

Mobile Monitoring Service
with Existing Facilities

BD App

EMCT Co., Ltd.

Tel. 1855-1317

Email. sales@emct.ai

Web. <https://bdapp.ai>



A fire facility remote control system is a **MUST**,
not an option

Automatic Fire Alarm Systems malfunction rate



[IoT-based real-time fire facility management system standardization trends,
Korea Information and Communication Technology Association, April 2023]

ThePalyVoice

May 4, 2021

Smoke detector malfunction triggers fire alarm

A faulty smoke detector in the Palo Alto High School Tower Building triggered a fire alarm at 8:35 a.m. Wednesday morning, forcing students to evacuate to the football field.

Newsweek

Jan 10, 2022

Bronx Building Residents Say Fire Alarm Often Went Off, Ignored Sound Before Deadly Blaze

Residents in the Bronx apartment building that caught fire January 9, 2022, said the fire alarms would frequently go off and they ignored the initial warning because they thought the smoke detectors were a

IFSI INTERNATIONAL
FIRE & SAFETY JOURNAL

October 11, 2022

Report reveals 90% of false fire alarms are caused by faulty apparatus

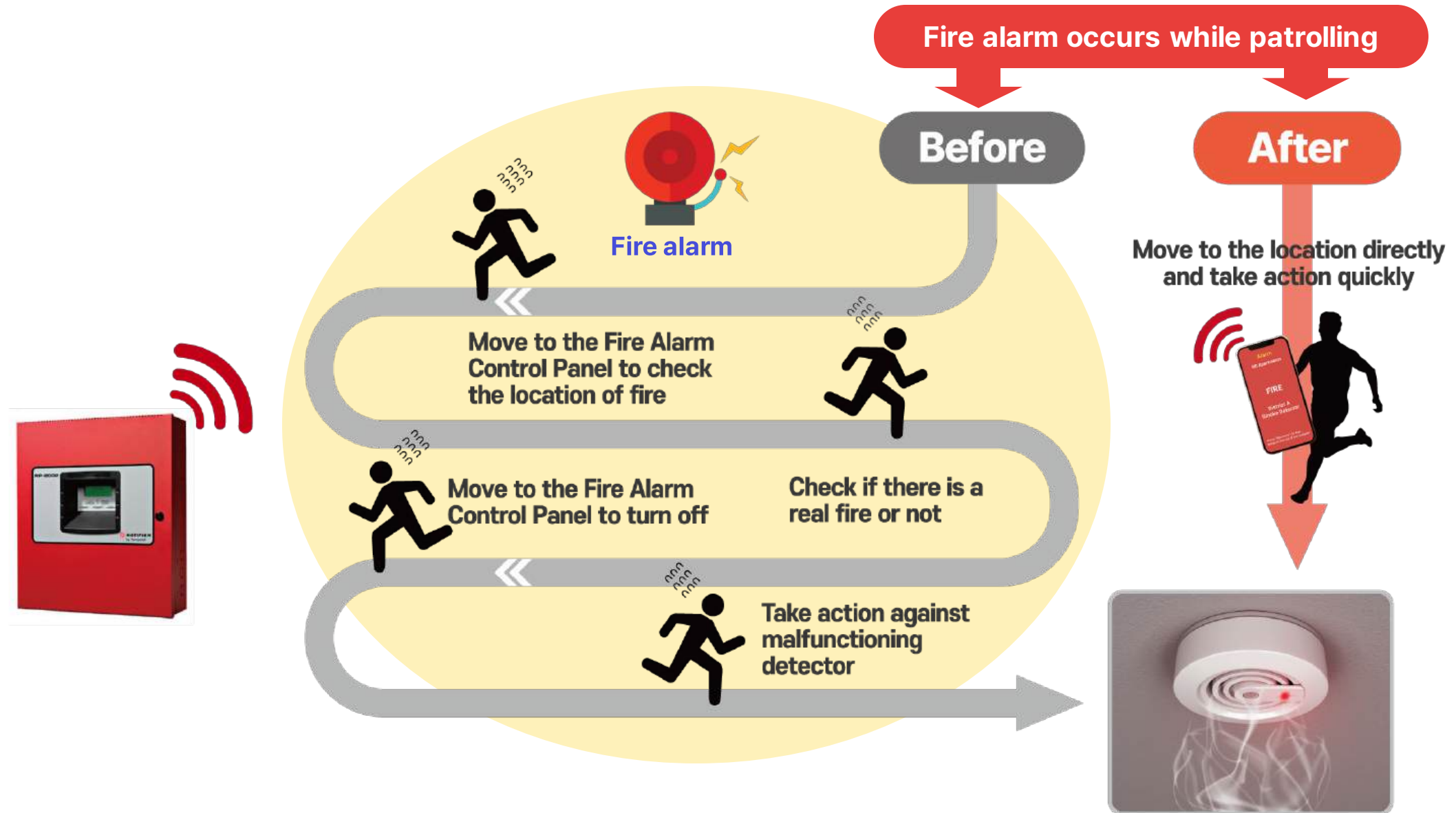
According to the latest Home Office report, false alarms make up 98% of automatic fire alarm confirmed incidents in 2020/21; with 90% of this figure a result of faulty apparatus.

The Importance of Adopting a Remote Control System for Fire Facilities

"It is imperative that we have the ability to monitor fire equipment information for each building and respond quickly to abnormal situations, minimizing fire equipment malfunctions and non-fire alarms..."

[Source: Korea Fire and Rescue Agency, Office of Representative Park Wan-soo, 2021]

The Limitations of Current Fire Safety Management



The Need for Costly Facility Investment The Failure in Equipment/Data Integration

Fire Facility Manufacturers

Government

Private Companies



Costly facility investment & stability issues

Facility upgrades can easily cost
\$30K-\$50K



Outdated equipment & frequent malfunctions

Simple fire notifications only,
frequent equipment malfunctions



Manual installations & limited service

Limited and unstable service,
only for smaller buildings

BDApp is the only remote facility control service that doesn't require replacing your existing equipment

**BDApp collects data using AI algorithms,
without the need to replace equipment**



The Core Technology of BDAp

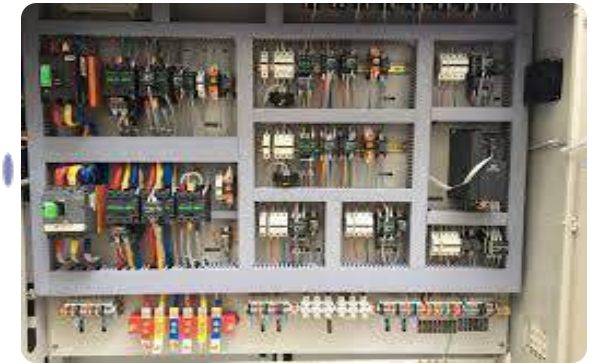
Gather Internal Communications and Analyze with AI Algorithms to Extract Data

**Only
BDAp**

HMI



MCC



-. . . - . . . - . . . - . . . - . . .

Signal Acquisition



-. . . | -. . . | -. . . | -. . . | -. . .

Pattern Detection



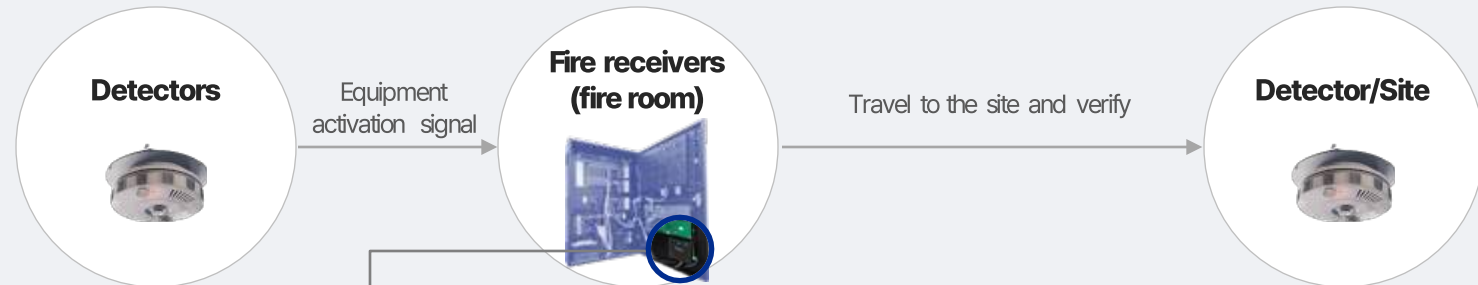
B D A P P
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Packet Analysis

BDApp Uses AI Algorithmic Analysis to Display the Same Information as the Receiver

The process of receiving a fire signal in your facility

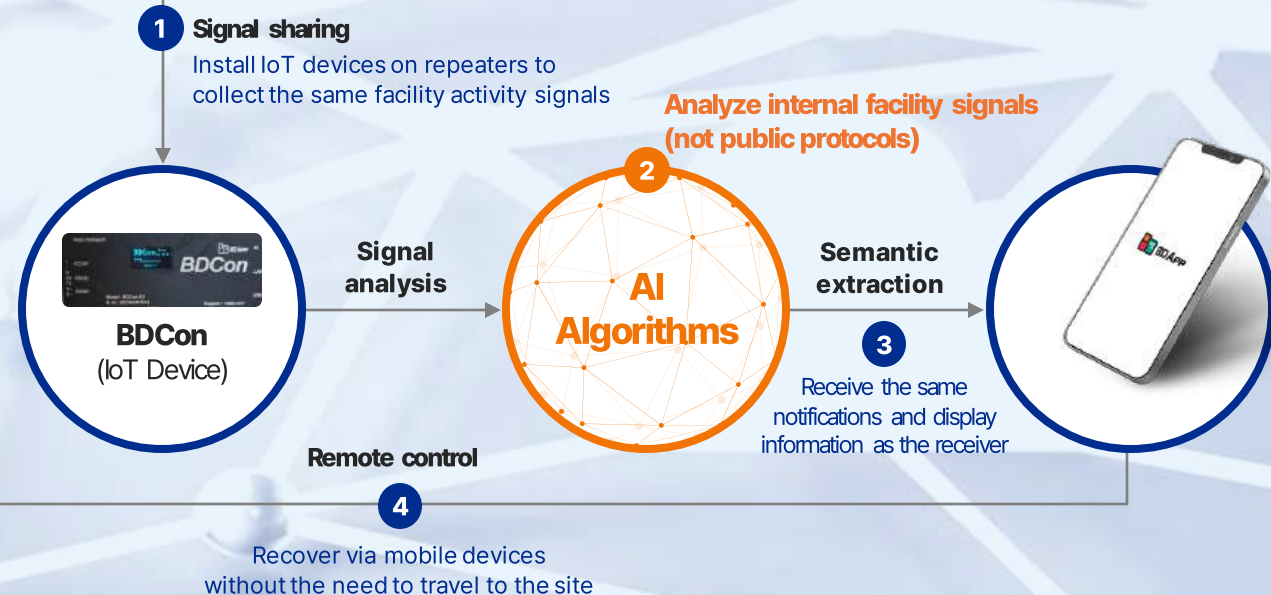
Signal is received in the fire control room



Only
BDApp

BDApp Solution

Receive signals remotely and control from anywhere, anytime



BDAApp's Innovative Facility Management Solution is Affordable for Everyone

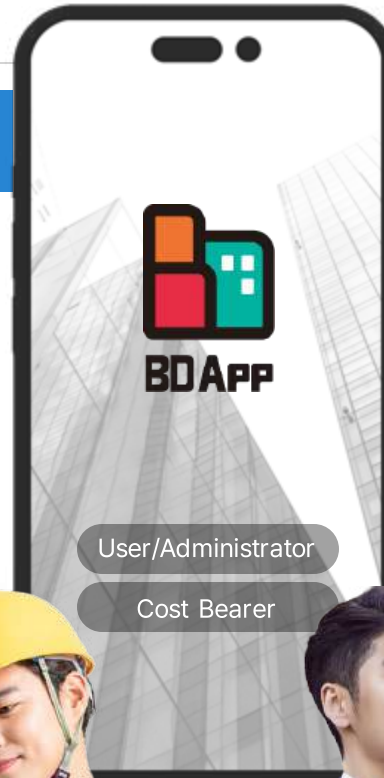
User / Administrator

Anywhere, Anytime

Remotely receive and monitor the same information as the fire receiver

Remotely detect and repair malfunctions in the event of a false alarm

Unified control and management across multiple facility systems in one building or multiple buildings



User/Administrator

Cost Bearer

Cost Bearer

Any Facility, Any Building

Easy to adopt with no equipment replacement costs

Only
BDAApp

Works with all fire receivers, including P, R, and GR types

Only
BDAApp

Integrate with any system in the building, not just fire receivers

Only
BDAApp

USER

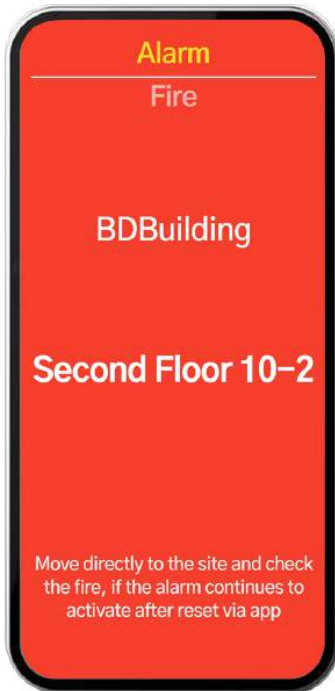
COST



BDAApp Key Features

01

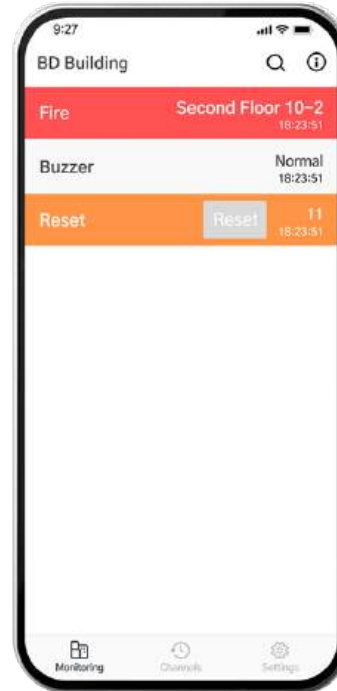
Remote monitoring



Mobile alert of fire location and activated equipment, 30 seconds before the building-wide fire alarm sounds

02

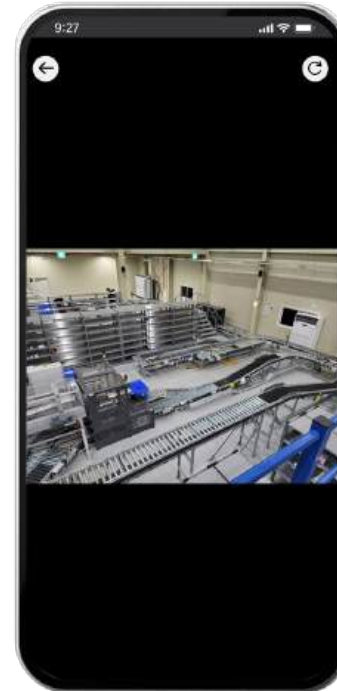
Fire alarm reset



Immediately recover from a false fire alarm by resetting it remotely

03

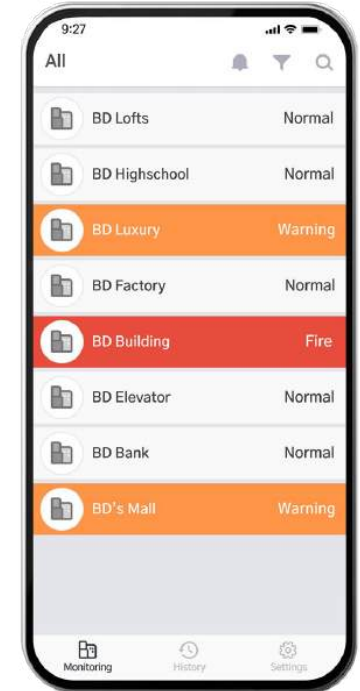
CCTV integration



In the case of a real fire, check the location's CCTV camera and immediately respond to the fire situation

04

Multi building



Real-time monitoring and control by integrating the facility status of multiple buildings by a single manager

Comparison with Competitors

BDAApp: No Need for Facility Investment & Support for All Functions

Item	BDAApp	Fire Dispatch Service	A.N.Fire CNC	FireView GDS (Siemens)	Government Firefighting Service
Real-time status monitoring	O	X	O	O	X
Remote reset and control	O	X	X	O	X
Location tracking and operational equipment notifications	O	X	X	O	X
Mobile app	O	X	O	O	X
System implementation costs	None	closed	\$1500	\$50,000	\$1000
Monthly usage fees	\$100	\$100	\$10	closed	?
Applicable equipment	All types	All types	P type	Own products only	Some products
Response time	prompt	30 minutes-one hour	prompt	prompt	prompt
Availability of on-site services	planned	O	X	X	X
Maintenance and Reliability	Good	Good	Bad	Bad	Bad

Easy to Install with Existing Equipment

Ease of Installation

Any Facility,
Any Building

Affordability

Compatibility

Scalability



Other services

Requires large investment to introduce a remote facility control system

System
Implementation
Costs



(Cost of replacing IoT-enabled equipment and installing additional sensors)

Monthly
Maintenance Fee



System implementation costs
\$50K

System go-live time
1 month or more

BDApp

Adoption without the cost and time of replacing expensive equipment

Cost to replace
existing equipment



Monthly
subscription fee



System implementation costs
Unnecessary

System go-live time
Within 1 day

Deployment Possible in Any Facility, Building, or Site Worldwide

Ease of Installation

**Any Facility,
Any Building**

Affordability

Compatibility

Scalability

Manufacturers

Receiver models

**Communication
methods**
(wired or wireless)

- ✓ **Applicable to all facilities regardless of receiver type, manufacturer or model**
- ✓ **Compatibility verified by over 750 field installations in Korea**



BDAApp Service can be Extended to Other Facilities that Require Remote Control

Ease of Installation

**Any Facility,
Any Building**

Affordability

Compatibility

Scalability



Remote Control Scope

Integrated control, including firefighting, only with BDAApp



Fire fighting
remote control



Monitoring water
level of water tank



Monitoring condition
of communication
room



CCTV
system



Remote monitoring
of gas facility



Remote monitoring
of drain pump



Elevator safety
managing system



Parking control
system



Mechanical facility
vibrated monitoring



Real-time indoor air
quality monitoring



Scrubber status
monitoring



Wastewater level
monitoring



Real-time monitoring
of thermometers and
hygrometers



Flowmeter remote
monitoring



Air conditioner energy
saving system



Solar panel energy
managing system



Low temperature
warehouse energy
saving system



Facility power quantity
real-time monitoring system



Light facility energy
saving system

Full Remote Facility Management
even when facility managers are out of the office



BDApp Offers Superior Functionality, Affordability, and Reliability over Traditional Services

Previous Solutions

Simple
fire notifications

Expensive
installation
costs

No
countermeasures
for malfunctions

Simple SMS
notifications

Stability issues



Detailed notification of fire location and facility information

Notification of fire location, facility details, etc., providing unrivaled facility interface technology

The realization of economic feasibility

Software data collection through analysis of communication signals inside the facility

Immediate remote reset in case of malfunctions

Artificial intelligence and big data utilization allows for immediate remote reset

Integrated view of combined information

Immediately view fire information, on-site CCTVs, other operating facilities, etc., via mobile app

Unrivaled stability

Automatically detect on-site problems and recover immediately, based on 20 years of facility monitoring operational experience



Fire



Elevator



Water Tank



Parking



HVAC



Lighting



CCTV



Energy

emCT is a Tech Company that Owns all the Technology Needed for Remote Control In-House

100% ownership of remote control technology



Software



Hardware



Mechanical Design



AI

Continuous R&D investment based on workforce expertise

Founder & CEO with both SW and HW expertise

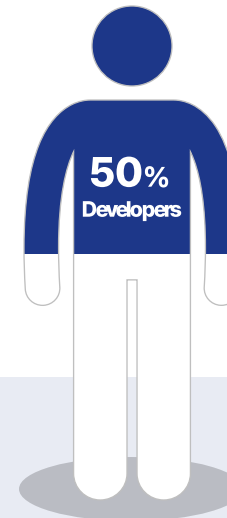
Bongho Lee CEO

**B.S. in Mechanical and Aerospace Engineering,
Seoul National University**

**20 years of S/W, H/W, and facility monitoring
development at large companies (Samsung, Hyundai, etc.)**

- Development of Integrated Facility Monitoring for Hyundai Motor Company
- Samsung Semiconductor Monitoring System Development

More than 50% of total workforce in R&D



CEO

R&D Team

Server

Field Engineering

UX

Mobile, Web



**Invested more than 170%
of existing annual revenue in R&D**

The Entire Customer Service Process is Delivered Directly by emCT

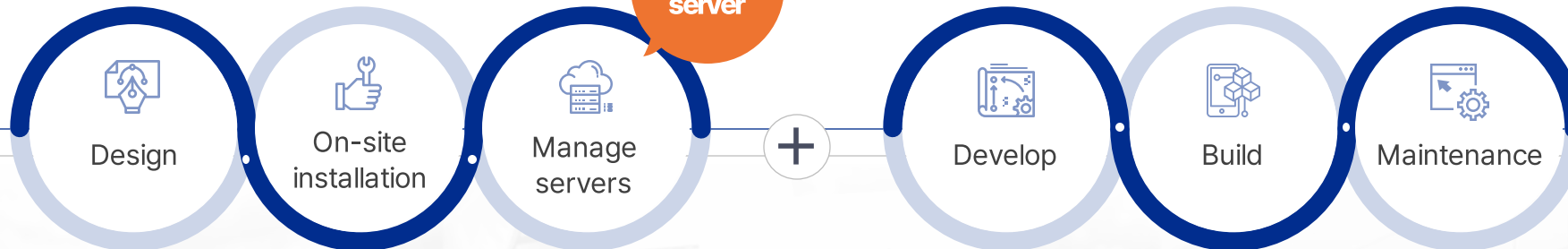
| The only end-to-end facility remote control service in South Korea |



IoT Device **BDCon**



Application **BDApp**



Maintenance teams continuously monitor and provide after-sales support to all our customers



24-hour call center



Remote monitoring



Onsite support

Partnerships with Large Building Management Companies, Fire Equipment Manufacturers, and Fire Facility Management Companies

Major Companies / Franchises



LOTTE Department Store

All Lotte Department Store locations to be implemented. Nowon and Guri stores have been implemented.



Hyundai Motors

Introducing BDApp services at Hyundai Motor Company factory.



CGV

Introducing BDApp services at CGV

Large Building Management Companies



XII S&D

GS Group affiliates are rolling out BDApp services across all new contract sites.



AJ Daewon

Signed MOU to deploy BDApp across all sites of a large property management company specializing in multifamily housing.



C & S

a mid-sized building management company
Enterprise-wide introduction completed

Promotion via Blog and Individual Sales



BDApp Blog

BDApp Blog

Promotion of services related to exhibitions, events, etc., and quick updates.



TM / DM

Sending out promotional materials for various events, exhibition schedules, and service-related updates.



Exhibitions

Participating in various exhibitions to promote services and conduct sales targeting various companies and customers.

Global Market Expansion

Completed U.S. Incorporation and POC with Washington DC Fire Patrol Company (July 2024) Coming soon to apartments, office buildings, hotels, and more in Vietnam

Europe / Middle East

- Facility control is being discussed with SNCF (railroad) in France
- In discussions with SAUDI Electricity
- POC discussions with Dubai Fire & Rescue and sales partners



NFPA 2024 Participation



CONFERENCE & EXPO

Conference & Expo | June 17-19
Technical Meeting | June 20-21

Orlando, FL



USA

- POC in DC in late July
- Participated in CES, NFMT, NSC, NFPA exhibitions
- Hired local staff and established a local Virginia corporation



Indonesia

- Lotte Mart Indonesia to implement integrated facility management for all 50 branches
- Negotiating with two building management companies for full implementation
- Proposing integrated control market by region/branch in collaboration with hypermarkets Tesco Lotus, Big C Market, department stores, etc.



Vietnam

- Ho Chi Minh City apartment POC planned
- Negotiating to introduce a parking tower at Ho Chi Minh Airport
- Hiring local employees and preparing to establish a corporation



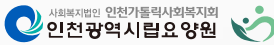
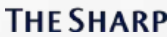
Obtained Grade 1 GS Certification, Qualifying for Procurement Contracts with Large Quantities



- Holds 8 intellectual property rights, including patents
- Won the ESG Social Venture Global Award
- Selected for pilot purchase of technology development products
- Recommended for priority purchase of excellent inventions
- Obtained KC-FCC-CE certifications
- Secured GS1 classification for procurement contracts
- Social Venture/Small but strong/INNOBIZ Company

emCT is Growing and Gaining Validation from Customers

Customers from all industries

Factories			
Hospitals			
Apartments			
Commercial			

CAGR
170% growth

2021 Revenue of 228 million KRW

2022 Revenue 612 million KRW

2023 Revenue 1.6 billion KRW

Finalized BDAp Demostration Project for Local Governments



- 2023 Smart Innovation Technology Demonstration Support Project Final Evaluation Result: **"Success"**
- Installation of 13 buildings in Yuseong-gu **completed and services being provided**

Since launching in August 2021, nearly **750** installations in apartments, stores, hospitals, schools, factories, etc.

2021.02 **Establishing emCT**

2021.05 **Establishing an R&D center**

2021.07 **Venture certification**

2021.08 BDAp Release

BDAp

At the heart of emCT is the pride that every installation of BDApp **SAVES LIVES**

“

After installing BDApp, all fire stations are back to normal...
Real-time alerts went to 4 workers as the fire broke out, and we watched the fire spread right from the app, all thanks to BDApp. ”

[Head of building management at Lotte Cinema in Incheon]



The Kyunghyang Newspaper 2023.04.13

Incheon Lotte Cinema building fire extinguished...

“No casualties”

The fire was extinguished 2 hours and 40 minutes after it started, and **all visitors and employees were safely evacuated.**

BD App

Mobile Monitoring Service with Existing Facilities

APPENDIX



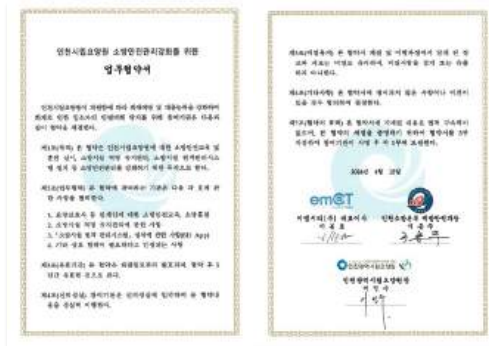
Service Adoption Impact

	Before	After
L Malls	 A restaurant complains of frequent detector malfunctions due to smoke from cooking. There were many cases of fire department calls due to non-fire alarms and the lack of a night watchman.	Reduce unnecessary complaints by using the mobile app's remote recovery feature to recover from non-fire alarms. On-duty personnel can respond in real time, even from outside the building.
P Apartments	 Increased administrative costs, including rising minimum wage, have eliminated weekend on-call personnel, making it difficult to respond quickly to fire alarms	Manage your building safely by being able to respond to fire alarms from anywhere, even on nights and weekends when no one is on duty
R Factories	 Fire hydrants are installed in different buildings in the factory, making it very difficult for a single onsite officer to manage all of them	Smooth on-call operations by enabling remote control of each building's fire equipment from anywhere through a mobile device
C Studios	 Frequent non-fire alarms due to indoor smoking	Reduce unnecessary fire department trips by remotely recovering from detector malfunctions

MOUs Signed with Public Institutions

Laying the foundation for shared growth with public sector MOUs

Incheon Fire Department Headquarters



Yuseong-gu Office



Daegu Facilities Management Corporation



Namdong-gu Urban Management Corporation



Incheon Urban Development Corporation Integrated Control of Rental Housing

Selected for 2024 Smart-X City Verification Support Project
Installed in 132 units of rental housing in 3 buildings in Seo-gu, Incheon

Integrated facility management for 3 office buildings



Fire



Water Tank



Sump Pit



160-5, 37, 38, Gajwa-dong, Seo-gu, Incheon

Expansion to
200 locations
after completion

Integrated Control of Commercial Facilities

Preventing elevator entrapment

- Instant Elevator Fault Alarms
- Detailed error code notifications enable accurate initial response
- Detect elevator abnormalities, such as overheating, and prevent trapped elevators with alarms



Rapid initial response to fires

- Guidance to fire alarm locations and working equipment
- Minimize loss of life and property by improving initial response
- Improve fire alarm confidence with remote recovery in the event of a malfunction



Prevent water overflow incidents

- Real-time monitoring alerts you to high water alerts
- Minimize damage with trend analysis to prevent flooding
- Prevent leaks and blockages with usage management

Save energy with heating and cooling monitoring

- Monitor building temperatures using existing HVAC system installations
- Monitor operating status, error detection, and increase energy savings with remote control



Before and after mobile control for electric car fire in Cheongna apartment

Mobile surveillance can speed up initial response

Before Mobile Control - In Action

06:08 AM

- Fire receiver main alarm sounds after detector detects smoke

06:09 AM

- Site manager goes to the fire room and presses the fire receiver interlock stop button to stop interlocking and then goes to check the site
- Sprinklers stopped

06:14 AM

- Disengaging after recognizing a fire
- Fire wiring burns out in the meantime, disabling sprinklers

06:15 AM

- **Call 911 to report a fire**
- **8 hours and 20 minutes to complete**
- **Damage is at least KRW 10 billion**

After mobile control is introduced - Home

06:08 AM

- Fire receiver main alarm sounds after detector detects smoke

- ✓ Fire alert and perimeter (where the fire is) displayed on multiple room workers' smartphones within the next 3 seconds
- ✓ See smoke and more with one-click direct access to CCTV illuminating the fire's location from the mobile app

06:09 AM

- ✓ **Call 911 to report a fire**
- ✓ **Check the mobile app to see if the sprinkler has been disconnected for maintenance, inexperience, etc. and immediately disconnect it if necessary to ensure the sprinkler is working properly.**
- ✓ **Encourage immediate evacuation of residents**
- ✓ **Minimize damage**

Thermal Camera Solutions

Add thermal imaging cameras for safer parking lot fire detection

Pros

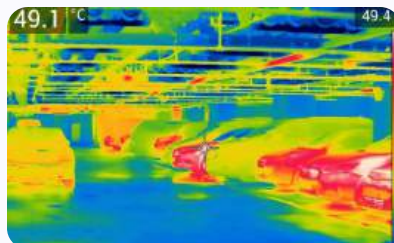
Unlike smoke detectors, they are immune to malfunctions and can accurately detect fire

Cons

Highly expensive. Camera and installation cost 200~500 million won/monthly management fee 10,000 won Can be difficult to detect in the early stages of thermal runaway from under the vehicle

Conclusion

Combine with existing smoke detectors and CCTV to make your underground parking garage more secure underground parking garage management



Camera Specification

Thermal Module

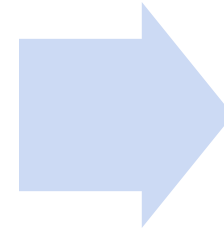
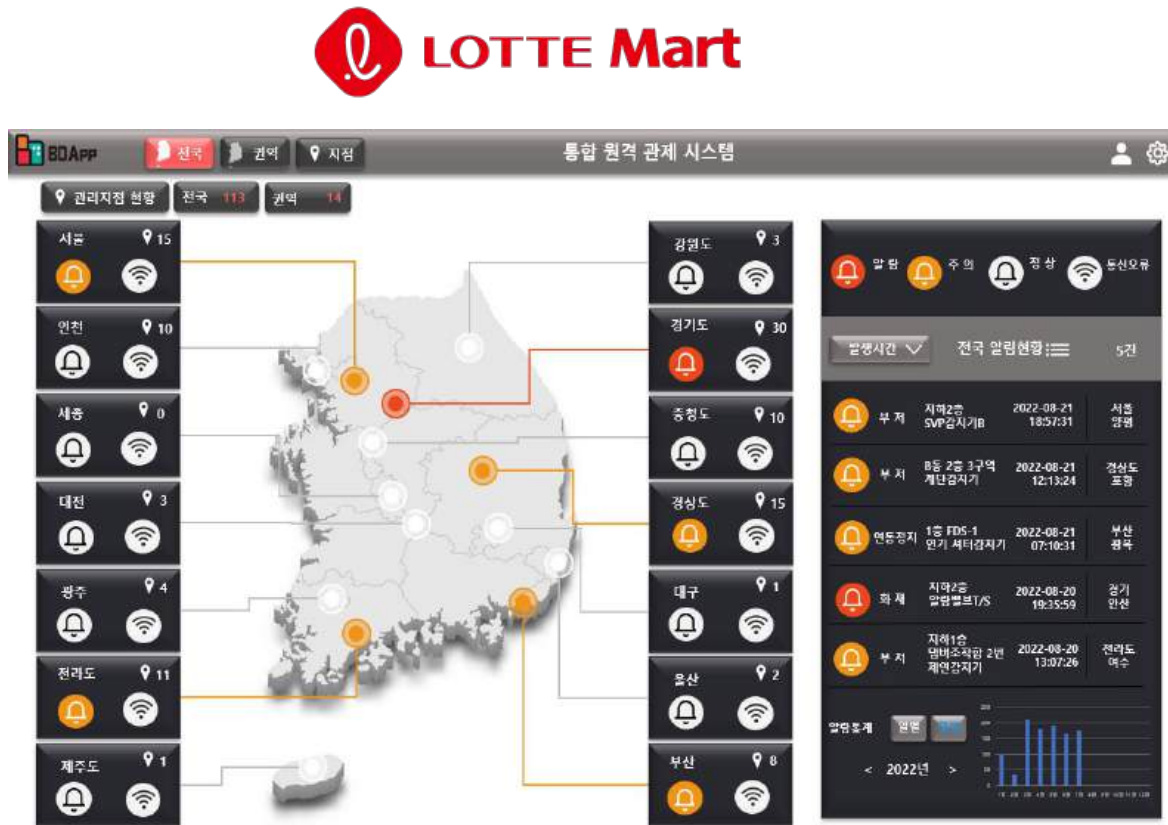
Image Sensor Vanadium Oxide Uncooled Focal Plane Arrays
 Resolution 160 × 120
 Pixel Pitch 17 μm
 Spectral Range 8 μm to 14 μm
 NETD <40 mK (@ 25 °C, F# = 1.1)
 Focal Length 1.8 mm
 IFOV 9.44 mrad
 Field of View 90.0° × 66.4° (H × V)
 Min. Focusing Distance 0.1 m
 Aperture F1.1
 Digital Zoom × 2, × 4

Optical Module

Image Sensor 1/2.7" Progressive Scan CMOS
 Resolution 2688 × 1520
 Min. Illumination 0.0176Lux @(F2.25, AGC ON), 0 Lux with IR
 Shutter Speed 1 s to 1/100,000 s
 Focal Length 2 mm
 Field of View 119.3° × 93.3° (H × V)
 Aperture (Range) F2.25
 WDR 120 dB

*Specifications subject to change upon delivery.

Market Expansion as a Large-Scale Franchise Following Introduction at All Lotte Mart Branches

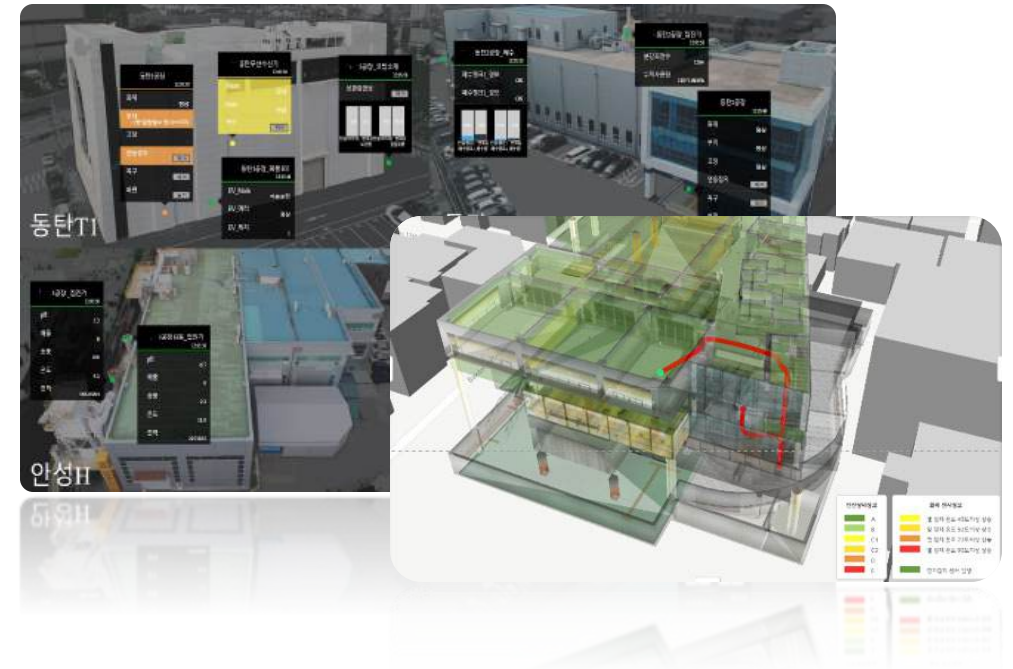


Unified Control and Immersive Digital Twin Platforms

See your entire facility status on one screen

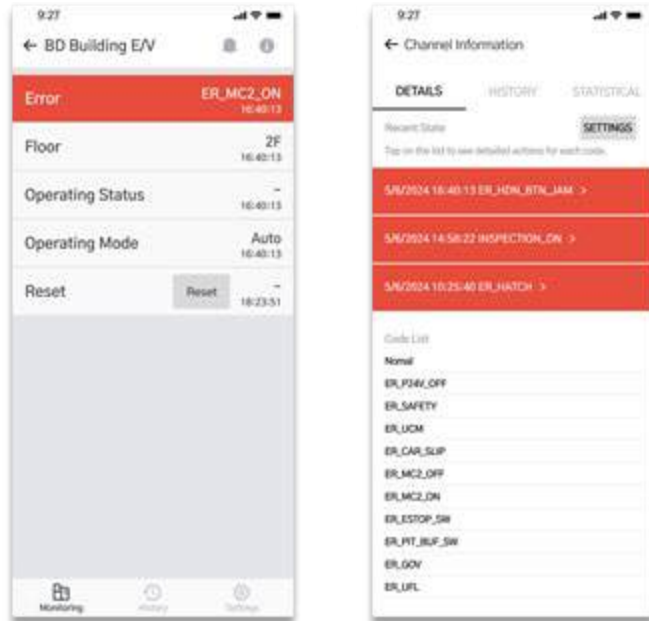


Show fire alarm locations via maps & drawings



Remote Control of Elevators

Immediately detect elevator failures and respond via BDApp



Instant notification when an error occurs



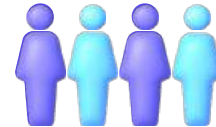
Overhaul with
advanced remote
control systems



Automatically
detect anomalies
with real-time
monitoring



Remote recovery
support in case of
anomalies



Rapid rescue in the
event of a passenger
entrapment
incident



Real-time
inspection records
management

BDPark - Upgrade Your Existing Parking System

Existing Parking Facilities



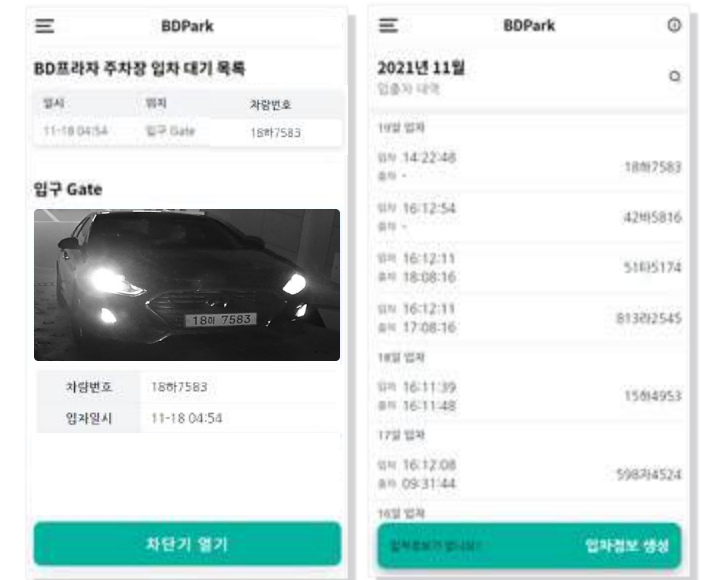
Parking Breaker
Manual Button



CCTV integration
available
(optional)

BD Park
Server

BDPark Services



Mobile/PC Web Control

CCTV Remote Control

Connect to existing CCTV in the building and check the site on your mobile device when an abnormal signal occurs

Alarms are raised



Fire



Water Tank



CCTV



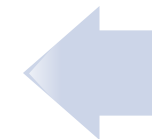
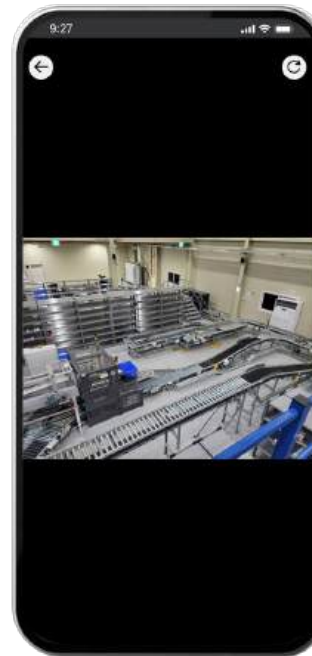
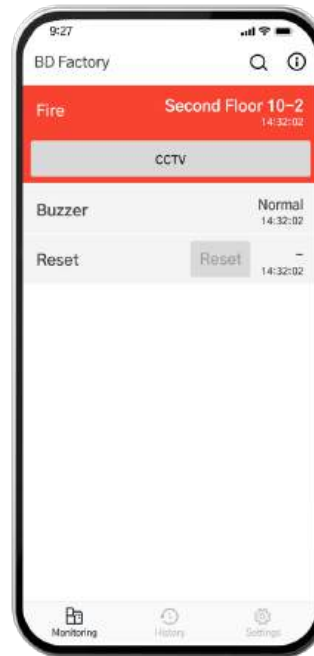
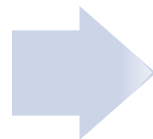
HVAC



Elevator



Energy



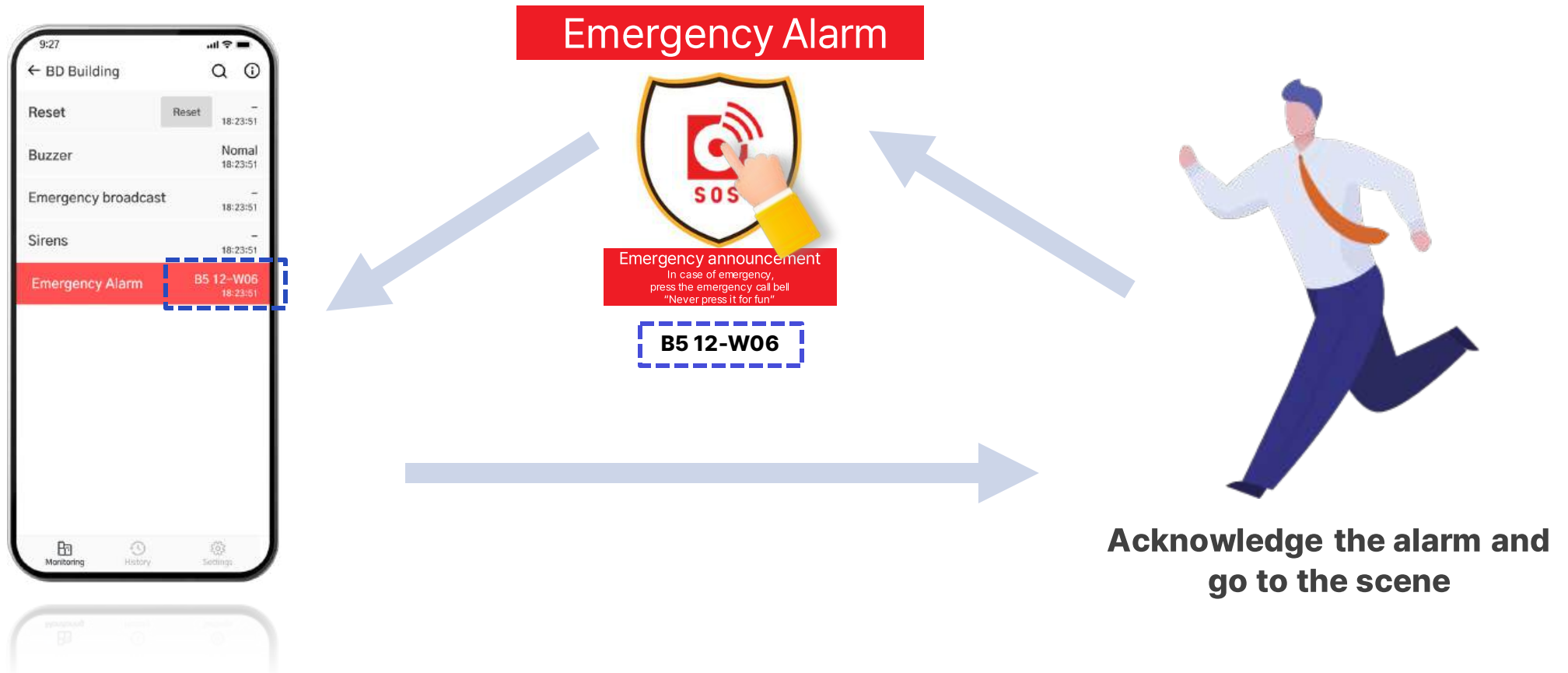
Live video feed verification



Remote Monitoring of Emergency Alarms

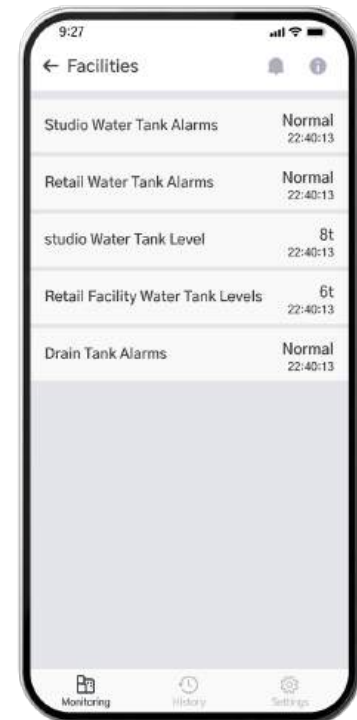
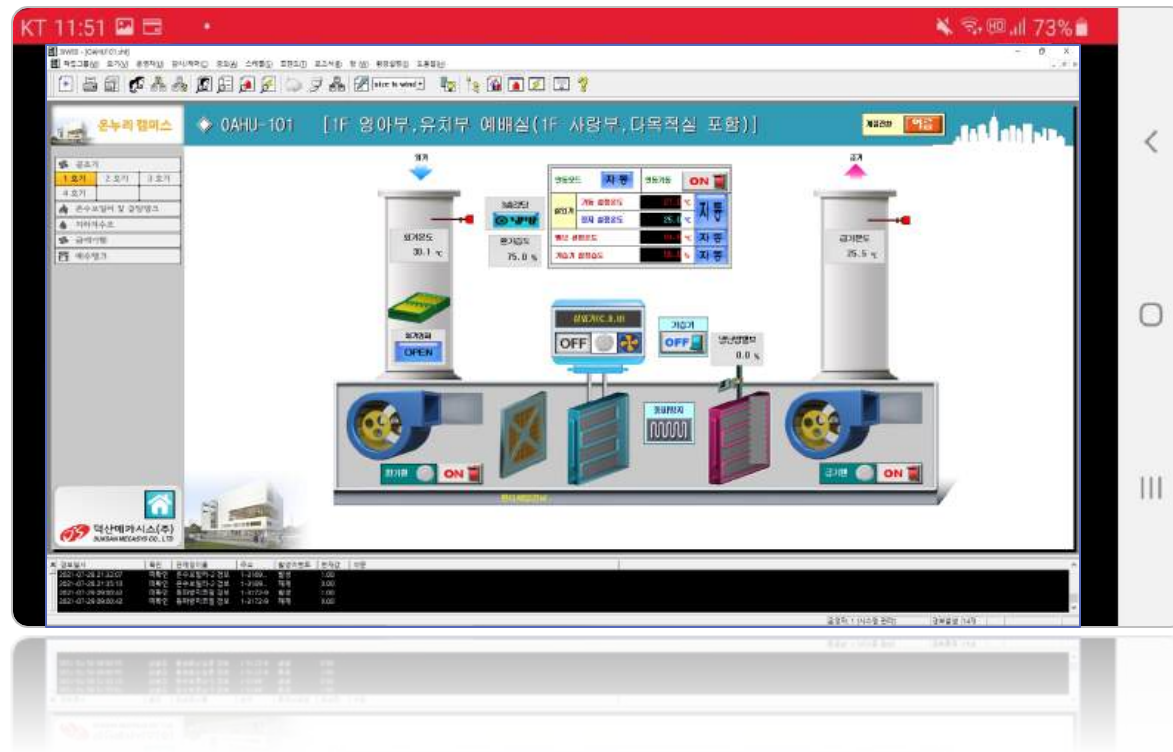
Real-time location alerts via mobile app in case of emergency

Immediate response to dangerous situations without the need for a human presence in the control room



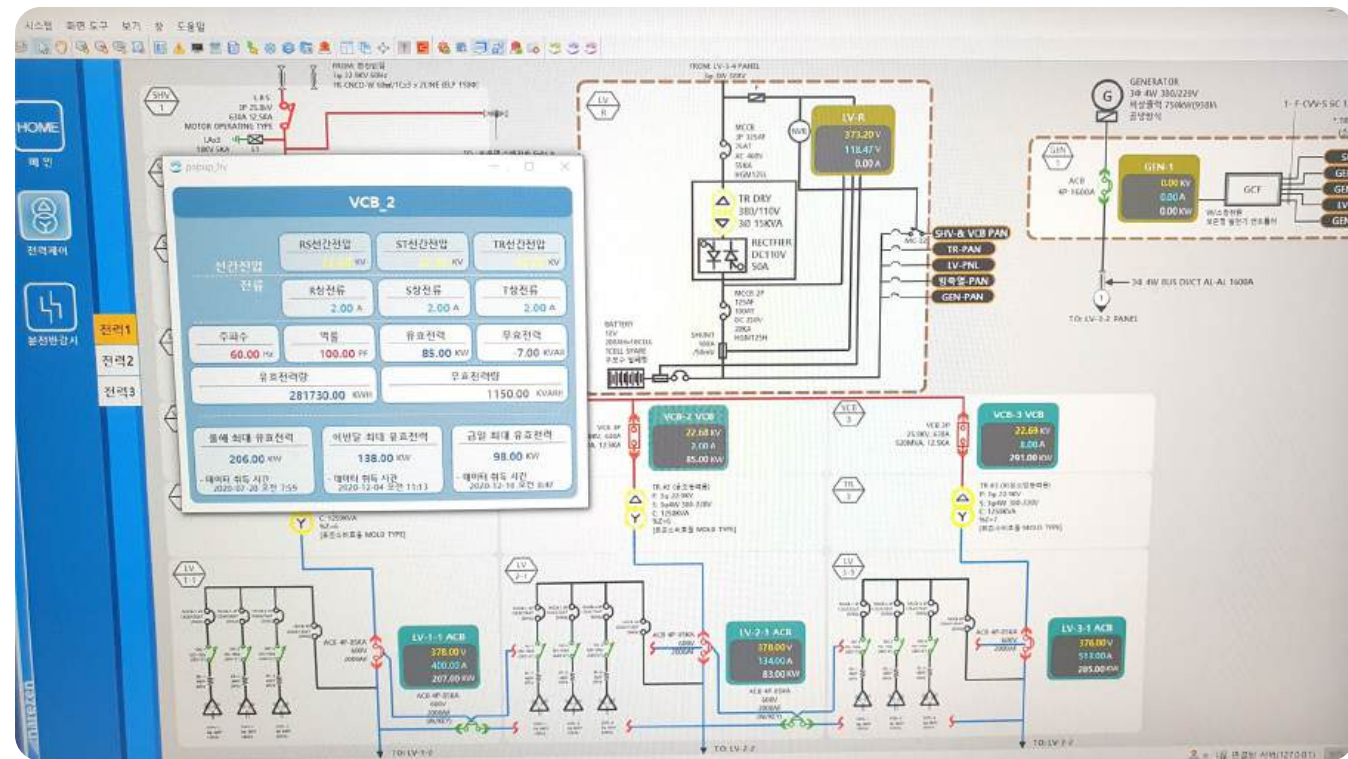
Monitoring Automated Control Equipment

Monitor mechanical equipment such as reservoirs, catch basins, sump pumps, etc.
View equipment-connected workstations from your mobile device



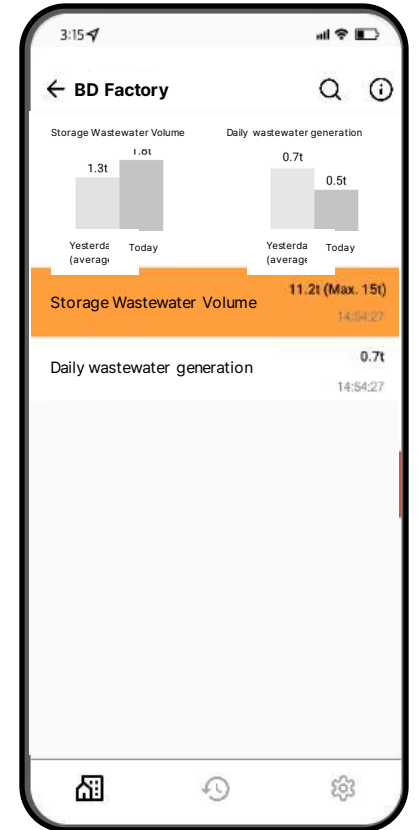
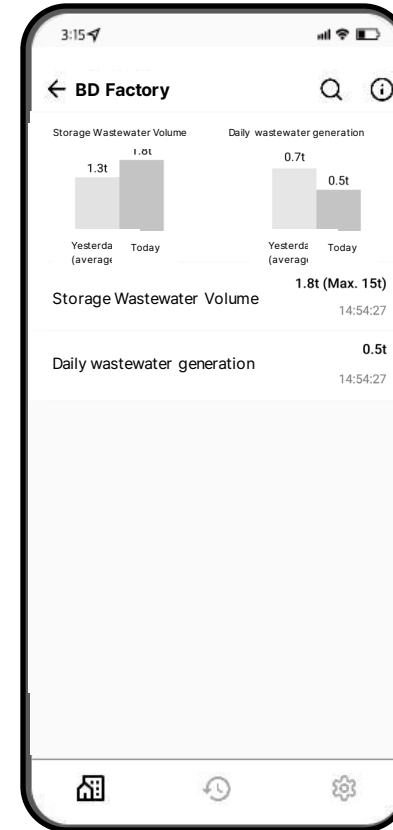
Monitoring Power Usage and Control Peaks

Power usage peak monitoring and auto-off control

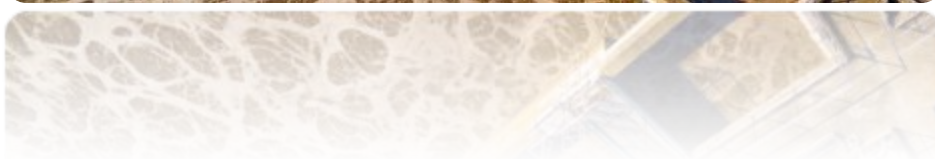


Monitoring Septic Tank Levels

Monitor septic tank levels and analyze daily discharges

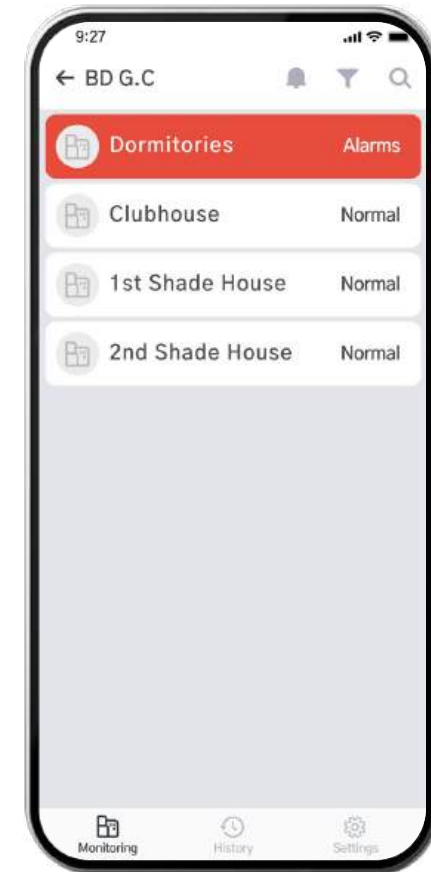


Integrated monitoring and automatic on/off control of wastewater treatment plants



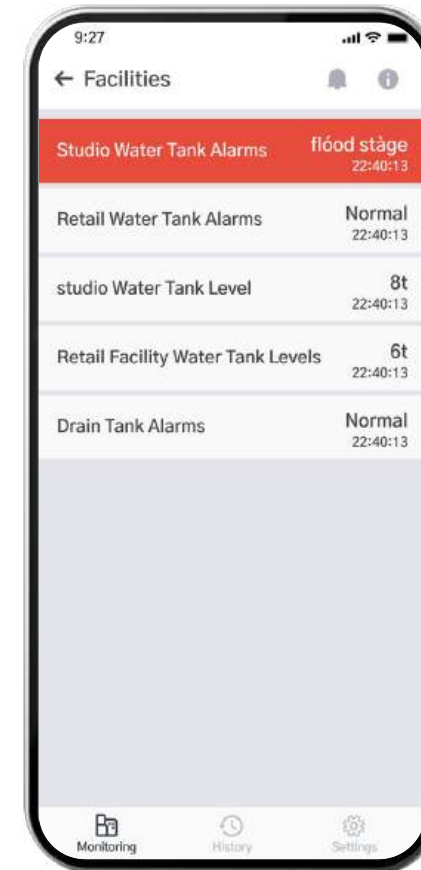
Golf Course Management Service #1

Unified control of multiple buildings, including clubhouses, shade structures, dorms, etc.



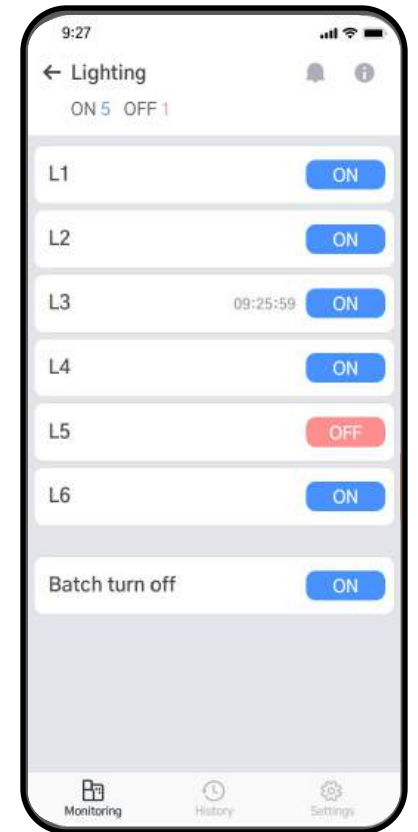
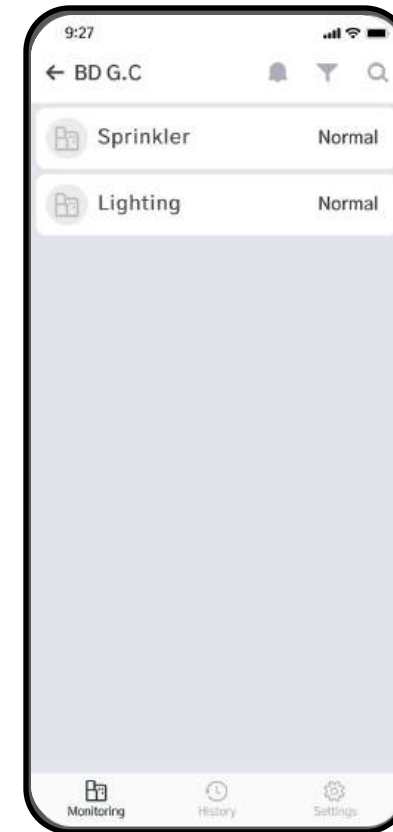
Golf Course Control Service #2

Water tank level monitoring: Manage water tank levels for landscape management



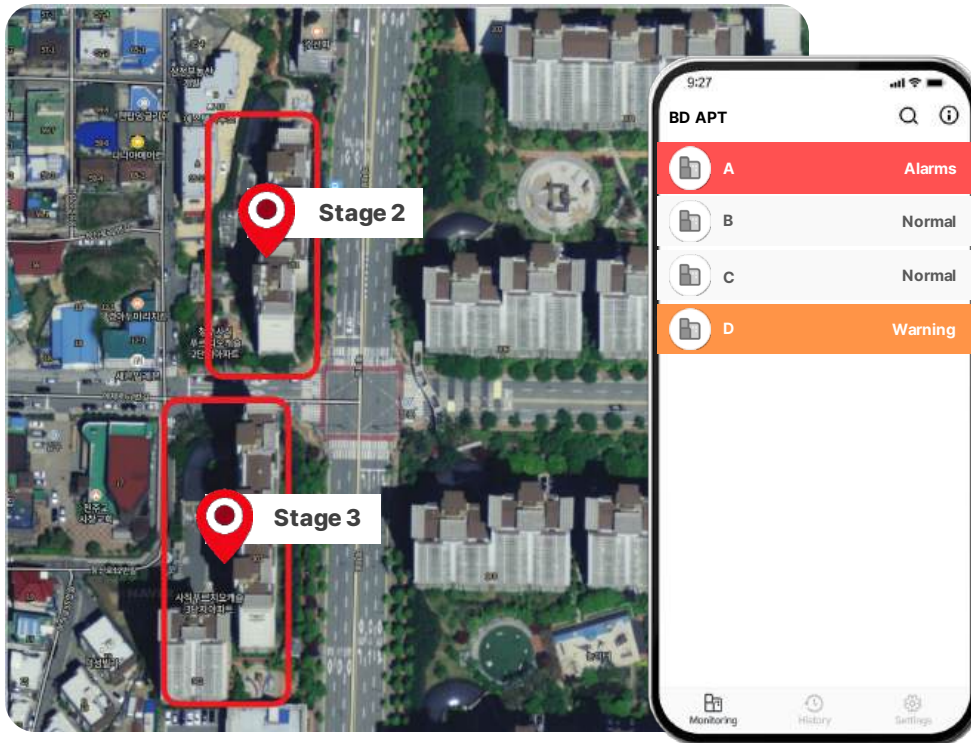
Golf Course Control Service #3

Remote on/off control of sprinklers and night lighting fixtures

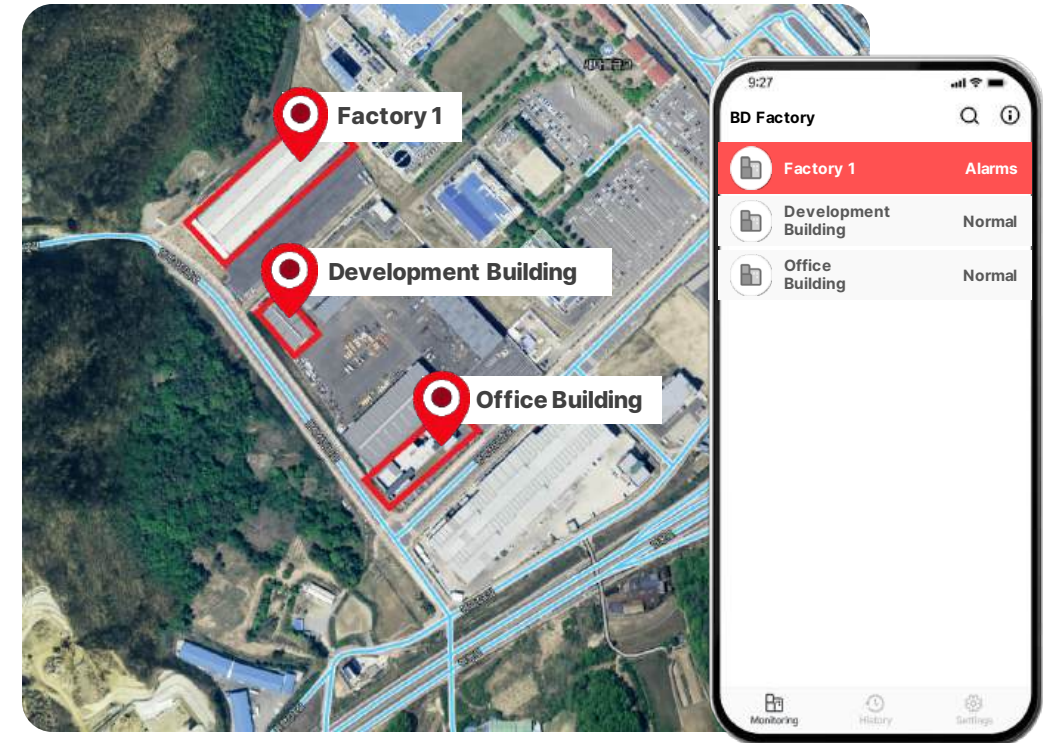


Apartment Complex Integration and Factory Integration Control

Simultaneously manage two complexes divided by roads

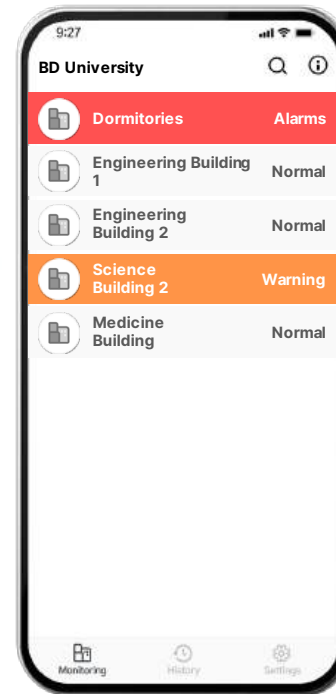


Unified control of distributed factory buildings



Integrated Control of University Campuses with Frequent Malfunctions

Integrated control of receivers in each building with BDApp



✓ **Integrated management of multiple buildings within the school**

✓ **Maintain an academic environment by solving frequent malfunctions**

※ Installed at Gwangju National University of Education, Mokpo National University, Pusan National University, Andong National University, Osan University, Chosun University, Hankyong University, etc.

Integrated Control of Hotels

Integrated control with existing facilities

Before BDApp



"Increased labor cost"

After BDApp



"Hotel quality UP"

* The Born Hotel Jeju, Jeju Beach Hotel Hamdeok, Golden Daisy Jeju, U5 Myeongdong, Hotel With, Howard Johnson Incheon, etc.

Integrated Control of Cooling and Heating

Temperature measurement & control with existing equipment



- No need for facility investment since existing facilities are used as is
- Prevent unnecessary energy waste through remote control of equipment
- Increased work efficiency for management

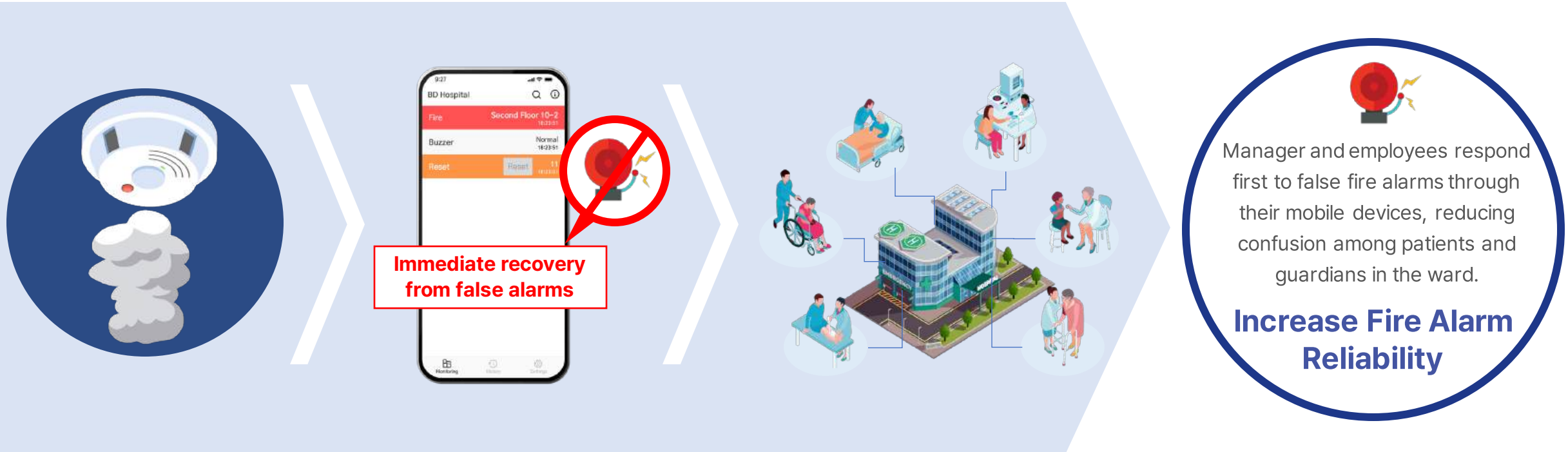
Save energy by controlling heating and cooling as guests enter and leave rooms

When entering a facility, the air conditioning and heating are turned on in advance to provide a comfortable space, then immediately turned off upon leaving the room

* Temperature sensors are used as is



Minimize False Alarms through Remote Control of Hospitals and Nursing Homes



※ National Medical Center, Mokpo City Medical Center, Changwon Nursing Hospital, etc.