HANGIL HC CO., LTD.
www.hangilhc.com

SMART TRAFFIC SYSTEM

HANGIL HC will make a safe walking environment for everyone!

Traffic system specializing company
HANGIL HC CO., LTD.

01 ABOUT US

Better Life with Advanced Technology

We expect a safer life in the high-tech traffic environment created by HANGIL HC!

Corporate objective

1 Preemptive respond to new paradigms

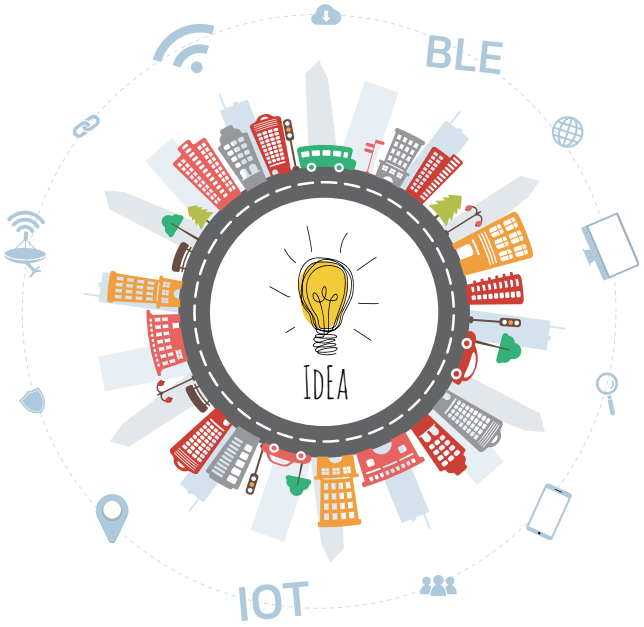
HANGIL HC company, a corporation employee, meets the needs of rapidly changing markets with rigorous client oriented thinking and execution, keeping pace with the information and communication environment that goes into constant technological development and we will implement I.O.T (Internet Of Things) that all products connect the Internet. We promise to undertake the role and responsibility of the industry as a leading provider of transport systems.

2 Accumulated experience and technical competitiveness

In 1999 starting with HANGIL Handy Care company, we had established the " HANGIL H.C " in 2007 through the separation of corporate and telecommunications sectors. Until now, With advancements in technology and advanced technology, we continue to advance our domestic transportation system by introducing advanced technology.

3 Warm interest in the traffic abbreviation

HANGIL HC company is developing products for safe walking environments with careful attention to the delicate parts of them. All transportation related systems and products are aligned to the level for the weak.



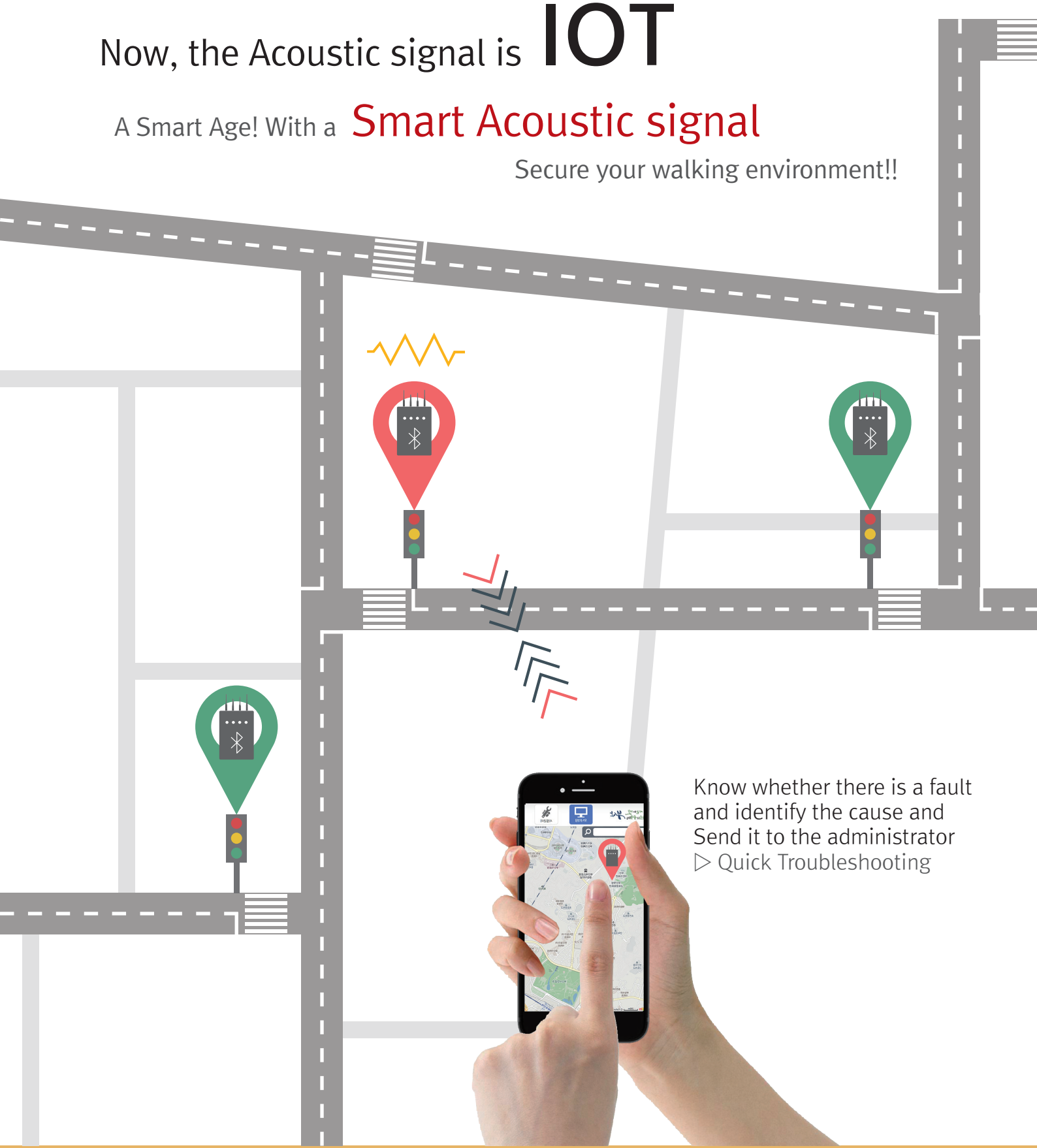
CONTENTS

02 Smart Acoustic Signal Based on IOT

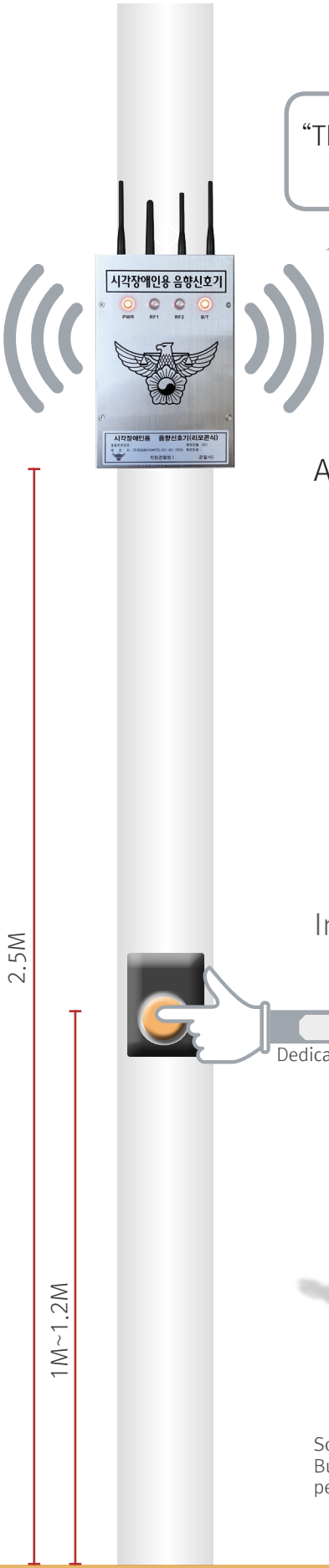
Now, the Acoustic signal is IOT

A Smart Age! With a **Smart Acoustic signal**

Secure your walking environment!!



Know whether there is a fault
and identify the cause and
Send it to the administrator
▷ Quick Troubleshooting



Provides transportation guidance with visual and voice to the busy modern era of IT.

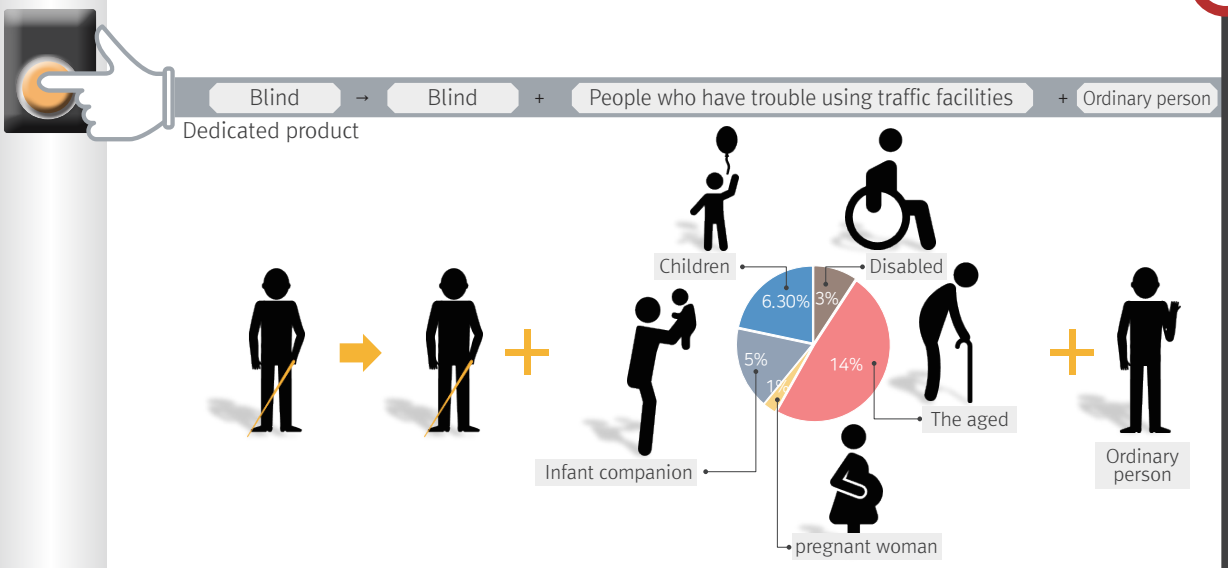
Acoustic Signal Installation Standard

1. Acoustic Signal : Installation at 2.5 M height above the signal lamp towards the road

2. Manual Operation Button :
   Installation on the opposite side of the road 1m to 1.2m above ground.
   Mode of operation : 1. Operate manual operation buttons
   2. Operation of public remote controls for visual impairment

3. Guide Sign : Installation on top of manual operation buttons.

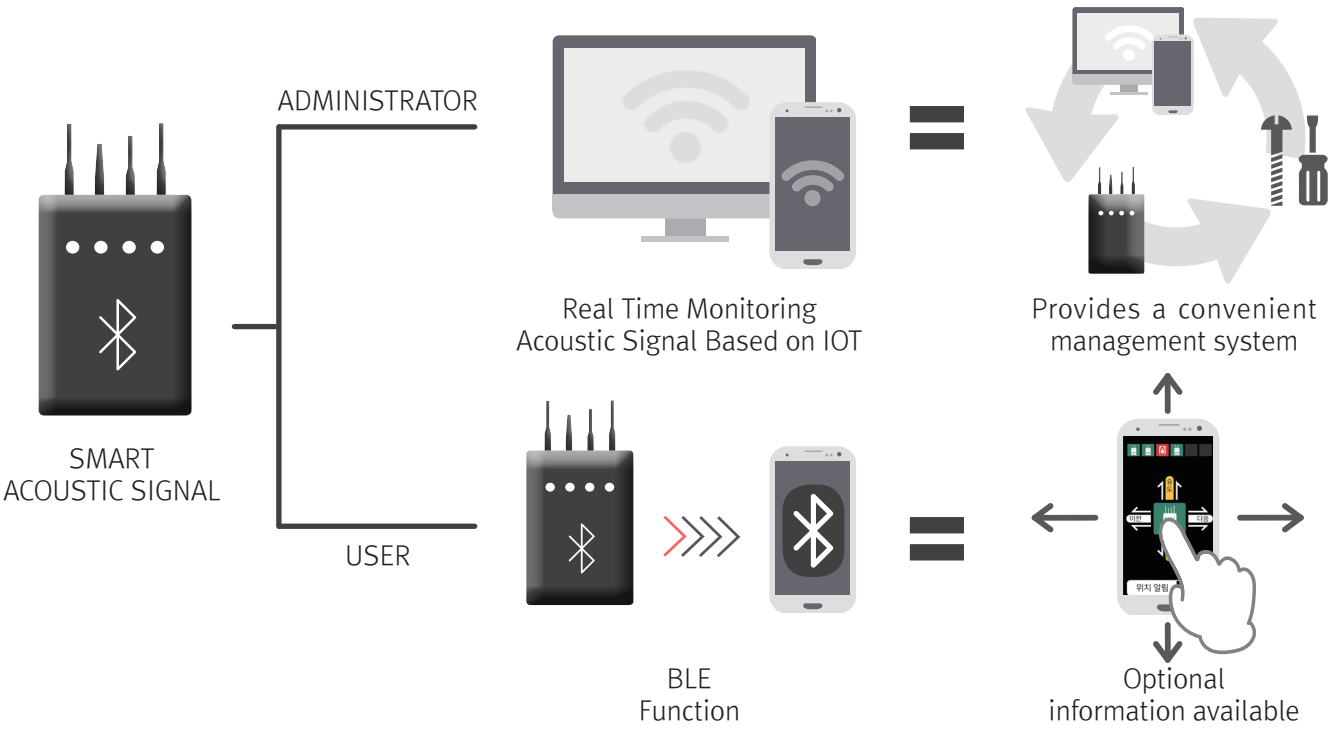
Increased use of Acoustic Signals



So far, the Acoustic signal was limited to the primary purpose of the blind.
But we expect to secure safe transportation culture by extending to the public and ordinary people in the future.

02 Smart Acoustic Signal Based on IOT

Acoustic Signal(HG Smart-18A) Function Diagram



Real Time Monitoring System

This is a managed system that the acoustic signals used by the IOT technology to control acoustic signal with PCs and smartphones are used to determine whether the sound signals are faulty and check. So this enables administrators to conveniently identify and manage information on the information of sound signals by using the IOT wireless Internet network in a PC or smartphone, using the IOT wireless Internet network.

BLE Function

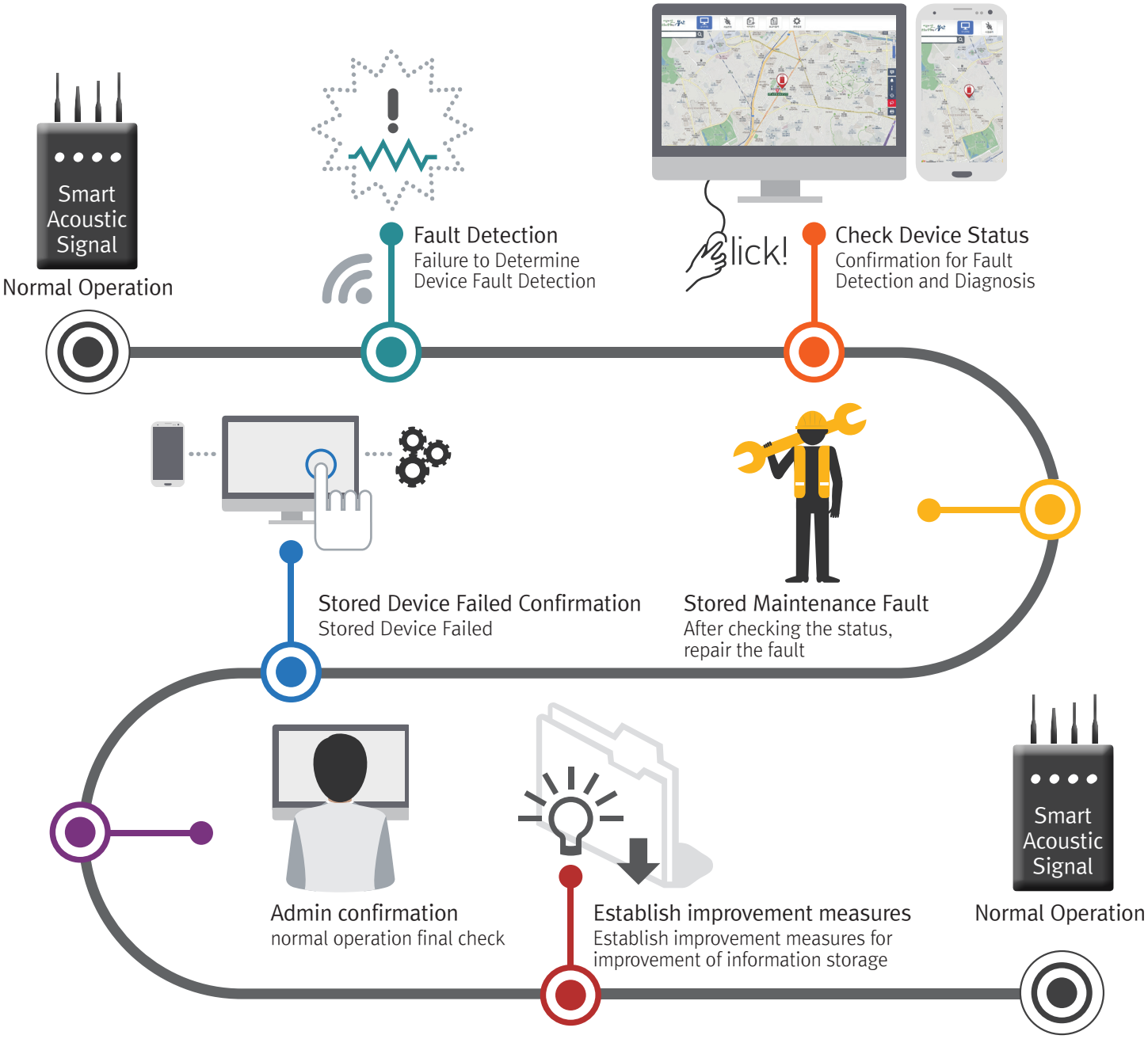
With the addition of BLE function to the acoustic signal and voice inductor, It automatically sends information about devices around the smartphone to the smartphone. Users can select and listen only to the information they need.

Smart Acoustic Signal Product Explanation

Model Name	HG Smart-18A
Function	Connection to the pedestrian signal at the pedestrian crossing, functions of the remote control and manual operation buttons informing the visually handicapped people about location and pedestrian crossing signal status near information.
Advantage	Administrator : Assess whether faults are present or not. So this enables administrators to conveniently identify and manage informationon the information of sound signals by using the IOT wireless Internet network in a PC or smartphone, using the IOT wireless Internet network USER : Public remote control application development allows the smartphone to operate acoustic signals and voice inductor and to selectively listen to the information they need without the need for a public remote control.
IOT based on real time monitoring key function	1. Show map based locations on various management facilities 2. Convenient registration and management of structures 3. Preparation of various statistics and reports 4.Convenient facility and maintenance history management 5. Check real-time status dissemination and processing details
Smart phone application function	1. Quickly figure out location 2. Check facility history on site 3. Using BLE : Users can Selectively listen only to the information they need.
Option	1. Product powder painting 2. LED Button, add the pedestrian button 3. Unable to implement radio management function with Model Name of HG-Smart-18A if exclude IOT module

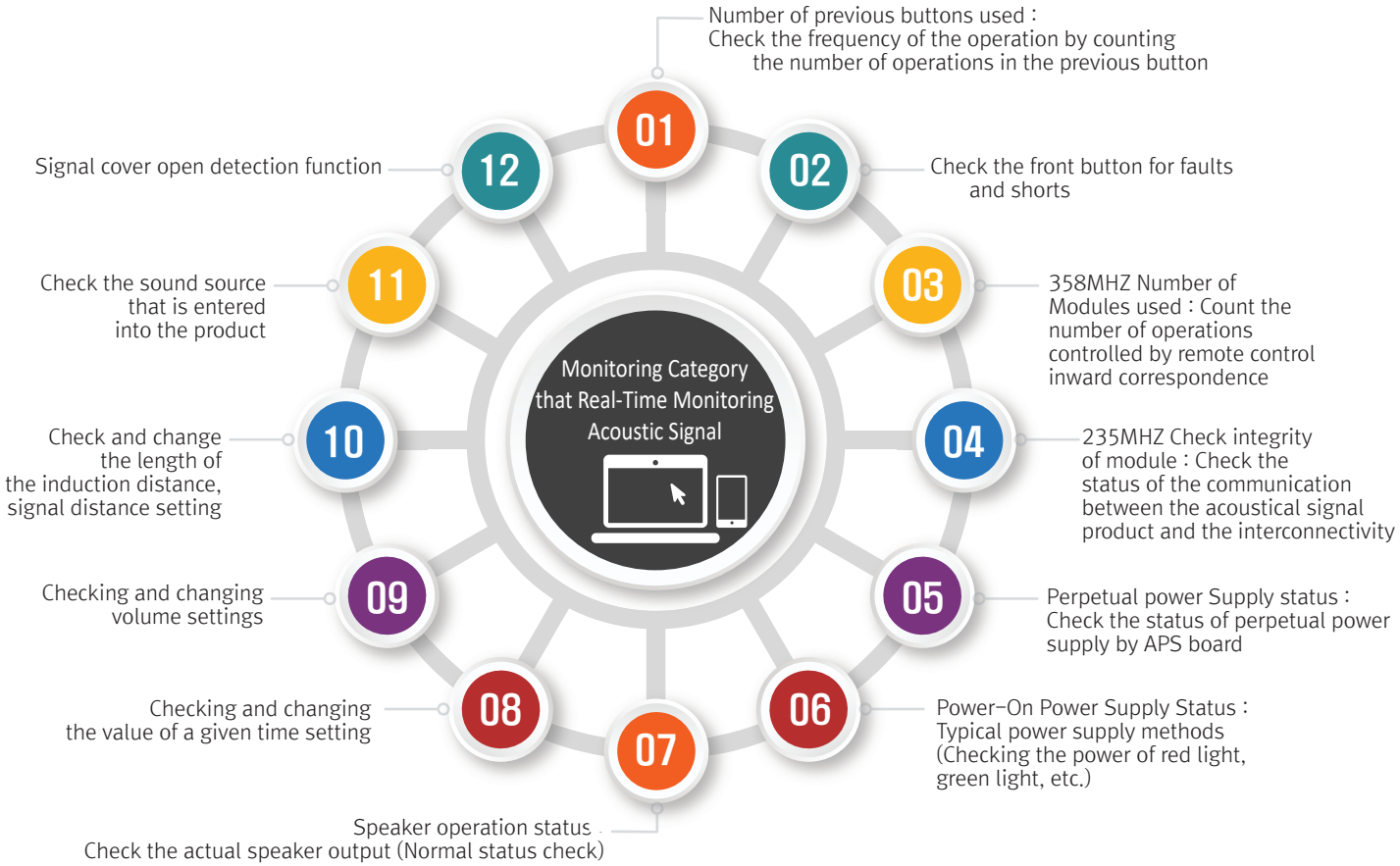
IOT-based real-time monitoring acoustic signal development background

IOT based real time monitoring acoustic signal management system



02 Smart Acoustic Signal Based on IOT

Monitoring Category that Real-Time Monitoring AcousticSignal Based on IOT



Introduction effect that Real Time Monitoring Acoustic Signal system Based on IOT

List	Problems of existing acoustic signal	Real-time monitoring sound signals based on IOT
Failure Status	- General : Unable to identify product failure - Blind person : Difficult to report faults - Identify the failure of the client and identify it as a regular inspection operation only	- Real time monitoring can be automatically monitored - Real-time monitoring of civil affairs with real-time monitoring systems
Facility Management Center	- Many expenses are incurred during regular inspection - Unable to manage proactive management prior to receiving visibility - Unable to locate accurate location and information of facilities - Difficulty in managing operational information and operational history of facilities - Difficulty in identifying utilization patterns of facilities installed - Unable to check real-time inspection and failure	- Real-time monitoring requires no other regular inspection → Lower maintenance costs - Able to repair fault before complaint occurs - Accurate location information, operational information, and fault history of the facility Stored, managed - Management plan can be established by identifying the usage pattern of the installation point - Able to check condition of real-time facility and check for failure handling
Maintenance cooperative company	- Difficulty locating facilities - Difficulty in locating facilities information - Difficulty in transmitting real-time information on site	- Real-time facility placement, information, failure history, etc. - Real-time information transfer between the site and the administrator

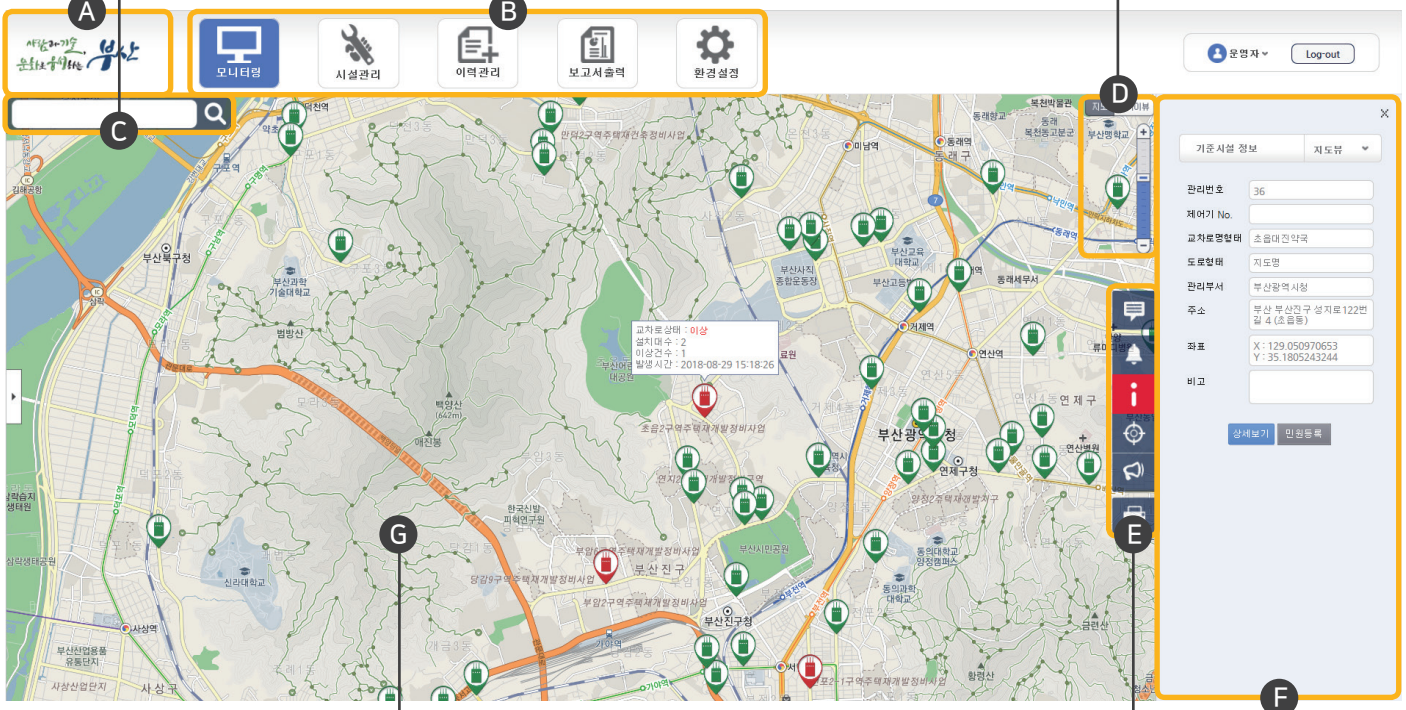
Server – Monitoring main screen

A : Local government logo

C : Facilities Finder, Address Finder Active Button

B : Menu button (Monitoring / Facility Management / History Management / Report Output / Preferences)

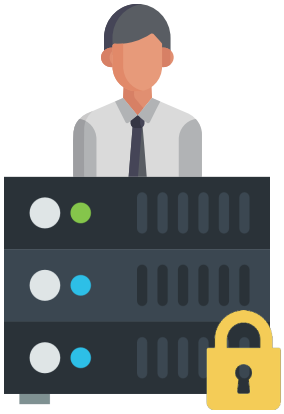
D : Toggle button in map / skyview / load view mode, Zoom control button position



Acoustic Signal Server Management

Information transfer :
The acoustic signaler transmits information to the server through the IOT network once every 4 hours
→ When server is down, send information to next time zone

Server down :
Since the acoustic signal is connected to the traffic signal controller and the traffic light, it is independent of the operation of the acoustic signal



Development workforce
In-house development room : Professional development staff and server administrator resident

Server
In-house server room : Xeon 2.5GHz server, periodic backup

Security
Firewall, SQL Injection against hacking, intrusion detection monitoring in operation

02 Smart Acoustic Signal Based on IOT

BLE Put a Public Remote Control in a Smartphone!

A convenient function for automatically informing about the surrounding device information and selecting and listening to only the required information.

Ambient acoustic signal information is automatically received by the smartphone.
▷ Only listen to the information you need selectively

Development Background of Public Remote Control Application

1. It is inconvenient to have a separate public remote control for the blind to hear the voice coming from the acoustic signal when moving.
2. Multiple operation problems with the existing RF (Public Remote Control) system.
   ▷ Simultaneous operation of the peripheral receiver causing confusion and noise.
3. RF sensitivity plausibility problem with existing RF system voice guidance device.
   ▷ Irregular sensitivity not proportional to the distance between receiver and transmitter
4. The necessity of a product that is compatible with the fourth industrial technology
   ▷ The necessity of voice guidance systems using popular smart phone technologies
5. Remove problems arising from the use of acoustic signals by the blind

Public Remote Control Application

① : Induction button of Acoustic Signal
(Guide to the location of the crosswalk)

② : Signal Button of Acoustic Signal
(Voice guidance for crossing the crosswalk)

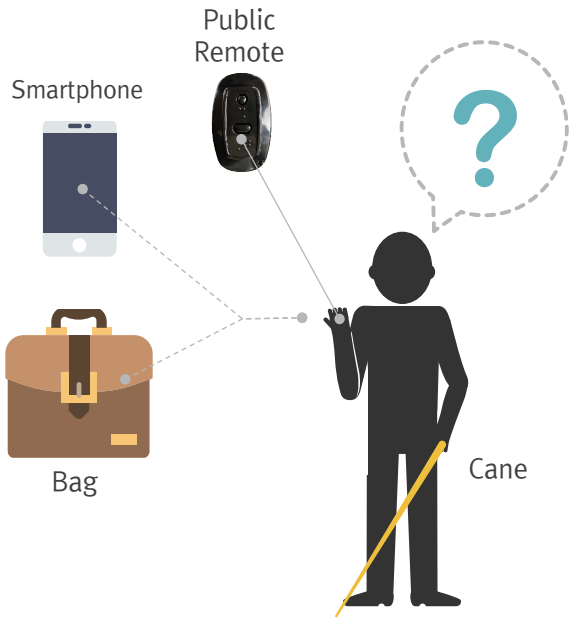
Problems for the Blind

1. Inconvenience of possession
   ▷ Using the public remote control function inserted into the smartphone, the solution is made.

Essential belongings for the blind
A. Staff
B. Public Remote
C. Smartphone
▽
A. Staff
B. Smartphones with Public Remote Apps

2. Unintentional operation of the acoustic signal
   ▷ Resolution through the use of the BLE function.

3. Insufficient connectivity of voice aids for the blind. (Separate operate)
   ▷ Acoustic Signal and Voice Inductor products are compatible with one smartphone application and can be operated by people who are blind directly using the device by selecting the device.

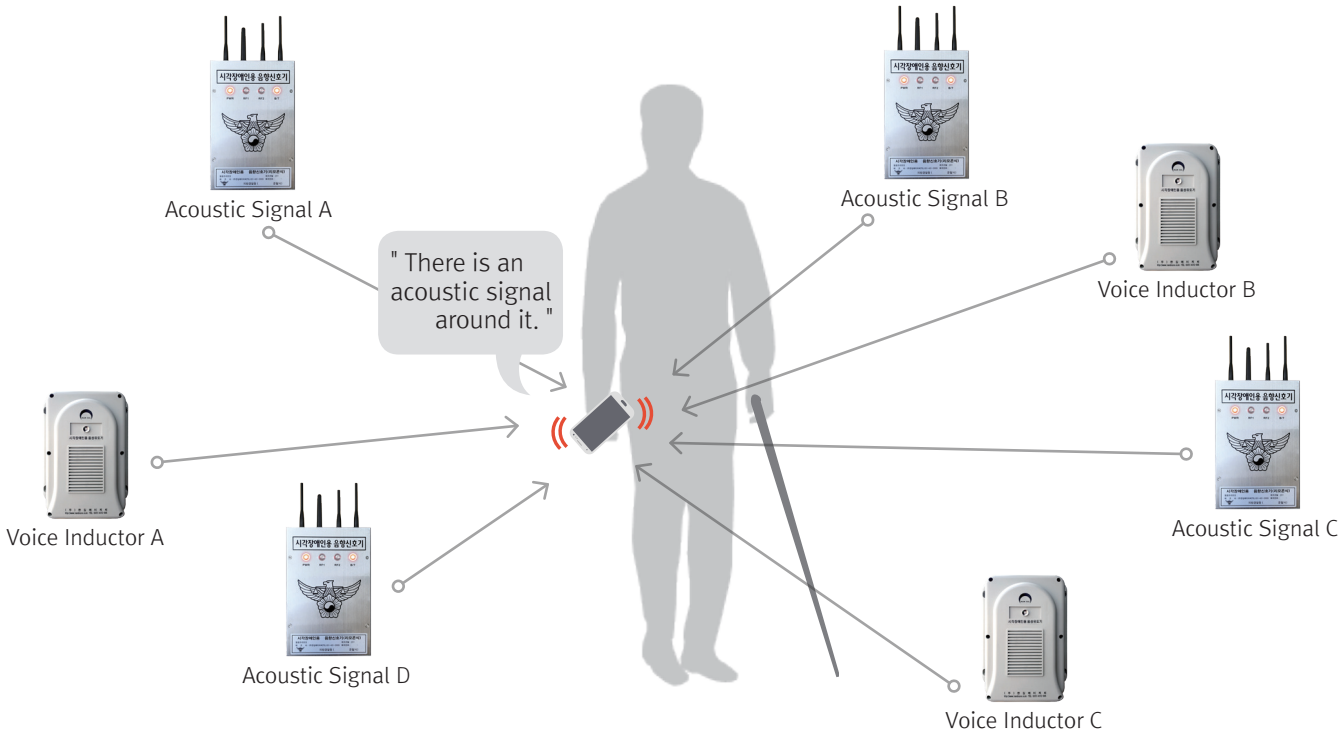


Smartphone usage rate of the visually impaired is about 43%
Future Creation Science Department, Korea Information Society Agency "2014 Information Gap Index and Survey"

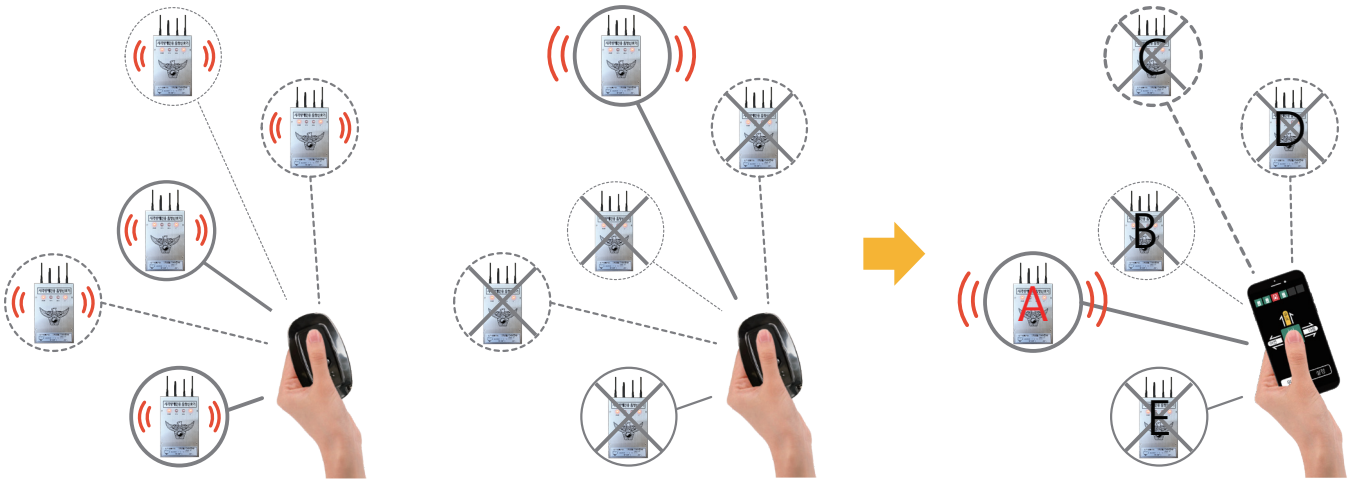
02 Smart Acoustic Signal Based on IOT

BLE – Peripheral device information automatically receives to the application and informs

Automatically recognize nearby devices and list them in your application so you can listen to only the voice you need
→ Improved problem of simultaneous operation of sound signal according to receiving sensitivity regardless of distance / Improving the inconvenience of having a public remote



How smartphone applications work



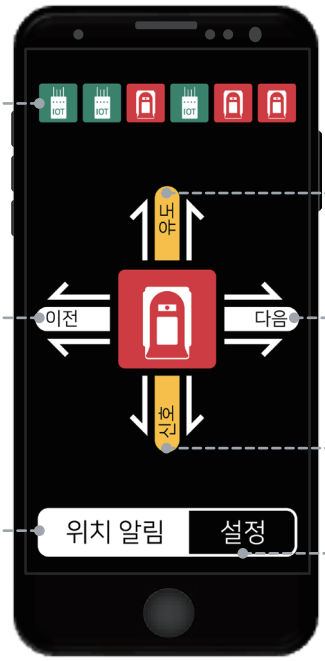
Simultaneous operation of Acoustic signal

Distance-free, long-range operation

Device selection and operation with smartphone

Smartphone application function : Main screen and function

By inserting the function of the public remote control into the application, the IOT acoustic signal and the voice inductor can be operated by the smartphone. Can be used with a public remote control and can easily be operated by a smart phone application without having a public remote control.



Accumulation of information of acoustic signalers and voice inductor around the user

Swipe to the up : Confirm the induced sound of the selected device

Swipe to the left : Confirm the previous device in the list of acoustic signals

Swipe to the right : Confirm the following device in the list of acoustic signals

Swipe to the down : Confirm the signal sound of the selected device

Identify and transfer your current location, request assistance, and check public transportation

Language setting, Check the user's Manual, Scan Function Forced Exit, Select Help Number, Select Contacts to Notify Location

Location notification screen

Show map-based current location

Automatically transfer your location to your existing contacts

Send my location to KakaoTalk

In case of an emergency Call to the registered number (112, 119, Dasan call center, etc.)

Setting screen

Choice of Korean / English

how to use the application → Normal / Talkback mode

Forced termination of scan function : Reduced battery consumption

Specify the telephone number to be automatically connected in case of an emergency (112, 119, Dasan Call Center)

Specify contacts to send my location to

02 Smart Acoustic Signal Based on IOT

Development background of APS boards for permanent power supply

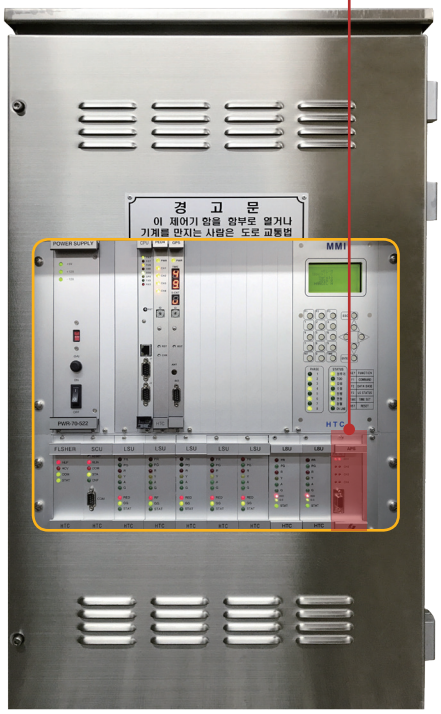
1. When the traffic light is blinking or goes off at night : Acoustic signal not working
   → Walking risk of visually impaired mainly moving at night.
2. AC power supply
   → If you supply AC power to the metal button, the risk of electric shock is very high.

Insert APS board :
Acoustic signal works even when the traffic lights are off

APS board not inserted :
Turn off the acoustic signal when the traffic light is off

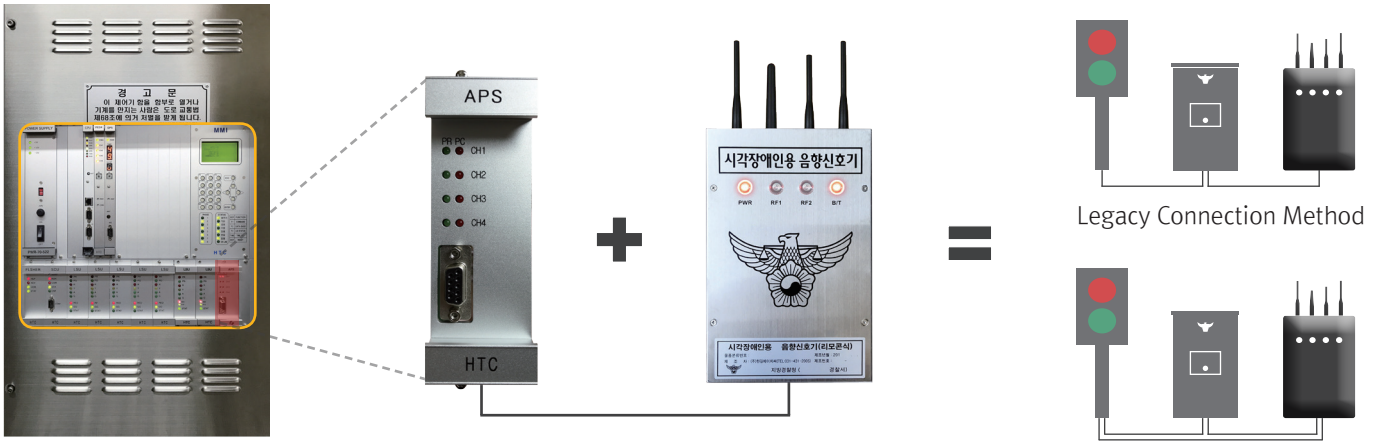
Traffic light off or flashing signal

APS Board :
Always supply power separately from signal lights



Insert APS boards for permanent power supply

APS 보드는 신호등이 점등된 상태에서만 작동을 하는 음향신호기에 상시 전원을 공급해주어 야간 점멸 신호의 경우, 또는 신호등이 소등되었을 경우에도 음향신호기가 정상 작동 할 수 있도록 하는 장치. DC 전원 공급으로 감전의 위험이 없음



Traffic Signal Controller

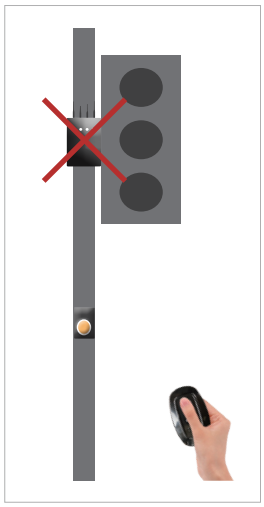
Insert APS Board

Connecting the Acoustic Signals to the APS Board

APS Board Connectivity Effect!

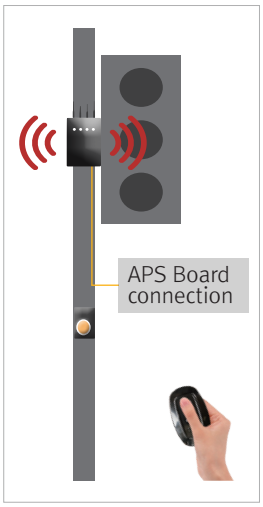
1. Permanent power supply to the acoustic signals independently of the power supply of the traffic light.
2. DC power supply eliminates the risk of electric shock
   (Very high risk of electric shock when AC power is applied to metal buttons)

When general acoustic signal installation



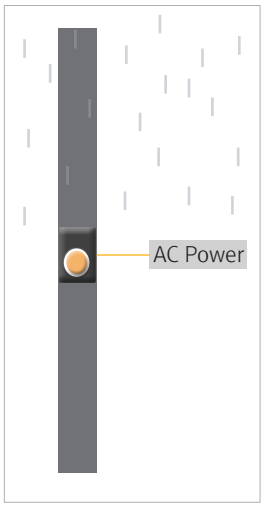
when lights off lights : Acoustic signals inoperative

When additional installing the APS boards on acoustic signals



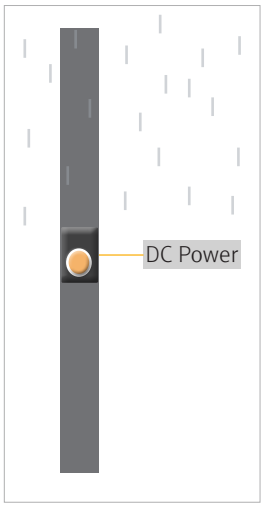
when lights off lights : Acoustic signals operative

When installing the acoustic signal with another company's APS board



AC Power Connection : Very high risk of electric shock

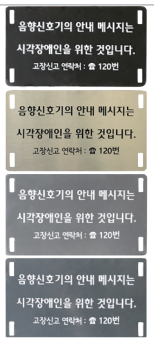
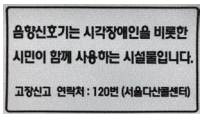
When installing the acoustic signal with our company's APS board



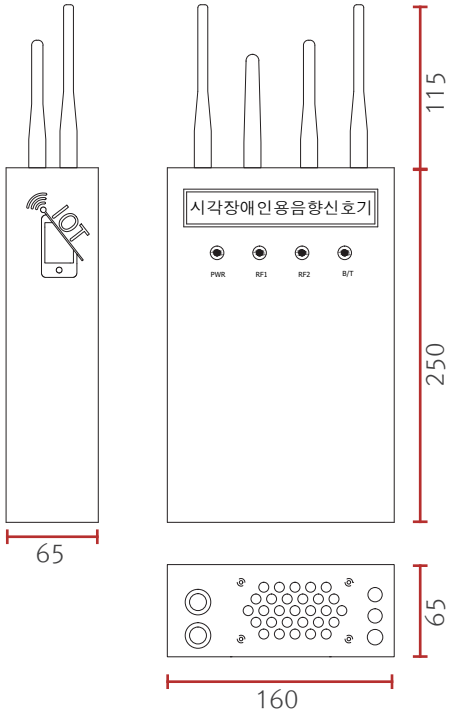
DC Power Connection : No risk of electric shock

02 Smart Acoustic Signal Based on IOT

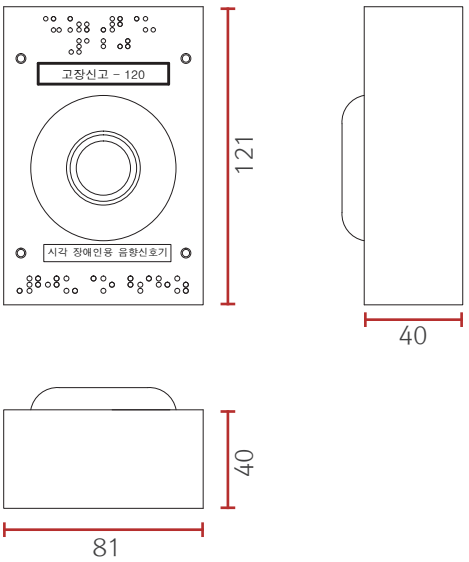
Acoustic signal product photo

			
Acoustic signal	Smart Acoustic signal	General button	
			
LED button (RED)	LED button (GREEN)	Guide board (SUS)	Guide board (Sticker)

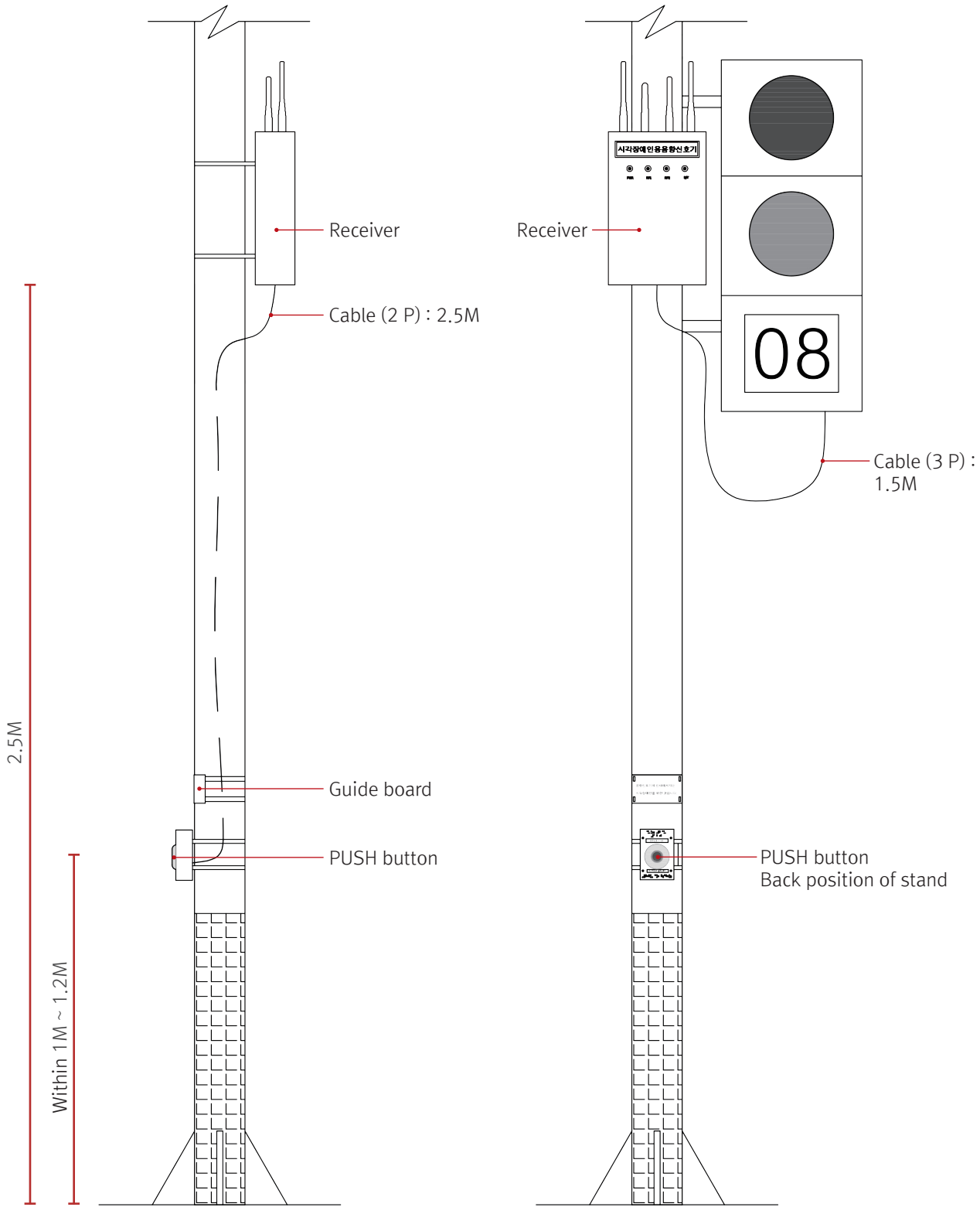
Acoustic signal Drawing



Button Drawing



Acoustic Signal Installation Map

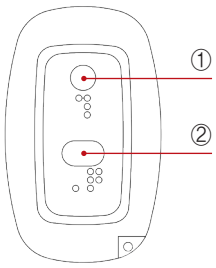


02 Smart Acoustic Signal Based on IOT

Smart Acoustic Signal Performance

Category		Standard	Note
Usage power		SMPS(switching mode power supply) mode 85V~275V power supply	Stable power supply possible
Radio form	235.3000MHz	F(G)2D, F(G)3E 〈FSK〉	
	358.5000MHz	F(G)2D 〈FSK〉	Public remote control
Frequeny	Inward correspondence	235.3000MHz ± 500Hz / 358.5000MHz ± 500Hz	
	Transmit	235.3000MHz ±500Hz	Product Interconnection
Power protection circuit		Hughes&Lightning&Protection circuit& Noise filter& Two way gait protection circuit	
Receiving sensitivity		Less than -100dBm	
Sending output		2~4mW	Public remote control
Control system		TCXO control mode	
Sound output		More than 5W	Remote controller control for administrator
Consumption power		Within 30W	
Receiving distance adjustment		Location Guidance Acoustic : 2 × or Up to 15m wide Signal Guidance Sound : Cross sectional width or up to about 10m ▷ Can be adjusted using a method(HG-administartor)to adjust data with a public remote control	Avoid simultaneous operation noise
Voice Control system		Set location and signal guidance to 70 dB ± 5 dB Variable range : 40 dB to 90 dB (setting for ambient environment) ▷ Timer : Volume adjustment by time zone	Timer Selection Orders
Speech built-in selection system		Cross-reference of girls, male, female, single girl, bird songs, cricket sounds ▷ Use the tip switch to select the desired voice	Remote controller controls for administrators
Front LED display system		Check whether the product is abnormal (Red) -PWR: ON-Normal operation / OFF-Faulty -RF 1: ON-358 During communication / OFF-Communication abnormality -RF 2: ON-235 During communication / OFF-Communication abnormality -B/T: ON-Normal operation / OFF-Button signal input	If public remote control and button turn on, RF 1,2 turn ON
Priority of guidance		-First user priority -Signal guidance sound priority -Cross-strip guide priority	Revised Police Agency Specifications 2009.06.03.14P : Fit
Program system		CPU program system	Can upgrade product
Insert part		SMT (surface mount technology) Apply surface packaging technology	Improved durability and reliability
Quality of the material		SUS304	
Product Size	signal body	(width) 160*(height) 250* (width) 65*	SUS304
	Button (Small)	(width) 80* (height) 120* (width) 40*	SUS304
	Button (Big)	(width) 90* (height) 125* (width) 35*	SUS304
	Sign	(width) 160* (height) 90/130* Size order	SUS304

Public remote control name and functionality

Floor plan	Name	Explanation
	Function	Activate the acoustic signals and voice inductors for the blind.
	Power	DC 12V A23 Battery
	Frequency of use	358.5000MHz
	Sending output	Within 2mW ~ 4mW
	① Button	Voice Inductor : Government office, railway station, etc. Acoustic Signal : Guide to the location of the pedestrian crossing
	② Button	Acoustic Signal : Guide you through the crosswalk by signal.
	Authentication details	Obtain national certification of information and communication services for subsidiaries / Radio certification acquisition

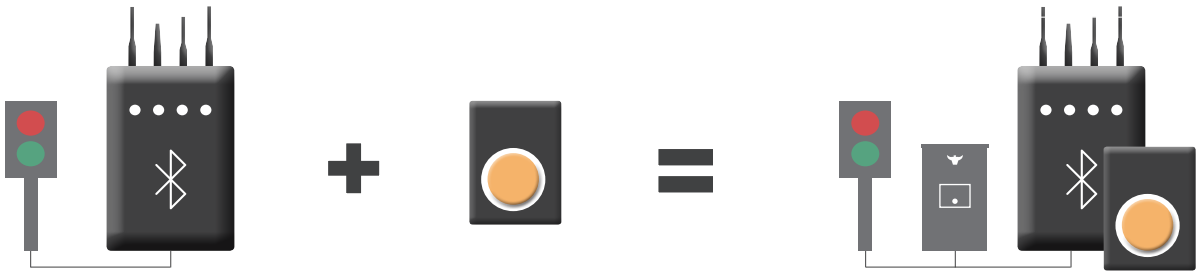
Remote Control Names and Features for the Administrator

Floor Plan	Name	Explanation
	Function	Activate to Acoustic Signal and Voive Inductor
	Setting Mode enter	1. Check the address number corresponding to the device and enter by pressing the numeric pad 2. On entering set mode : " Acoustic signal adjustment mode." Voice check
	볼륨 UP	Volume up when entering setup mode
	볼륨 DN	Volume down when entering setup mode
	시작 시간	Function selection(back) when entering setup mode
	종료 시간	Function selection(next) when entering setup mode
	OK	Setting Mode off
	Red UP & Yellow UP	Increase of receive sensitivity when entering setup mode (Red : +2 / Yellow : +1)
	Red DN & Yellow DN	Decrease of receive sensitivity when entering setup mode (Red : −2 / Yellow : −1)
	V	Selection button to adjust the inductive distance when entering setup mode
	T	Selection button to adjust the signal distance when entering setup mode
	유	Inductive button function : Same as the Public Remote Control ① button
	신	Signal button function : Same as Public remote control ② button

03 Pedestrian Operating Acoustic Signal

Pedestrian Operating Acoustic Signal

It is made up of integral type. The way is that by oneself pressing the button to request. A signal Pedestrian Operating Signal that install on pedestrian walkways where pedestrians are rarely found or at regular intervals is added the function of the acoustic signal for the blind person.
(General acoustic signal is connected to a walking signal. On the other hand , Pedestrian Operating Acoustic Signal is connected to the pedestrian traffic lights and traffic signal controllers.)



Acoustic Signal

Pedestrian Operating Signal

Pedestrian Operating Acoustic Signal

Pedestrian Operating Signal : Normally, pedestrian signals are not functioning properly. Only when a pedestrian is pressed by pressing the button to request a signal, according to signal cycle, pedestrian signal works.

Acoustic Signal : The device is connected to the pedestrian traffic light of crosswalk,which provides an audible reminder of the light emitted by the pedestrian signalling lights.This gives visual guidance to visually impaired people and information on walking signals to facilitate convenient traverse across the road safely.

Pedestrian Operating Acoustic Signal Development background

Advancement of traffic operating system → Expansion of nighttime blinking signal operation
(Turn off pedestrian lights) → Acoustic signal OFF : The visually impaired is exposed to dangerous traffic conditions
(the acoustic signaler operates only when the traffic light is on)

Pedestrian Operating Acoustic Signal Feature of HANGII HC

Pedestrian Operating Acoustic Signal has inserted a APS board of HANGIL HC for the visually impaired to rely on the acoustic signal. This is a device for a safe walking environment in which pedestrian traffic is low and operates normally during nighttime blinking or when the traffic lights are off.
For details of the APS board, see pages 17–18.

Pedestrian Operating Acoustic Signal installation effect

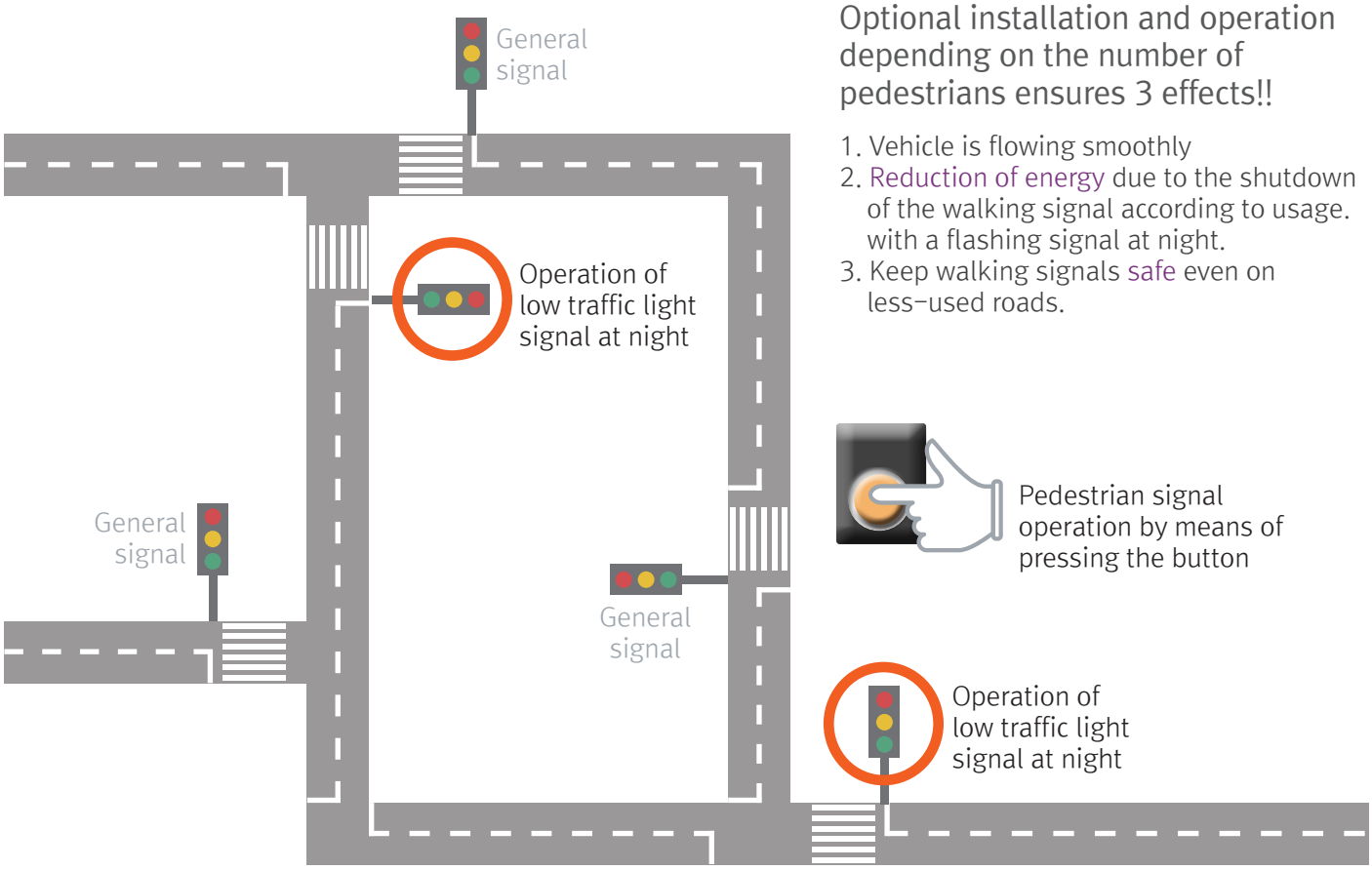
1. Minimize unnecessary traffic waiting for the vehicle at low pedestrian traffic and install to maximize smooth traffic communication effect.
2. Ensuring safe mobility of pedestrians and visually impaired persons using crosswalk reports.
3. Reduced energy due to effective operation of the traffic signal system.
4. LED Button to secure pedestrian visibility at night.
5. Remove inconvenience of drivers, pedestrians and handicapped people.
6. Voice guide sound guidance when working on buttons give us visual and audible traffic guidance.
7. DC power supply eliminates the risk of electric shock.
   (Very high risk of electric shock when AC power is applied to metal buttons)

04 Pedestrian Operating Signal

Pedestrian operating signal

Signal installed for pedestrian to cross walk on rare or time-limited pedestrian walkways, such as pressing a button on one's own during a pedestrian crossing

Pedestrian operating signal Concept diagram



Optional installation and operation depending on the number of pedestrians ensures 3 effects!!

1. Vehicle is flowing smoothly
2. Reduction of energy due to the shutdown of the walking signal according to usage. with a flashing signal at night.
3. Keep walking signals safe even on less-used roads.

Pedestrian Operating Signal Installation Effect

1. Minimize unnecessary traffic waiting for the vehicle at low pedestrian traffic and Install to maximize traffic communication effect.
2. To secure safety of pedestrians using pedestrian walkways.
3. Reduced energy due to effective operation of the traffic signal system.
4. Reduce Driver's Traffic Law.
5. Drivers and pedestrians get rid of inconveniences.

04 Pedestrian Operating Signal

Pedestrian Operating Signal Development Background

The pedestrian signal located in a single row provide a pedestrian signal every cycle provided by the preset values in the local controller and in case of a single low pedestrian traffic, there has been an inefficient aspect of signal operations By providing pedestrian signals even if there is no pedestrian. Due to this, when pedestrians did not exist, drivers were forced to experience unnecessary signal waiting time. Consequently, Motorist passing through a crosswalk and in violation of the signal are produced. So it is made a criminal offender. To enhance pedestrian protection and pedestrian signal efficiency, a pedestrian operation signal was installed.

The reason that a pedestrian operation signal installation is required.

1. If the vehicle lights are flashing overnight
2. A pedestrian crossing that is located in the children's protection area, with the exception of a specific time zone, where the usual amount of pedestrian traffic is not high
3. The area where the traffic volume of pedestrians is not high on general national roads or in provincial areas, however, it is necessary to cross the road and therefore a signal is installed on it
4. The point of intersection of pedestrian traffic fall short of the standard of signal installation, but the location of the signal is installed according to other installation criteria.
5. Pedestrian traffic may not reach the traffic signal installation standards, but other installation criteria may cause traffic on minor roads to be cleared at any non-route crossing point within one cycle (Minimum green time for the given disclosure if there is no sign of a pedestrian request) even at signalized intersections (3 or 4)
6. A point where the street-activated signals can significantly improve traffic congestion on the main road and reduce the time on minor roads without adverse effects.
7. If it is recognized to be necessary to facilitate the communication of vehicles with other pedestrians

Operation of pedestrian operating signal

Normal condition
Red light

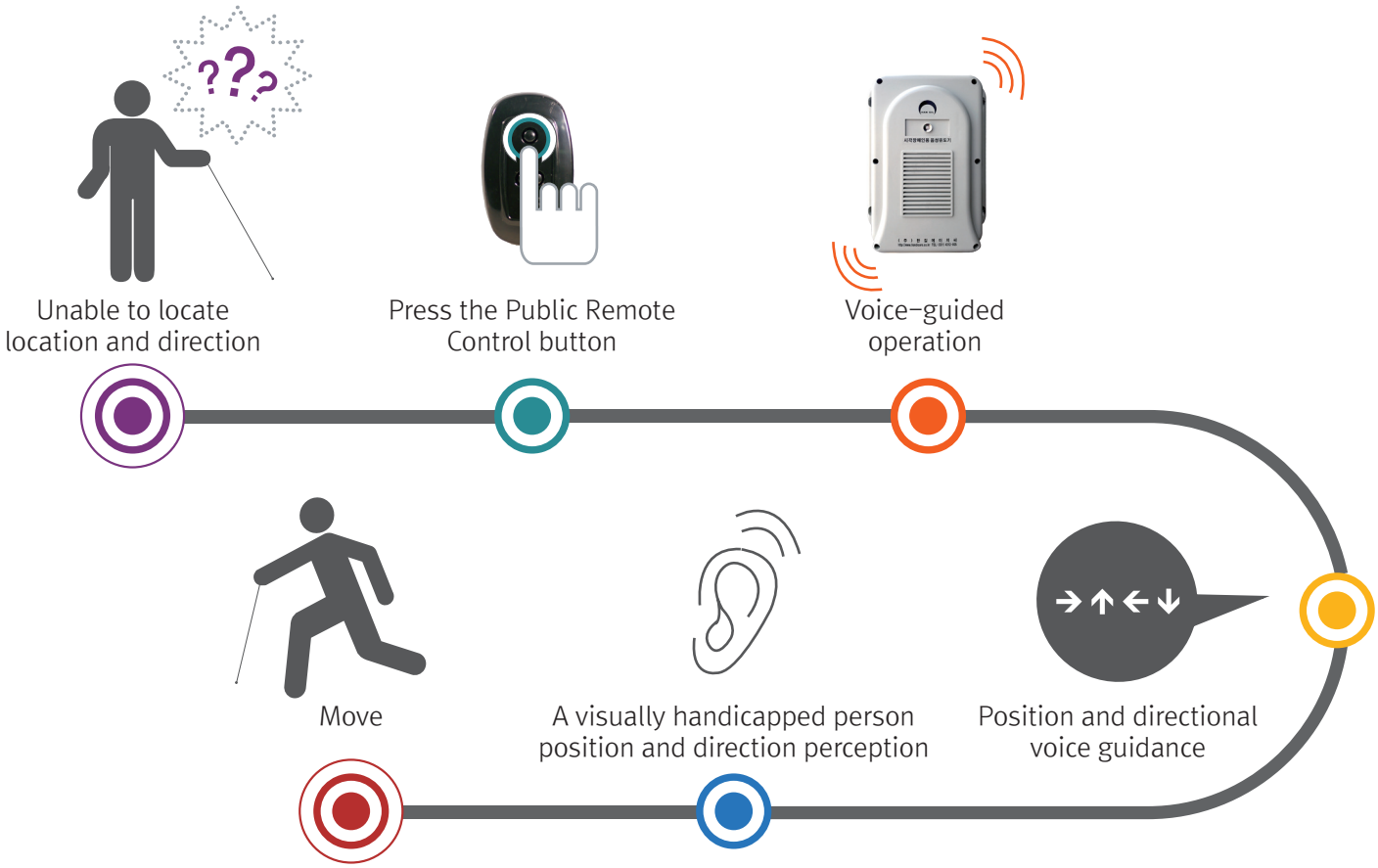
Button operation
Red lamp flashing

When walking signal
signs Green light

Voice Inductor

When the visually impaired is moved, attach it to the public transportation facility and the entrance to the building.
So they can check their location or whereabouts through sound, sound, melody.
For that reason, this equipment is designed for visually impaired people.

Voice Inductor Operation

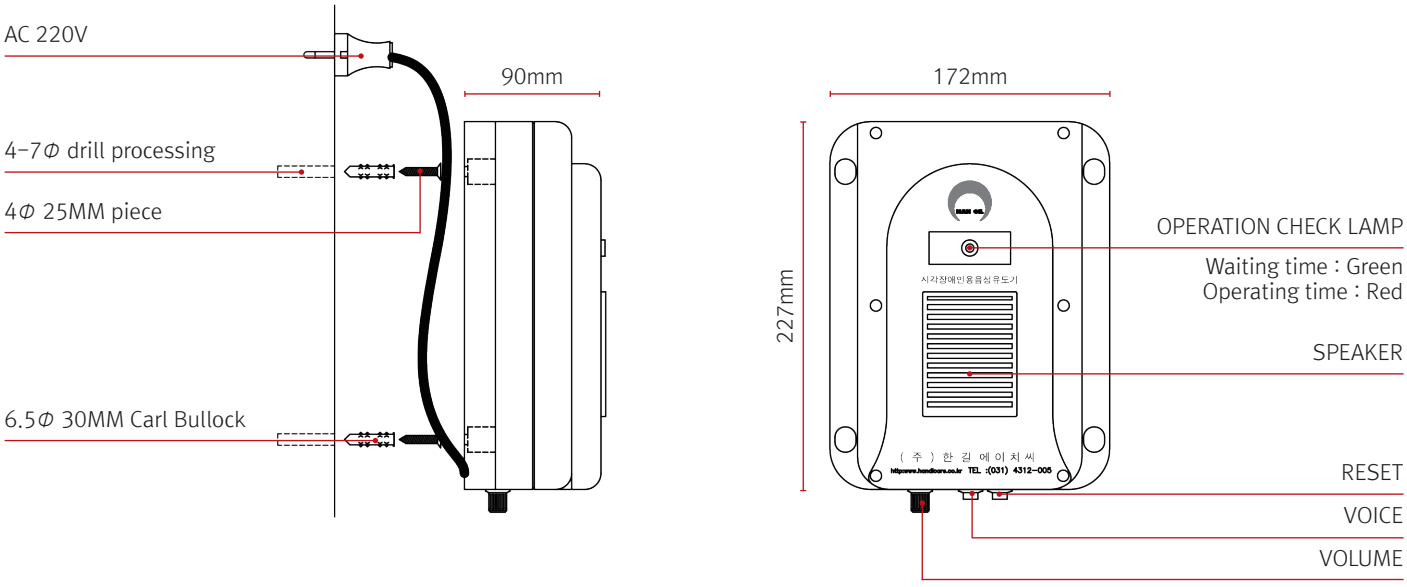


Voice Inductor Characteristics

1. Information and Communication Organizations Standard (Visually handicapped people Voice inductor Radio specification, TTAS, KO-06.0046/R3) and Wireless Specifications Standard Compliance
2. Products certified according to the criteria of KC certification (National Integrated Certification System)
3. Complies with the performance standards of the functional apparatus of the induction signal apparatus
4. TTA Compliance with conformance test specifications
5. Korea Institute of Machinery and Materials Research Institute of Electrical and Electronic Minorities National recognition of authorized agencies
6. Field strength adjustment allows field strength to be adjusted to 32 phases using remote controller for field conditions.
7. Range tuning voice amplitude sequential operation (Starting Time End Time) auto reset function with remote reset function controlled by remote control

05 Voice Inductor

Voice Inductor floor plan



Voice Inductor Name and Function

Name	Explanation
LED Lamp	Install LED on the front of the voice inductor, so visually check whether or not to operate.
Distance Adjustment	Operating distances can be divided into 32 stages according to project conditions. Avoids proximity and redundancy.
Receiving Antenna	Receive signal from public control.
Order Application Switch	Apply priority operations to the product to avoid simultaneous operation.
CPU Chip	Program storage device.
Sound Chip	A chip that allows you to record the contents of a safety facility separately from 0 to 60 seconds in relation to the safety facility.
Charging Terminal	If a permanent power source (220 V) shuts down or is not available, use an external battery to connect the product to a DC (12 volts) drive.
Sensor Connection Terminal	Terminals that connect various sensors. (human body detection, infrared heat detection)
External Switch Connection Terminals	Product drive when connecting separate switch.
Volume Regulation	Control tone of voice.
Power Connecting Terminal	Always connect with permanent power AC 220V.

Voice Inductor Performance

Category		Standard	Note
Usage power		85V~275V SMPS(switching mode power supply)	Stable power supply possible
Input power	Inward correspondence	AC220V 60HZ	
	Transmit	DC 12V	Public remote control
Frequeny	Inward correspondence	358.5000MHz±500Hz	
	Transmit	358.5000MHz±500Hz	Public remote control
Radio form		358.5000MHz – F(G)2D 〈FSK〉	
Power protection circuit		Hughes & Lightning Protection Circuit & Noise filters	
Receiving sensitivity		Less than –100.0dBm	
Control system		TCXO control system	
Consumption current		Within 30mA	
Consumption power		Within 8w	
Operating temperature		–33~+74℃	
Operating distance		SELECTIVE 32steps	
Sending output		2mW~4mW	
Receiving distance adjustment		Reminder Acoustic : Remote Control Motion at approximately 5M distance from receiver (Considering the radio wave characteristics and site conditions, set the site accordingly.) ▷ Entering, adjusting, and adjusting data with wireless remote control	Simultaneous operation, excessive noise protection
Voice control system		1. Room : 0~120dB (40 dB recommend) 2. Outdoor : 0~120dB (60 dB AM 07:00 ~ PM 7:00(±10min) /40dB PM7:00 ~ AM07:00(±10min) recommend) ▷ Timer: Volume Adjustment by Time Zone	Timer Selection Orders
Voice-enabled alerting system		An audible reminder and a functional reminder sound of each product are embedded in the sound chip itself. ▷ Taking the status of the product into a voice to guide management	
Front LED display system		LED Green ON: Power ON LED Red ON: 358 Inward Correspondence LED Green Blinking: Setting Mode	
Program mode		CPU Program Mode	Can upgrade product
Insert part		Apply SMT(surface mount technology) surface packaging technology	Improved durability and reliability
Product size	Receiver	(width) 172* (height) 227* (width) 90±5	ABS
	Transmitter	(width) 37* (height) 61* (width) 15±5	
	B/T BOX	(width) 80* (height) 120* (width) 40±5	

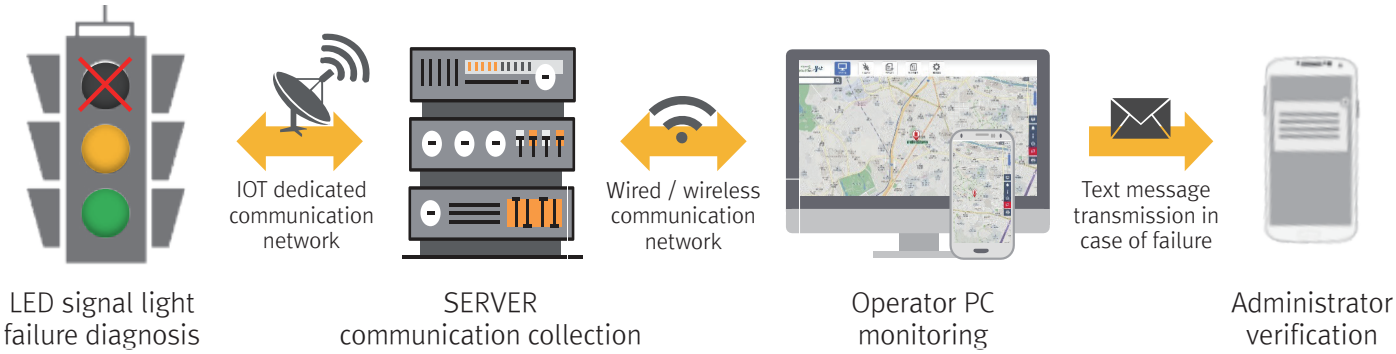
06 LED Traffic Lights to diagnose faults

General traffic lights

Traffic lights are devices that refer to signals such as progress, suspension to secure traffic safety or facilitate traffic flow. Using for LED, it is possible to increase life expectancy and enhance the visibility. Even though some of the LED fail, the entire signal lamp does not extinguish. So it improves driving stability.

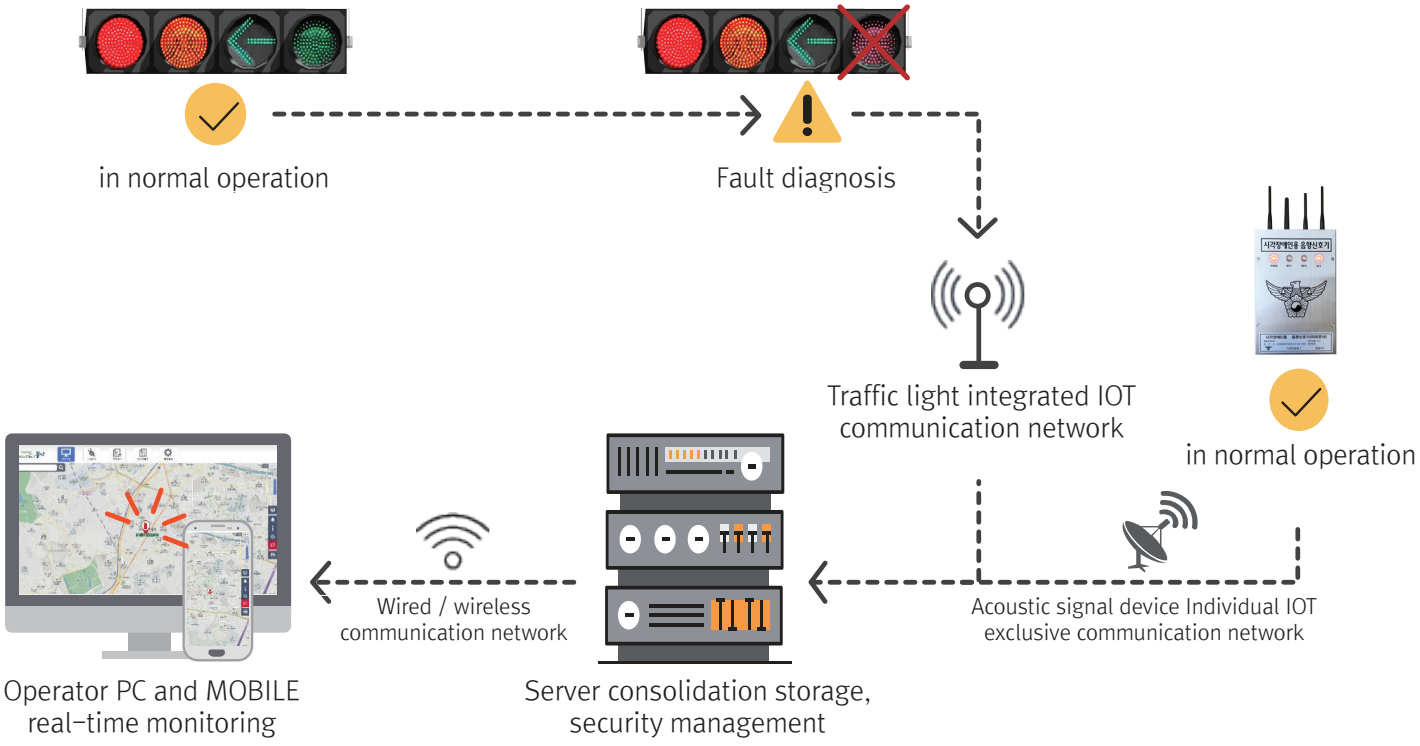
LED Traffic Lights to diagnose faults based IOT

- When the signal lamp lights up, it can judge the failure of the LED element by itself and transmit it to the server through the IOT communication network so that it can be monitored in real time
- Reminder when the failure rate reaches the pre-specified percentage → Preemptive repair before signal failure

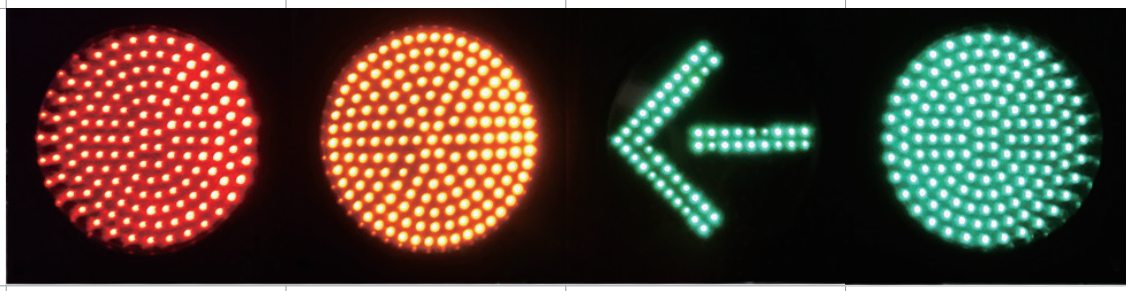


IOT-based traffic system concept diagram (when installed with IOT acoustic signal system)

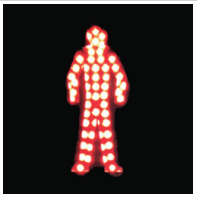
- When installed with IOT acoustic signal, IOT network of the acoustic signal is shared with the server, so there is no additional fee.
- GOTEWAY required for IOT network when IOT signal lamp is installed separately



LED Traffic Signal Specification

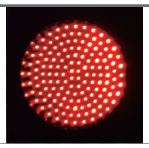
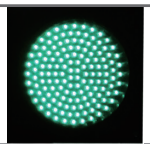
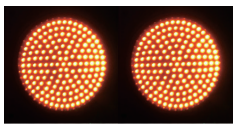
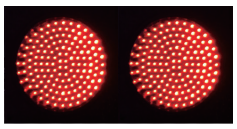
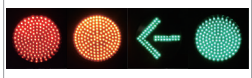
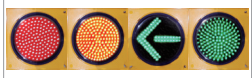
Classification	Red light	Yellow light	Green light Left (right) rotary signal lamp	Green light
Photo				
Model Name	HLS-7011-R	HLS-7012-Y	HLS-7014-A	HLS-7013-G
Standard	350x350x150	350x350x150	350x350x150	350x350x150
Consumption Power	6.97W	6.78W	3.4W	6.06W
Power Compatibility	-1.3%	0.35	-0.7%	-0.8%
Power Factor	0.94	0.94	0.94	0.92
Harmonic Inclusion Ratio	21.0%	21.0%	18.7%	22.2%
Luminous Distribution	616cd	554cd	9994cd	545cd
Operating Temperature	-30℃~70℃	-30℃~70℃	-30℃~70℃	-30℃~70℃

LED Walkling Signal Light Specification

Classification	Walking Red Light	Walking Green Light
Photo		
Model Name	HLS7015-PR	HLS7016-PG
Standard	350x350x150	350x350x150
Consumption Power	4.04W	4.4W
Power Compatibility	-0.8%	-0.8%
Power Factor	0.94	0.96
Harmonic Inclusion Ratio	24.4%	14.5%
Luminous Distribution	1011~3246cd	1116~3146cd
Operating Temperature	-30℃~70℃	-30℃~70℃

06 LED Traffic Lights to diagnose faults

Public Procurement Service Korea Online EProcurement System Product Registration Information

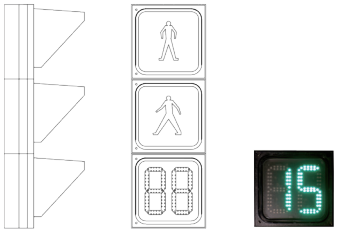
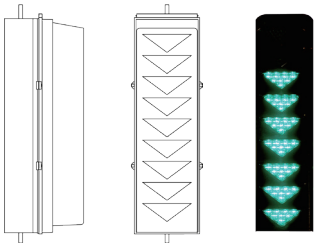
Photo					
Model Name	HLS7001-R	HLS7002-Y	HLS7003-G	HLS7004-A	HLS7005-PR
Configuration	Red	Yellow	Arrow	Green	Walking Red
Identification No	23464207	23464208	23464209	23464210	23464211
Photo					
Model Name	HLS7006-PG	HLS7520-RG	HLS7210-YY	HLS7410-RG	HLS7220-RR
Configuration	Walking Green	Walking (Red/Green)	Yellow / Yellow	Red / Green	Red / Red
Identification No	23464212	23464202	23464204	23464205	23464206
Photo					
Model Name	HLS7300-3C	HLS7310-3A	HLS7200-YYY	HLS7400-4C	HLSC7803-NP3C
Configuration	Red/Yellow/Green	Red/Yellow/Arrow	Yellow/Yellow/Yellow	Red/Yellow/Arrow/Green	Red/Green/Number
Identification No	23464200	23464201	23464203	23464199	23464213
Photo					
Model Name	HLS7001-SZ-R	HLS7002-SZ-Y	HLS7003-SZ-G	HLS7004-SZ-A	HLS7005-SZ-PR
Configuration	Red	Yellow	Arrow	Green	Walking Red
Identification No	23464222	23464223	23464224	23464225	23464226
Photo					
Model Name	HLS7006-SZ-PG	HLS7520-SZ-RG	HLS7210-SZ-YY	HLS7410-SZ-RG	HLS7220-SZ-RR
Configuration	Walking Green	Walking (Red/Green)	Yellow / Yellow	Red / Green	Red / Red
Identification No	23464227	23464217	23464219	23464220	23464221
Photo					
Model Name	HLS7300-SZ-3C	HLS7310-SZ-3A	HLS7200-SZ-YYY	HLS7400-SZ-4C	HLSC7803-SZ-NP3C
Configuration	Red/Yellow/Green	Red/Yellow/Arrow	Yellow/Yellow/Yellow	Red/Yellow/Arrow/Green	Red/Green/Number
Identification No	23464215	23464216	23464218	23464214	23464228

Remaining time indicator

An LED auxiliary device that is installed with a pedestrian signal installed on a pedestrian crossing, with a green flash signal indicating the correct time to cross the pedestrian crossing to ensure that the pedestrian cross can be safely.

- Installable point
  1. More than Round six lane, installation on crosswalk that is frequent pedestrian traffic and Pedestrian accident.
  2. Less than Round six lane, if you need to set up a safe installation, it is possible in accordance with the decisions of the competent police agency.

Remaining Time Indicator Specification

Classification	Numbering type Remaining time indicator	Graphic type Remaining time indicator
Photo		
Input power	- AC110V/220V(FREE VOLTAGE) - Input voltage - AC 110V : 88V ~ 121V - AC 220V : 176V ~ 242V	- AC110V/220V(FREE VOLTAGE) - Input voltage - AC 110V : 88V ~ 121V - AC 220V : 176V ~ 242V
Output power	- MAIN + LED MODULE Driving voltage DC + 5V - Power : MAIN + LED MODULE 12W	- MAIN + LED MODULE Driving voltage DC + 5V - Power : MAIN + LED MODULE 12W
Power factor	- More than 0.9 (0.9)	- More than 0.9 (0.9)
Signal period change	- Automatic recognition → Accurately remaining time indication according to changing traffic cycle depending on traffic conditions.	- Automatic recognition → Accurately remaining time indication according to changing traffic cycle depending on traffic conditions.
Consumption power	- Low power consumption	- Low power consumption
Moving installation	- Moving installation possible	- Moving installation possible
Total higher harmonics	- Less than 40% (32%)	- Less than 40% (32%)
Mark	- Remaining time number	- Nine inverted triangle patterns
Module	- Number shape Size - B : 240±5mm x L : 220±5mm	- More than minimum 8 modules, Same module size
Operation	- Walking light green flashing and Simultaneity starting - If the red light turn on, disappear the number signa within 3 seconds - Turn off during red light	- Walking green light and Simultaneity (Switch-off the green flash signal equal to the number of modules divided by the number of modules) - During the red light off
Enclosure	- Same as the height of the walking light (1 color light)	- Same as the height of the walking light or small (2 colour light) - Front display window and Back panel a warship integral
Installation location	Installation for lower section in traditional pedestrian light 1. Depending on site conditions, installation can be installed 2. In view of appearances, attach to match traditional pedestrian light	Installing in space between walking light landowners

08 Traffic Signal Controller

Traffic Signal Controller

A warship (Waterproofing)	
Central processing unit(CPU) – Signal master control section (MCU : Main Control Unit)	Central processing unit(CPU) – Signal beacon unit (SCU : Signal Control Unit)
1. Information processing of traffic conditions including detector data 2. Controlled algorithm treatment 3. Communication with the central control center 4. Operator input device(MMI : Man Machine Interface) Connection	1. Turn on/off traffic lights exclusive charge according to commands from the main control department 2. Increased stability of the system through safety control functions that perform primary signal output control in the event of a failure of the primary control plane

- HTC-7100 WPVNADMS 2010 Observance for revised standard by the National Police Agency Traffic Signal Controller
- Assurance of reliability through inspection of authorized institutions or national authorized testing institutions authorized by this standard according to the testing and inspection criteria provided by the Tester
- Stable operation exposed to external traffic sites
- Construct a circuit using a semi element that is resistant to temperature and humidity changes
- Minimize damage caused by voltage and lightning, including protection circuitry

Traffic Signal Controller Product Classification

Traffic signal controller			
Standard controller			General controller
			
A fundamental form HTC-7100 A-TYPE	Slim type HTC-7500 BS-TYPE	Small type	General type HTC-7100
- Double-shaped surface treatment - Highlighting in the form of multi-factor and curved processing - Minimizing a pedestal and occupied space of the road. - Multi-color using	- Construct one side of both sides in a plane and attach it to another facility. - Lower cost of controller installation - Minimizing a pedestal and occupied space of the road. - Multi-color using	- Double-shaped surface treatment - Highlighting in the form of multi-factor and curved processing - Minimizing a pedestal and occupied space of the road. - Multi-color using	- Universal using - Rectangular shape

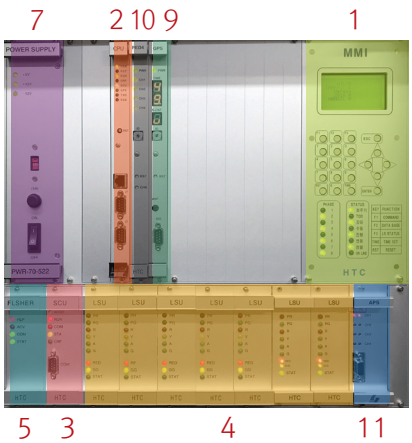
Traffic Signal Controller Product Specifications

Category	Standard
Normal type size	H1000*W580*D448
Slim type size	H1205*W348*D320
Material and thickness	Cooling-rolled iron sheet more than 2.0mm
Input power	DC +5V(8A), DC +12V(3A), DC -12V(1A)
Insulation resistance	DC500V= More than10㏁
Operating temperature	-34℃~+74℃
CPU	More than 32bit processor / More than Operating frequency 180MHz
Memory	SRAM: More than 64MB, FLASH : More than 8MB
Number of Communication Ports	Ethernet 1 port, RS 232C 6 ports
Communication speed	38.400bps
relative humidity	Maximum 95%(+4.4℃~+44.0℃)
LOOP channel	4 channel, 8 channel
Satellite receiver	VME Bus Interface Method, Time Accuracy : 200 ms
Output circuit	6 electric circuit = 48 Output

Traffic Signal Controller Product Function

1. National Standards Traffic Signal Controller
2. Central Remote Control via Online
3. Real time control via traffic information and detector
4. Left-hand response control function
5. The maximum emission rate response control, the response control, Pedestrian response control
6. Front blocking control
7. Special Control Functions and Manual control function
8. 3 or 4 color equalization control function

Traffic Signal Controller Board Layout



1. MMI
2. MCU
3. SCU
4. LSU
5. FLASH
6. MODEM
7. POWER SUPPLY
8. LOOP
9. GPS
10. PIO
11. APS

08 Traffic Signal Controller

Standard Traffic Signal Controller Board Module

Classification	Function	Detail Specification
MMI	– Correcting / modifying data with keyboard manipulation. – Checking the status of the controller.	– Input Power : +5VDC – Connection mode : Serial communication – Key Scan Time : Within 17m
MCU (TCP/IP)	– Signal control and Calculation of detector information. – Online / Offline Control and Induction control (TOP / IP communication)	– OS : Linux – CPU : AT91SAM9260 32bit ,180MHZ FLASH Memory : 8 Mbyte SDRAM Memory : 64 Mbyte
MCU	– Signal control and Calculation of detector information. – Online / Offline Control and Induction control	– OS : Linux – CPU : AT91SAM9260 32bit ,180MHZ FLASH Memory : 8 Mbyte SDRAM Memory : 64 Mbyte
SCU	– Registered drive and Signal inconsistency detection – function by controlling LSU	– CPU : ARM series 32 bit micro-processor 50MHZ FLASH memory : 256 Kbyte SRAM memory : 64 Kbyte
LSU	– A device that controls the alternating current output of the signal lamp	– Rated voltage : 110 / 220V plus LSU 8 = 48 output – Leak current : 8 mA (110 VAC) minimum – Output circuit : 6 (G.R.R.M.P.P.) Circuit
FLASH	– DC power abnormality, Controller board error, Blinking Instructions from controller boards, A device that flashes the signal light by independent power, when instructed to flash LSU board	– Input Power : +5V, ±12VDC – Connection mode : Serial communication – Key Scan Time : Within 17m
MODEM (PSTN)	– As Frequency modulated device, Card type communication device that data communication is possible during the control central unit and traffic signal period	– Control time connection signal : RS232C signal system – Date rate : PSTN 2,400 bps
MODEM (optical)	– As Frequency modulated device, Card type communication device that data communication is possible during the control central unit and traffic signal period (Optical communication method)	– Control time connection signal : 10/100 base Ethernet LAN
POWER SUPPLY	– Input AC power (110 / 220 volts) entered DC power (+5V, ±12VDC) to the controller	– Input Voltage : 110 / 220 V, – Output voltage : DC+5V, ±12 VDC – Load rate : not less than ±5 % of the output voltage
LOOP	– Determination whether passing vehicles are in conjunction with the roof coils. – Open circuit detected by roof coils	– Input channel number : 4 channels per card – Used power : DC 12V ± 10 % DC 5 V
GPS	– Receives time information from satellites	– Interface : VME BUS back – Provide time information using for the built-in RTC to provide time information if there is no satellite
PIO	– Activity-action signal recognition	– Interface : VME BUS back – Input channel : 4-channel pedestrian operation signal button support
APS	– Permanent Power supply to pedestrian assist devices	

HANGIL HC CO., LTD

As a leading-edge transportation system specializing in advanced transportation systems and technology,
we are leading the nation's transportation culture.
To establish a safer and more convenient transportation system,
we have been working on integrating IOT into products.
Beginning with the IOT based smart acoustic signal,
it will lead to the creation of and globalizing the product in a rapidly changing market situation.
Every product we make is the basic idea of seeing, listening, and thinking about all of the traffic underdogs,
including the disabled and I promise to play the role of the whole thing
to create a safe transport environment for everyone without discrimination in any case.
Thank you.

Traffic system specializing company

HANGIL HC CO., LTD.

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