Non-proprietary Approach to Destination Control

CIBSE Lifts Group AGM 6 March 2025

Dr Richard Peters
Peters Research Ltd

1

1

Presented by

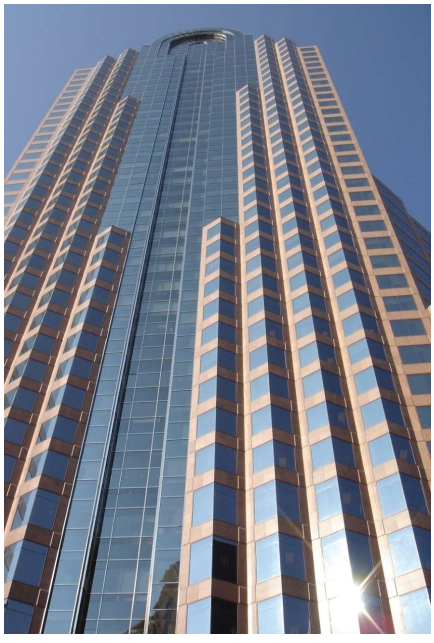
- Dr Richard Peters,
- Director of Peters Research Ltd
- Visiting Professor of Elevator Modelling & Simulation, University of Northampton
- CIBSE Guide D author
- BSI Representative ISO 8100-32:2020, *Planning and selection of passenger lifts*

2

3

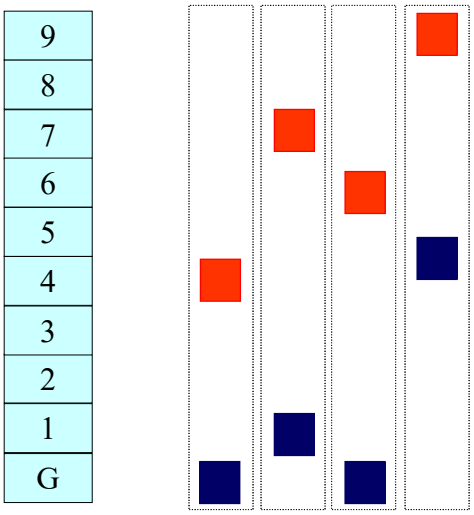
Dispatching Background

Building dispatching algorithms for simulation since 1986
Consultant to ThyssenKrupp (now TK Elevator)
TAC 50 Destination Control
& Hybrid Destination Control



4

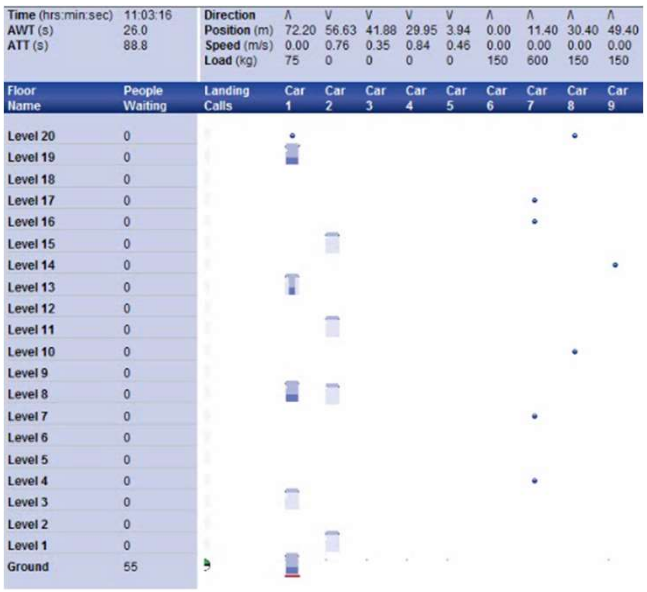
TWIN™
Two cars per shaft



5

6

MULTI™ Ropeless lifts



Time (hrs:min:sec)	11:03:16	Direction	Λ	V	V	V	V	Λ	Λ	Λ	Λ
AWT (s)	26.0	Position (m)	72.20	56.63	41.88	29.95	3.94	0.00	11.40	30.40	49.40
ATT (s)	88.8	Speed (m/s)	0.00	0.76	0.35	0.84	0.46	0.00	0.00	0.00	0.00
		Load (kg)	75	0	0	0	0	150	600	150	150

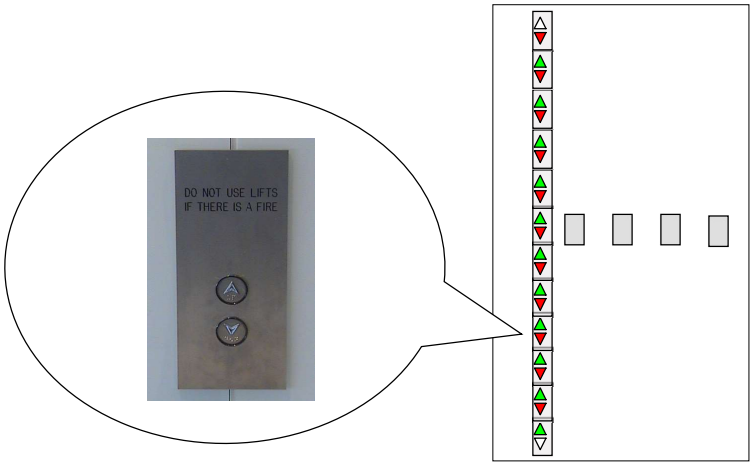
Floor Name	People Waiting	Landing Calls	Car 1	Car 2	Car 3	Car 4	Car 5	Car 6	Car 7	Car 8	Car 9
Level 20	0										
Level 19	0										
Level 18	0										
Level 17	0										
Level 16	0										
Level 15	0										
Level 14	0										
Level 13	0										
Level 12	0										
Level 11	0										
Level 10	0										
Level 9	0										
Level 8	0										
Level 7	0										
Level 6	0										
Level 5	0										
Level 4	0										
Level 3	0										
Level 2	0										
Level 1	0										
Ground	55										

7

8

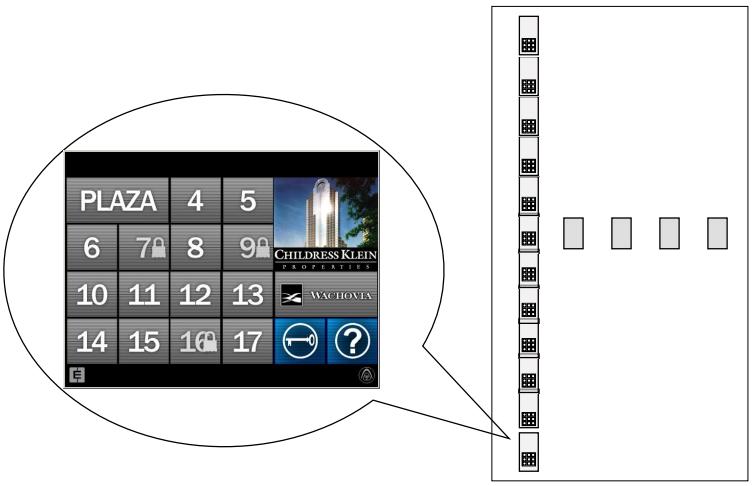
9

Conventional systems



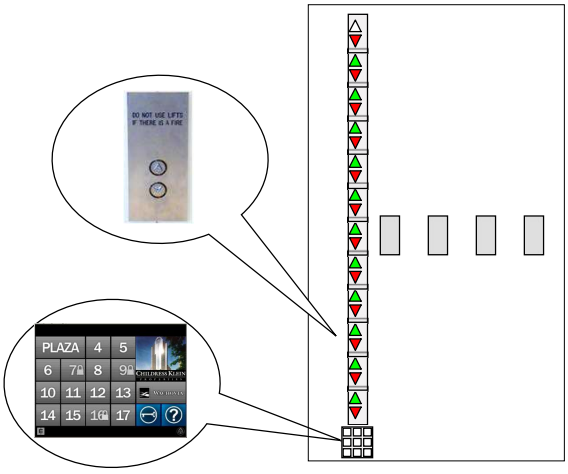
10

Destination Control

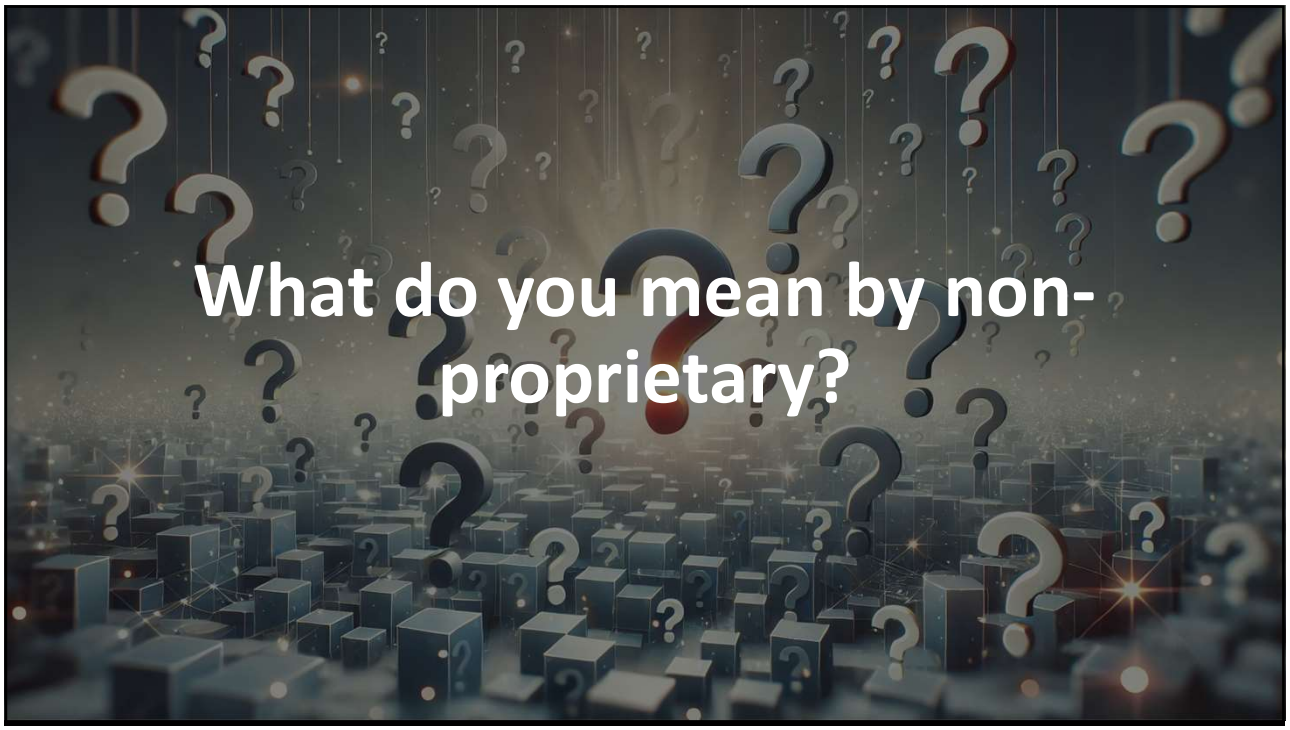


11

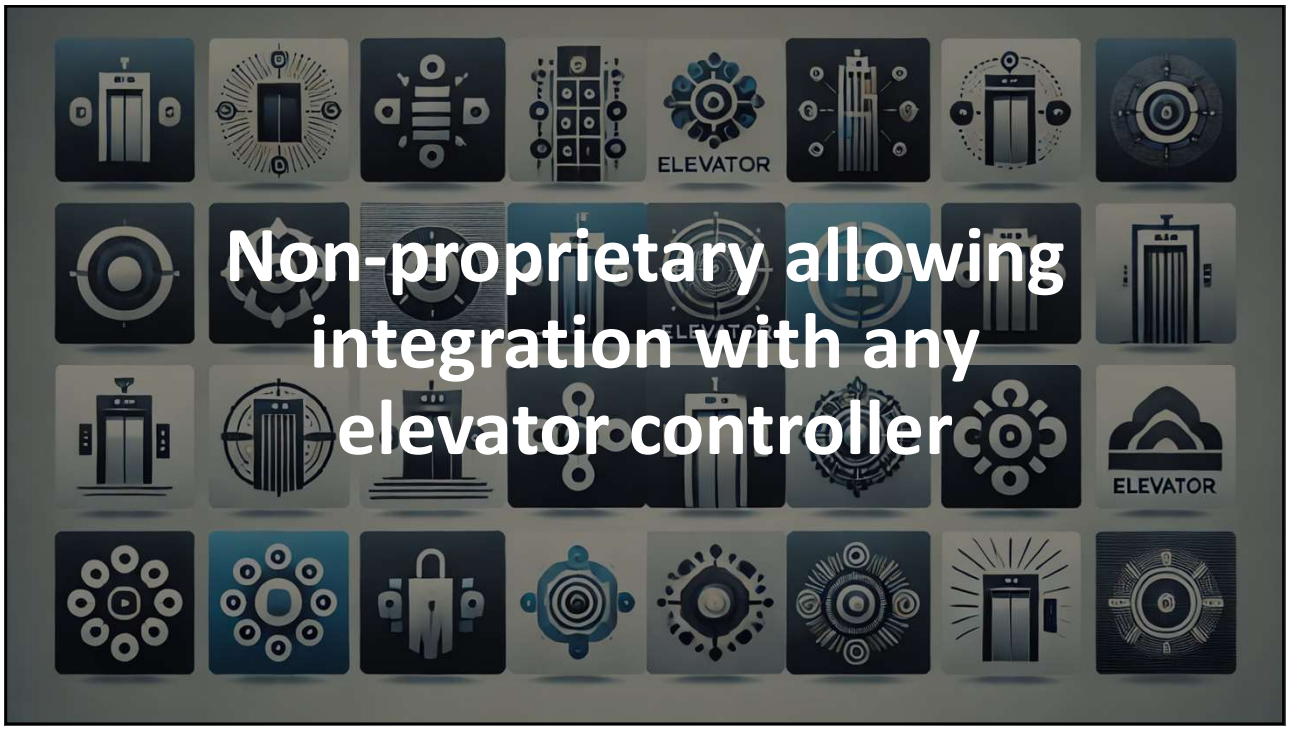
Hybrid destination control



12


What do you mean by non-proprietary?

13


ELEVATOR
Non-proprietary allowing integration with any elevator controller
ELEVATOR

14

15

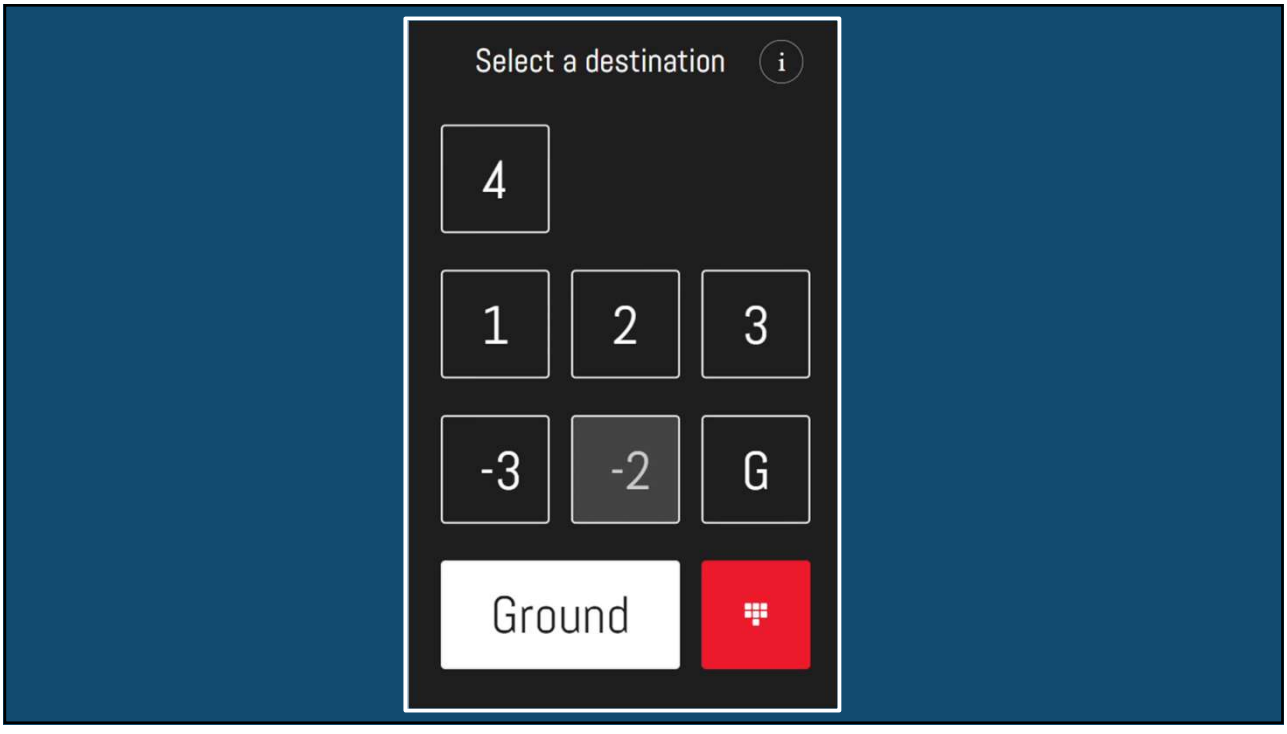
Lester CONTROLS

MKM ELEVATORS LTD

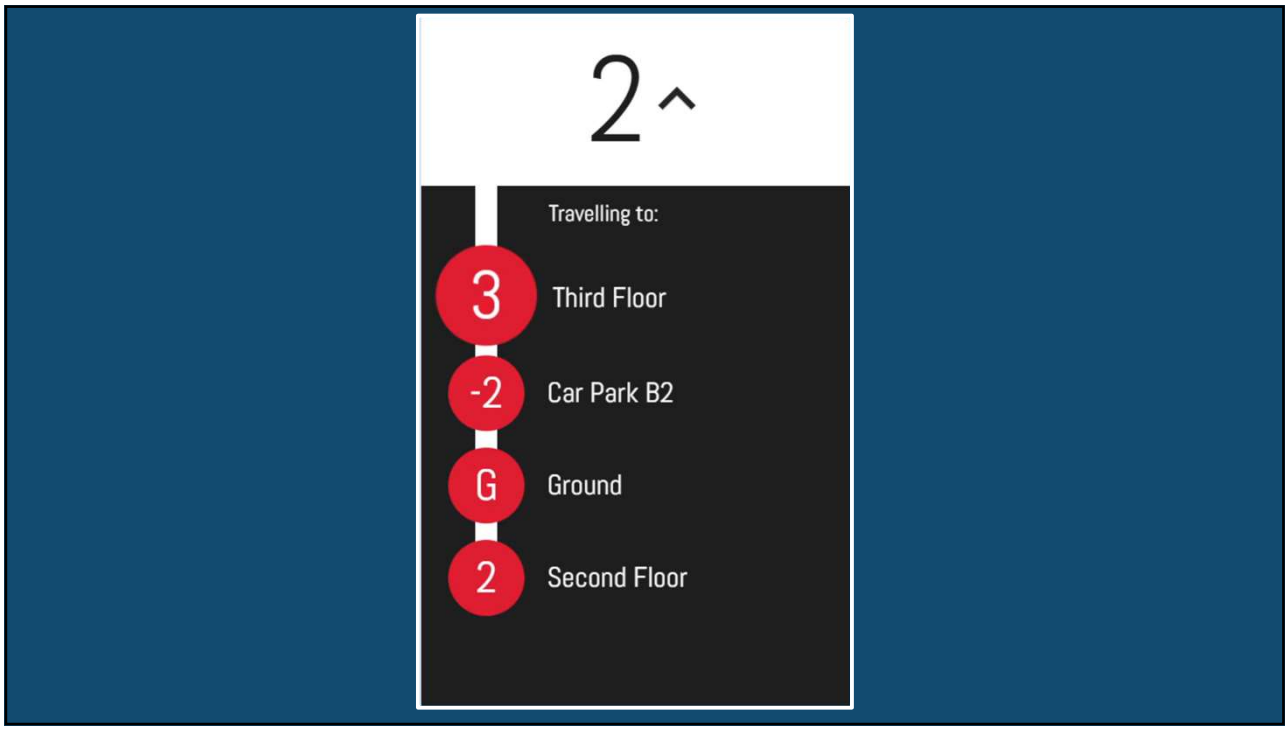
16


G
13 PERSONS OR 1000KG
LIFT A
Select a destination
3
4
G
1
2
-3
-2
-1
Ground

17


Select a destination
4
1
2
3
-3
-2
G
Ground

18

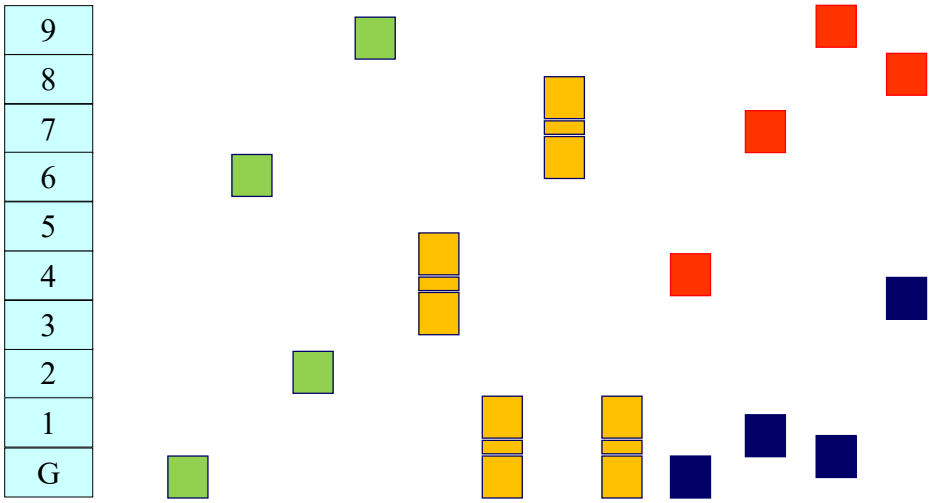

2 ^
Travelling to:
3
Third Floor
-2
Car Park B2
G
Ground
2
Second Floor

19


Time (hrs:min:sec) 00:15:09
Direction /\ \/ /\ /\ /\ /\
Position (m) 15.20 34.20 22.80 16.38 0.00 30.40
Velocity (m/s) 0.00 -0.00 0.00 1.56 0.00 0.00
Load (kg) 300.00 375.00 150.00 150.00 225.00 75.00
Floor
Landing Calls
Shaft 0
Shaft 1
Shaft 2
Shaft 3
Shaft 4
Shaft 5
Level 12
Level 11
Level 10
Level 9
Level 8
Level 7
Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Elevate Visualiser Version 1.2.1

20

Global dispatcher



21

For all controllers and in simulation

22

Why?

- Development and maintenance of 14 different algorithms
- Only want to write one
- Address issues become aware of after 37 years
- It can be done

23

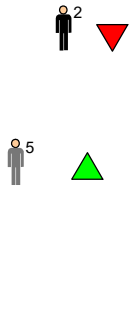
Controllers behave differently

24

Order serving of calls

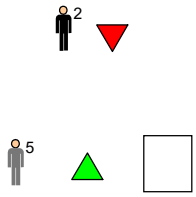
25

Basic control system design full collective (controller logic)



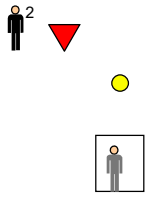
26

Basic control system design full collective (controller logic)



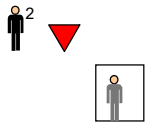
27

Basic control system design full collective (controller logic)



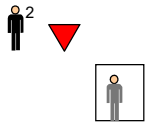
28

Basic control system design full collective (controller logic)



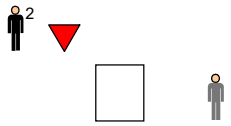
29

Basic control system design full collective (controller logic)



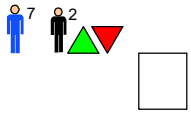
30

Basic control system design full collective (controller logic)



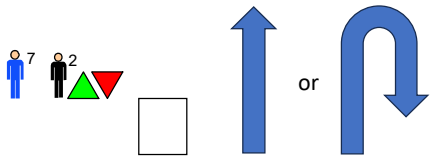
31

Basic control system design full collective (controller logic)



32

Basic control system design full collective (controller logic)



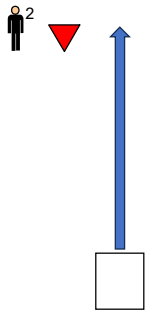
Take the decision away from the controller. The dispatcher makes every start/stop decision

33

Changing target floors

34

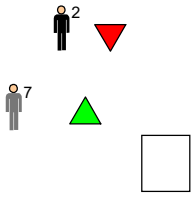
Basic control system design full collective (controller logic)



Current target floor

35

Basic control system design full collective (controller logic)



Current target floor

Preferred new change target

Will the controller be able to change the target floor?

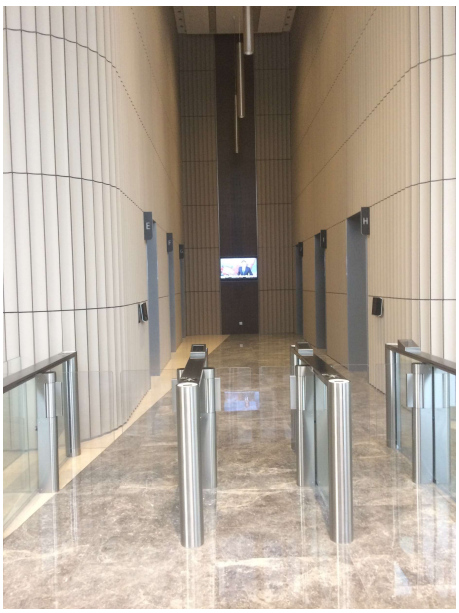
36

37

Requirement for variable door dwell times

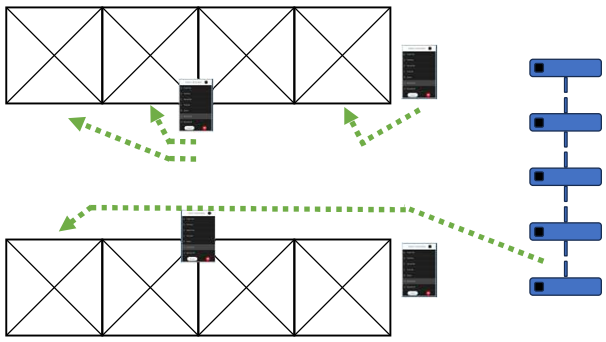
38

Security Integration



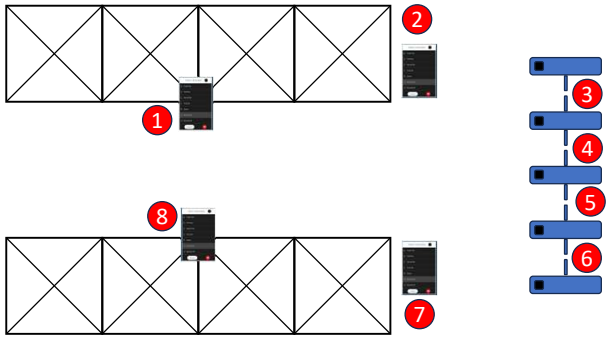
39

Walking times vary with destination input location and allocated elevator



40

Input devices have riser index



41

Walking times table required

	Riser 1	Riser 2	Riser 3	Riser 4	Riser 5	Riser 6	Riser 7	Riser 8
A	4	..						
B	2	..						
C	2	..						
D	4	..						
E	5	..						
F	3	..						
G	3	..						
H	5	..						

42

Dispatcher must instruct door open/close/ dwell (subject to controller safety)

43

Remove collective control and door logic from the controller.

Become the responsibility of the dispatcher.

The controller remains in control of safety.

This is a paradigm shift for controller developers

44

Sends messages to controller requesting

Global Dispatcher

- Door open/close
- Go to floor
- Change the target floor

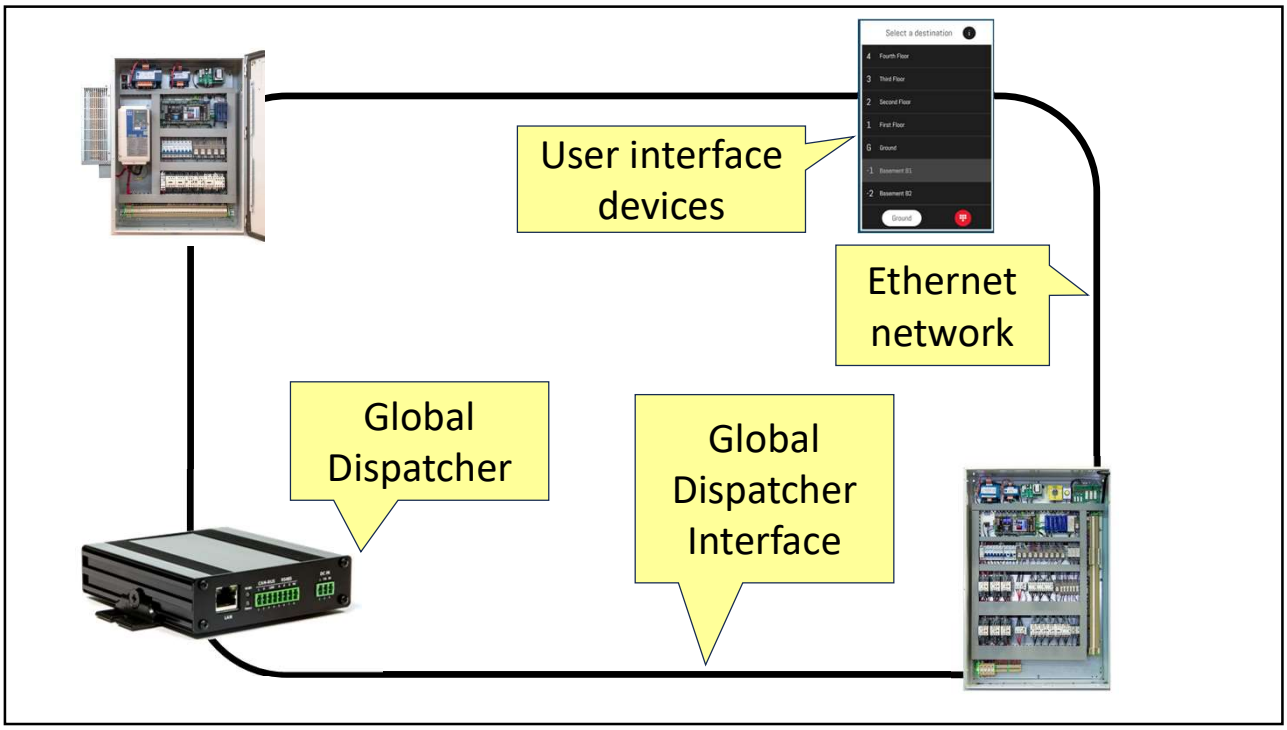
45

Receives messages from controller

Global Dispatcher

- Door/beam status
- Travel status
- Current floor
- Quickest stop floor
- Availability (in/out service)

46



47

Controllers without an ethernet port

48

No ethernet port, but CAN

CAN GATEWAY

Global Dispatcher

49

No ethernet, no CAN or foreign controller

Discrete inputs for car calls and door buttons

Global Dispatcher

50

Sends messages to controller requesting

Global Dispatcher

- Door open/close
- Go to floor
- Change the target floor (may not be possible)

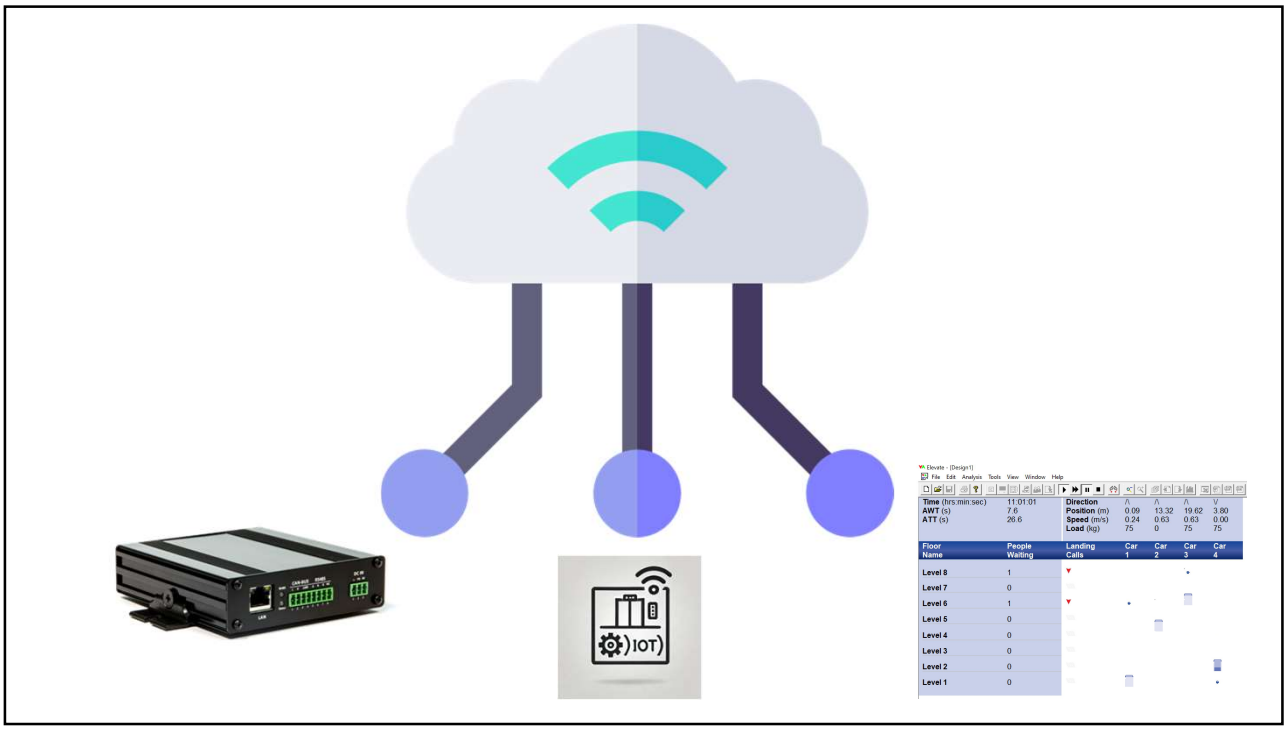
51

No messages from controller

Global Dispatcher

- Door/beam status – direct interface, .e.g. CEDES
- Travel status - accelerometer
- Current floor – accelerometer/barometer
- Quickest stop floor – fix target or learn
- Availability (in/out service) - learn

52



53

Non-proprietary destination control applying Global Dispatcher

- Early versions in Elevate 9
- Some features still under development, to be completed for Elevate 10 (2025)
- Partnered with Lester Controls in 2015 for proof of concept development in UK. Launched 2022.
- UK Installations 2023/2024. International partners from 2025 Q4.

54