

HiTRONIC™

Blaster



30. AUG, 2022

Table of Contents

- 1. Product Overview
 - 1.1 Product characteristics
 - 1.2 Product Specifications
 - 1.3 Product Components
 - 1.4 Precautions for handling products
- 2. Blasting sequence
- 3. Configure and operate the UI
 - 3.1 Power On
 - 3.2 Power Off
 - 3.3 Operation
 - 3.4 Charging
- 4. Troubleshooting
 - 4.1 Troubleshooting during blasting operations
 - 4.2 Troubleshooting after blasting
- 5. Technical support

1. Product Overview

1.1 Product characteristics

Blaster for UG is an Android-based machine that can be easily operated through UI that is easy for users to see.

It can also be used by connecting LAN lines, so it can be used in underground mines.

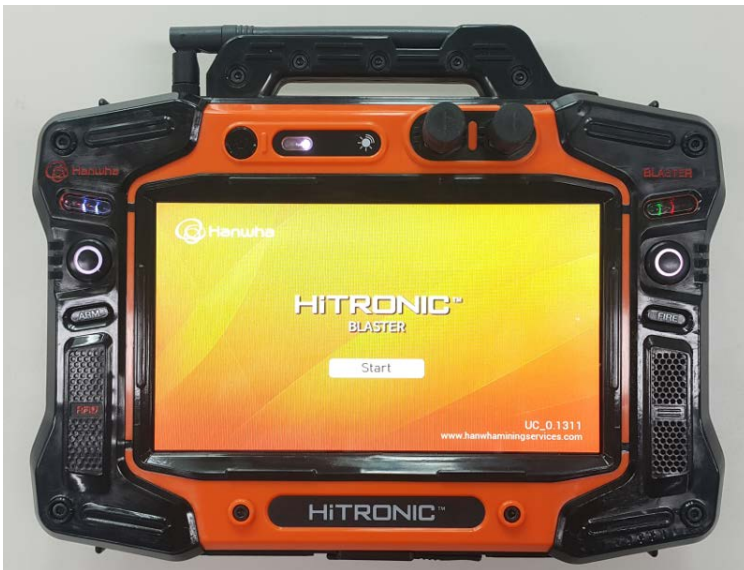
It can work and print blasting results and reports in compatibility with Windows programs that are easily accessible, so it improves the inconvenience of using blasting results data through existing planners, and it has been reborn as a user-friendly blasting machine by facilitating F/W update.

It also enhances security by adopting RFID (NFIC) card

1.2 Product specification

Name	HiTRONIC Blaster
Size	242mm x 189mm x 52mm
Maximum dets per blaster	standalone: maximum 3,000 dets Multi mode: Up to 63,000 dets can be use with 21 blaster
Weight	1.45kg
Interface	Touch screen, button
Connectivity	Ethernet, WLAN, Bluetooth, RFID, USB, Sub-GHz
LOS	5km
Battery	Li-ion, 7,000mA @ 12.6V, Rechargeable
Components	Blaster, AC adapter
Operating system	Android 9.0
Language	Korean, English
Waterproof Dustproof	IP65
Operating temperature	-20°C ~ +60°C
Storage temperature	-30°C ~ +60°C
Charging Temperature	0°C ~ +45°C
Warranty	1 year free from the date of purchase

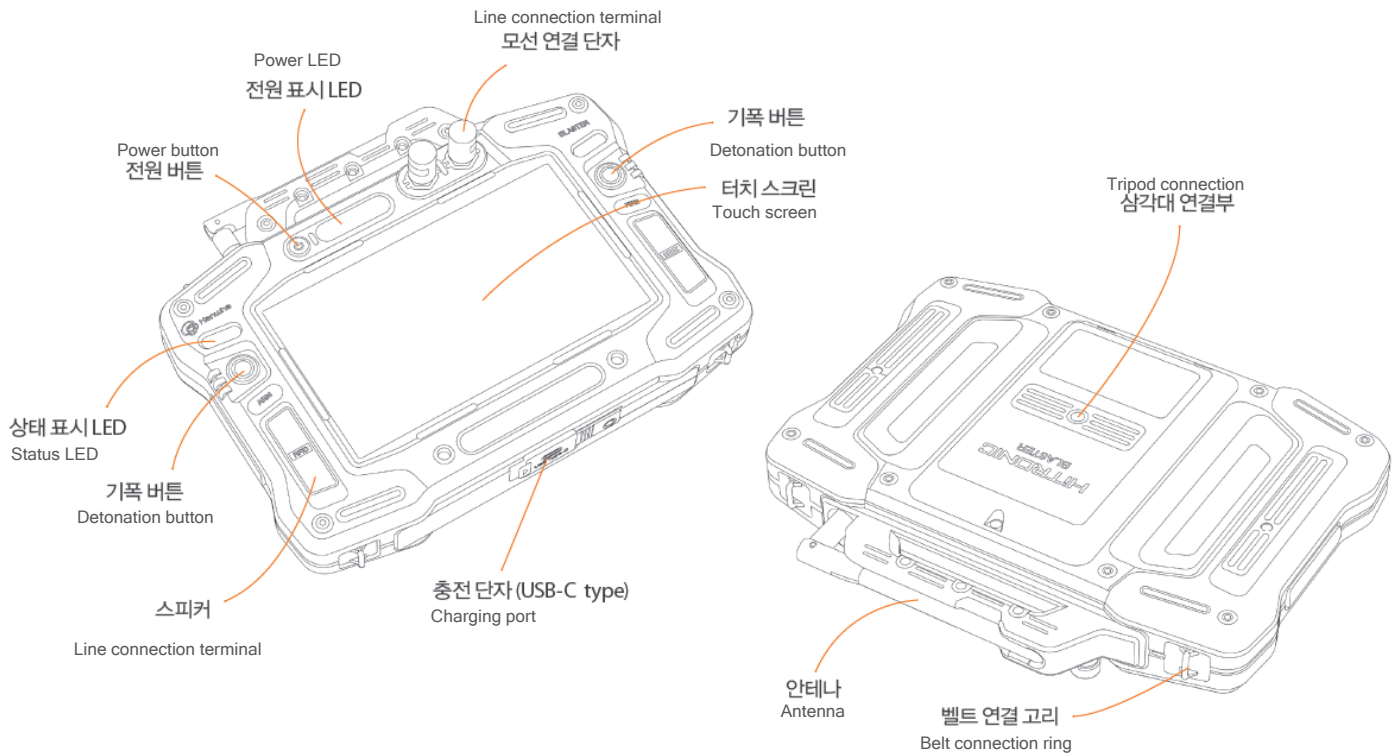
1.3 Product components



<Blaster>



<AC Adapter>



1.4 Precautions for handling products

- 1) This instruction manual is described based on pre-payment settings..
- 2) This blasting machine is used in cool places without direct sunlight and is prohibited from being used near fire.
- 3) If a problem occurs by installing an app that was not provided by Hanwha, it may be difficult to respond immediately.
- 4) If a user arbitrarily modifies the system settings or operating system software, causing functionality and compatibility problems, it can be difficult to respond immediately. If you modify your system settings at your discretion, your product or app may not work properly.
- 5) Disassembly of the equipment may cause water pressure problems and malfunction of the equipment, so it should never be disassembled.
- 6) It violates Hanwha's software license rights if it arbitrarily changes the software provided by Hanwha or leaks the software through an unofficial route.
- 7) There is a possibility that the wireless facility may be radio-crazy during operation.
- 8) This product has been electronically marked with product information. To check the information, run the Settings app and tap your mobile phone information.
- 9) If the blasting machine is hot, turn off the power and wait for more than 30 minutes.
- 10) If there is physical damage to the device, such as damage to the device due to falling or broken screen, or damage to parts such as terminals, please contact Hanwha.
- 11) If left near the blasting site when not in use, it may be damaged by a tombstone, so please keep it in the office or case.

2. Blasting sequence

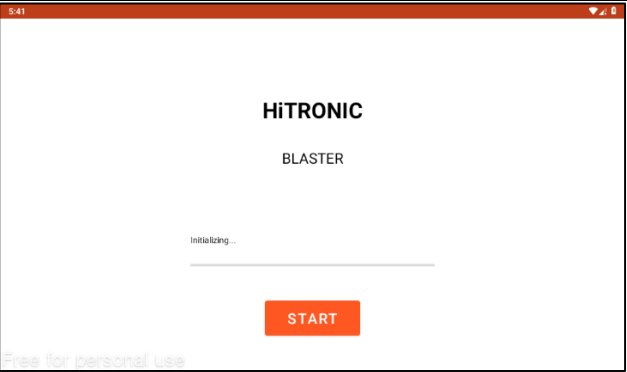
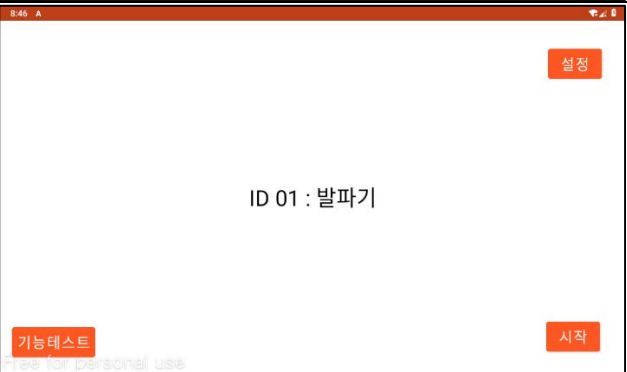
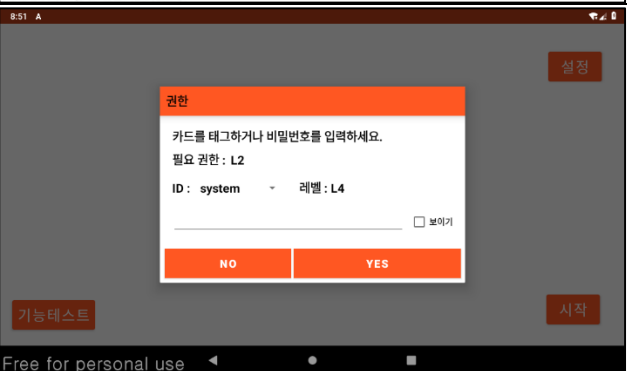
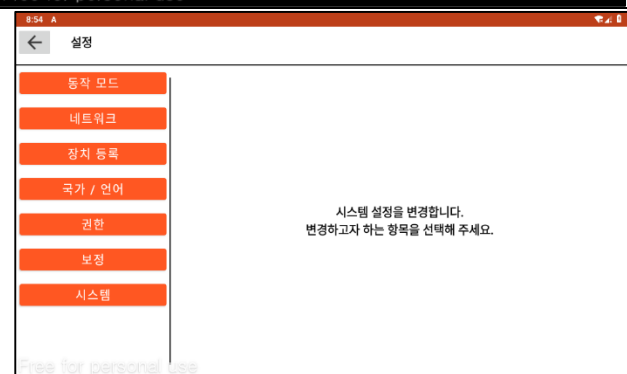
Main	Settings	Operating mode	Blaster	
			Remote	
		Network		
		Device registration		
		Region/language		
		Authority	L1	
			L2	
			L3	
			L4	
		Correction	Current Correction	
		System		
	Blasting start	Download		
		Communication		
		ARM		

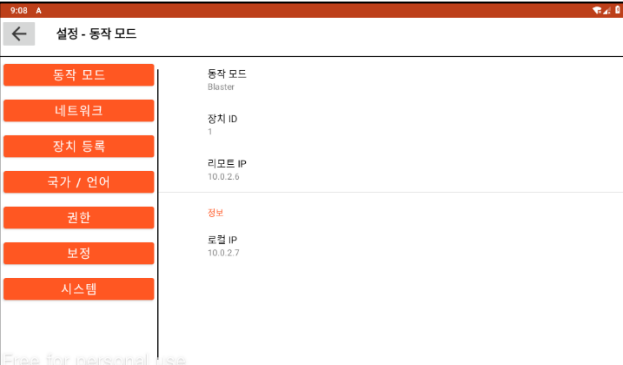
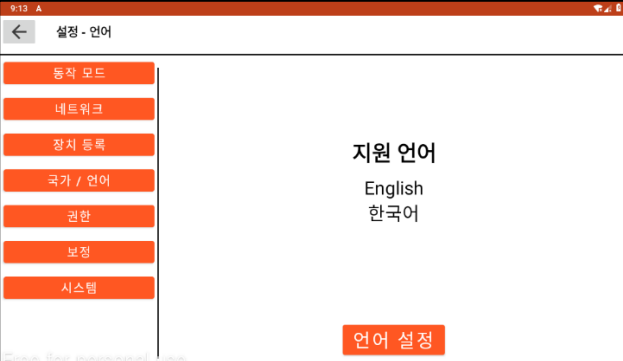
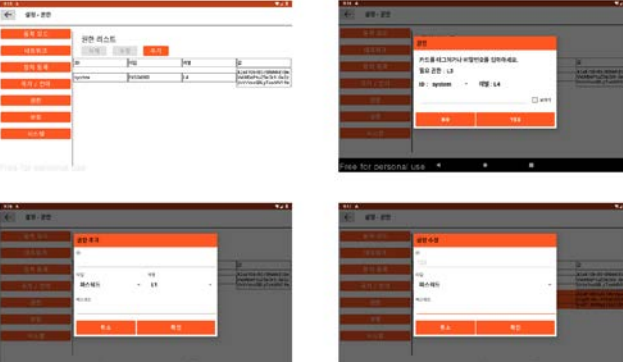
3. Configure and operate the UI

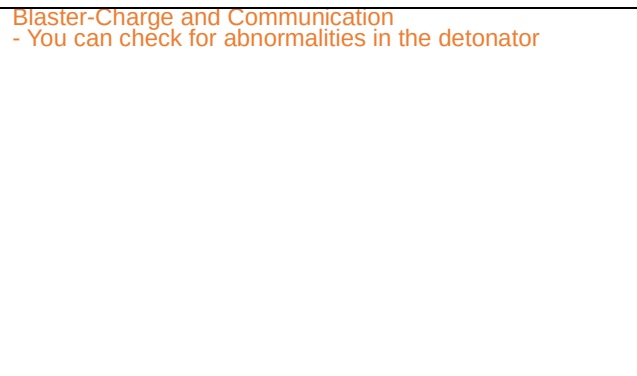
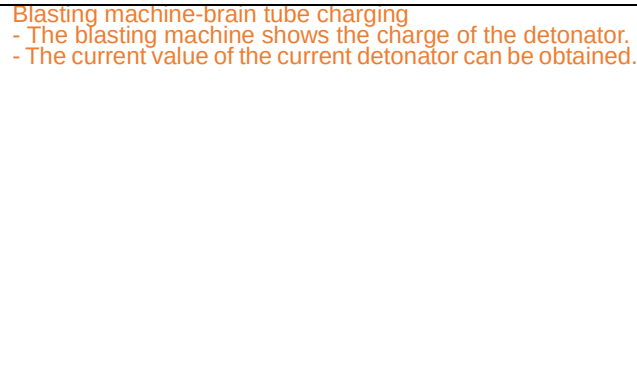
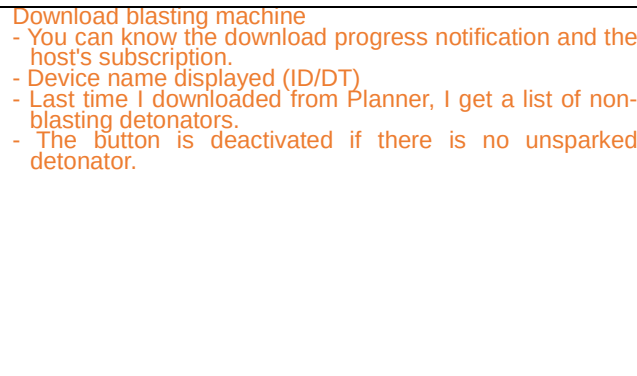
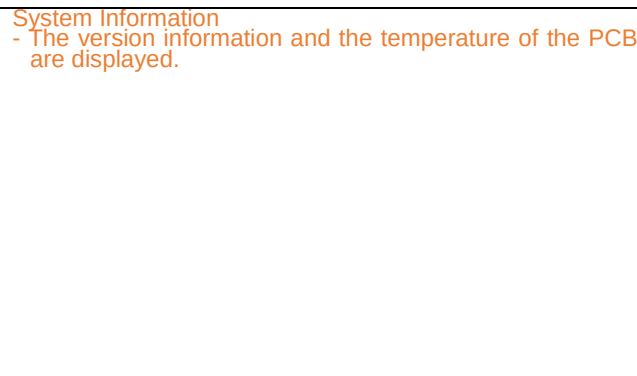
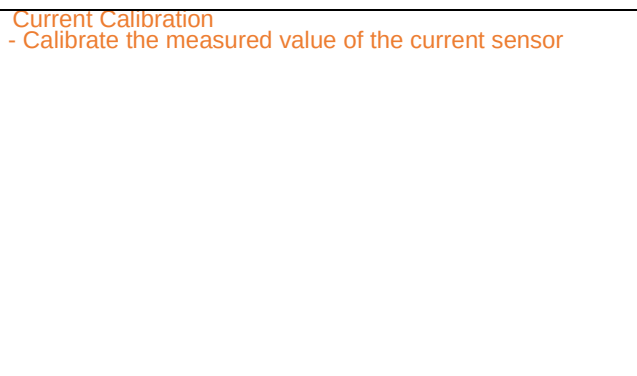
3.1 Power On: Press the power button on the upper left for more than 5 seconds..

3.2 Power Off: Press the power button on the upper left for more than 5 seconds, the message 'Do you want to turn off the power?' is displayed and the power is turned off when you check OK..

3.2 Operation

	Start screen - This is the first screen that appears when you press the power button, and you can check the program version of the blaster.
	Blasting machine main screen - You can check the currently set equipment ID and operation mode. - Settings icon: Go to the settings screen. - Start icon: Start blasting operation in the currently set blasting mode. (Required permissions consist of 'Blaster: L2', Remote: L3'.
	Permission confirmation screen - The authority is classified into four categories. - L1 : Network and Settings Manager - L2 : General worker - L3 : Blasting approval authority - L4 : System Privileges - Select according to the order of the screen. - Select an ID with each level and enter the password
	Main System Settings Screen - It is the entry screen for each mode.

	Operation Mode - You can choose from two modes: Blaster and Remote. - When Blaster is selected, the device ID is configured, and if the ID is not entered, the ID is not valid,' a warning message appears. - If the Remote IP rules are violated, a warning message appears stating 'IP address is not valid'.
	Operation Mode - You can choose from two modes: Blaster and Remote. - When Blaster is selected, the device ID is configured, and if the ID is not entered, the ID is not valid,' a warning message appears. - In case of a rule violation in Remote IP, a warning message 'IP address is not valid' appears.
	Pairing - The remote IP, device ID, and local IP of the configured pairing device are displayed. - When connecting the remotes, the phrase 'connected' is displayed. - When the paired device is registered, the phrase 'registered' is displayed.
	a supporting language - It consists of eight types: Korean, English, Japanese, Spanish, Indonesian, Finnish, French, and Russian
	Privilege List - A list of privileges currently registered on the device is displayed. - The level is selected from L1, L2, and L3. - Permission IDs can be deleted/modified/registered. - Only L3 and above are allowed for registered rights.





Blasting - Permission Verification
 - You can check the authority of the blasting machine.
 - Blasting authority is classified into three categories: L1, L2, and L3.
 - If you touch an unauthorized card, the phrase 'unauthorized' is displayed.



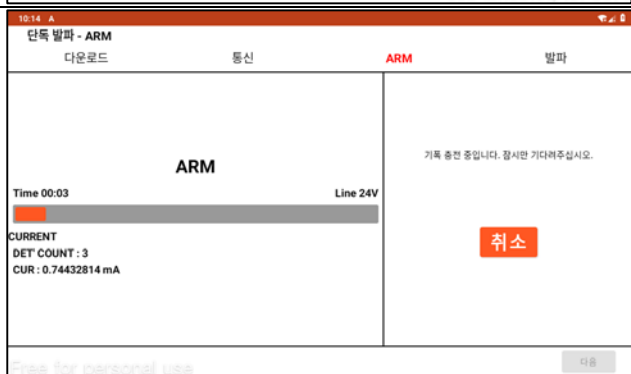
Blaster-Select blasting mode
 - You can choose between remote blasting and standalone blasting.



standalone blasting - ARM proceeding
 - With the safety of the blasting area secured, select whether to proceed with ARM.

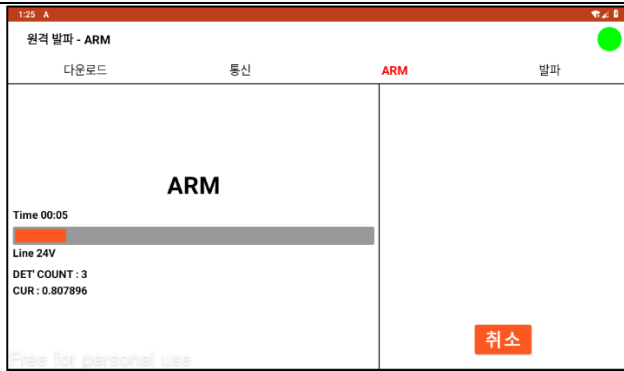


standalone blasting-ARM progress reconfirmation
 - The NG detonator's confirmation request and warning text are displayed.
 - After that, select whether to proceed with ARM.



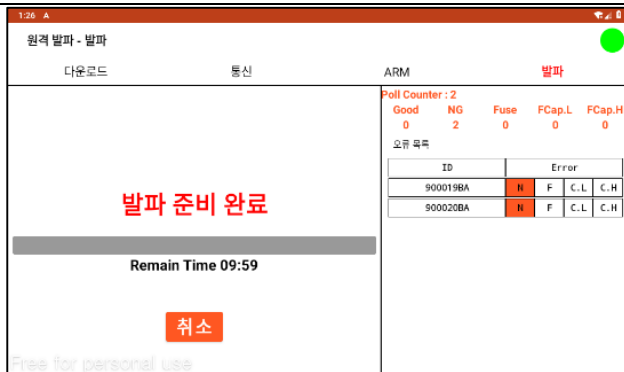
standalone blasting-ARM
 - You can know the progress of ARM.
 - The current value of the current detonator can be obtained.

10:15 A 단독 발파 - 발파 다운로드 통신 ARM 발파 발파 준비 완료 Remain Time 09:49 취소 Free for personal use	standalone blasting-waiting for blasting command - Blasting command standby status is displayed. The initial wait time is set to 10 minutes. - Polling progress and the number of NG detonators are listed
10:18 A 단독 발파 - 발파 다운로드 통신 ARM 발파 안전 대기 3발의 뇌관이 발파가 완료되었습니다. 안전 확보시간이 지날때까지 현장에 접근하지 마세요. --- 안전 확보를 위한 대기시간 00:18 Free for personal use	Network blasting - wireless network verification - The network status is displayed. - It is divided into green (normal), red (disconnected) and gray (not set). - When the 'Cancel' button is selected, the wireless mode is interrupted and moved to the main screen.
10:37 A 원격 발파 - 통신 다운로드 통신 ARM 발파 원격 발파 대기중 발파기 ID 01 취소 Free for personal use	Network blasting-checking progress - It is possible to know the progress of radio blasting. - You can see the charge status of the detonator.
10:59 A 원격 발파 - 통신 다운로드 통신 ARM 발파 뇌관 충전 Time 00:02 DET COUNT : 3 REF : 0.02 mA CUR : 0.9519389 취소 Free for personal use	Network blasting-charging and communication - You can check the communication status on the blasting machine
1:24 A 원격 발파 - 통신 다운로드 통신 ARM 발파 통신 중 Total : 3 Good : 3 NG : 0 취소 Free for personal use	Network blasting-ARM - The blasting machine shows the presence or absence of abnormalities in the detonator.



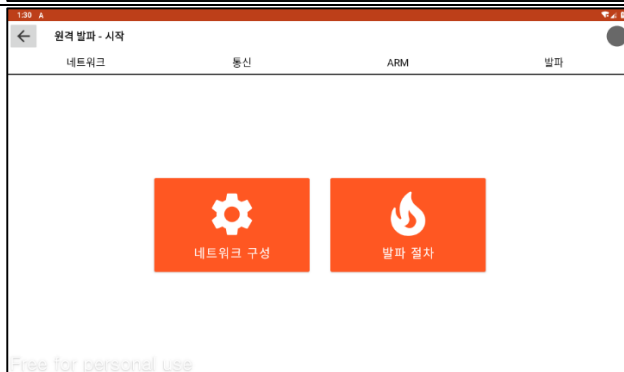
Network blasting-ARM

- You can know the progress of ARM.
- Activated after 8 seconds calibration.



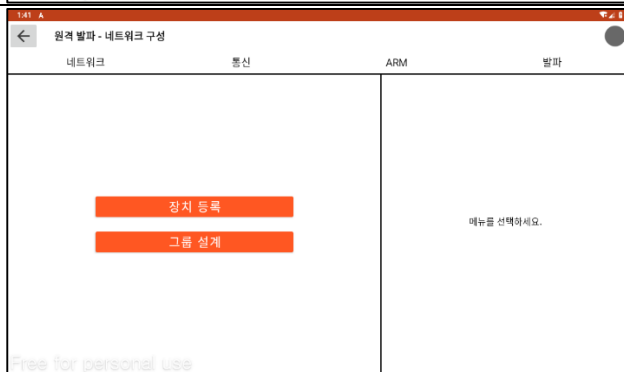
Remote blasting-waiting for blasting command

- Blasting command standby status is displayed. The initial wait time is set to 10 minutes.
- Polling progress and the number of NG detonators are listed.



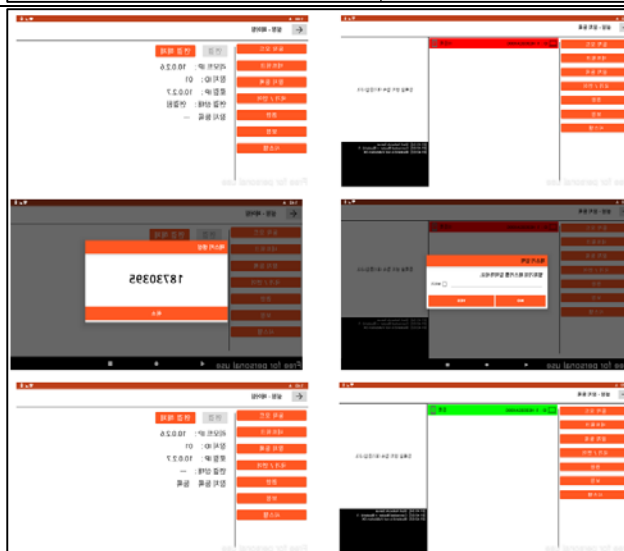
Remote-Wireless Blasting

- Modify the network configuration.
- Perform the blasting process.



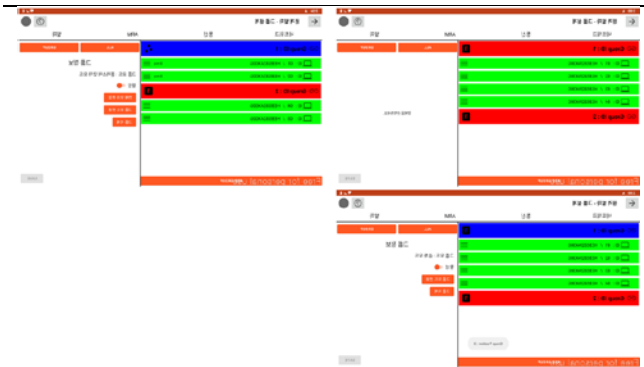
Remote-Network Configuration

- Perform device registration.
- Perform group design.



Remote-Device Registration

- Register the device in remote Hwaguna.
- Entering the blasting machine's password key (RFID?) activates the list item and updates the blasting machine's information.
- If the password key input fails, a warning sign appears saying, "Pass key does not match."



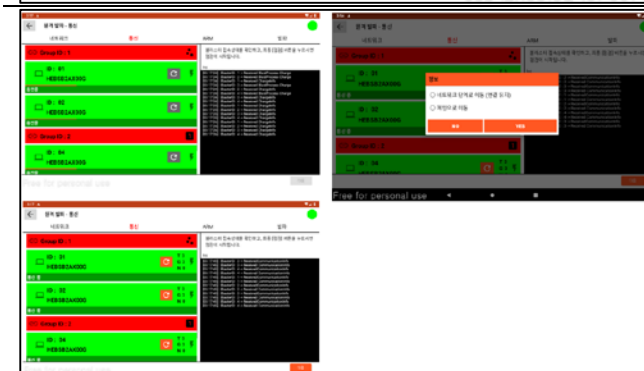
Remote-Blasting Network Group Design

- Indicates the blasting machine registered in the network.
- Group information and group mode can be selected.
- The blasting machine's information appears.



Remote-Charge and Communication

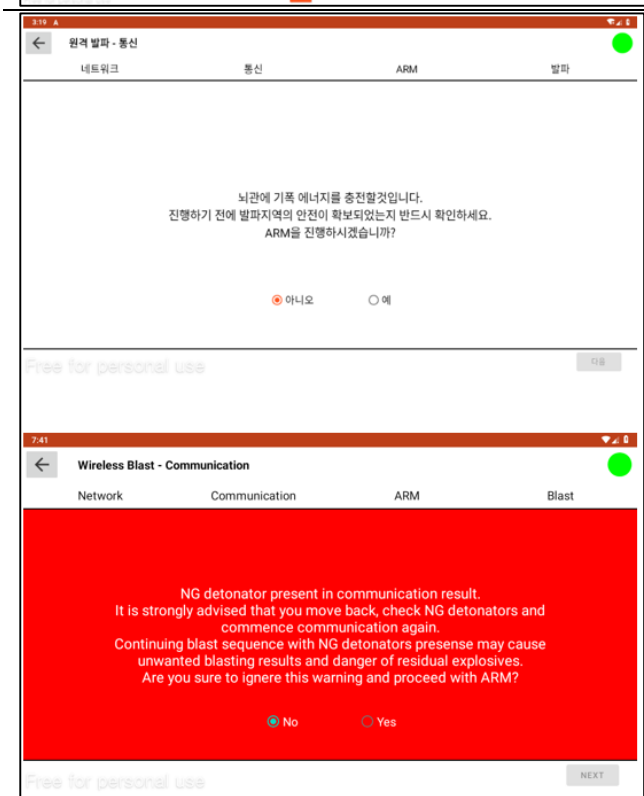
- A list of equipment connected to the blasting machine is shown.
- After checking the communication status, select the group list.



Remote-Charge and Communication

- The status of the blasting machine appears as a list.
- Abnormalities in the detonator can be identified.

(T : total number of detonators, G : Good number of detonators, N : NG number of detonators)



Remote-Safety Verification

- With the safety of the blasting area secured, select whether to proceed with ARM.

	Remote-ARM - Proceed with charging of the connected detonator.
	Remote-Safety Check (Blasting) - With the safety of the blasting area secured, the blasting process is selected.

3.4 Charging: Charge the blaster through the C-type connection jack under the blaster.

4. Troubleshooting

4.1 Troubleshooting during blasting operations

1) When you can't control the screen

a) Safety standby

After blasting/discharge, the screen is not operated in the safe waiting state,
Do not enter the site during the safe waiting time and then turn off the blasting machine power.

b) Blaster wireless control operation

There is no screen manipulation while the blasting machine is wirelessly controlled.
However, if the blasting must be stopped urgently by the on-site personnel, pressing the power button for 5 seconds will display the power off dialog box, so the power can be turned off.

c) Reset the device by pressing the power button of the abnormal status of functions such as non-touchable/screen stop/screen break for at least 30 seconds.

d) When the touch is wrong or a certain part is not touched

- Check the screen for moisture or foreign substances.
- Check if the screen is damaged and cracked → Request A/S.
- Perform touch correction: Touch the screen with three fingers while pressing the left and right buttons for about 40 seconds. Follow the instructions on the screen when performing the correction function afterwards.

2) No wireless communication

- a) After pairing, change the radio channel, ID, or device mode (Remote, Blaster, Repeater) of any of the paired devices.

The pairing information is initialized, so pairing must be restarted.

- b) On the remote blasting network check screen, 'xx blasting machine is not ready for blasting'
After downloading the detonator information, you should select wireless blasting by selecting the blasting mode.

- c) 'No communication with xx device' indication

- Check the battery condition.
- Check the antenna engagement.
- Check the waiting status of blasting.
- Check that the line of sight is secured.
- If LoS is not secured, it is installed in a place that can be secured.
- If LoS cannot be secured, consider using Repeater..

- d) The communication is not working box

- Check the condition of the antenna.
- After changing the radio channel remotely, the pairing is performed again to try.
- Check that the line of sight is secured.
- If LoS is not secured, it is installed in a place that can be secured.
- If LoS cannot be secured, consider using Repeater.

3) Blaster does not communicate with the detonator

- a) Check the condition of the harness wire: Perform resistance measurement, etc.

- b) Checking the condition of the binding post: Check if mud or foreign substances are stuck.

- c) Make sure the download data matches the detonator you are currently communicating with.

4) If you lose your password, request an A/S..

5) Not charging

- ㄱ) Flip the USB-C cable and try to tighten it.

- ㄴ) Check the USB-C port or cable for damage.

- ㄷ) Try another charge.

6) Damage to blasting shears, harness wires, and bus sheaths (Short)

• Symptoms

- Blaster can't communicate if both wires are peeled off and shorted to each other

• Solution

- Check the cover of the bus.
- The harness wire must be checked, and the coating of the knotted part for fixing may come off, and the coating at the end may come off and touch.
- To find the short circuit, check by cutting the lines sequentially from 1/2 of the connected harness wire (this method is faster on average than the sequential verification method)

7) Faulty contact of track (Harness wire, blasting bus)

• Symptoms

- 'DISCONNECTED' message when harness wire or blasting bus is open circuit

• Solution

- Make sure the wire is properly connected to the blaster connection terminal.
- Check the connection between the harness wire and the blasting bus, and if there is no problem, check if the line is cut in the middle.

4.2 Troubleshooting after blasting

1) How to dispose of misfired hole

- a) Check the location of the unexploded hole and check if each line is visible.

- b) Remove the covering at the end of each line and perform ID check using the logger and planner (ID check is possible by the logger alone)

- c) For re-communication and re-explosion, connect each line of the unexploded hole to the

mother line using an auxiliary mother line.

d) If the ID is checked by ID Check, enter the ID and second time by manually entering the planner and try to re-wave it.

e) If you don't know the ID, enter a random ID and 0ms per second in the logger and try to re-wave it. At this time, the random ID entered will appear as NC, and the global detonator will be identified once, and the global initial time will be entered into the detonator and detonated.

2) Cause analysis based on re-communication & re-explosion results

Re-communication	Re-firing (0ms)	expectation
O	O	- Partial damage to power or communications - Partial damage to the power capacitor - Partial damage to detonation capacitor - MCU malfunction
O	X	- firing part damage - firing capacitor damage - damage to fusehead
X	O	- Damage to power or communications parts - Partial damage to the power capacitor
X	X	- Damage to power or communications parts

3) Misfire the detonator: PCB damage

a) Symptom : Damage to the power supply or communication unit

- If you try to communicate again, NC can come up.
- If only the communication response unit is damaged, a reboot may be possible.

Re-communication	Re-firing (0ms)
O or X	O or X

ㄴ) Symptom : Damage to firing block

- If you try to re-communicate, you can communicate, but it doesn't trigger.

Re-communication	Re-firing (0ms)
O or X	O or X

※ Solution If possible, connect and attempt to re-explode to 0ms, and retrieve if not detonated.

4) Misfire the detonator : Capacitor damage

ㄱ) Symptom : Damage to Power capacitor

- Failure may occur, and if recovery and re-explosion are attempted, the charging voltage may not be sufficient and thus the operation may not be performed or the discharging may be accelerated.
- It may be possible to detonate if you try to detonate again at 0ms or short seconds, but it is not detonated at long seconds.

Re-communication	Re-firing (0ms)
O or X	O or X

ㄴ) Symptom : Damage to firing capacitor

- Failure can occur, recovery and communication are successful without any problems, but if you try to restart, it may be detonated at 0ms or short seconds, but it is not detonated at the beginning of the market.

Re-communication	Re-firing (0ms)
O	O or X

※ If the solution is possible, try to re-explode it at 0ms by connecting it, and if it is not detonated, recover it and take action according to the criteria for disposing of the non-

explosion product.

5) Misfire the detonator : fusehead damage

- ㄱ) Symptoms: Breakage of ignition jade or falling solder area..
- In this case, a reboot attempt is not triggered.

※ Recall the solution and take action according to the criteria for disposal of non-conforming products.

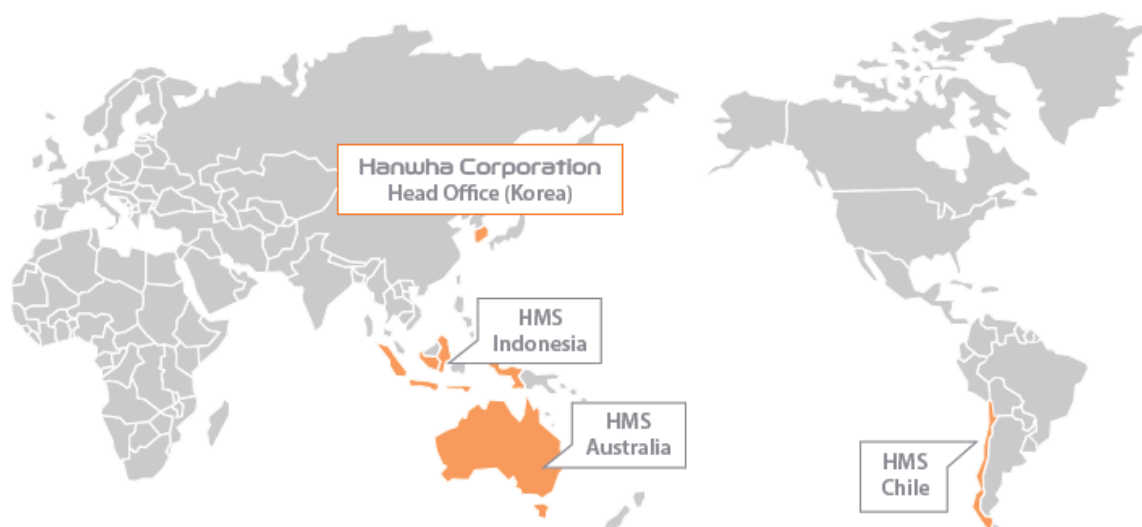
6) Precautions when entering the site

- ㄱ) When entering before blasting, take a discharge action before entering.
 - Press the [BACK] button during arming or on the blasting standby screen to discharge.
 - To discharge naturally, turn off the blaster and wait for 10 minutes..
 - ㄴ) To check the blasting results after blasting, enter the blasting site after waiting 10 minutes for the natural discharge time. After 10 minutes, all of the detonation energy is discharged naturally, so it is safe.
- Ensure that the detonator of the unexploded hole is alive only with a logger, and communicate in a safe place in preparation for the risk of explosion.

4.2 lasting alarm display information (display the contents of the main alarm

- TBD

5. Technical support



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FCC

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 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's

authority to operate the equipment.

This device complies with RF exposure requirement.

IC

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

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

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes aux RSS exempts de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes: (1) Cet appareil ne doit pas provoquer d'interférences. (2) Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent provoquer un fonctionnement indésirable de l'appareil.

This device complies with RF exposure requirement.

Cet appareil est conforme à l'exigence d'exposition RF.