Operation System

- Destination Selecting System
- Group Control System
- Interface with IBS

HYUNDAI ELEVATOR

1. Destination Selecting System

1. Destination Selecting System

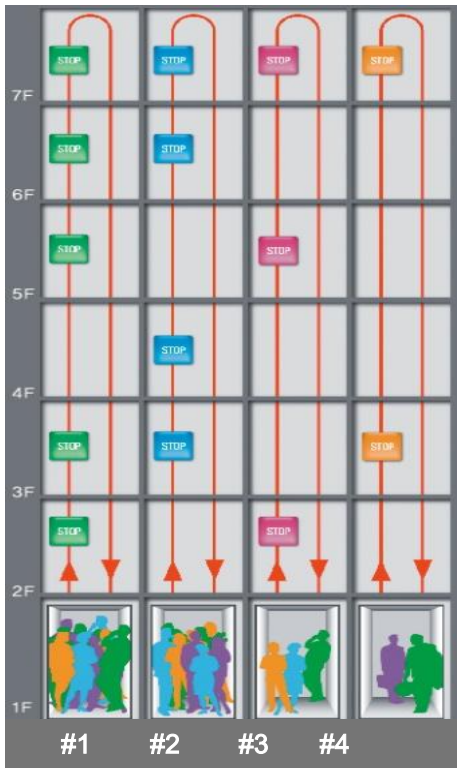
1) Outline

- Input destination floor before entering elevator
- Allocated elevator will be displayed
- Passenger would wait in front of allocated elevator
- Passenger could reach their destination floor in shortest time without pushing button inside elevator

2) Efficiency of Destination Selecting System

Increase traffic efficiency

<Conventional Group Control>

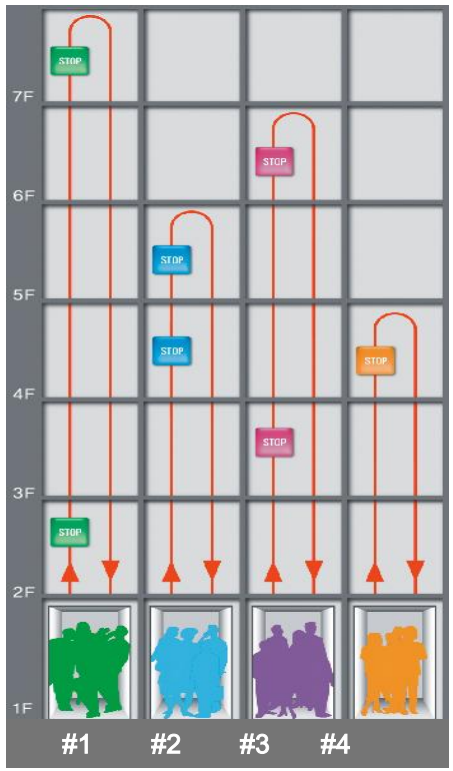


Elevator should stop at many floors

Waiting time & time to destination take longer

25% Efficiency improved

<Destination Selecting System>



Grouping destination calls efficiently

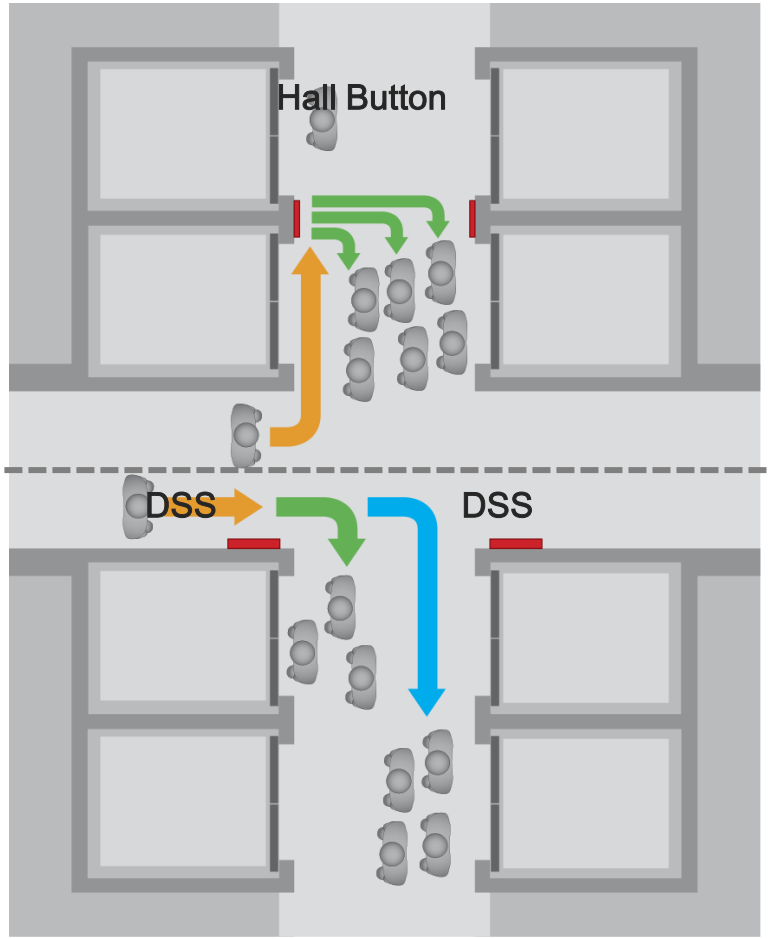
Reduce waiting time & time to destination

1. Destination Selecting System

Solve Lobby Congestion

<Conventional group control>

- All passengers are waiting in front of elevator door which will be arrived first
- Lobby is congested

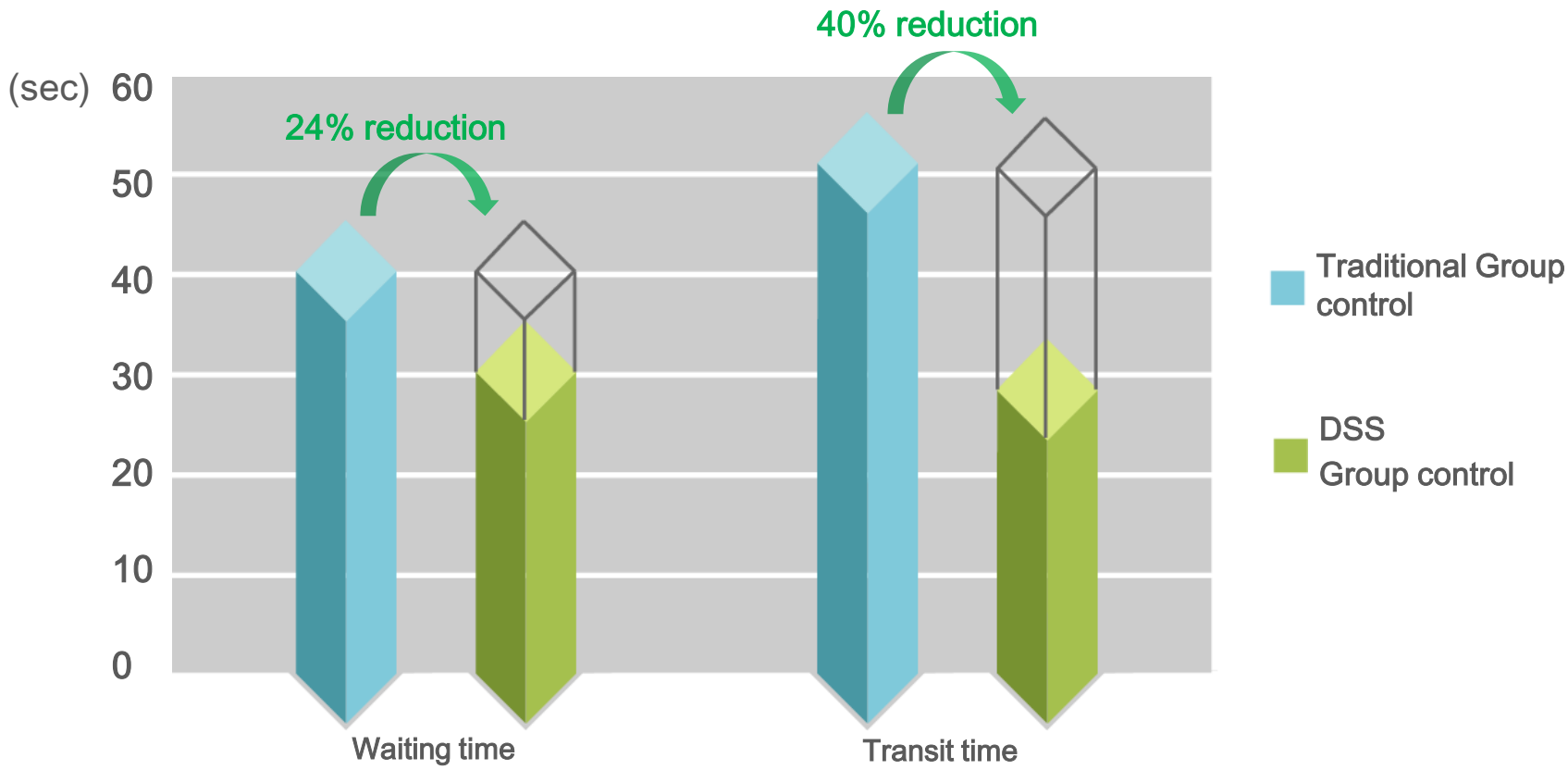


- Passengers are dispersed into each elevator according to their destination floors
- Clear congestion

<Destination Selecting System>

1. Destination Selecting System

Reduce waiting time & transit time



Comparison table of waiting & transit time
between DSS & Group control (based on Sample Project)

3) Comparison between DSS & Group control system

	Traditional Group System	DSS(Destination Selecting system)
Pros	• Familiar with passengers • Price is lower than DSS	• Reduce waiting time & time to destination drastically • Reduce energy consumption • Reduce lobby congestion • Increase handling capacity • Increase the life time of Components
Cons	• Passenger should wait more • Less efficient operation • Lobby congestion when crowded	• Higher installation price • Need to explain how to use the system to passengers

4) Design

▸ Wall mounted type at hall
Type-A

▸ Wall mounted type at hall
Type-B

1. Destination Selecting System

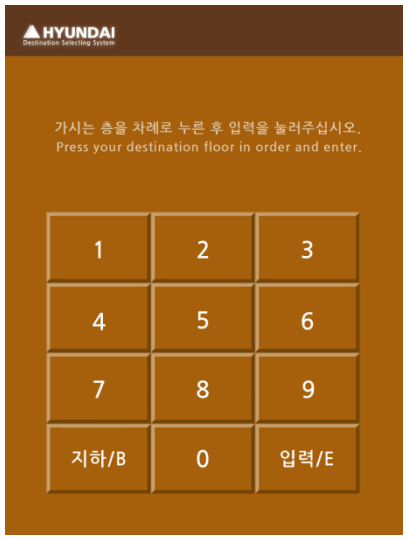
▸ Wall mounted type at hall
Type-C (boxless)

▸ Kiosk type

5) GUI Display Design / A-type

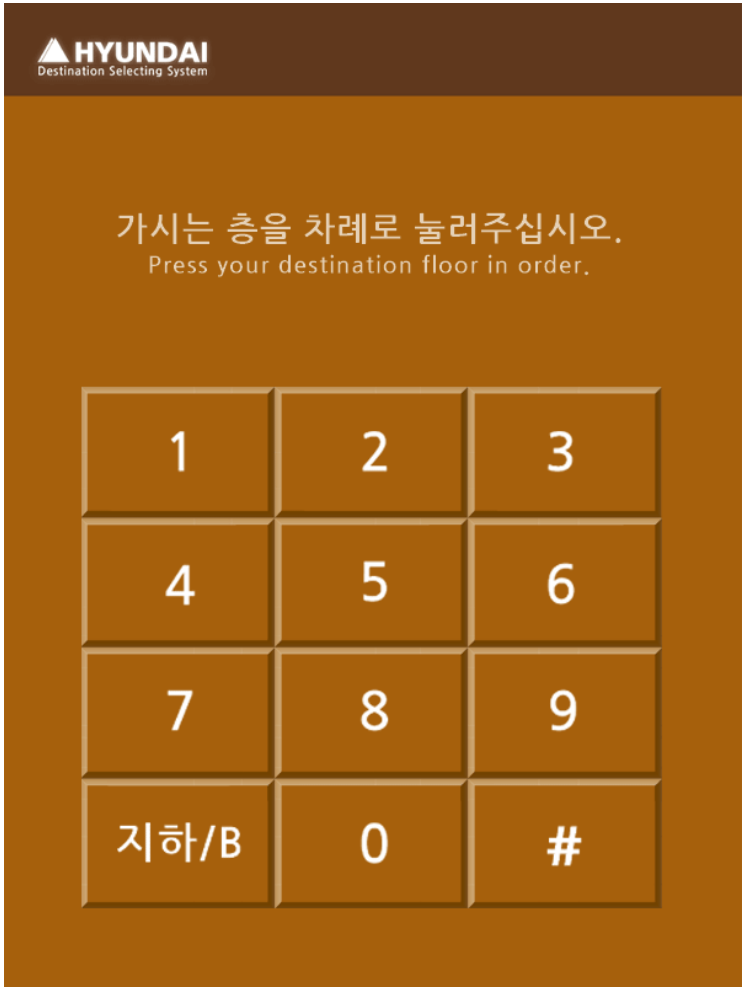
▸ Target
Modern classical building

▸ Concept
Simple & elegant design



Ten-key type

All floor displaying type



* GUI : Graphic User Interface

5) GUI Display Design / B-type

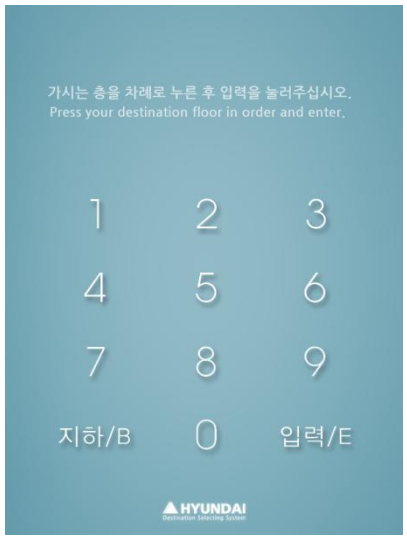
▸ Target

Minimal design building

▸ Concept

Minimal design with numbers

Taking more attention by changing size of numbers



Ten-key type

All floor displaying type

5) GUI Display Design / C-type

- ▸ Target
  - Unique building
- ▸ Concept
  - Minimal design with numbers
  - Taking more attention by changing color of numbers

Ten-key type

All floor displaying type

5) GUI Display Design / D-type

▸ Target

Trendy building

▸ Concept

Easy interface based on button design

Taking more attention with trendy colors

Ten-key type

All floor displaying type

6) Performance Records

Hyundai Group Building in Seoul
3m/s 15 stops Group of 4 Cars

KT&G Building (KOSMO Tower) in Seoul
4m/s 26 stops Group of 6 Cars

Hyundai Securities, Co. Building in Seoul
3.5 m/s 19 stops Group of 4 Cars

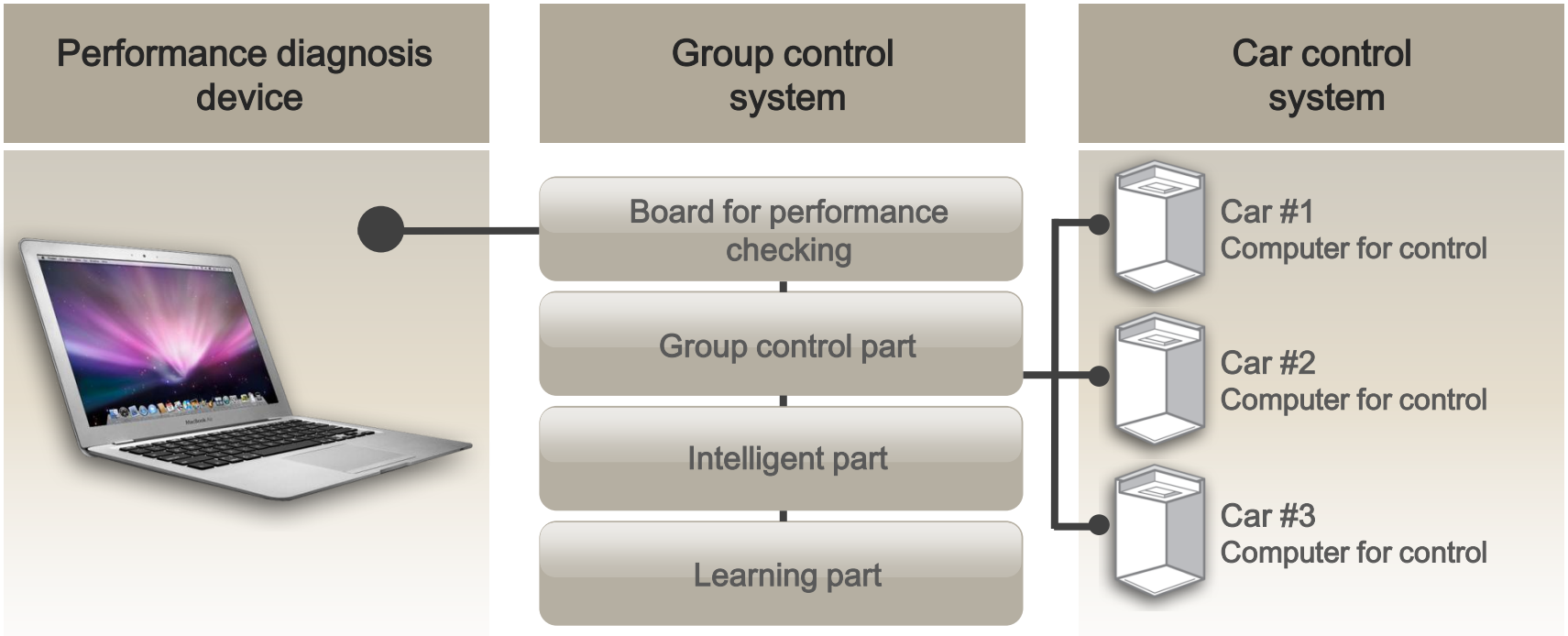
2. Group Control System

GC-3000

1. Outline

By grouping elevators, service fastest elevator to the passenger

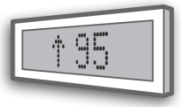
- Reduces average waiting time
- Saves energy and building maintenance expenses
- Develops optimum control through artificial intelligent functions

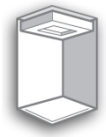


2) Specification

Application Range

No. of floors	Max. 96 floors
No. of cars in one group	Max. 2 * 8 units - double deck 8 units - single deck





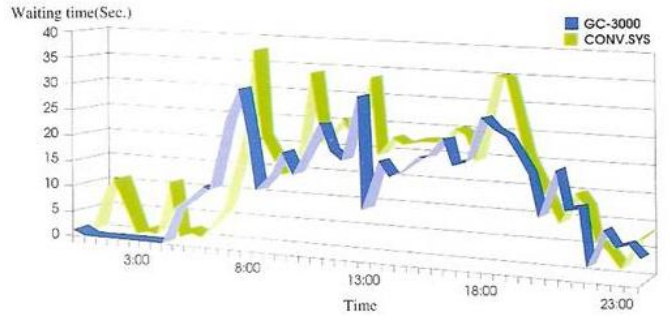
Group Control Unit (Microprocessor)

CPU	32-bit Arm Core MCU, 72MHz
Interface	Optical Communication Ports, CAN Ports, RS232C, LAN, USB
External memory	SD Memory Card Interface

3) Feature of GC-3000

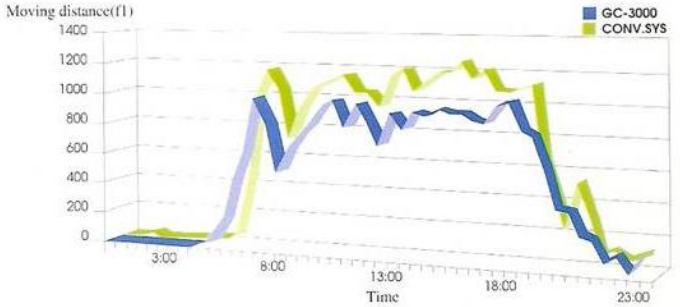
Reduction in waiting time

- Allocates elevator considering waiting time of passenger (shortest time)



Reduction in energy

- Reduces duplicated services



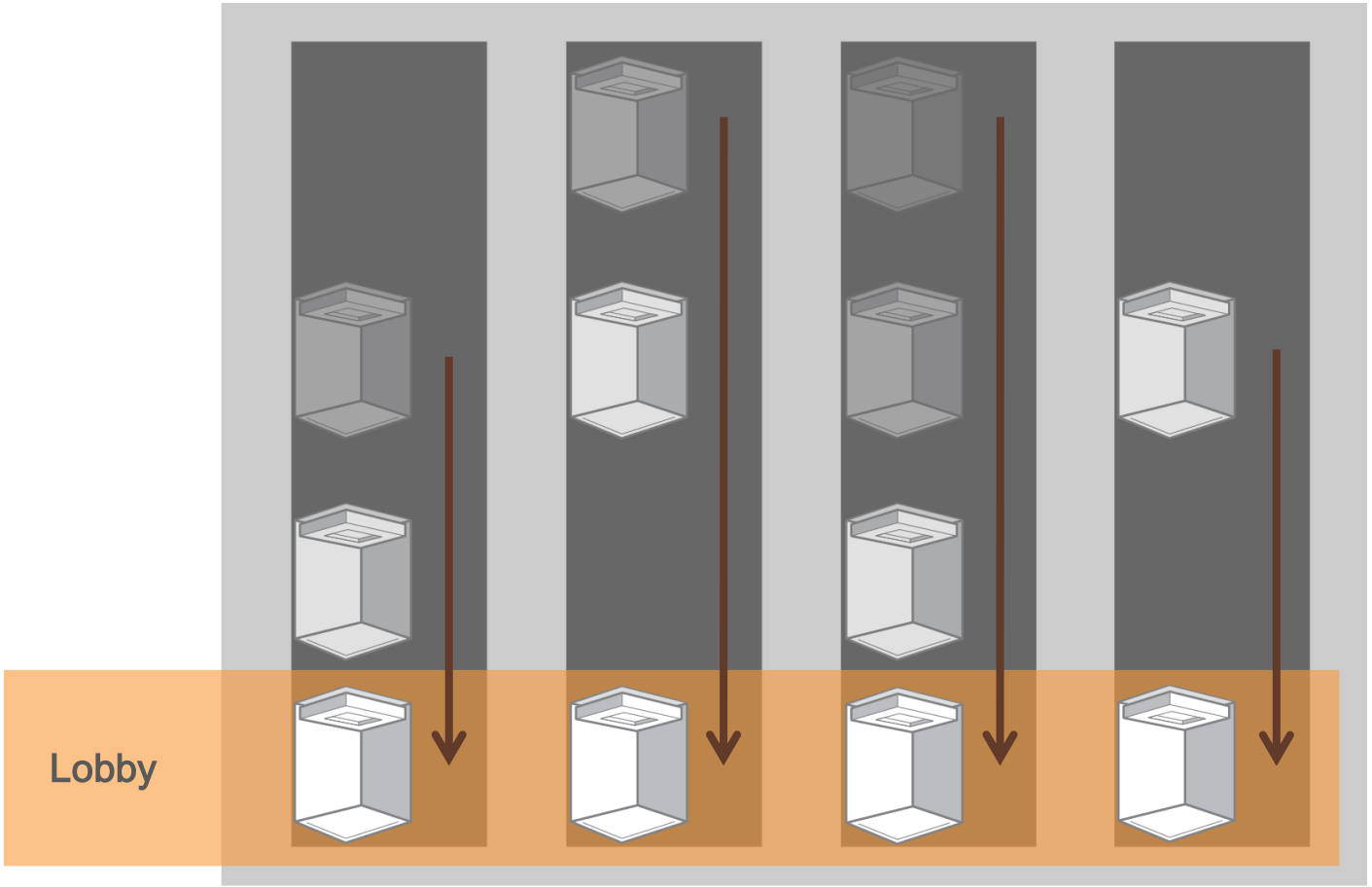
Fuzzy & Decision making

- Collects traffic data time & date basis
- Multi-objective control considering waiting time & energy consumption
- Predicts the changes of condition and provide optimum elevator operation

4) Major functions

Up-peak operation (morning, office)

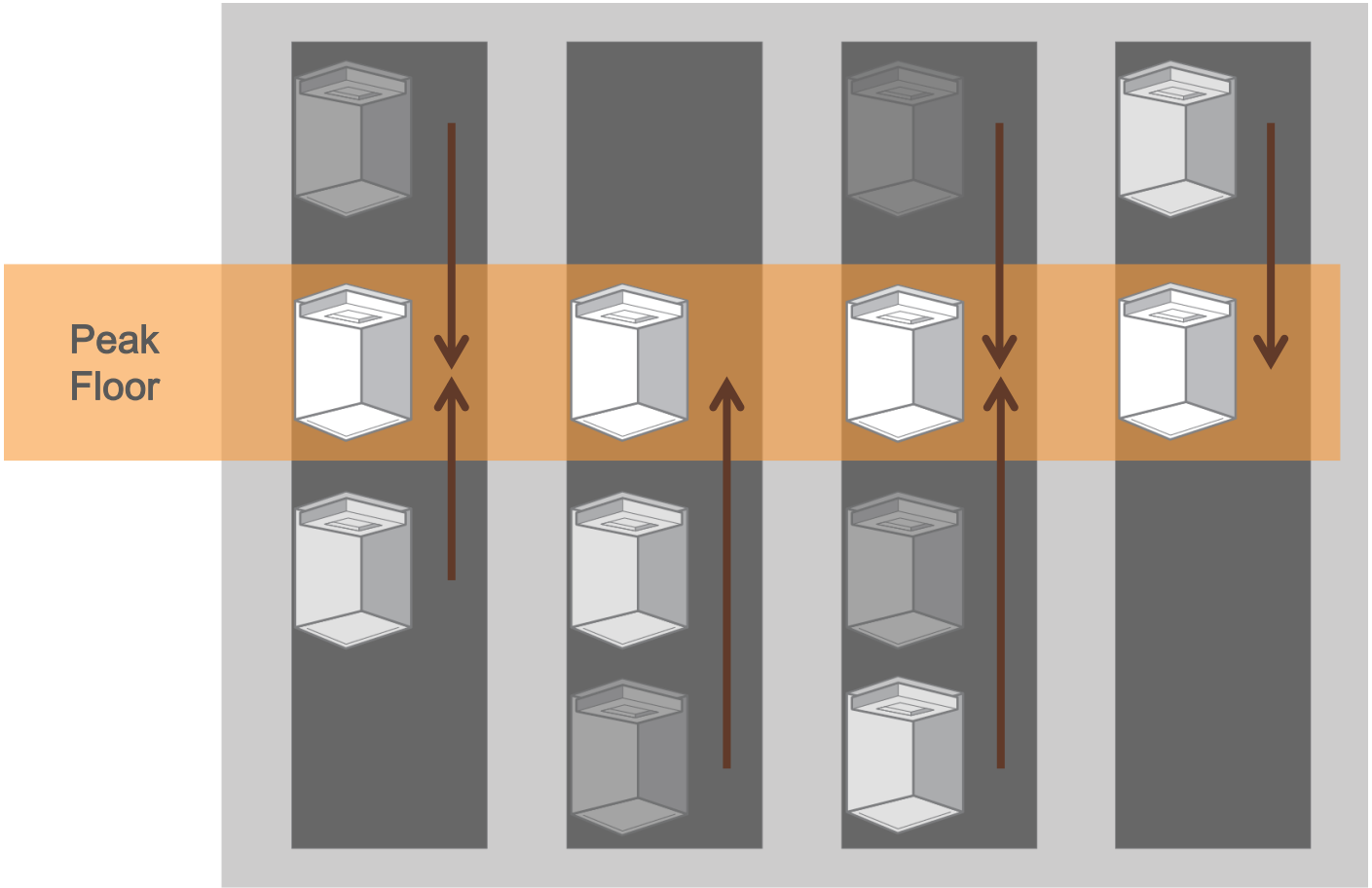
▸ Elevator will stand by at **lobby floor** after finishing their service



4) Major functions

Peak traffic operation

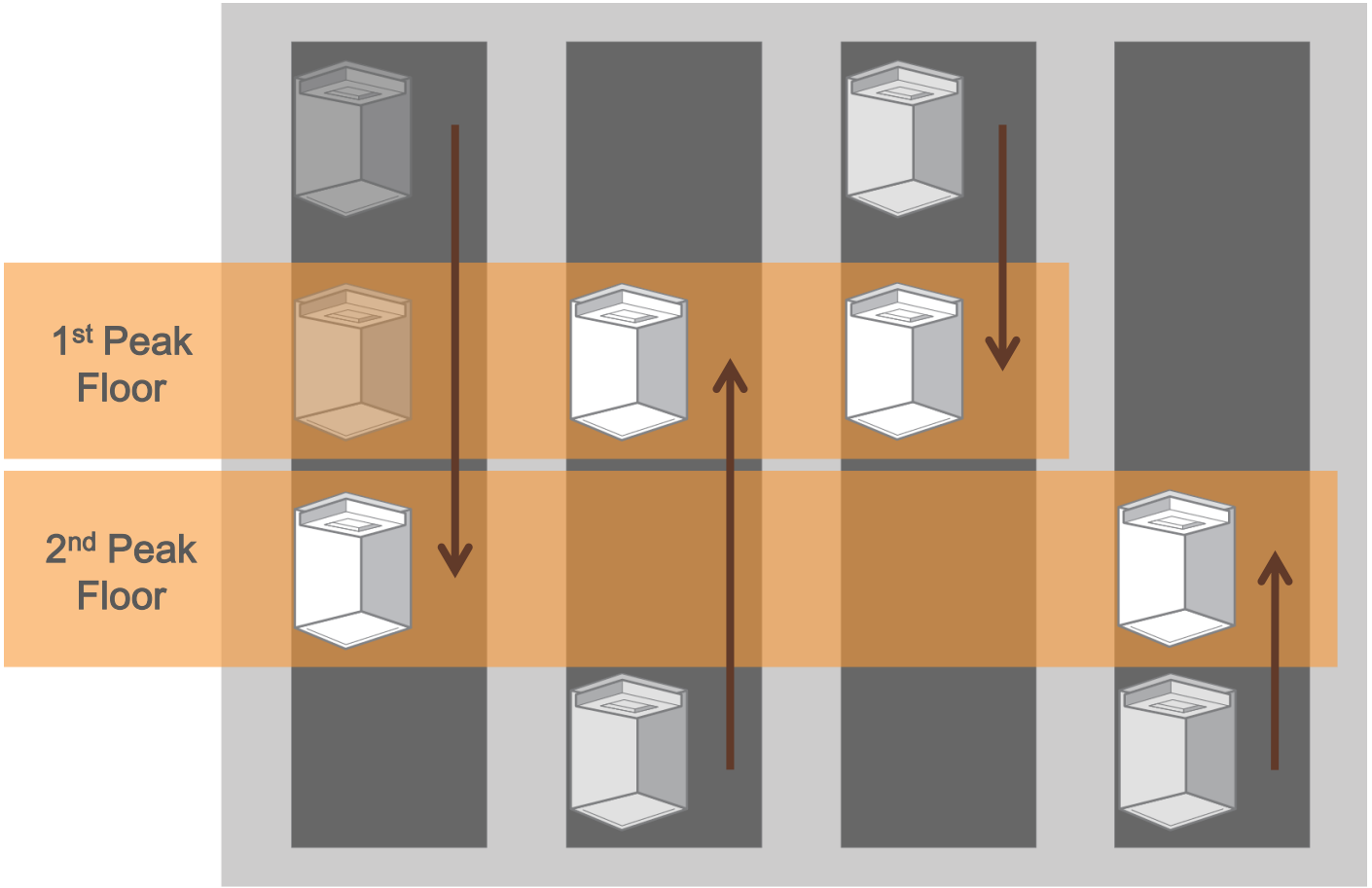
▸ Elevator will stand by at **peak floor** after finishing their service



4) Major functions

Distribution operation

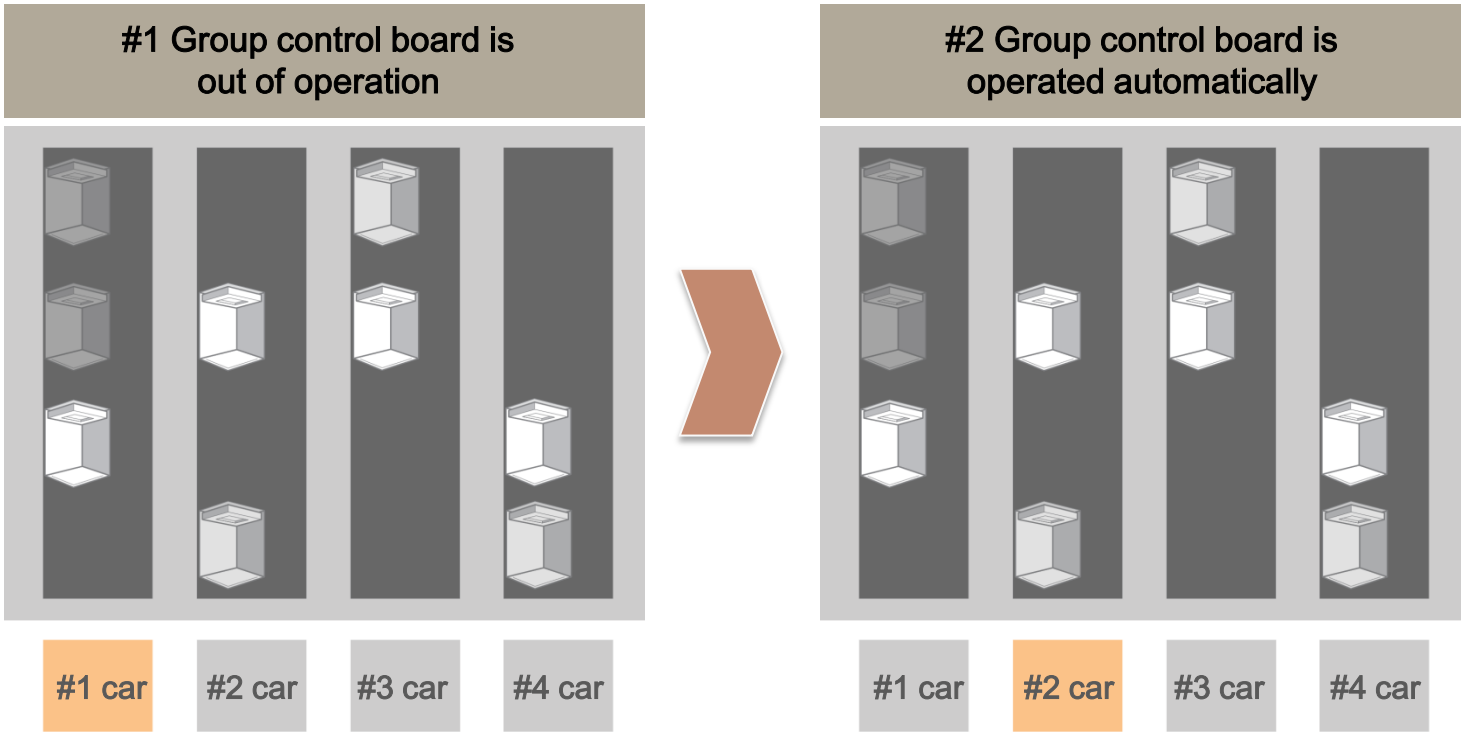
▸ Elevator will stand by at **separated location** throughout accumulated data



4) Major functions

Back up function

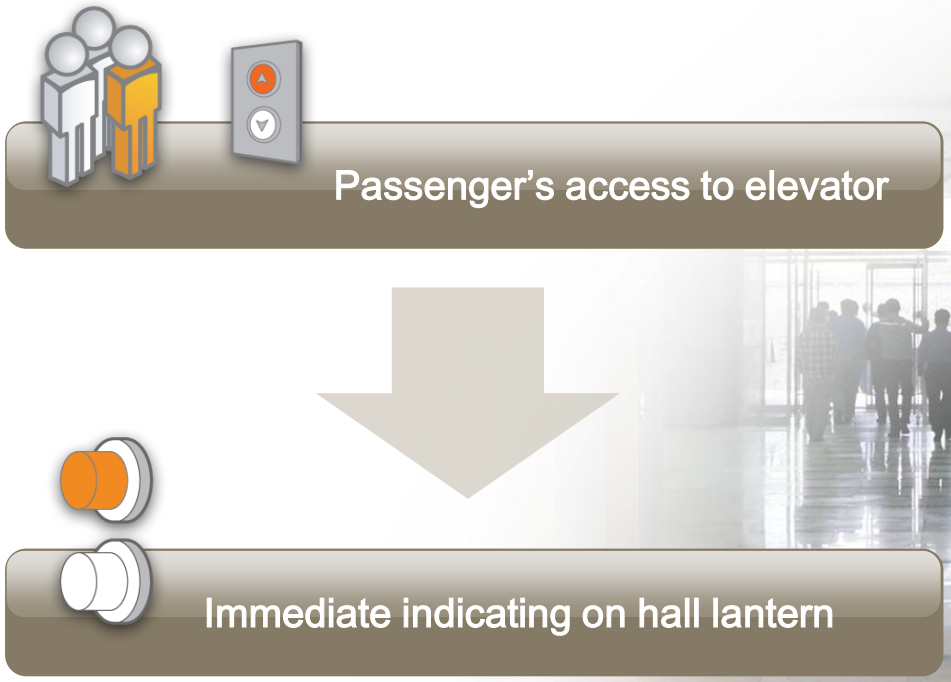
▸ If one car group control board is in trouble, group control board of other elevator will back up its function immediately and keep operating



4) Major functions

Immediate prediction operation

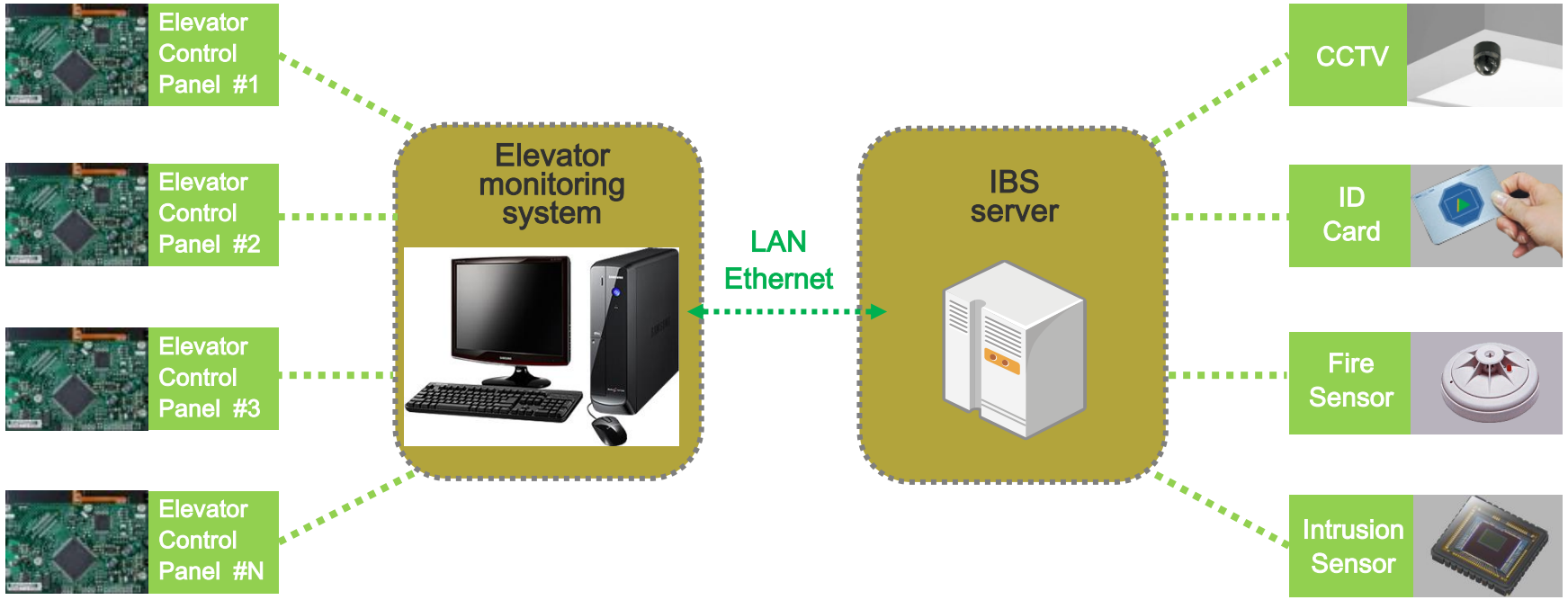
▸ When hall call registered, hall lantern indicates allocated elevator immediately



3. Interface with IBS

1) IBS(Intelligent Building System) Outline

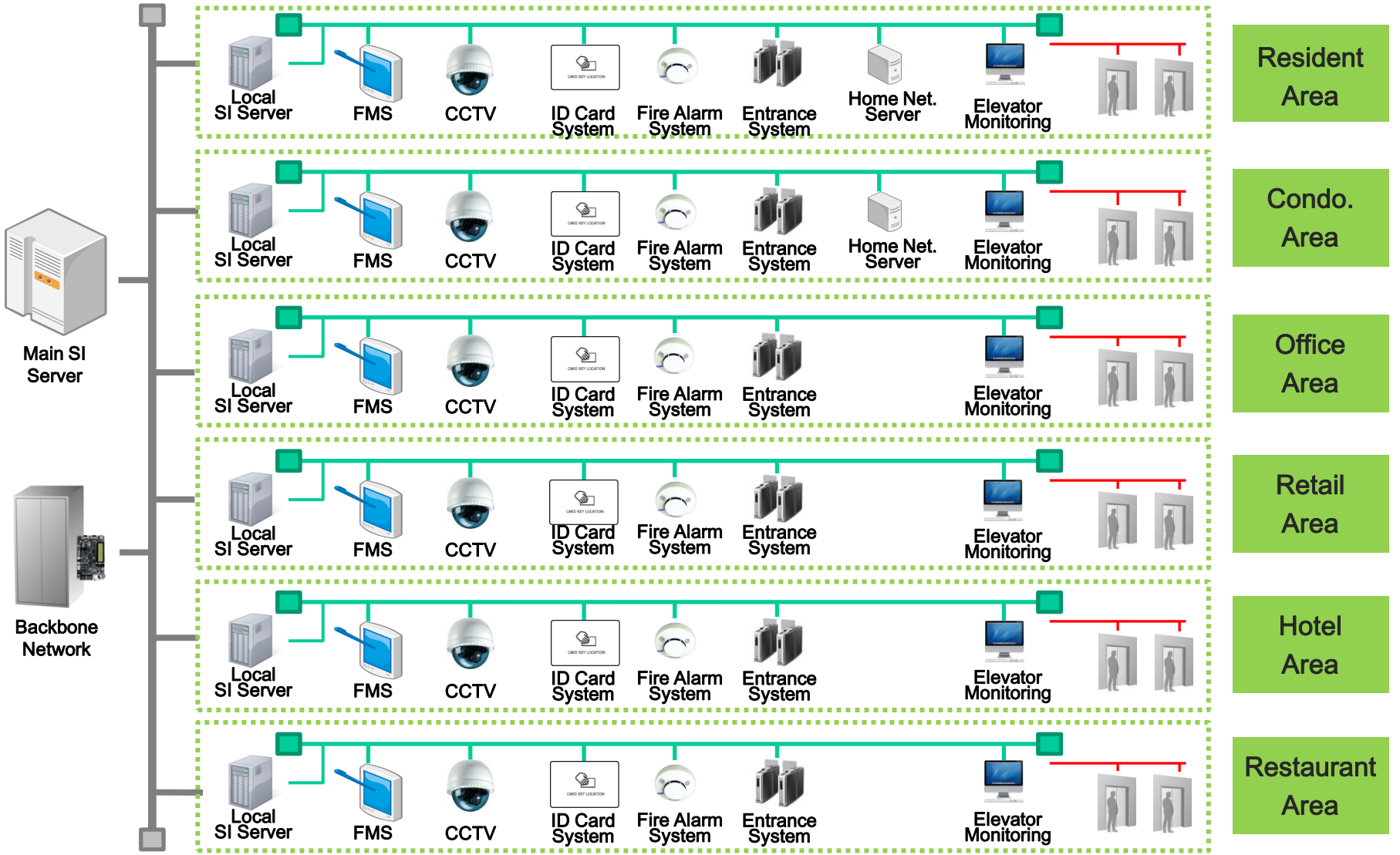
- Interfaces building system with elevator operation
- Enhances security & convenience of passengers



* IBS : Intelligent Building System

3. Interface with IBS

▸ Various building systems could be interfaced with elevator operation



◎ IBS and Elevators Configuration (example)

2) Entrance Security

- For security, elevator access could be limited
  - by ID card - by password

Checking the availability of touched card toward destination floor

Elevator machineroom

Elevator controller

Card reader controller (ACU)

Renew information of permission database

Elevator hall

Processing allowed destination

Allowance

Touched card information

HTS destination input device

ID card reader

- Manage and renewal the permission of ID cards
- Monitor the status of every card reader controller

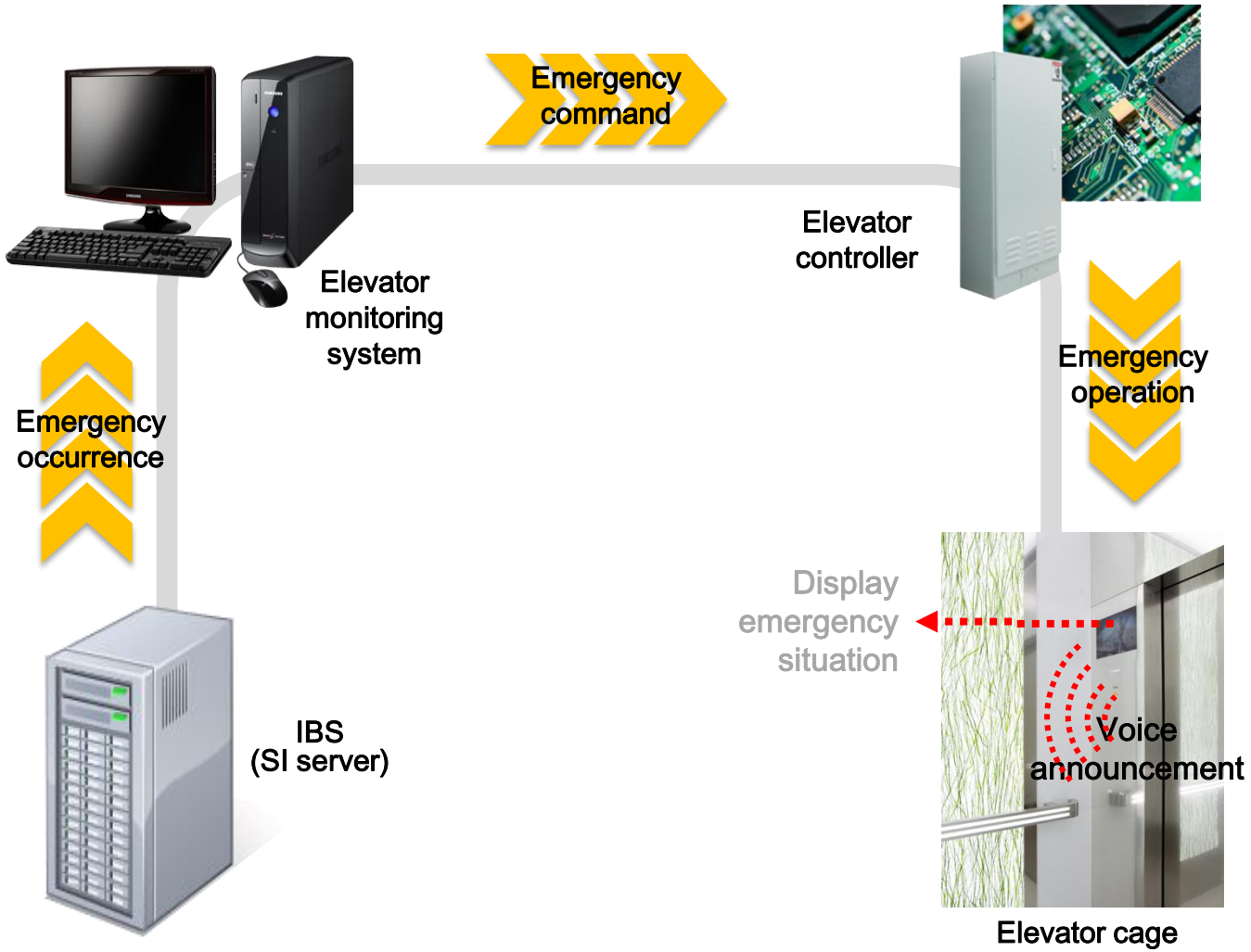
Card reader server

Building control room

Basic scheme of elevator security with ID card

3) Emergency Security

▸ Elevator announces building emergency situation



4) Interfacing Elevators with Turnstiles

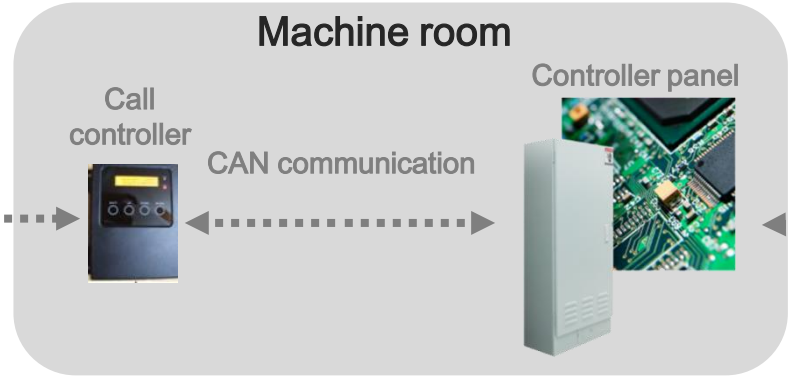
- Through the ID card of each passenger at turnstile,
  destination floor will be automatically registered
  (only available interfaced with Destination Selecting System)

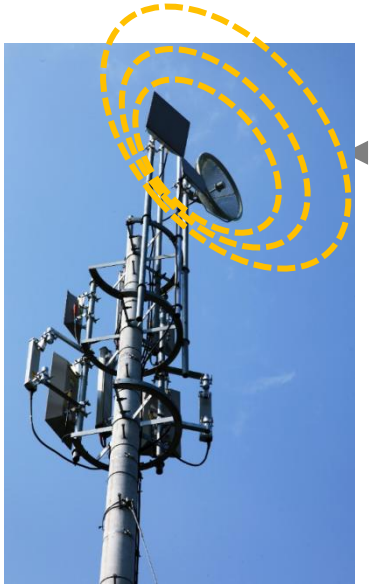
Turnstiles (speedgate)

Elevator

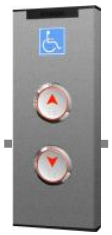
5) Mobile Call System

- Passengers could call their elevator with mobile
- Reduces waiting time of passenger





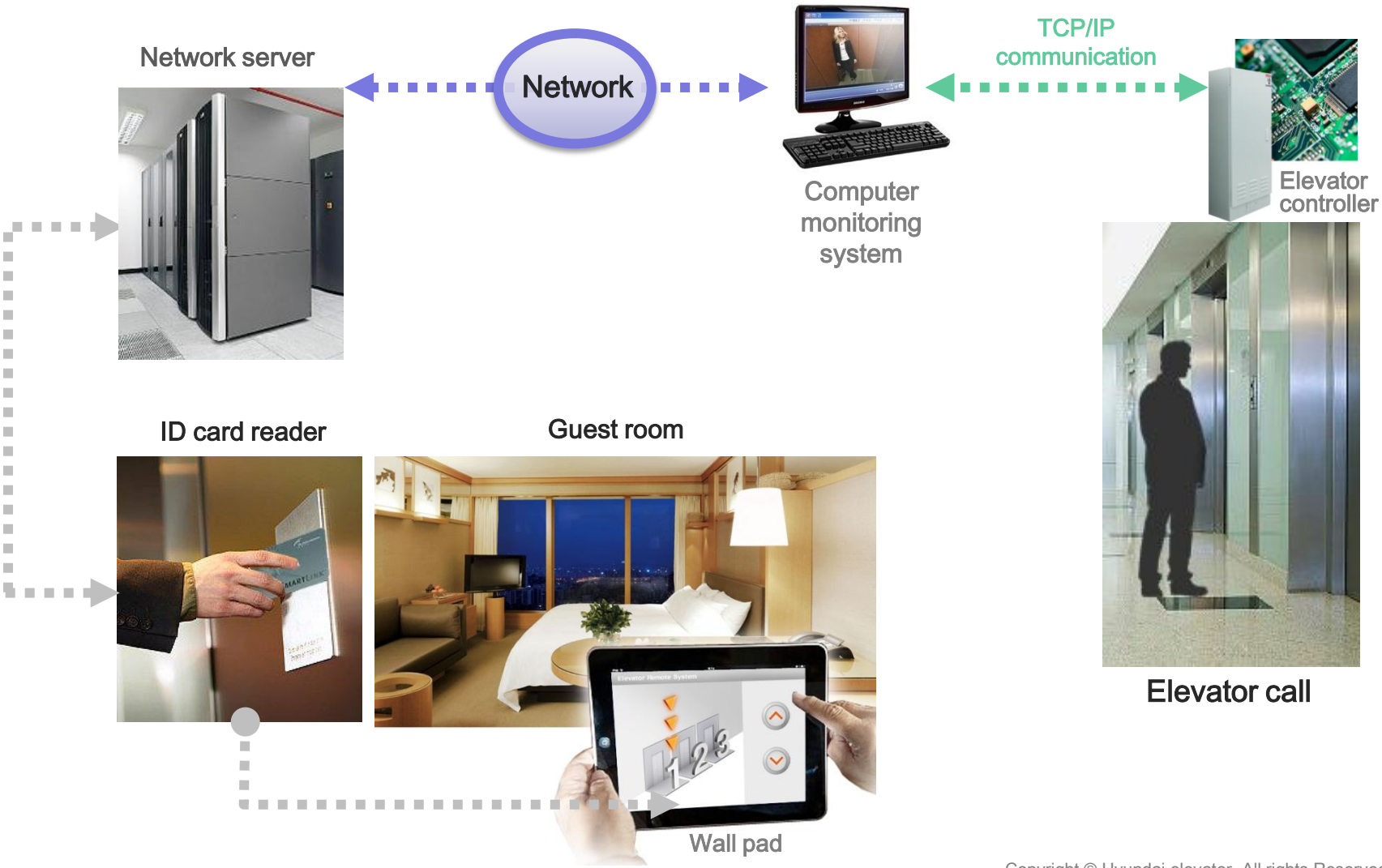
Telephone line



Call

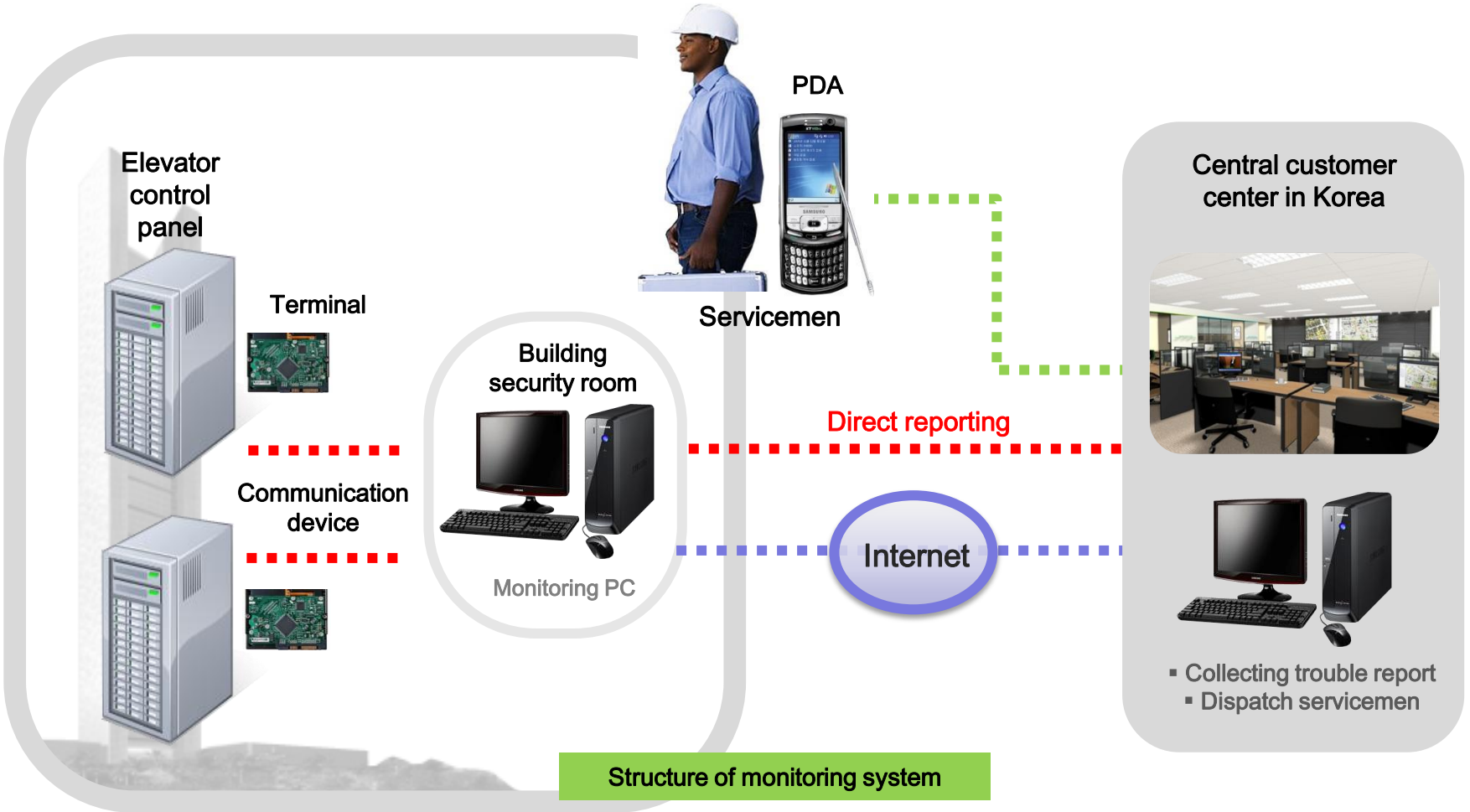
6) Home Network System

▸ Passengers could call their elevator at home



7) Remote Monitoring System

- Transmit monitored information to customer service center through internet
- Minimize restoration time through real time report to customer service center and servicemen



Structure of monitoring system

8) Bidirectional Video Interphone

- In case of emergency situation, video interphone would reduce tension of passenger inside elevator.

Elevator in emergency

View of call center

Customer service center

View of a passenger

9) Touch Screen Operating Panel

▸ Various graphic display with LCD touch screen for luxury buildings

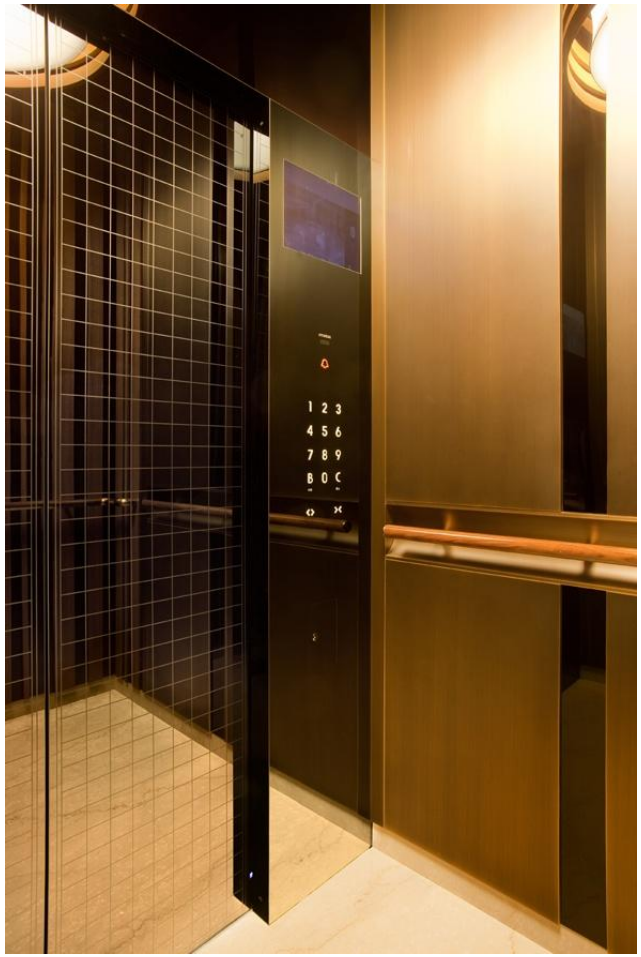
Hyundai Securities, Co. Building in Seoul

Hyundai Heavy Industries, Co. Building in Ulsan

10) Ten-Key Operating Panel

- Registers destination floor with ten key button suitable for luxury buildings

Design



11) Handwriting control panel

- Layered space technique with picture image
- Interface design taking more attention with grid box & letters

Interface Design

Register

By using hand cursor, taking more attention of user

Completion

Announce by voice when registered

Thank you.

Hyundai Elevator

for your safety, comfort & green