



TK AIRPORT SOLUTIONS

Munich, Inter Airport 7-9 Oct 2025





AGENDA

TK Airport Solutions S.A.

01

Who are we?

02

MAX Automate

03

Other Digital
Solutions



AGENDA

TK Airport Solutions S.A.

01

Who are we?

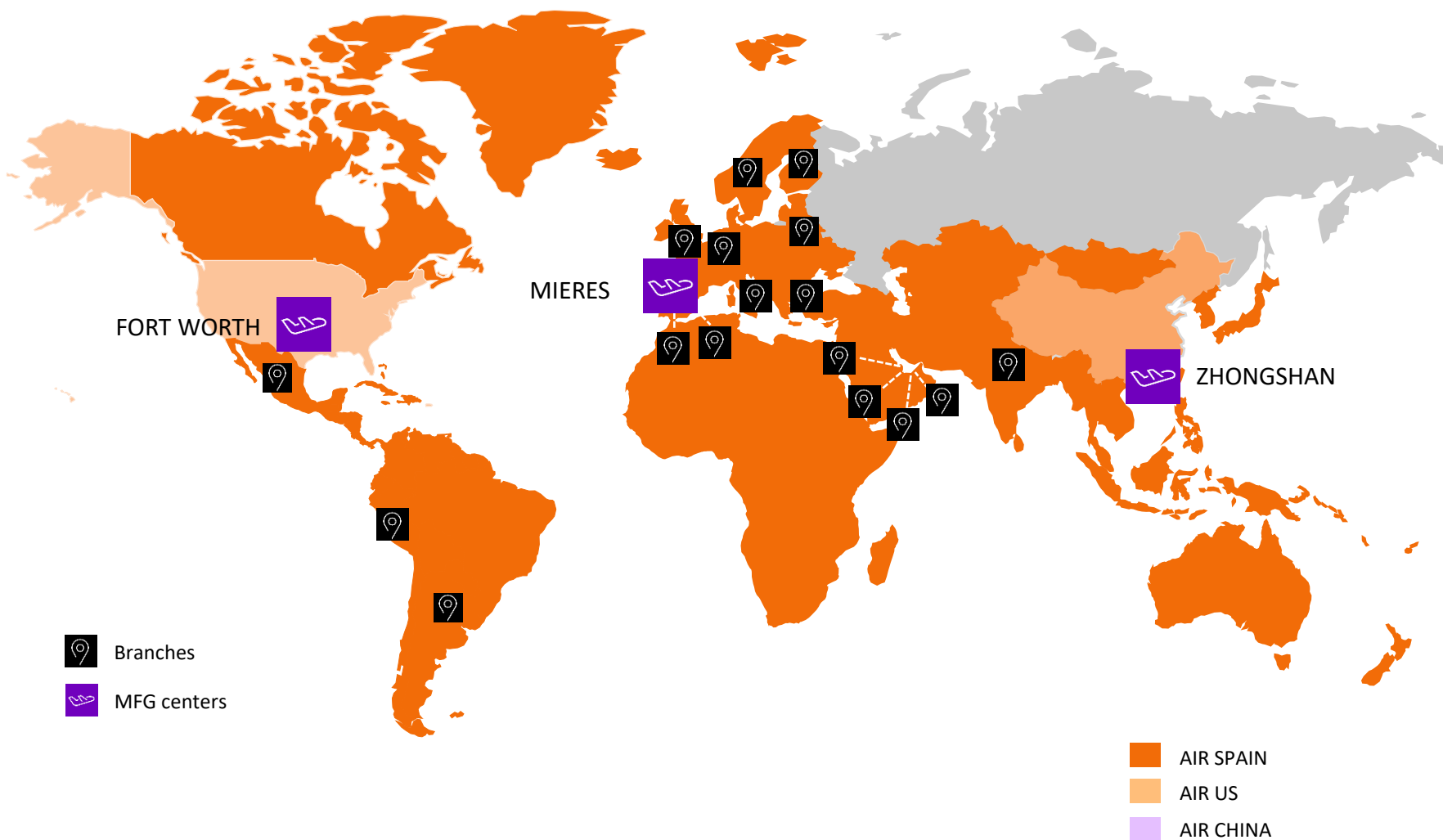
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TK AIRPORT SOLUTIONS. OUR FOOTPRINT



KEY DATA



~ 1.200
people



3
MFG centers



+ 5.500
PBBs installed in +370 airports



20
branches



+ 1.200
UuM in 45 airports



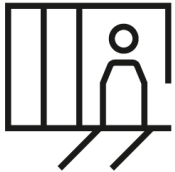
+ 50
airports with MAX solutions

TK AIRPORT SOLUTIONS BUSINESS LINES

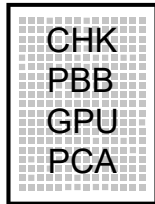
New Installation

PBB & GSE

Industry-leading passenger boarding bridges and ground support equipment engineered for your airport

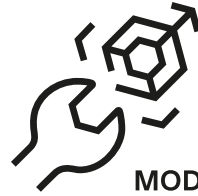


VDGS



Made for the future, from the pioneers of VDGS

MOD



Your **expert modernization partner**, keeping assets up and running for longer

SER

Your **expert service partner**, worldwide, at all times

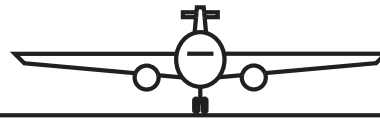
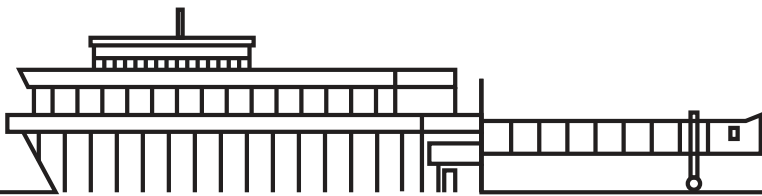


Digital



Pioneering future intelligent gate operations

MAX Solutions: Making your turnarounds safer, faster and more efficient





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MAX AUTOMATE

TKE

Adolfo Suárez Madrid-Barajas Airport is the world's first fully remote-operated hub, managing 129 PBBs accross all terminals. Innovation keeps you moving: welcome to the future of airport operations!

MOVE BEYOND

PROJECT DESCRIPTION

MAX Automate value proposition

Safety

By minimizing in-person involvement in danger situations, MAX Automate significantly reduces potential incidents and the risk of damage to PBBs and aircraft, ensuring safer and more reliable operations.

Efficiency

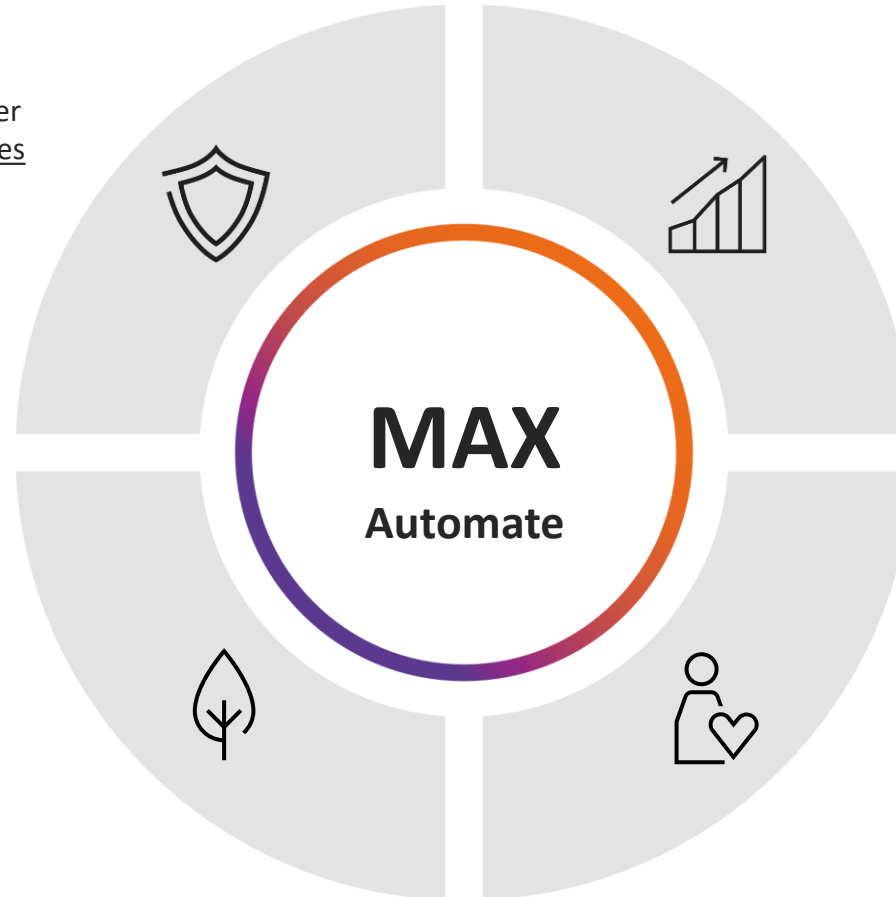
MAX Automate delivers exceptional operational quality while cutting costs and minimizing downtime. It bridges gaps in docking kick-off, streamlining workflows and reducing operational demands

Sustainability

By eliminating operator transfers between PBBs, MAX Automate significantly reduces vehicle usage on the apron, leading to lower CO₂ emissions and a greener, more efficient operation.

Inclusivity

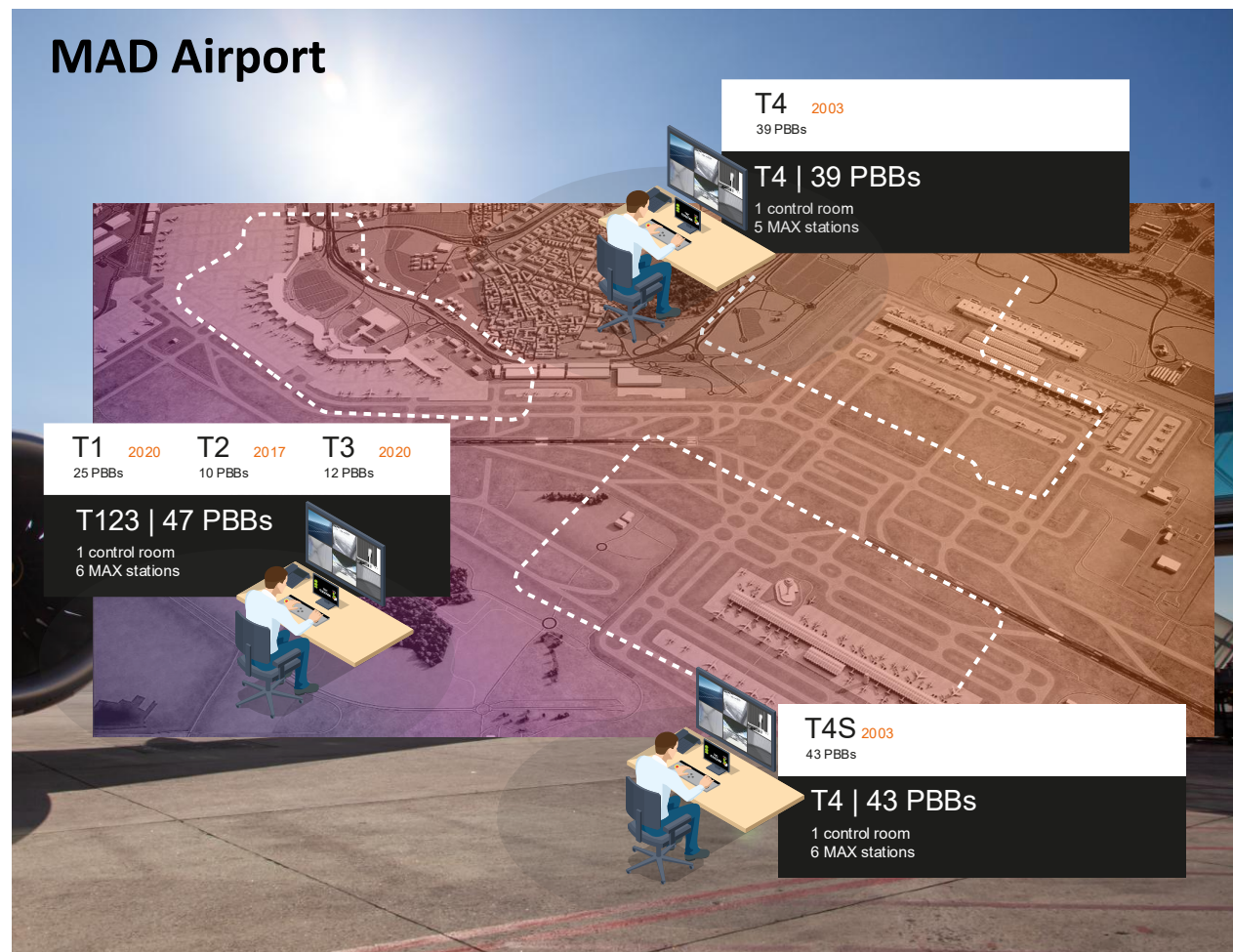
MAX Automate remote-control room provides superior working conditions and accessibility, making it ideal for individuals with disabilities and promoting a collaborative and inclusive workplace.



Efficiency, Safety, Sustainability & Inclusivity

PROJECT DESCRIPTION

MAX AUTOMATE: MAD RCS DEPLOYMENT



Scope

129

PBBs

5

Terminals

3

Control Rooms

17

Control Stations

Performance

+1,000

Daily remote operations

Passenger volume

+66

M passengers / year

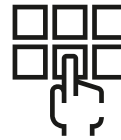
ROAD MAP FOR REMOTE OPERATIONS

Journey to involve manual operations...

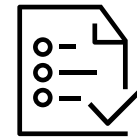
... towards an integrated and fully remote operations of PBB require for a detailed approach to combine the RCS system' implementation with daily MAD operations



1. Upgrade of all existing boarding bridges to comply with RCS requirements



2. Functional test of all upgraded PBBs including contingences simulation



3. Operational validation test with real operations in each terminal



4. Recertification process by a third party to probe PBB well-performance

Fully remote PBB operations

In conjunction with airport daily operations



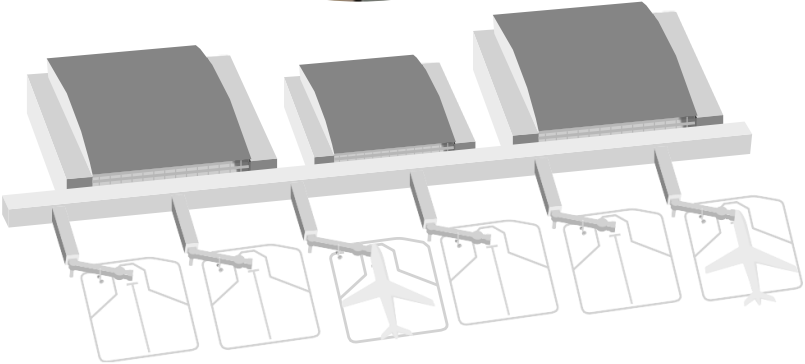
PBB REMOTE DOCKING OPERATIONS

PBBs are at the touch of a button, saving travel time.

The PBBs can be operated locally from the cabin when necessary.

All PBBs can be controlled from a remote-control station

Each PBB can be controlled from any remote-controlled station



REMOTE OPERATIONS EXECUTION



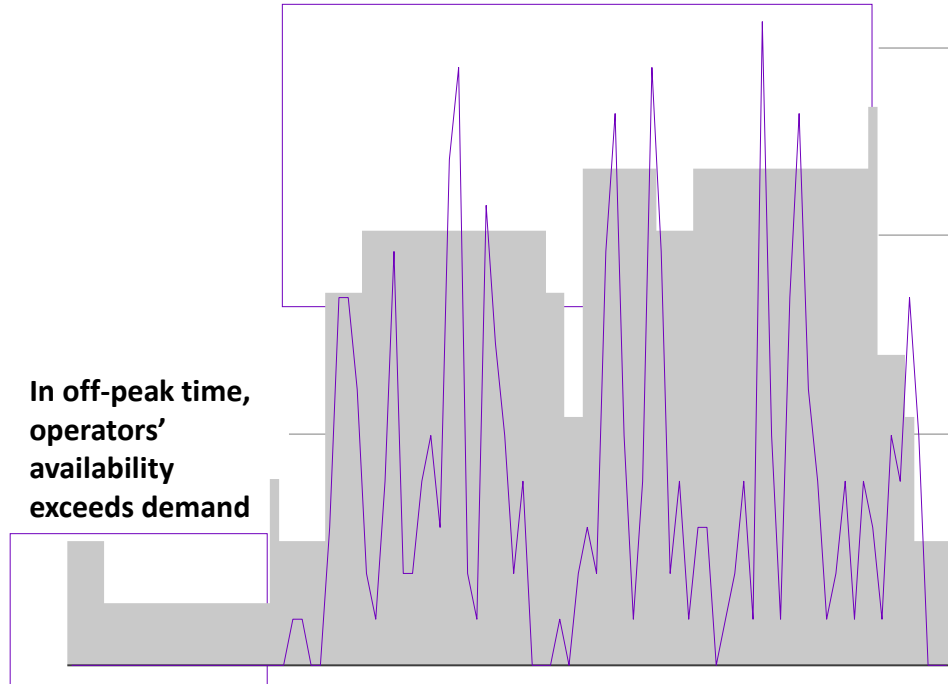
Remote Operations consist of 5 consecutive steps

- 1 Information display  AENA publishes **daily flights** and once the aircraft touches the ground, **AENA assigns the stand**
- 2 Operator assignment  RCS **coordinator assigns the operation** to a specific remote operator
- 3 Stand Activation  **Check list:** Activation of RCS, selection of terminal/stand, stand' activation and cameras ON
- 4 PBB Operation  **Execution of remote operation** once all checks are correctly performed
- 5 Completion  Once the PBB docking is completed, **the light turns green** and docking operation is finished

REMOTE VS MANUAL OPERATIONS: DEMAND MANAGEMENT

MAD real operations (T4) – 15 minutes operations

In peak hours, flight demand exceeds available operators



Manual operations require for higher operational time for operators due to unnecessary displacements; **it could lead to situations in which flight demands exceed operators' availability**

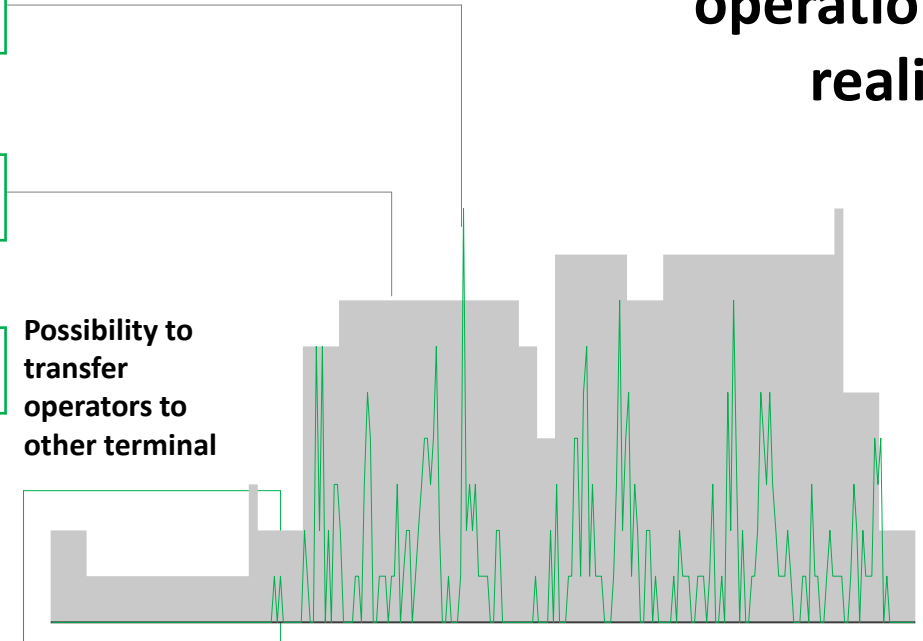
Improvement in demand management

Reduction in number of operators by -35%

Improvement in resources allocation

MAD real operations (T4) – 5 minutes operations

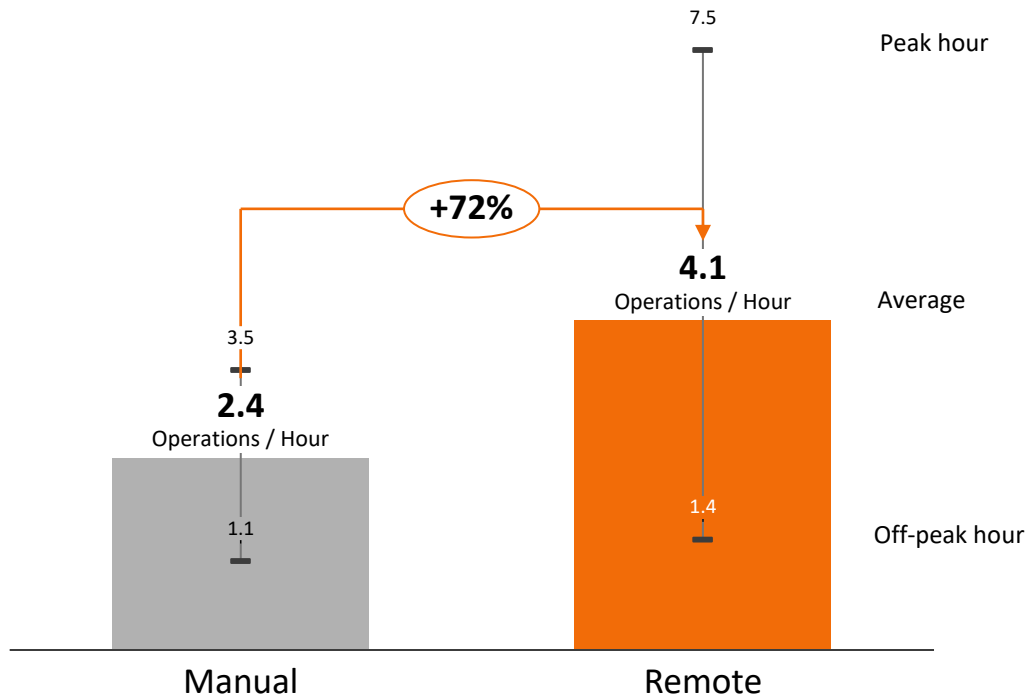
Remote operations reality



Increasing operators' availability (due to reduction of unnecessary operations during pre-docking) leads to **better demand management**. Additionally, possibility **to allocate resources in other terminals** in case of operators availability exceeds demand

REMOTE VS MANUAL OPERATIONS: OPERATORS EFFICIENCY

MAD operators' capacity
has increased by **72%**



Average number of operations executed by an operator in a certain day in MAD Airport (manual vs remote)

Driven by the rise in
operators' availability

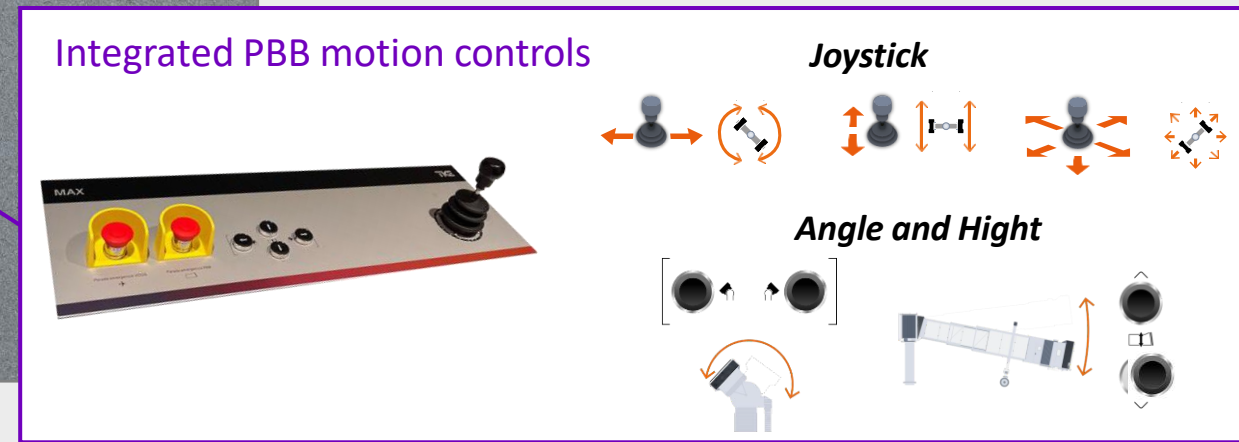
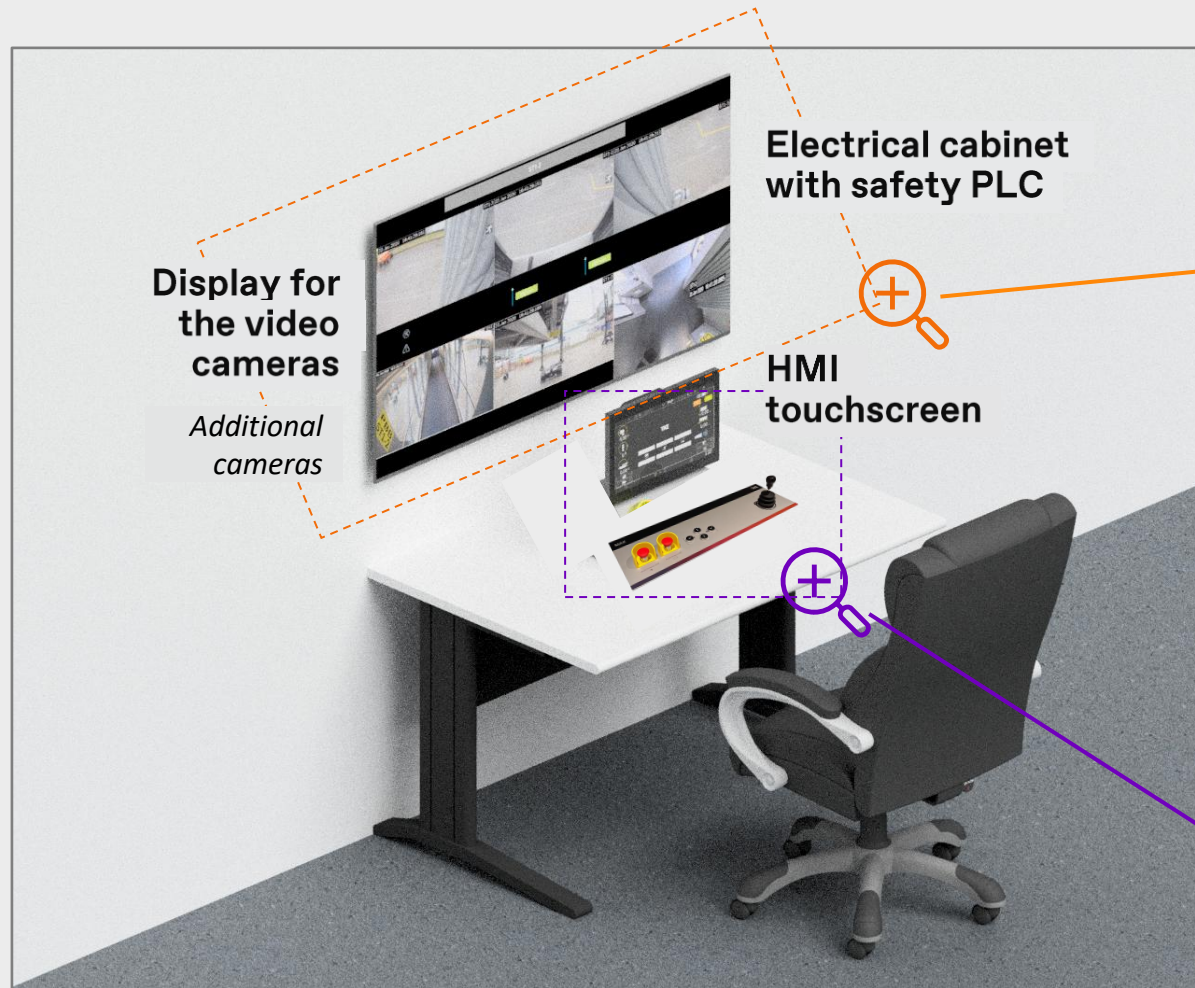
Reasons for optimizing operators' capacity

1. Subtraction of time-consuming operations (e.g., displacements between gates)
2. Possibility to deviate demand in case of traffic jam / operators' unavailability
3. Docking specialized team: increase in efficiency & efficacy of the operations while reducing uncertainty for overall operations timing

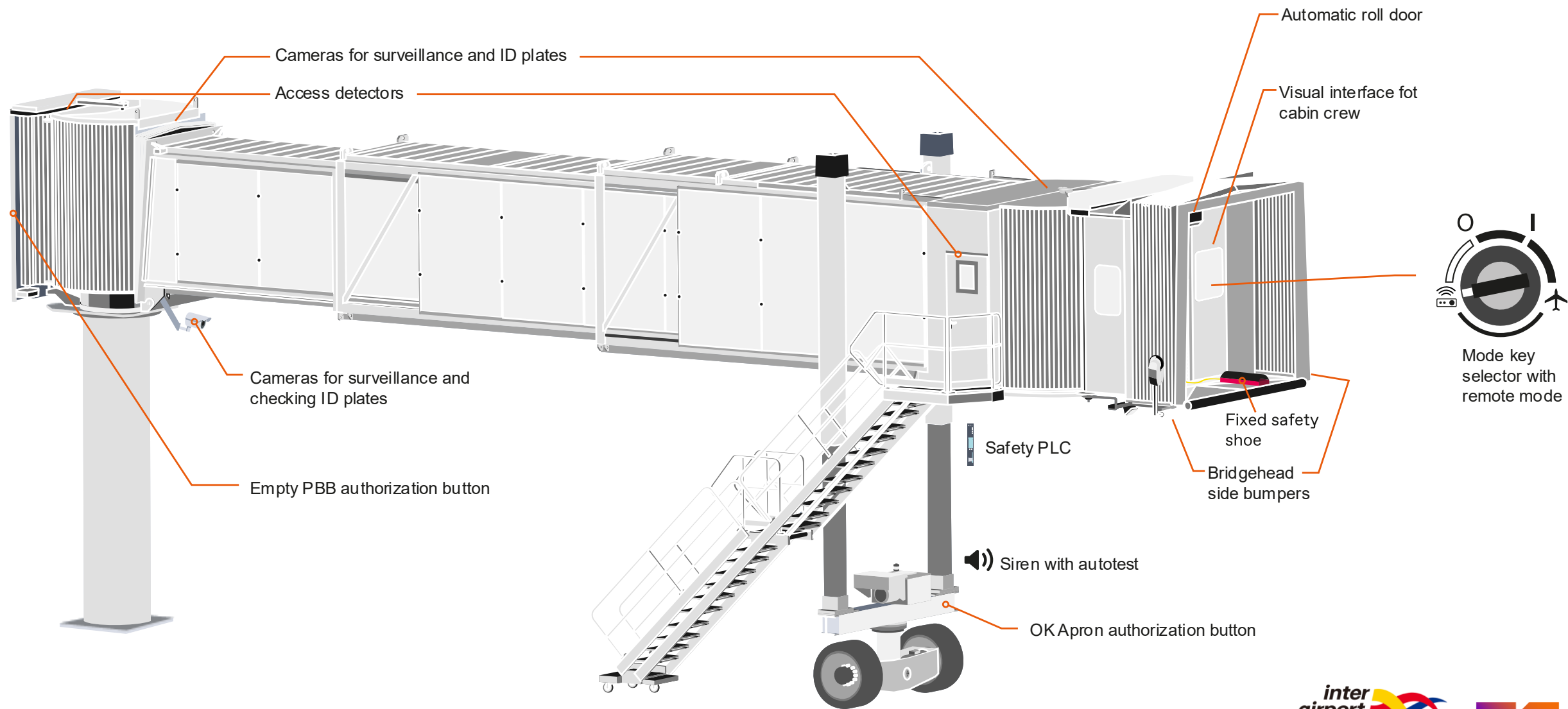
Leading to a nimble demand management

1. Demand-tailored real time assignment
2. Shortening of operators dedicated time per operation
3. Management of ups & downs in air traffic

REMOTE CONTROL STATION ELEMENTS



PBB components for remote control



PBB camera display

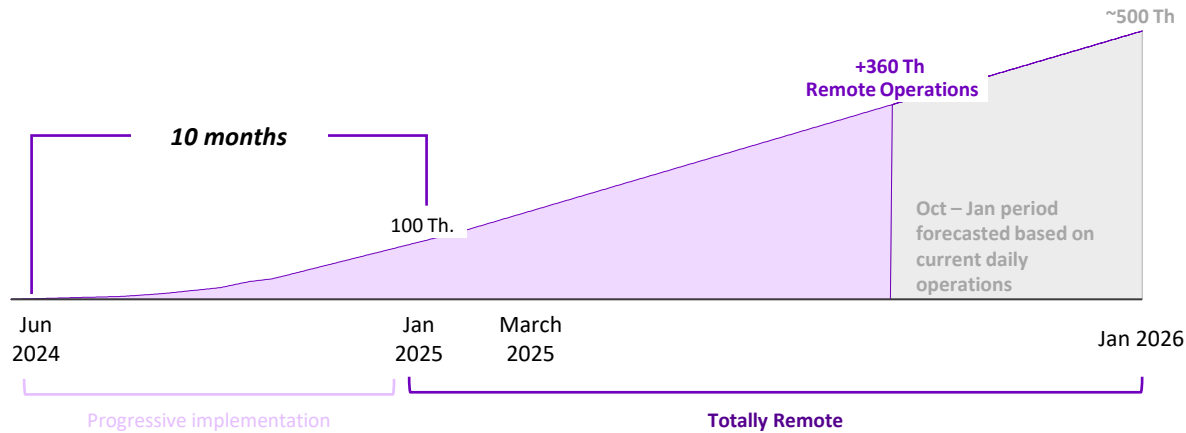
Camera
setup

360° Degrees Monitoring using IP Cameras



REAL LIFE INDICATORS AND KEY MILESTONES

Operations evolution: cumulative



Note (1): since the implementation of RCS, no work accidents related to bridge operations were reported Note (2): number of hourly operations have raised by 72% due to higher availability of operators by eliminating the displacements between gates Strictly confidential Source: Aena and TKE internal information

- MAD RCS project took **1 year** since the start of boarding bridges reconconditioning process to operate 100% of bridges remotely
- 10 months to reach **+100,000** remote operations controlled by MAD RCS hub (+1,000 daily operations)
- MAD RCS Hub provides an **accessible, safe and climate-controlled** workplace for operators:

↘ **100%** Work accidents¹

- And **increasing operators' efficiency**:

↗ **72%** Operations / Hour²



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MAX AUTOMATE – BUILDING BLOCKS

RCS – Remote Control System



ADA – Automatic Docking Assistance



➤ EFFICIENCY

➤ OPERATIONAL AVAILABILITY

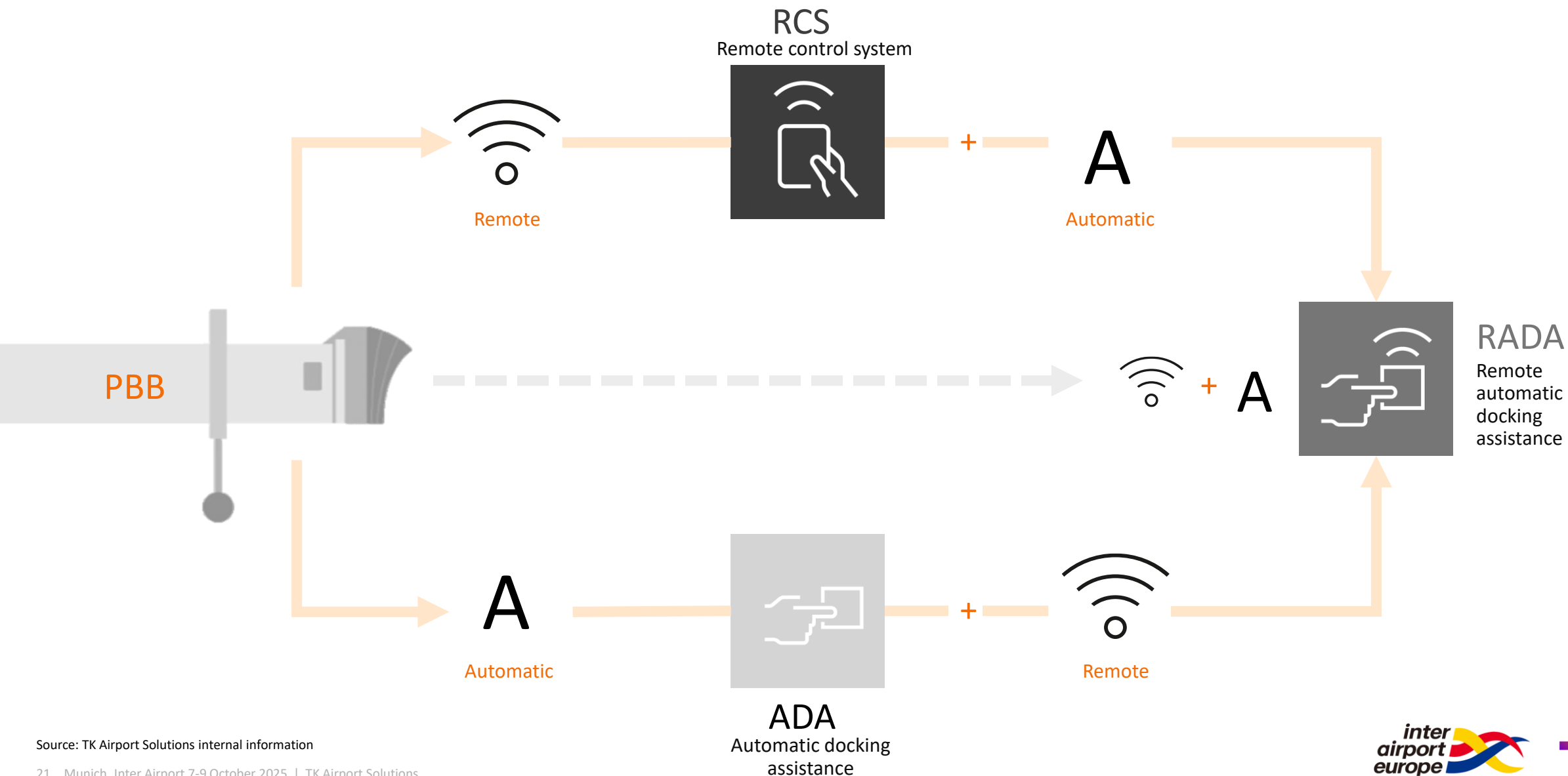
➤ PERFORMANCE

➤ SAFETY

Driving PBBs remotely and safely from a control room

Eliminating the human factor from PBB driving process

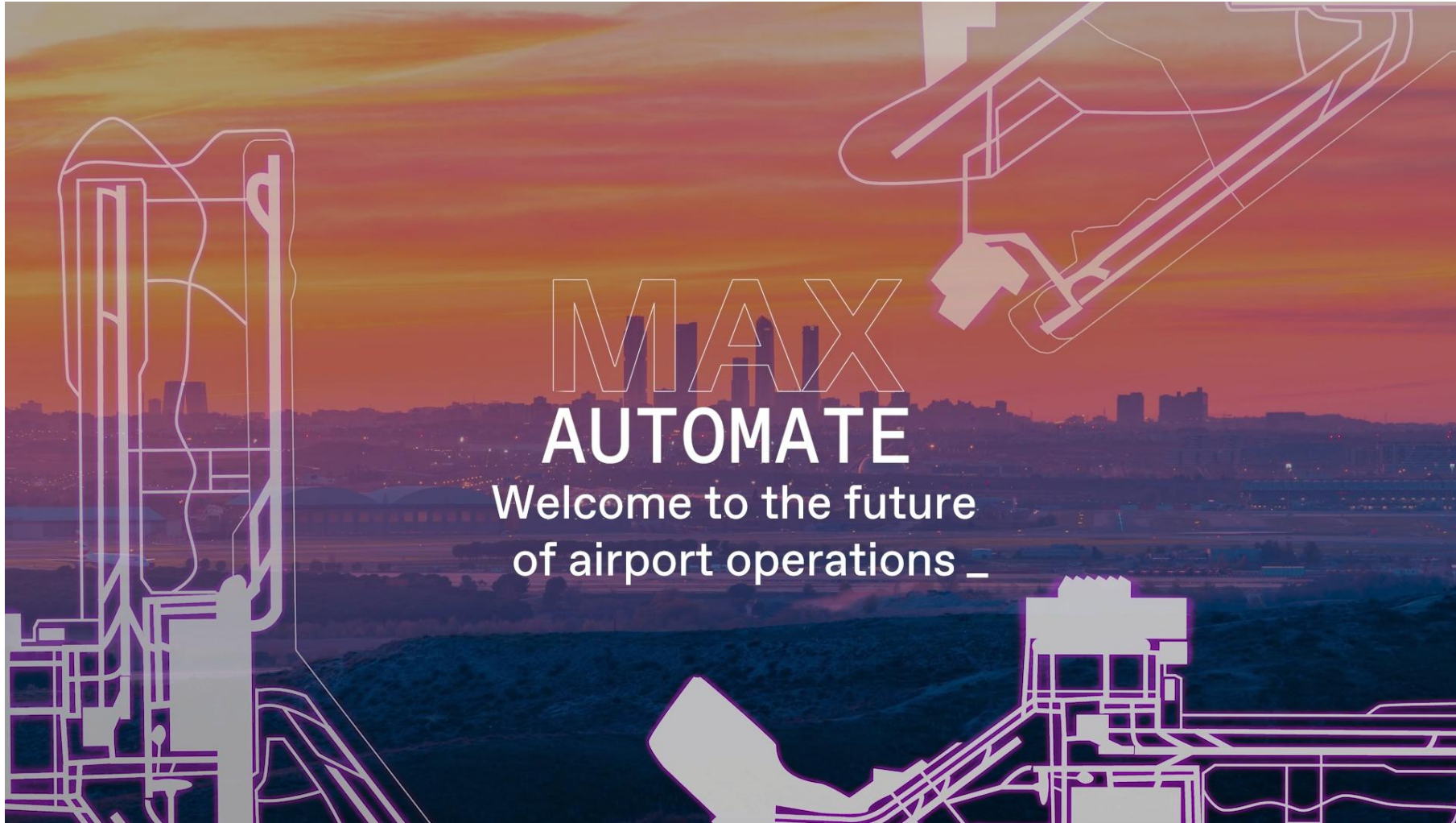
MAX AUTOMATE: FLEXIBLE & MODULAR SOLUTION SUITE



Source: TK Airport Solutions internal information



MAX AUTOMATE VIDEO





ST1-3

Waiting for remote authorization
00:00:00 | 03/03/2025

2622 mm

Distance to

2712 mm



MAX

TKE



MAX A

Raymond

Med

STING

2008



MOVE
BEYOND