep the two machines close to each other when transmitting data, do not principle.

Register

Registration

Bluetooth

1

Version Name:1.0.0.20240520180324

Data Source

Please use the detonator machine to scan the QR code

Figure 4.9 Logger data transfer interface

4.2 Blaster

BLASTER

AB terminal post — AB terminal post

Battery Light   Safty Light   Front Camera

Scaner   Power Switch
Rope Hook   Flash Light
NFC   Back Camera
Wireless Mini-PCIE Blasting Card   Speaker
Battery Cover Switch

Left Blasting   Main Scan / Right Blasting

Rope Hole

Left Scan

485/Type-C Port   Right Scan   Safety Switch

4G ｜ GPS Position ｜ Bluetooth / WIFI ｜ CAN Bus Cascade

Operating Temperature: -25℃-85℃	
Number of Detonators : ≤500	
Communication Distance: 1000m（500 Detonators）	
Network Connection Mode: Parallel	
Number of Cascaded Blasters: ≤10	
Protection Grade: IP67	
Battery Capacity: 3500mAh	
Operating System: Android	

4.2.1 Introduction to the BLASTER homepage

Figure 4.10 Introduction to the Blaster homepage

4.2.2 Projects

Create a project in "Projects" and fill in the project or contract

information to facilitate project management

4.2.2.1 Create a new project

For the first job, click to enter the project management page, click the

"+" sign in the upper right corner to enter the project information page, fill

in the project name and click "F1-Save" to save the project information.
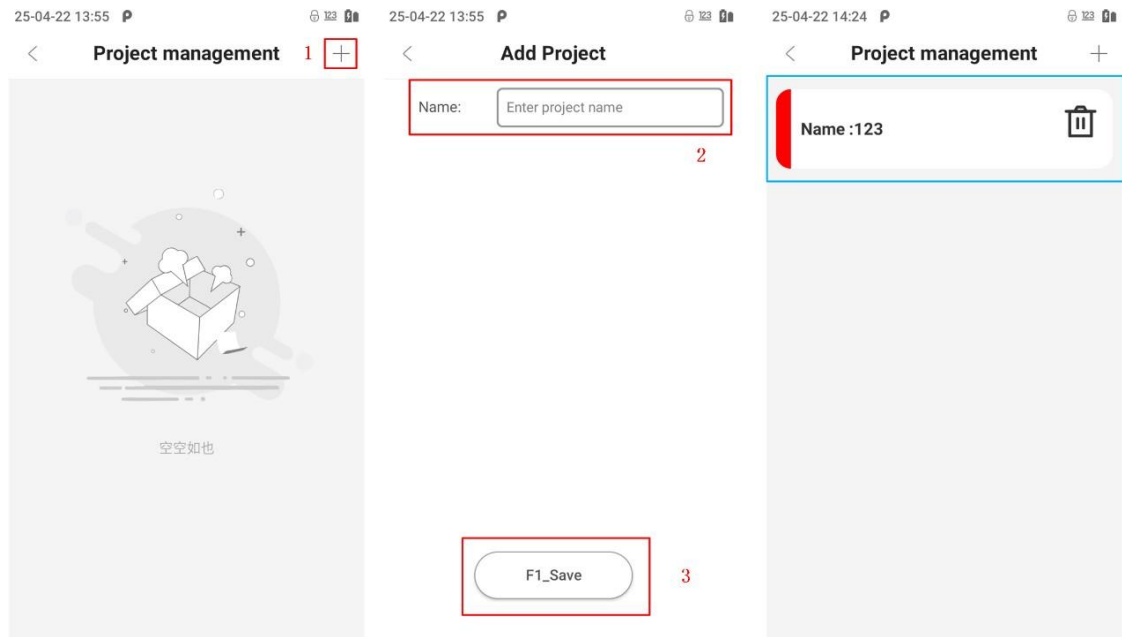
Figure 4.11 Project creation process

4.2.2.2 Deleting Projects

On the Select Project Information page, click the Delete button on the right of the project information, and click OK when prompted.
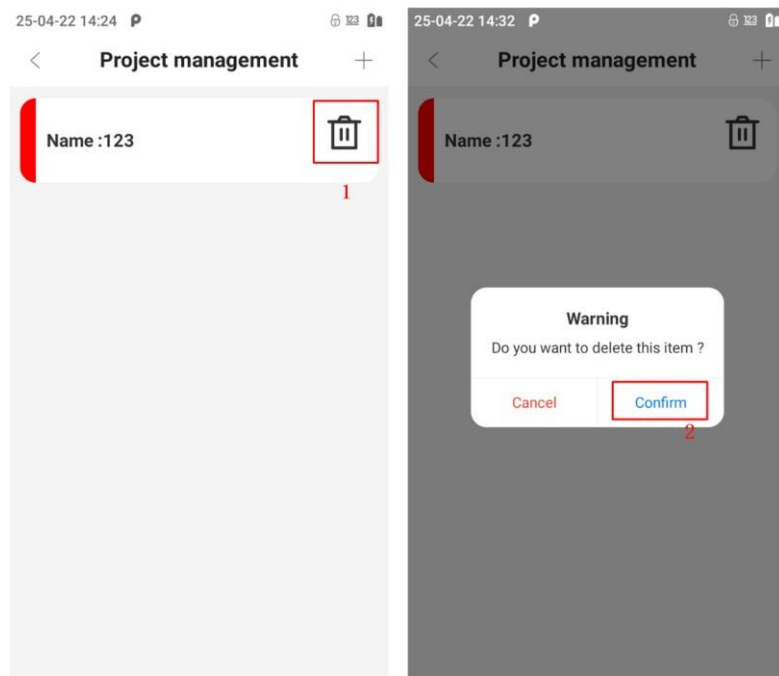
Figure 4.12 Deleting a project

4.2.3 Registration

Detonators			
Total: 10	Minimum Delay: 0ms		
	Maximum Delay: 153ms		
1 row Detonators: 10 Initial Delay:0			→
1-1-1	9940401A00000	0	
1-2-1	9940401A00001	17	
1-3-1	9940401A00002	34	
1-4-1	9940401A00003	51	
1-5-1	9940401A00004	68	
1-6-1	9940401A00005	85	
1-7-1	9940401A00006	102	
1-8-1	9940401A00007	119	
1-9-1	9940401A00008	136	
1-10-1	9940401A00009	153	

Figure 4.13 Registration in Blaster

In "Registration", you can edit the detonators in the list, for example: modify the delay of the detonator, delete the detonator.

4.2.4 Detonation

4.2.4.1 Networking detection & initiation process

After entering the networking detection interface, it will prompt that it is scanning, the detonator will compare the detonator of the registered group with all the online detonators, if all the comparison is successful, it will automatically enter the setting delay, after the delay setting is

completed, click "Confirm" according to the screen prompts to enter the

initiation process, the detonator will verify the detonation password, after

the password verification is successful, follow the on-screen prompts, first

open the "safety switch" on the side of the detonator, and then click

"Confirm", the detonator will enter the detonator charging stage, and after

the charging is completed, Click "Confirm", then press and hold the

detonation double button with both hands until the 5s countdown ends,

and the detonator will automatically return to the main interface after the

detonation command is initiated.
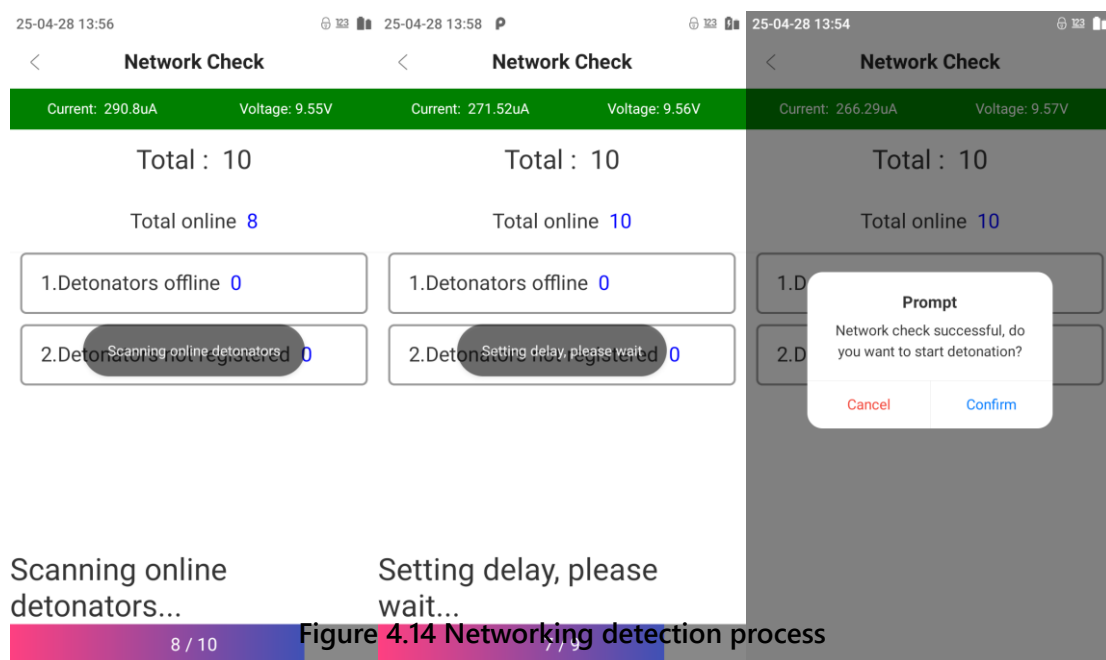
Figure 4.14 Networking detection process
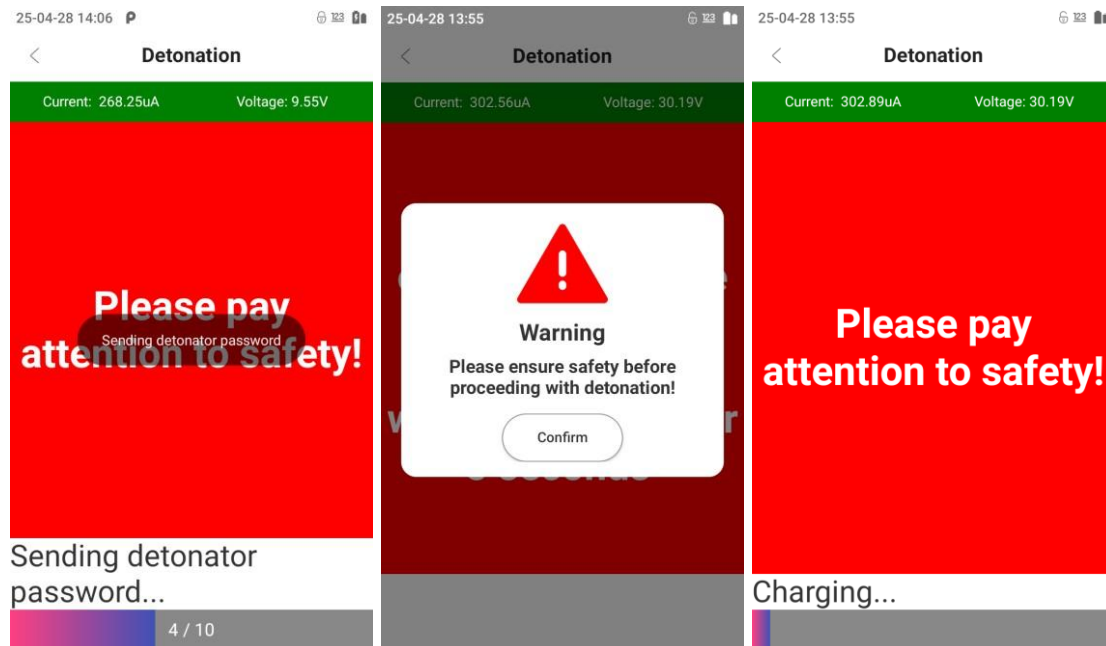
Figure 4.15 Verification password and charging process
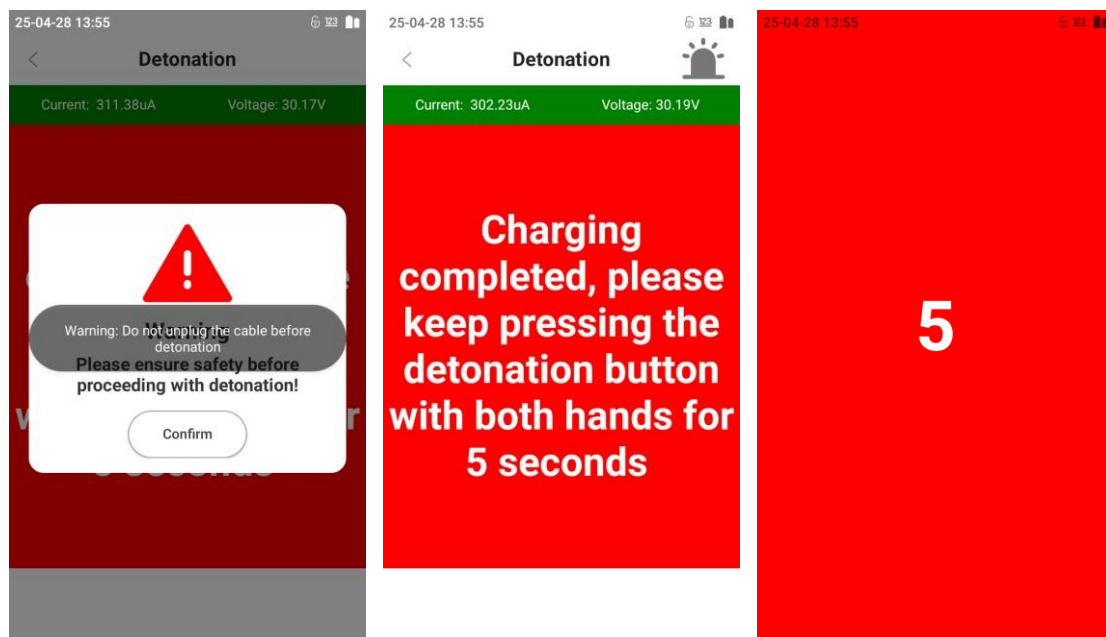
Figure 4.16 Detonation process

4.2.4.2 Abnormal networking detection

If the comparison between the registered group and the detonator in the detonator network is unsuccessful, click "Confirm" according to the prompts on the screen to view the abnormal detonators. Detonators that

are registered in the group, but not in the detonation network, are
displayed in the "Detonator Offline" entry; Detonators that are in the
detonation network, but are not in the registered group, are displayed in
the "Detonator not Loggered" entry.
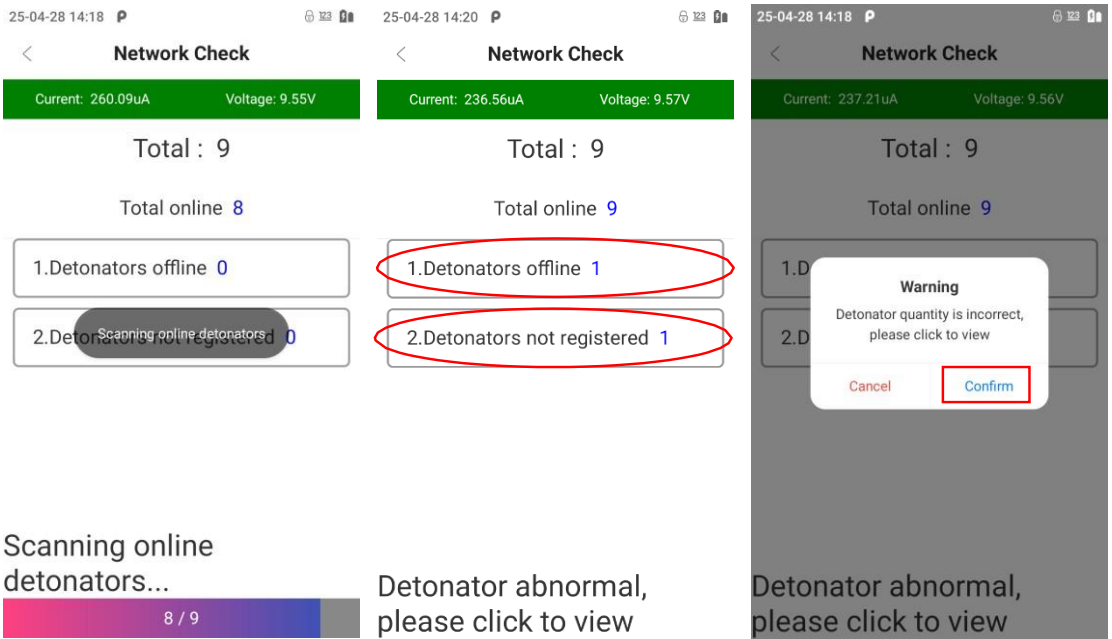
Figure 4.17 Networking Detection Exceptions

< **Network Check**   < **0ffline**

| Current: 236.56uA | Voltage: 9.57V |

Detonator ID (Total：1)
1111111111119   location: 1-10

Total：9

Total online 9

1.Detonators offline 1   1

2.Detonators not registered 1

Detonator abnormal,
please click to view

Figure 4.18 non-line detonators

Network Check

Not registered

Current: 236.56uA	Voltage: 9.57V

Total : 9

Detonator ID (Total：1)

Total online 9

1111111111110

location: 18-18

1.Detonators offline 1

2.Detonators not registered 1

1

Detonator abnormal,
please click to view
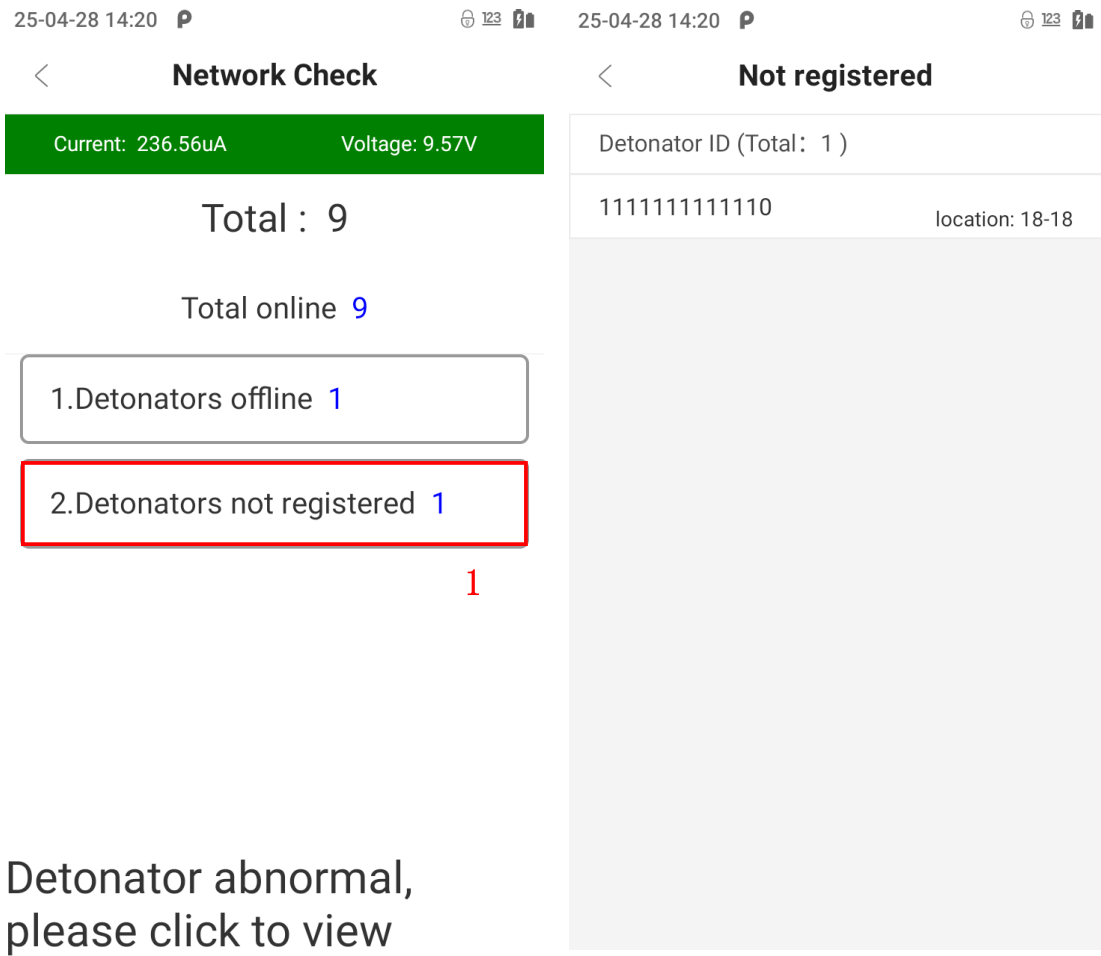
Figure 4.19 Unregistered detonators

4.2.5 Records

After the detonation is completed, the detonation data will be generated, and you can enter the blasting record page, where you can view the unuploaded and uploaded blasting data.

4.2.6 Detection

Before the detonator is used in the field, it is recommended to test each detonator once and confirm that it is normal before it can be used, and it is recommended to operate the single detonator detection in a safe area. The specific test items are as follows:

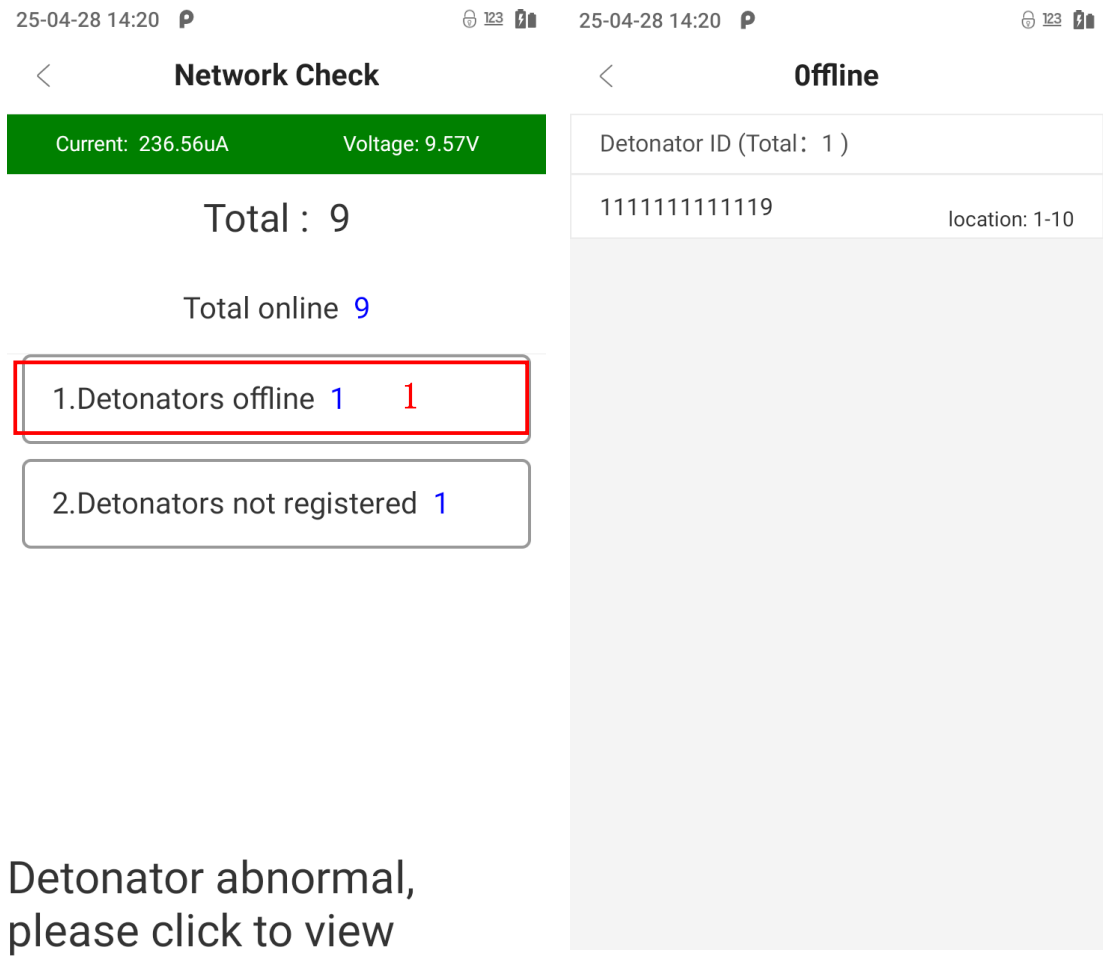| serial number	Detection items	illustrate
1	Code	the shell code of the connected detonator;
2	Manufacturing Date	the date of manufacture of the detonator;
3	Feature Code	Characteristic codes of detonator production;
4	Serial Number	Five-digit serial number;
5	Delay	the delay time of the detonator (the delay can only be displayed after timing, otherwise it is displayed as 0);
6	Row Number	the segment number of the detonator;
7	Hole Number	the hole number of the detonator;
8	Lock Status	Locked status, locked and unlocked of the detonator; If unlocked, it will be shown in red
9	Bridgewire Status	The state of the bridge wire connecting the detonator,

		normal and abnormal; Exceptions are shown in red
10	Detonator Capacitor	the value of the initiation capacitance of the connected detonator; Outliers are shown in red
11	Current	the value of the current connected to the detonator;

The operation method of single-shot detection is as follows:

Click the single-shot detection button on the home page to enter the single-shot detonator detection interface, and reliably connect the detonator to be detected with the initiator binding post. Click "Start" to start the detection of the connected detonator, and the detection result (normal detonator/abnormal detonator) will be displayed in the middle of the lower part of the screen.

Detection

Current: 16.66uA	Voltage: 9.58V

59-50109-Z-10683

Manufacturing Date:20250109

Feature Code:Z

Serial Number:10683

Delay:16000ms

Row Number:0

Hole Number:20

Lock Status:Locked

Bridgewire Status:Normal

Detonator Capacitor:97.94uF

Current: 17.32uA

Detonator normal

Start

Figure 4.20 A single shot detects a normal detonator

25-04-22 15:04

〈 **Detection**

Current: 16.66uA　　　Voltage: 9.58V

59-50109-Z-10683

Manufacturing Date:20250109

Feature Code:Z

Serial Number:10683

Delay:16000ms

Row Number:0

Hole Number:20

Lock Status:Locked

Bridgewire Status:Abnormal

Detonator Capacitor:98.69uF

Current: 17.32uA

Detonator abnormal

Start
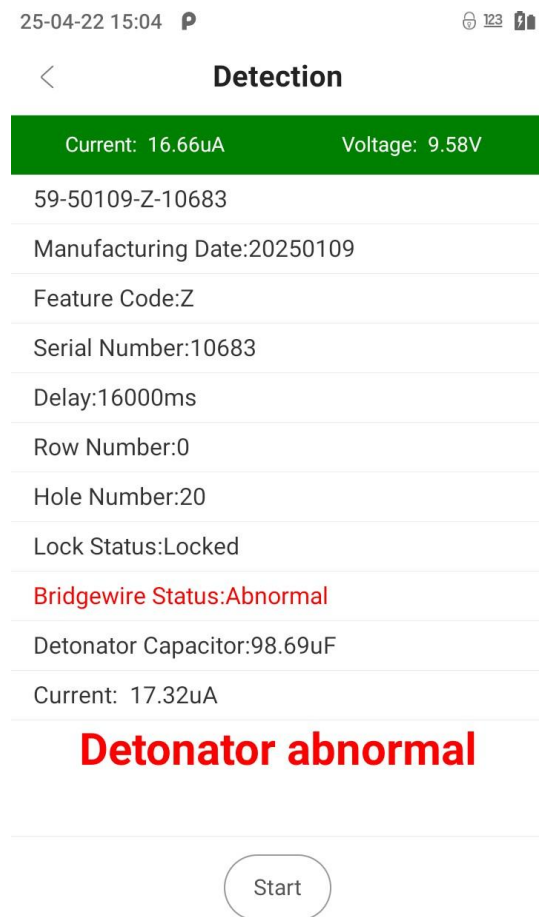
Figure 4.21 A single-shot detection anomaly detonator

4.2.7 Bluetooth

Click the "Bluetooth" button on the home page, follow the prompts to scan the QR code on the keygen, and click "Confirm" to confirm the import of the data from the keygen. The imported data replaces the detonators in the current project.

Note: After clicking "Confirm", the detonator in the registration will be deleted, please be cautious.
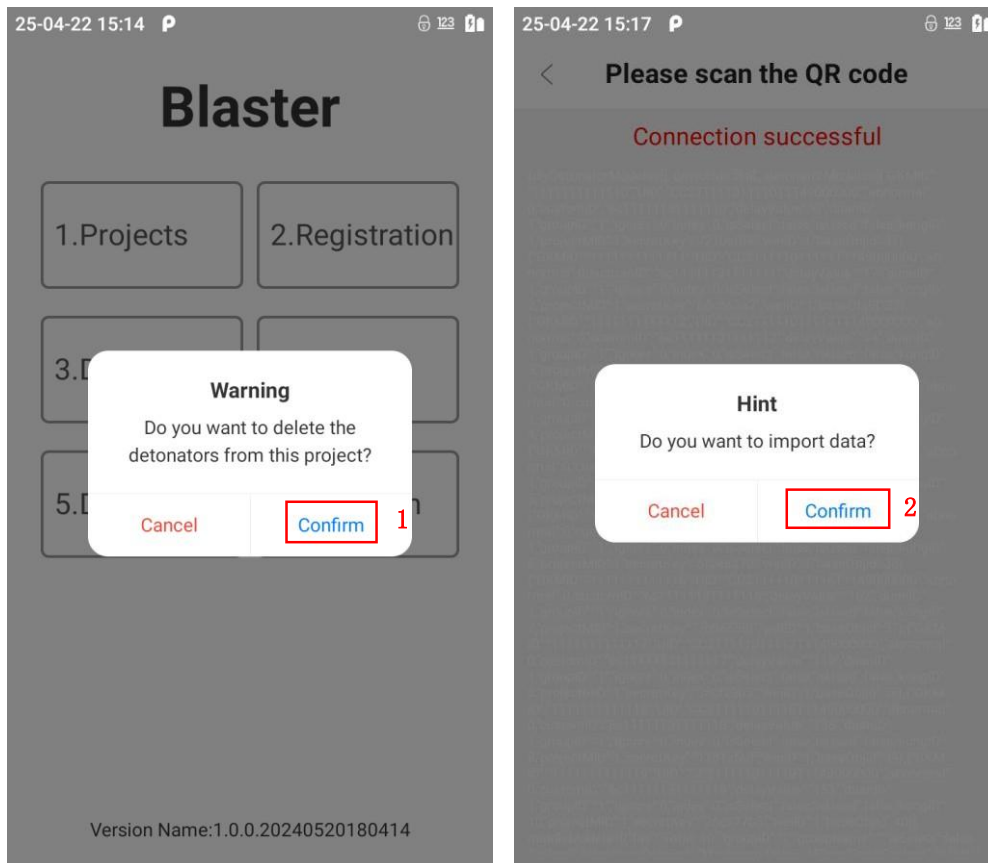
Figure 4.22 Prompt for clicking Bluetooth in Blaster

Chapter 5 Instructions for Button Operation

1. Click the "Edit" button of the detonator button, and you can see the screen cursor positioning.

2. Press the edit key in the detonator keyboard to switch the cursor, press once, switch one, only in sequence, non-reverse selection (if you accidentally miss the button to be operated, you need to start from the beginning and re-select).

3. Position the screen cursor to select the operation to be carried out, and click the "Confirm" button to perform the selected operation.

4. The operation process is completely consistent with the above screen operation process, and only switches to key operation.

Figure 5.1 Explosive button identification

Figure 5.2 Cursor illustration

Chapter 6 Matters needing attention

1.When the blasting bus is connected to the initiator for networking detection & detonation, it is necessary to pay attention to the current/voltage value at all times.

2.Pay attention to the battery level of the initiator to ensure that the initiator is used in an environment with sufficient power.

3.If the network detection or timing operation was carried out before, it is necessary to wait for no less than 10 minutes before entering the artillery area for troubleshooting; If the high-voltage charging operation is carried out before, it is necessary to wait for no less than 15 minutes before entering the artillery area for investigation.

4.When used in a metal mine environment, it should avoid dust particles falling into the line card, blasting the network connection joints should be suspended, and the exposed parts should be wrapped with insulating tape to ensure that they are insulated from the ground or other objects.

5.It is strictly forbidden to re-connect the initiating bus after the initiation network is timed and in the state of high-voltage charging, and if the initiating bus is snapped, the network needs to be re-timed.

6.After detonation, wait at least 15 minutes before entering the detonation area for post-detonation inspection.

7.If the system displays an abnormality or freezes during use, you can try to restart it.

8.If it is not confirmed that detonation can be carried out, do not perform high-voltage charging operation; If the initiation operation is canceled after high-voltage charging, it is necessary to wait for no less than 10 minutes before proceeding with the subsequent operation.

11. Precautions for battery use:

serial number	Precautions
1	The battery of this device is a lithium-ion polymer battery.
2	Please use the original charger and do not change the adapter at will.
3	When you first get the battery, the battery may only have about 50% left, you can charge it through the included power adapter, and the first charge should be more than 8 hours.
4	Please avoid metal objects (such as keys, etc.) touching the battery electrodes or thinking that the battery electrodes are short-circuited.
5	Do not place the battery in an environment of excessive heat, moisture or corrosion, and must not be crushed or collided.
6	It should not be stored for a long time when the power is empty or full, and it should be stored at about 50% power.

7	If the device is not used for a long time, remove the battery from the device.
8	If the battery is swollen or swollen, please replace it with a new battery in time.

Chapter 7 Common Problems and Handling Methods

7.1 Common Problems and Solutions

Table 1: Common problems and how to deal with them

serial number	frequently asked questions	Possible causes	Solution
1	can't turn on	1. The battery connector is damaged 2. The battery is drained 3. The detonator has not been used for a long time	Check that the battery connector contacts well and please charge the battery
2	Unable to charge	1. The battery or charger is damaged	Replace the battery with a new one or recharge it (Contact Technical Support)
		2. The charger is not properly connected with the device	Connect the plug properly
		3. Do not use our company's standard charger	Use the charger as standard

3	The standby time is shortened	1. After a long period of charging and discharging, the battery has gradually worn out 2. There are other faults in the initiator	Contact technical support
4	The power supply is not working properly	1. The detonation card is poorly connected to the device 2. There are other faults in the initiator	Contact technical support

7.2 Common problems and solutions in the registration stage of detonators

7.2.1 Wiring registration fails or does not respond

How to troubleshoot wiring problems:

➢ Disconnect from the bus, exit and re-enter the registration interface;

➢ Check whether the contact between the card and the bus is good, if the contact is good, click the button to re-register;

➢ If the line clip is in poor contact with the bus, open the line clip and re-register the line clip;

➢ When the wire clip is damaged or the exposed foot wire outside the hole is broken, please connect and insulate it and re-register;

➢ If the registration still fails, remove the line clip, and connect the foot wire directly to the bus of the initiator to prevent leakage and water ingress, and re-register;

When it is determined that the detonator is damaged and cannot be registered:

➢ In the unpacked state, a detonator can be added first

➢ If the detonator cannot be added when it has been filled, it should be judged by the blasting engineering and technical personnel, and the damage to the detonator can be ignored for networking and detonation when the blasting safety and effect are not affected. (Note: The location of the blast hole of the unregistered detonator should be remembered, and the position of the blind cannon should be marked after blasting, so as to remind the construction personnel to pay attention, and solve the blind cannon to eliminate potential safety hazards).

7.2.2. Missing guns during the registration process (missing the registration detonator).

If the gun is lost, confirm the location of the blast hole, add the blast hole to the initiator according to the detonation sequence designed by the detonation network, and register the detonator.

7.3 Common problems and solutions in the networking phase

7.3.1 Excessive current or short circuit (with leakage affecting network detection).

➢ Disconnect the bus, use the dichotomy method to find the leakage, and analyze the cause of leakage;

> If the clip is flooded, the detonator pin is damaged, the leakage caused by contact with the wet ground or short circuit can be cleared, reconnected and insulated to solve the leakage or short circuit;

> If it is a detonator in the blast hole, water ingress, leakage or short circuit

1. Use a universal detonator to detect the leakage detonator and check the current value;

2. If within the allowable range, another detonator can be used to delay the leakage detonator according to the detonation time and register; A separate network is laid, and the cascade blasting is adopted;

3. If the leakage of a single detonator has exceeded the limit and cannot be detonated by the network, the blasting engineering and technical personnel shall determine whether to remove it from the network and detonate other detonators according to the actual situation; (Note: The position of the blast hole of the detonator should be remembered, and the position of the blind gun should be marked after blasting, so as to remind the construction personnel to pay attention, and solve the blind gun to eliminate potential safety hazards).

7.3.2 Bus open circuit (the current value of the initiator is obviously small).

(1) If the current value of the initiator is displayed as 0uA, it means that the bus is not connected to the initiator or all the detonators are offline

> Check whether the bus is connected to the binding post of the initiator;

- whether the bus is connected to the bus (the line connecting the detonator in the operation area);

- Focus on checking whether each parallel line connection point is reliably connected;

- If the problem cannot be solved, contact the technical staff to communicate for the next step;

(2) If the joint is fine:

- Check whether the cable is damaged or disconnected, and if so, reconnect and insulate.

7.3.3　There is an abnormal detonator on the bus

1.The networking scan displays an abnormal pop-up window

- When the networking scan prompts that there is an abnormal detonator, press the "Abnormal pop-up window" to enter the view interface, view the abnormal detonator, and view the information of the failed detonator.

- If the error is displayed as an unregistered detonator, the dichotomy method is used to use the detonator networking detection function to detect the explosion area separately until the abnormal detonator is located

- According to the location of the blast hole, the unregistered detonator is registered to the appropriate hole according to the blast network design

- If the error is displayed as an offline detonator, it means that the detonator is not connected to the bus, exit the initiation interface,

remove the detonator bus, and enter the artillery area after 5 minutes to check whether the detonator showing the offline error is missing the card, or the line clip is in poor contact, if the clip is broken or other problems, the detonator pin can be dialed out and directly connected to the bus, and insulated;

➢ If the connection is normal, then exit the networking interface, restart the program, enter the networking interface to re-test, the result shows that there is a problem with the detonator itself, and the detonator should be judged by the blasting engineering and technical personnel when the detonator cannot be replaced after the filling is completed, and the error detonator can be ignored for detonation without affecting the blasting safety and effect. (The location of the failed detonator should be indicated, and the inspection should be focused on after the explosion, and if the blind cannon is generated, it should be handled according to the regulations to eliminate potential safety hazards)

2.When networking, a "Abnormal pop-up window" is displayed

➢ The pop-up window selects to view the failure message or choose to ignore the problem and continue to detonate;

➢ Select View Failure Information to record the problem information and benchmark the problem detonator. Exit the networking interface, disconnect the bus (detonator shutdown, bus disconnection), observe

the surrounding environmental conditions before entering, and enter the view after 10 minutes (under normal environment);

➤ If there is a high-voltage power supply or other source of danger (chemicals, falling rocks, etc.) in the vicinity, 15 minutes is recommended

➤ After entering the explosion area, the corresponding problem is eliminated.

7.3.4 Summary

1. The main reasons for networking detection failure:

➤ Wiring issues

It is important to ensure that there is a good connection between the footwire, the wire clip, the bus, and the binding post of the initiator;

➤ whether the connection is intact and whether there is water ingress;

2. Handling of networking detection failures:

➤ When the networking detection is abnormal, be sure to check the error prompts carefully.

➤ If the networking detection is abnormal, check the cause and do not simply repeat the networking detection operation

➤ According to the detailed information of the abnormal detonator, determine the position of the hole, find the abnormal detonator as soon as possible and deal with it

7.4 Precautions for construction operation

7.4.1 Blasting plan preservation

If there is a blasting plan that needs to be saved and used continuously during the construction on the same day, it is only necessary to save the blasting plan, and then import the relevant blasting plan according to the user manual;

When there is a failure on the same day, please feedback the fault information to our technicians in time;

7.4.2 Fault Feedback Mechanism

If there is an abnormality during the construction process and it is necessary to feedback the abnormal information to our company, please follow the standard format to facilitate the detailed tracing of the cause of the abnormality;

The standard format includes: detonator number, APP version, fault screenshot, blasting record, and log file.

7.4.3 Blasting record upload

If you fail to upload the blast log, try to check the network and change the upload location (move to a location with a good network signal).

7.4.4 Detonator Registration

When registering this new project, please clear all the registration data of the previous project to avoid the remnants of garbage data and ensure the correctness of networking detection;

7.4.5 Judgment of construction environment

When working in an unfamiliar environment, it is recommended to

evaluate the impact of the surrounding environment on the construction, including electromagnetic fields (substations, high-voltage lines, railways, highways, power poles), water environment (soil or air humidity is relatively high), and other environments that affect the use of digital electronic detonators.

7.5 Other Recommendations (Special Circumstances)

1. The detonator pins fall into the blast hole

➢ At the top of the rod, make a hook from a stiff copper wire or iron wire, and insulate the hook;

➢ Put the hooked rod into the hole, rotate it in one direction and lift it up, if it feels like it is hanging to the footline, hook the footline out of the hole evenly;

➢ If the length of the cannon rod is insufficient, add a detonator to the unfilled blast hole to replace the original detonator to avoid blind cannons.

2. How to deal with blind guns

➢ Carry out a single-shot test on the detonator in the unexploded blast hole, if it is in the normal range, it can be re-registered, connected, increase the warning distance, and carry out a second detonation;

➢ If the second detonation cannot be carried out, the blind cannon will be processed according to the blasting safety regulations, and the detonator will be recovered;

> Recycle the detonator for processing, return the detonator manufacturer for problem analysis if conditions permit, and destroy it if it cannot be returned to the factory, and make a record of destruction.

7.6 Troubleshooting Sheet

1: All communication errors	Short circuit condition: voltage 0~3V, current 40~200mA; Circuit breaker: The voltage is about 10V, and the current is 0mA.
2: The network is disconnected	A: The voltage is about 10V, and the current is about 0mA, which means that there is a broken circuit in the network, please check the network cable between the first detonator and the detonator at the head of the explosion area, and reconnect the disconnected network cable.
3: Network short circuit	A: The voltage is about 0V, the current is greater than the number of × 30uA or more, it means that there is leakage in the network, please use the dichotomy method to investigate, cut the network cable in the explosion area into two sections, select one of them for detection first, if there is a short

	circuit, please continue to refer to this split section method to check, and reconnect the disconnected network cable after the investigation is completed. Enter the networking detection interface, if the network is short-circuited, the detonator will prompt a short-circuit pop-up window.
4: A fixed communication error occurs	A: Poor contact of the line card and missing card connection - the detonator can check the shell code of the wrong detonator, find the detonator to re-card or cut off the line card, and directly connect the tare foot wire into the network cable;
5: Continuous normal, continuous communication error occurs	A: Network cable disconnection between the correct and incorrect detonators – find the disconnection and reconnect.
6: Random communication error is detected	A: Leakage - check the network cable and line card soaked in rain or mixed with muddy water, wipe the surface moisture, wipe the muddy water in the line card, overhead network cable and wrap the exposed part with insulating tape (current and voltage reference

	value: voltage 10V, bus current is greater than the total current of the detonator connected to the load, the total current of the detonator is roughly 10 rounds 300uA, 50 rounds 1.5mA, 100 rounds 3mA, 200 rounds 6mA, 400 rounds 12mA), The detonator will prompt a suspected leakage when it judges that there is leakage in the network. The resistance of the initiating network cable is large or the wire is too poor - please replace it with twisted pair pure copper wire, do not use iron wire, aluminum wire and inferior copper wire with large wire group.
7: Online detection errors	A: Disconnected situation - there is a loose detonator line card or a multi-channel network cable interface is loose, if all offline, please check the network cable between the first detonator and the detonator at the head of the explosion area, and reconnect the disconnected network cable. If part of the network cable is continuously offline, please

	check the network cable, find the disconnection and reconnect it. If the individual is offline, find the detonator and re-connect or cut the line card, and directly connect the tare foot wire into the network cable;
8: Detection error after charging	A: Leakage situation - the charging is not full, exit the charging interface, wait for 10 minutes, detect the rainwater soaked or muddy water in the network cable and line card, wipe the surface moisture, wipe the muddy water in the line card, overhead network cable and wrap the exposed part with insulating tape. Recharge; Disconnection situation - if the detonator line card is loose or the multi-channel network cable interface is partially loose, exit the charging interface, wait for 10 minutes, and detect whether the network cable and line card are loose and fall off. Find the dropped detonator and reconnect or cut the line card, directly connect the tare cable to the network cable, and

	reconnect the multi-channel network cable interface.
9: The detection failure details show that the calibration is wrong or the password is wrong	A: The module is loosely connected - find the detonator and re-connect or cut the line card, and directly connect the tare cable to the network cable
10: The detection failure details show that the charging is not full	A: Leakage situation - the charging is not full, exit the charging interface, wait for 10 minutes, detect the rainwater soaked or muddy water in the network cable and line card, wipe the surface moisture, wipe the muddy water in the line card, overhead network cable and wrap the exposed part with insulating tape. Recharge; If the wire resistance is too large and the charging voltage is insufficient - exit the charging interface, please replace it with twisted pair pure copper wire, do not use iron wire, aluminum wire and inferior copper wire with large wire set.