Airport Solutions

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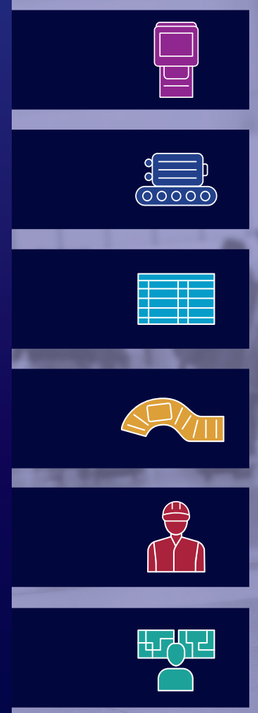

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Self-Service Technologies

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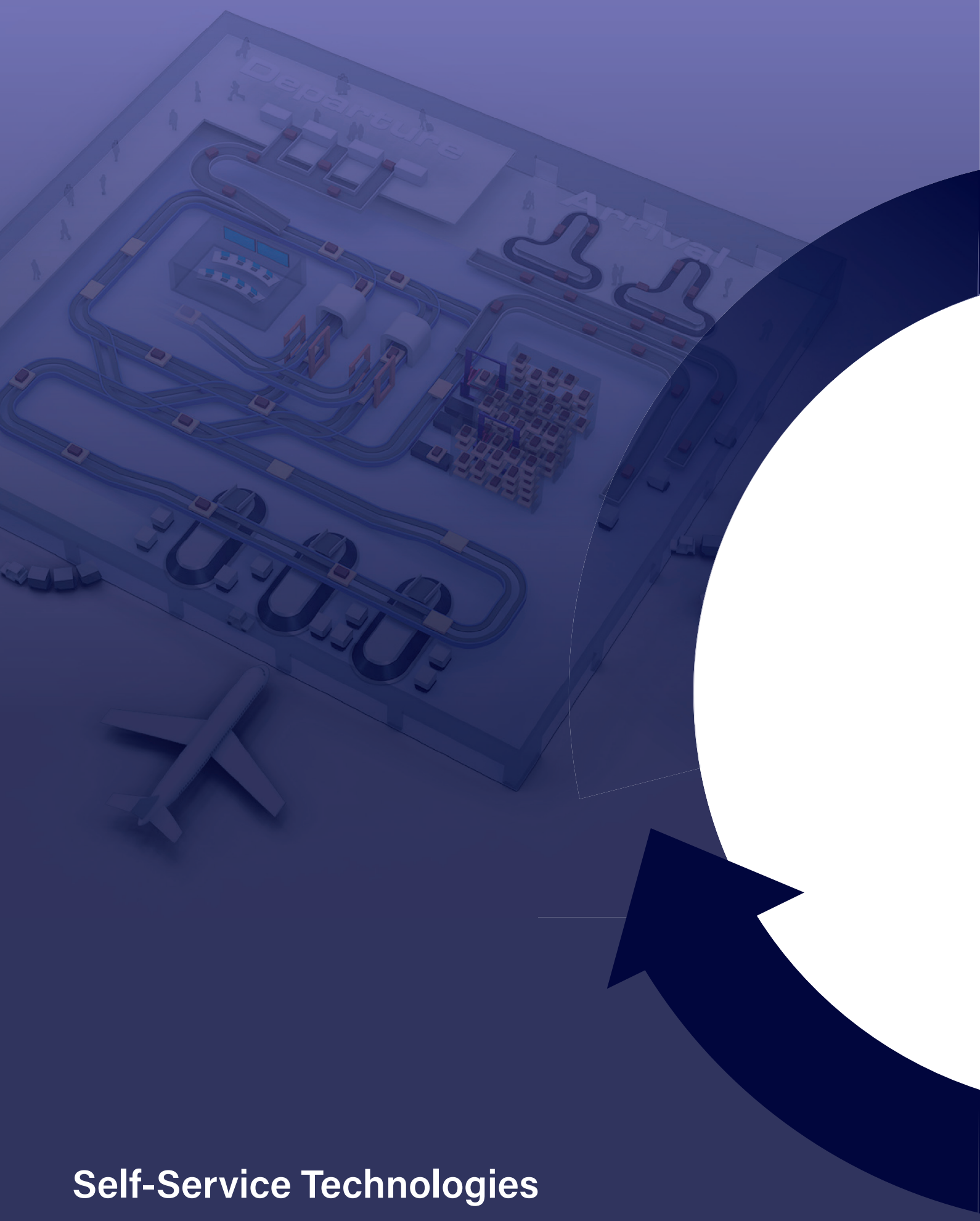

Self-Service Technologies

Daifuku is your dedicated partner at every stage of the journey. Discover our streamlined self-service check-in and cutting-edge airport bag drop solutions.

End-to-end Airport Solutions

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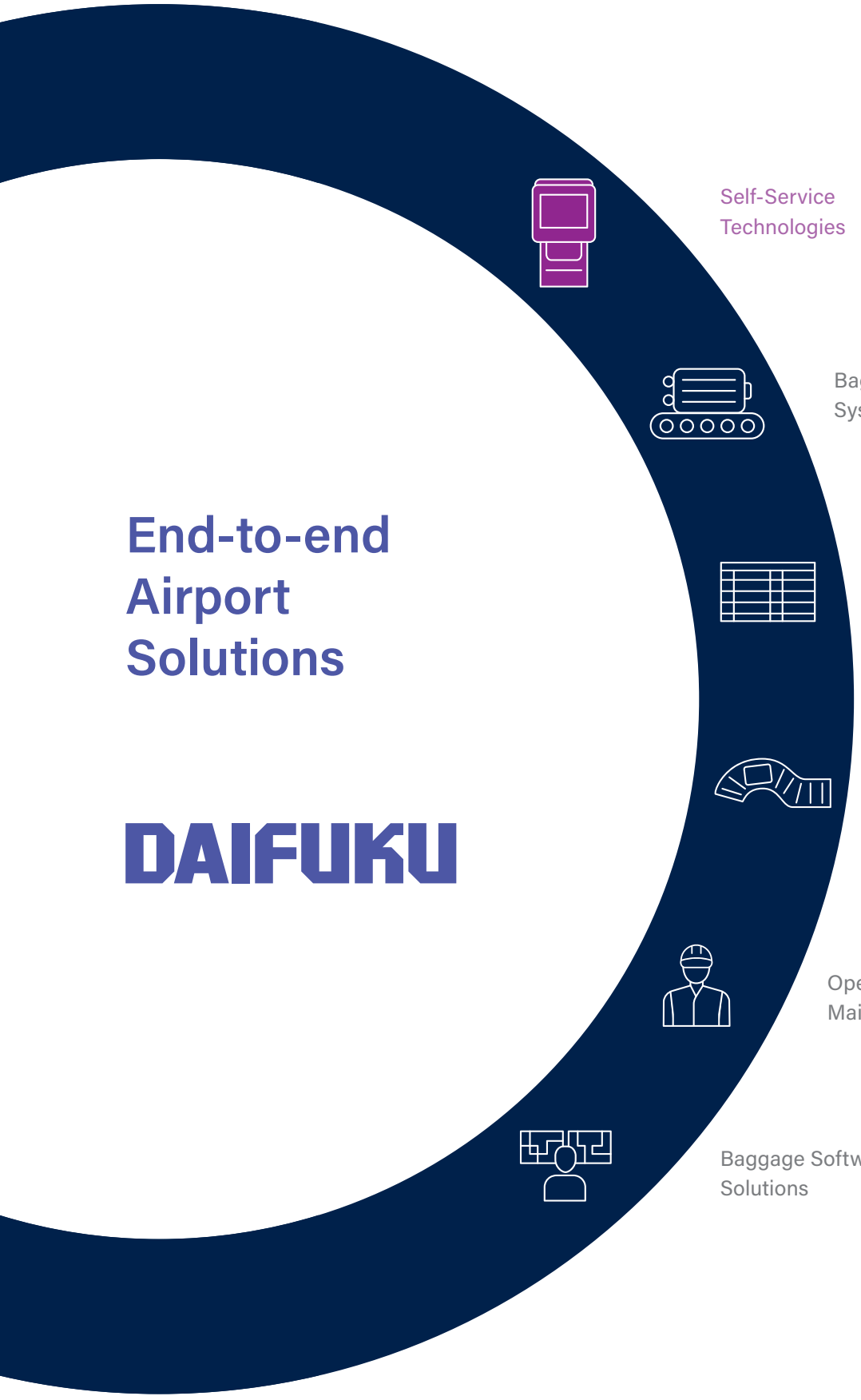

Self-Service Technologies

Baggage Handling Systems

Airport Operating Systems

Checkpoint Security Screening

Operations & Maintenance

Baggage Software Solutions

A Full Suite of Self-Service Solutions

Choose from our extensive range of Self-Service Bag Drop solutions, ensuring a tailored fit for your specific needs. Our models come in both Hybrid and fully Automated versions, seamlessly integrated with our Cloud Software Solution. This state-of-the-art software not only manages the units but also provides in-depth analytics to further enhance your check-in operations.

In addition to our Self-Service Bag Drop suite, we can complement with Common-Use Self-Service (CUSS) Check-in and Tagging kiosks to enhance your airport experience. Embrace a 2-Step Check-in process that optimises your airport space efficiently.

Self Bag Drop Key Features

	Feature	T Series	L Series	P Series	H Series	N Series	BagDrop©
CONFIGURATION	**Type**	Retrofit (hybrid mode capability with existing desk)	Retrofit (hybrid mode capability with existing desk)	Stand alone (hybrid mode capability with optional Dual Mode configuration)	Stand alone with integrated hybrid capability	Stand alone (self service only)	Stand alone (self service only)
	CUSS certified on a major platform provider	Daifuku CUSS, CUWS only	Daifuku CUSS, CUWS only	Yes	Yes	Daifuku CUSS CUWS only	CUPPS platform
	Touchscreen	10″	19″	19″ or 24″	17″	24″	15″ or 17″
	Low profile conveyor	No (retrofit)	No (retrofit)	Yes	Yes	Yes	Yes

	Feature	T Series	L Series	P Series	H Series	N Series	BagDrop©
PROCESS	**Bag tag scanning solution**	Handheld scanner	Handheld scanner	Camera tag reader and RFID with AI baggage analysis	Camera tag reader and RFID with AI baggage analysis	Camera tag reader and RFID with AI baggage analysis	Automatic laser reader OR RFID tag reader
	Multiple bag detection	No	No	Yes	Yes	Yes	Yes
	Heavy bag detection and printing	Printing only	Yes	Yes	Yes	Yes	Yes
OPTIONAL PERIPHERALS	**Intrusion detection**	No	No	Yes	Yes	Yes	Yes
	Automatic doors	No	No	Yes	Yes	Yes	Yes (patented design)
	Biometric integration	No	Yes	Yes	Yes	Yes	Yes
	RFID NFC card reading	Yes	Yes	Yes	Yes	Yes	Yes
	Payment hardware	No	Yes	Yes	Yes	Yes	Physical hardware required
	RFID bag tag reading	Yes (handheld scanner)	Yes (handheld scanner)	Yes	Yes	Yes	Physical hardware required
	Passport scanner	Yes	Yes	Yes	Yes	Yes	Yes

Self Bag Drops

Drop-UX T Series

Micro footprint

- 0.3 m / 1.0 ft depth
- 0.2 m / 0.65 ft width
- 1.32 m / 4.3 ft height

Upgrade your existing counters with the power of self-service without disrupting your workflow. The Drop-UX T Series Self Bag Drop seamlessly integrates as a compact pedestal kiosk, minimising space requirements while maximising passenger convenience.

Despite its compact size, the T Series delivers impressive throughput, significantly reducing queue times and improving operational efficiency. The kiosk can be utilised in either an agent-assisted or self service mode without the need for any change-over time, enabling agents to quickly resolve exceptions where required.

The micro bag drop solution offers a passenger-friendly way to transform your current check-in area quickly without the compromises.

Optional peripherals

- Document reader, payment devices, ADA accessibility keypad, NFC, Sensor arch with intrusion detection, bag camera and status LED

Features

19" or 24" touchscreen

Boarding pass reader with courtesy lighting

1 printer
- Bag receipt printer
- Heavy bag tag printer
- Bag tag printer

IATA CUSS or Native CUWS

1- or 2-step process

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A micro bag drop solution

Static conveyor integration option

- Optional static scale integration for out-of-gauge bag drops
- Can be implemented prior to security check-points where bag validation is required

Intuitive passenger or agent operation

- Simple intuitive operation for both passengers and agents
- Modern White Label Application to make best use of the micro form factor

Range of peripheral options

The micro kiosk is flexible enough to accommodate an array of peripherals:

- Boarding pass reader
- Passport reader
- NFC frequent flyer cards
- 1 x printer

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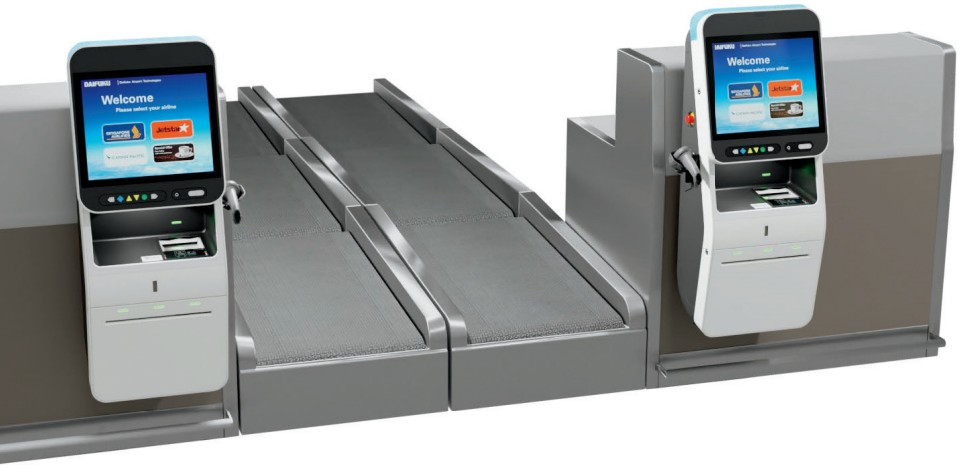
Self Bag Drops

Drop-UX L Series



Easily mounts onto existing desks

- 0.34 m / 1.1 ft depth
- 0.45 m / 1.5 ft width
- 1.48 m / 4.8 ft height

For 19" screen variant

The Drop-UX L series reimagines your check-in experience without major infrastructure overhaul. The L Series seamlessly integrates with your existing counters and conveyors, leveraging our proven Self Bag Drop technology. Passengers enjoy the same intuitive interface and consistent experience found across our self service network.

The L Series retrofit design provides the flexibility of operating in either agent or self-service mode, adapting to the airport operations' needs while improving passenger flow.

Enjoy the benefits of 1- or 2-step process self-service bag drop capabilities – reduced queue times, improved passenger satisfaction, and operational efficiency without complete infrastructure overhaul.

Features

- 19" touchscreen
- Boarding pass reader with courtesy lighting
- 1, 2, or 3 printers
- Optional sensor arch with intrusion detection, bag camera and status LED
- IATA CUSS or Native CUWS
- 1- or 2-step process

Optional peripherals

- Passport reader, Biometrics, Payment devices, ADA accessibility keypad, RFID, NFC

The L Series seamlessly integrates with existing infrastructure

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Full service retrofit Self Bag Drop

- Ease of mounting on to existing desks
- All equipment housed in the L Series unit to reduce impact to agent desk
- Agent desk can still be used for agent-assisted operation, providing dual mode capabilities

Optional sensor arch

Sensor arch can provide additional functionality:

- AI bag analysis
- Bag overheight
- Automated bag tag reading

Ease of maintenance and service

- Easy access to all components from front of unit
- Printer rolls easily replaced with a hinged door to provide full access to paper stock

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Self Bag Drops

Drop-UX P Series

Generation 6

Small footprint

- 2.58 m / 8.5 ft length
- 2.76 m / 9.0 ft width
- 1.48 m / 4.8 ft height
- 3.7 m / 12.1 ft pitch

For 19" screen variant

The generation 6 design of the Drop-UX P Series follows our standard kiosk design and allows for a consistent passenger experience between touch points along with common parts.

The new P series also includes our advanced AI baggage conveyability analysis and multi-point camera technology for fast, accurate bag tag reading.

P Series offers a complete self-service solution for fully automated self-service bag drop in 1- or 2-step configuration.

Our latest design builds on our previous generations and offers advanced features in a compact design that can provide throughput up to 100+ bags per hour.

Optional peripherals

- Passport reader, Biometrics, Payment devices, ADA accessibility keypad, RFID, NFC

Features

- 19" or 24" touchscreen
- Boarding pass reader with lighting
- 1, 2 or 3 printers
- Sensor arch with intrusion detection and status LED
- Advanced AI based baggage analysis and camera automated tag reader (ATR)
- 2 stage 2.5 meter long inclined conveyor & scale
- IATA CUSS or Native CUWS
- 1- or 2-step process

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A full service bag drop solution

Advanced bag analysis

- Dedicated AI deep learning processor trained on thousands of bags
- Multi-camera bag tag reading
- Intrusion detection

Inclined scale belt

- Provides higher throughput and shorter length bag drop
- Prevents passengers placing bags incorrectly with wheels down
- Low profile (100mm) front and side loading capability for ease of passenger use

Bonus features of the 24" variant

- Additional screen space for customised applications
- Consistent look and feel with our kiosks and bag drop range
- Custom application design for advertising, avatar assistants or other use cases

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Self Bag Drops

Drop-UX P Series Dual Mode

Integrated desk for traditional check-in or self-service bag drop.

Our traditional Hybrid solution is the Drop-UX P Series Dual Mode that consists of a fully automated P series unit with our swing desk, a traditional check-in counter than can swing closed along the unit when in self-service mode.

As this product utilises two sets of hardware for Self Bag Drop and traditional and check-in, we refer to this as a dual mode rather than a true hybrid design sharing the same set of peripherals, like our H series does. It is compatible with any CUTE/CUPPS or native airline check-in system and integrates cabling, power and controls in a standard manner.

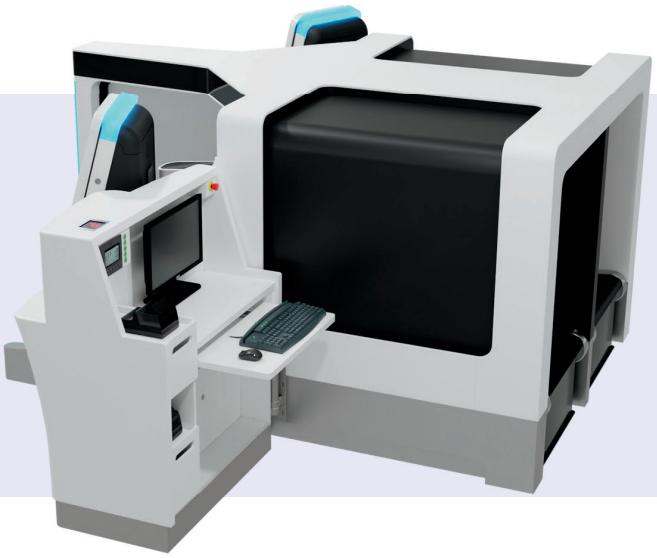
The CUTE/CUPPS printers are housed in an easy access drawer below the desk and additional space for storing consumables is also available.

Our standard roll-out tub holder integrates seamlessly with the P Series Dual Mode to allow agents or passengers easily access tubs depending on the mode in use.

Small footprint

- 2.58 m / 8.5 ft length
- 3.83 m / 12.5 ft width (open desks)
- 1.48 m / 4.8 ft height
- 34.0 m / 13 ft pitch

For 19" screen variant



Tambour shutter door

- Tambour shutter doors can be included restricting unintended access
- Door position sensors provide additional security

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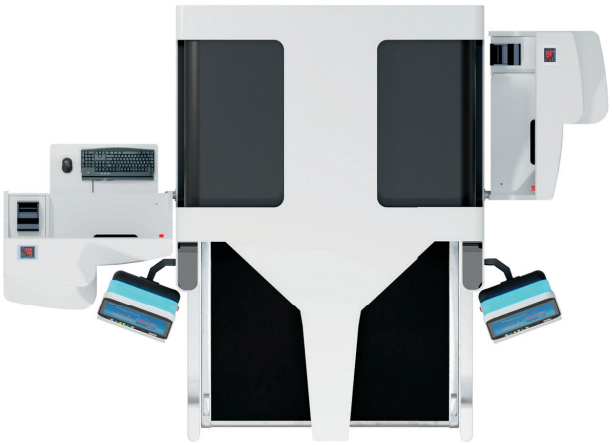
Custom desk design

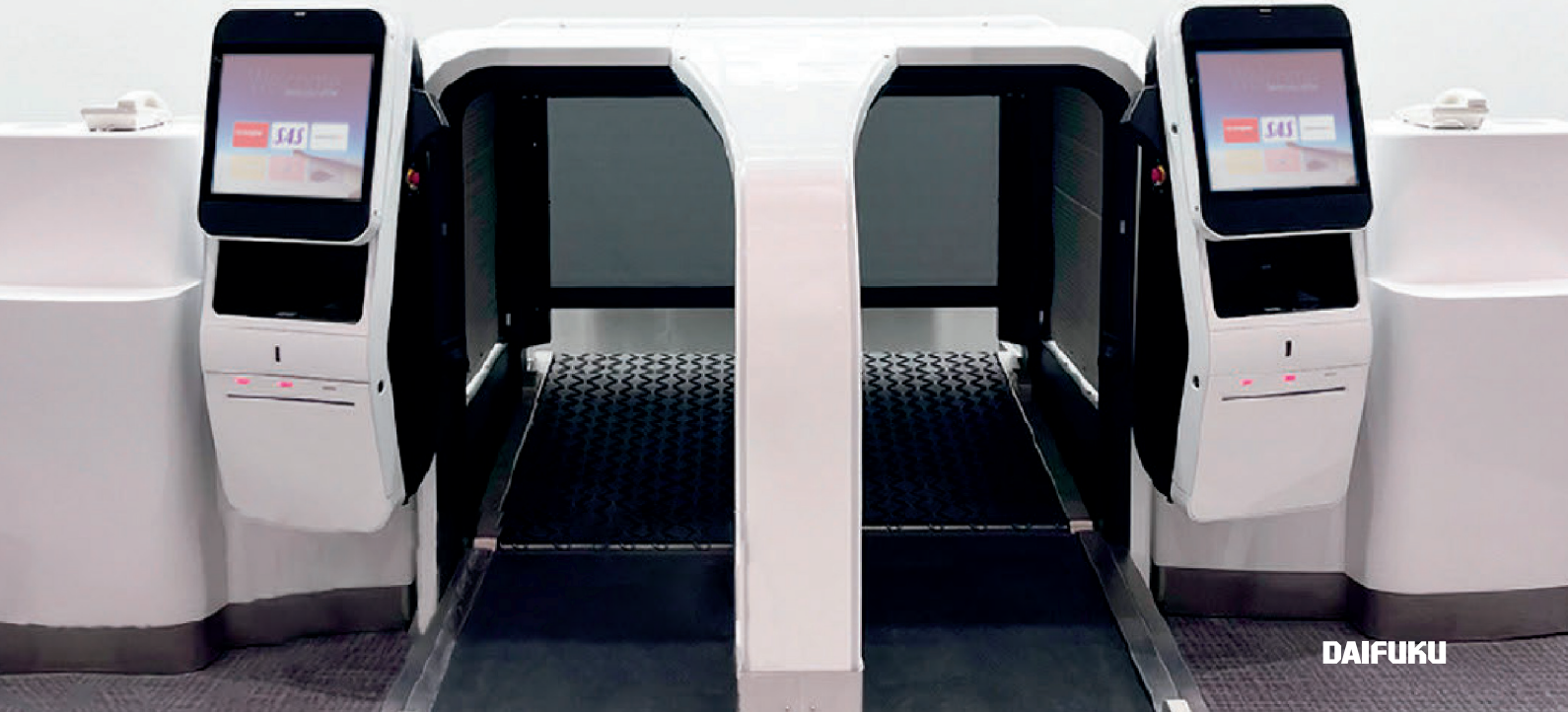
Desk design can be easily modified to align with airport terminal design providing a cohesive experience for passengers.



Full agent mode or self service

- Full agent desk for standard CUTE/CUPPS setup with own peripherals
- Close desk away to operate in full self-service mode
- Easy access to bags when in agent mode and secure when in self-service

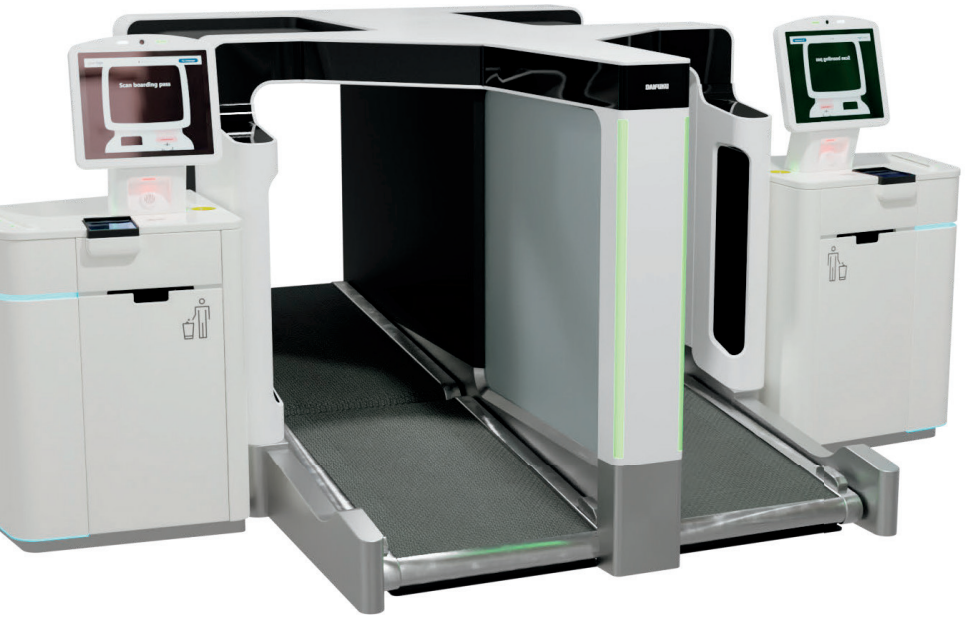
The new Drop-UX P Series dual mode is deployed in China, where 88 units are in operation at Chengdu Tianfu International Airport



Self Bag Drops

Drop-UX H Series

Generation 6



Small footprint

- 2.58 m / 8.5 ft length
- 3.38 m / 11.1 ft width
- 1.47 m / 4.8 ft height
- 4 m / 13 ft pitch

The unique design of the H Series provides a dynamic, flexible solution for airports requiring both bag drop and traditional desks in the same zone. By rotating the screen, airline staff can process passengers with the CUTE / CUPPS check-in system built into the desk and is fully compatible with many CUTE/CUPPS platforms.

Drop-UX H Series offers a complete self-service solution for fully automated self-service bag drop in 1- or 2-step configuration and offers the same AI and OCR technologies as the P Series for baggage analytics.

Our H series is unique in the market, providing a true hybrid solution in one desk, reducing power, equipment and environmental impacts.

Optional peripherals

- Passport reader, Biometrics, payment devices, ADA accessibility keypad, RFID, NFC

Features

- 17" touchscreen
- Boarding pass reader and integrated speaker
- 1, 2 or 3 printers
- Sensor arch with intrusion detection
- 2 stage 2.5 meter long inclined conveyor & scale
- Illuminated RGB LED panels for branding / theming
- IATA CUSS or Native CUWS
- 1- or 2-step process

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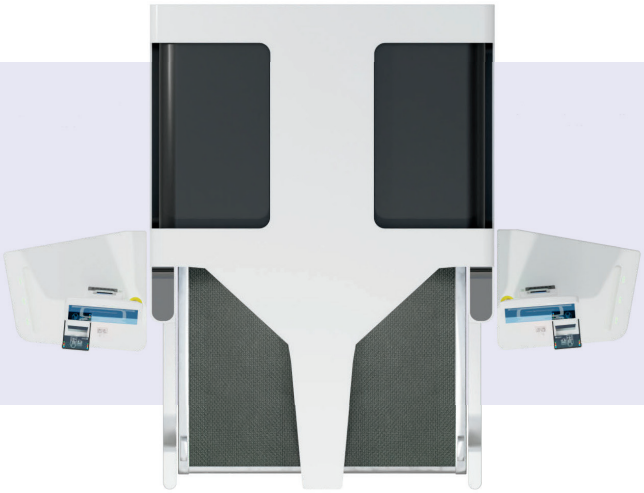


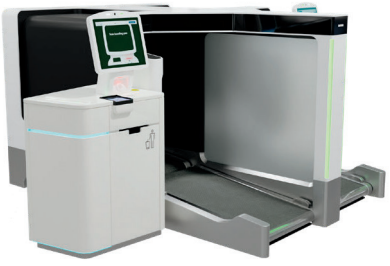
A hybrid bag drop solution.

Convenient access

- Printers output to the desk top for access by passenger or airline staff
- Access doors to replenish stock and consumables
- Simple lighting controls
- Lockable doors

Self-service to a full desk

- Transform in seconds from a self-service bag drop to a full check-in desk
- Mix and match modes depending on airline requirements and time of day



Inclined scale belt

- Provides higher throughput and shorter length bag drop
- Prevents passengers placing bags incorrectly with wheels down
- Low profile (100mm) front and side loading capability for ease of passenger use

Self Bag Drops
Drop-UX N Series

Small footprint

- 2.97 m / 9.7 ft length
- 2.76 m / 9.0 ft width
- 1.75 m / 5.7 ft height
- 4 m / 13.1 ft pitch
- Large bag capacity:
  1,300l x 550w x 700h

Our top tier SBD employs multiple screens and a large touchscreen interface to provide passengers with feedback aligned to their process steps and swiftly guide the passengers through the bag drop process. Our design prioritises safety and baggage throughput along with efficiently using space.

Additionally, it serves as a flexible platform for an airport or airline to introduce bag drop, promote its brand or advertising and deliver core messages to its customers.

Optional peripheral

- Integrated tub holder and passenger alert lights

Features

- Large 24" portrait style passenger interface-touch screen
- Convenient low-profile side loading conveyor with large bag capacity
- Additional passenger instruction screen directly above the bag with synchronised voice prompts
- Large digital signage screen at the end of the unit for instructions, advertising/ branding and other signage

> Our N Series bag drops are deployed over Japan Airlines domestic network at the five major airports in Japan.

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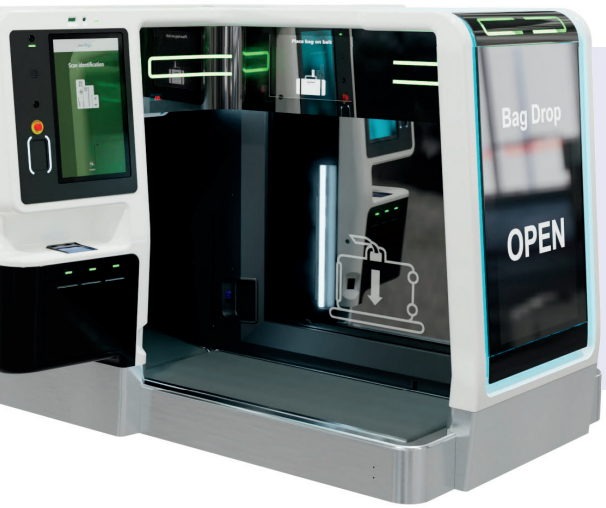
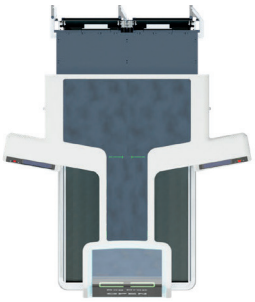


Advanced next generation features improve the passenger experience

Improved passenger experience

- Integrated digital signage and content management system for branding, instructional videos, call forward messages
- Integrates with SBD API to allow interactive content display on SBD status or events



Advanced bag analysis

- Dedicated AI deep learning processor trained on thousands of bags
- Multi-camera bag tag detection and recognition
- Intrusion detection by 3D stereo sensor
- Software update features and detections

24" touchscreen interface

- Additional screen space for customised applications
- Consistent look and feel with our kiosks and bag drop range
- Custom application design for advertising, avatar assistants or other use cases

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Self Bag Drops
BagDrop© V8

Small footprint

- 1.38 m / 4.52 ft height
- 1.3 - 1.55 m / 4.26 - 5.09 ft width
- 2.49 m / 8.17 ft deep

For standard units

Our BagDrop© solution is a fully integrated, single person touch-point that enables passengers to autonomously check-in and securely drop off their baggage. The outstanding and tightly controlled process is designed to support the use of biometrics enabling a 'single token to ride' journey.

Providing a trusted solution for all passengers, flights and destinations, BagDrop is shaped for success and built to perform. Our BagDrop units are half the size of a traditional check-in desk, the smallest footprint in the market.

The human centric design increases passenger adoption, enabling airline staff to deliver added value service resulting in shorter lines, less waiting times—meaning happier passengers, smoother travel and smarter business.

Features

- Smallest footprint on the market
- Intuitive Ergonomic Bag Placement
- Auto-Tilt system rotates the bag for you
- Modular and flexible
- Touchless, 1- or 2-step process

Safe and secure by providing a physical barrier to the BHS at all times

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Increase staff bag drop ratio up to 1:10

50%

Increase drop off positions by up to 50%

75%

Reduce operational costs by more than 75%

80%

Increase terminal capacity by up to 80%

40%

Reduce your terminal footprint by up to 40%

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Check-In Kiosks

Check-UX Series

Small footprint

- 1.5 m / 4.92 ft height
- 0.45 m / 1.48 ft width
- 0.35 m / 1.14 ft deep

Features

- 19″ passenger interface-touch screen
- Up to 3 printers:
  - Boarding pass printer
  - Receipt printer
  - Bag tag printer
  - Heavy bag tag printer
- Chip and pin payment solution
- Biometric platform integration
- Passport reader
- Weighing scale integration
- Easy front access for paper loading and maintenance
- Built-in maintenance application
- With CUSS 1.5, upgradeable to 2.X
- Modern & flexible design
- Accessibility keypad

Our latest kiosk offers a fully integrated solution optimising space for increased passenger capacity in a variety of use cases.

As part of Daifuku's Self Service portfolio, Check-UX also pairs perfectly with our Self-Service Bag Drop solutions. Providing a trusted solution for all passengers, flights and destinations, Check-UX is shaped for success and built to perform.

The human centric design increases passenger adoption, enabling airline staff to deliver added value services, resulting in shorter lines, and less waiting time — meaning happier passengers, smoother travel and smarter business.

Check-UX with optional scale

Advanced next generation features improves the passenger experience

Smart, modular, future-ready design

- Adaptable to meet varying requirements of airports and airlines
- Accepts a wide range of industry leading modules
- Smart design for flexible installations and easy access for maintenance

Check-In Kiosks

Tag-UX Series

Small footprint

- 1.32 m / 4.33 ft height
- 0.2 m / 0.66 ft width
- 0.325 m / 1.07 ft deep

Tag-UX is designed as a micro kiosk enabling bag tag issuance in multiple locations around the airport, resulting in improved baggage throughput with reduced departure floor footprint when used in conjunction with self service bag drops.

By simply scanning a valid boarding pass, a bag tag will be issued. Easily scan again for a second bag tag, up to the limit stipulated by the airline Departure Control System (DCS).

Versatile, the Tag-UX can be utilised across a number of usages relating to passenger processing; including boarding pass, lounge entry; and passenger at gate validation points. Tag-UX can also be linked with passenger tracking systems for a low cost, simple to deploy solution.

Features

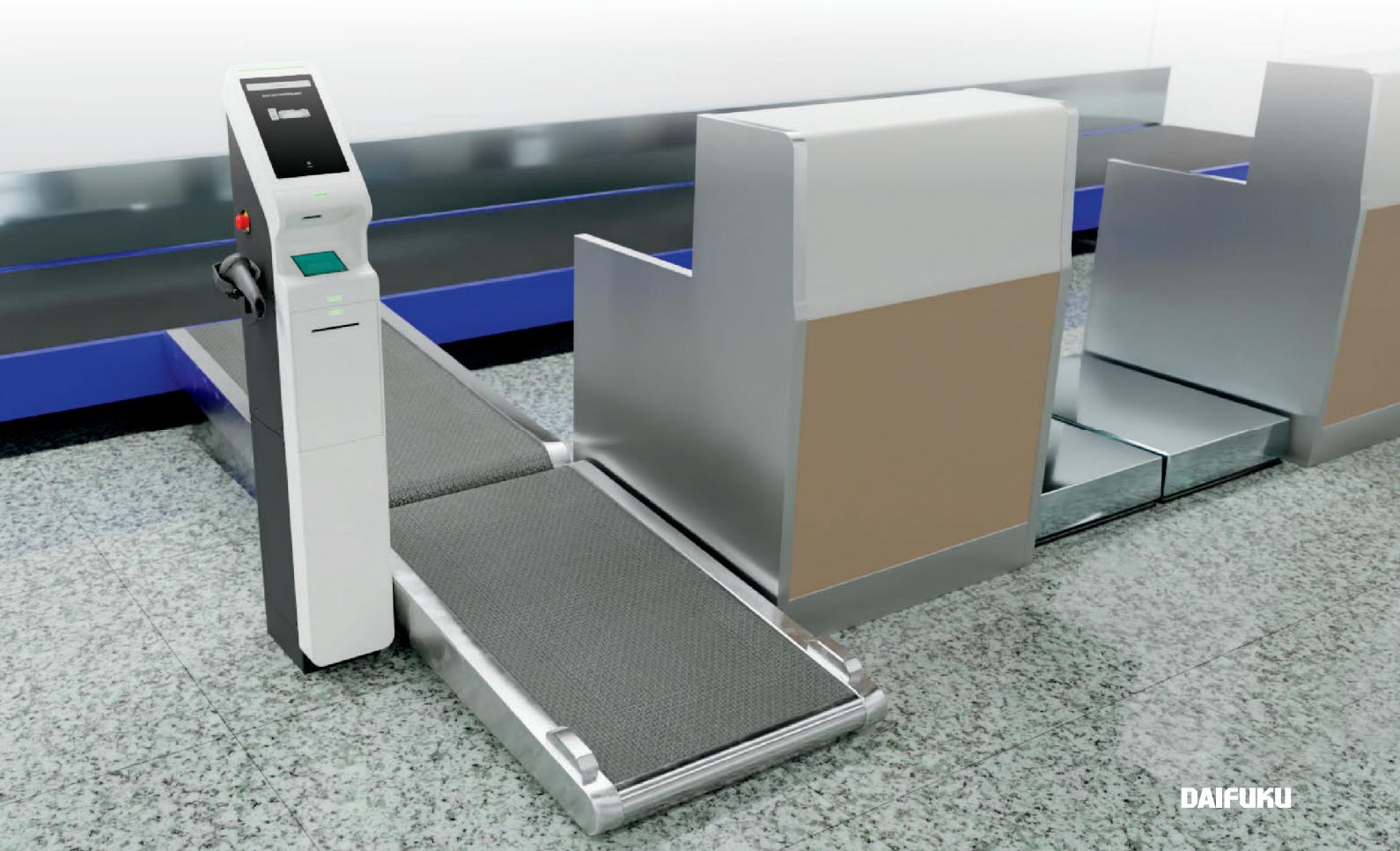
- 10" touch screen
- Boarding pass, bag tag or receipt printer
- RFID card reader
- Passport scanner
- Baggage scale
- Flip out panel for easy paper loading and maintenance
- Built-in maintenance application
- CUSS 1.5 compliant self-tagging application
- Modern design and small footprint
- Accessibility keypad
- Bar code reader

Tag-UX with scale

Flexible installations and versatile usage for passenger processing.

Smart software integration

- Tag-UX kiosk is designed for plug and play setup in Daifuku's cloud based platform, while providing ultra-quick and efficient tagging functions
- Daifuku's Management Software Suite allows direct monitoring of passenger and kiosk status from a tablet web based device and fully integrates with our Self-Service suite



Baggage Check-In

Bag-UX | Baggage Hygiene

Small footprint

- 1.25 - 1.72 m / 4.1 - 5.64 ft height
- 0.46 m / 1.51 ft width
- 0.29 m / 0.95 ft deep

Baggage jams, throughput issues, and items requiring further identification for IATA Resolution 753 are all common problems resulting in delays or the misplacement of bags.

Bag-UX analyses individual bags by shape and hygiene before being introduced to the baggage handling system. This crucial step prevents incorrect items from being directed into the system or other vital locations within the airport.

Bag-UX leverages Daifuku's Self Bag Drop vision technology for Baggage Analysis. Combining a deep learning artificial intelligence model to quickly and accurately analyse bags in motion on a collector conveyor, Bag-UX can detect unwanted items entering the Baggage Handling System (BHS) significantly reducing downstream issues.

> Bag-UX is the first solution of its kind

Features

- 10" touch screen
- Flip out panel for easy maintenance
- Built-in maintenance application
- Modern design and small footprint
- Adjustable Sensor pod height
- Dual cameras to sense baggage moving towards and away from the unit
- 3D and AI sensors for baggage orientation and dimensioning

Optional peripherals

- Additional cameras for bag tag data capture and images

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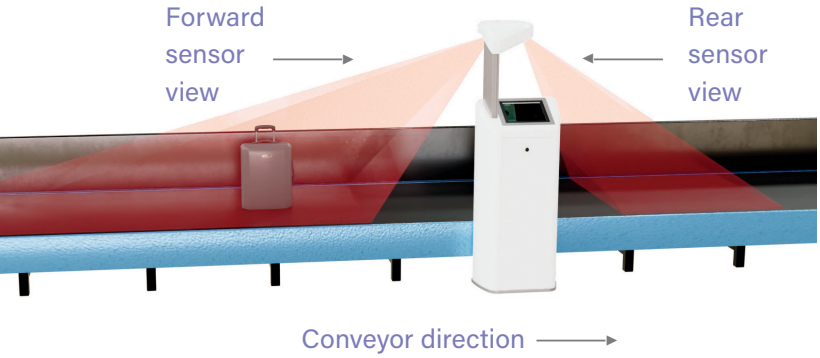
Functionality and smart design

- Bag-UX's imaging capabilities allow a bag's condition to be seamlessly compared pre-departure and on arrival for loss / damage waivers
- Bag-UX has the ability to classify bags in accordance with the IATA Baggage Identification Chart providing improved tracking and identification of baggage
- Bag-UX can pause the collector conveyor allowing staff to remove or reorient the bag, or the system can redirect or automatically handle the bag
- Bag-UX can be used for inbound baggage analysis to identify baggage types



Identifiable baggage issues:

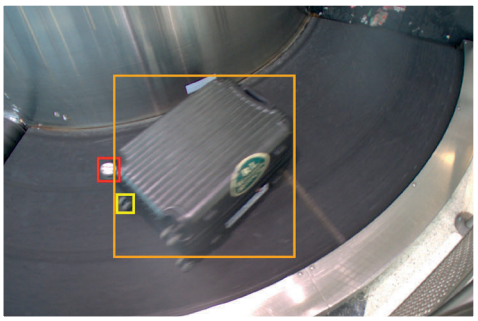
- Bag conveyability - orientation, position, handle extended
- Multiple bags/baggage spacing issues
- Tray/tub detection/usage
- Upright bag
- Images of bags for loss/damage
- Bag tag presence and location *
- Detection of documents left on baggage *
- Open or spilled baggage *
- IATA Baggage Classification Type *

* Under active development with industry

> 26 M bags were mishandled in 2019, costing the industry $2.6 billion

> 66% improvement in global bag delivery rates for airlines that track bags at check-in and arrival

Source: SITA 2020 Baggage IT Insights Report



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Self Bag Drops & Kiosks
Reference Projects

Over the last five years, Daifuku has embarked on an aggressive development program within its self-service suite of products.

The program has seen the incorporation of way-finding, branding/advertising, touchless technologies, biometrics, multi-tenant payment, industry-leading bag tag reading and AI bag assessment onto our bag drop suite.

This technology has proven to deliver real-world operational advantages to our partners.

These features are proving even more vital to ensure operational capacity and a seamless experience.

Over 13,000 Employees
in our global workforce

25 Countries and regions
are part of our global network

4,040 Patents
held globally

H Series

Qingdao Jiadong Airport

Qingdao, Shandong, China | 52 Units

- 17" Touchscreen, barcode reader, passport reader, payment device, biometrics, custom integrated HVAC and desk
- Automated bag tag barcode reader with RFID and 3D scanner
- Floor level conveyors and integrated X-Ray and tub return system
- Generation 4 design plus customisation

P Series

Chengdu Tianfu Airport

Chengdu, Sichuan, China | 88 Units | Dual Mode

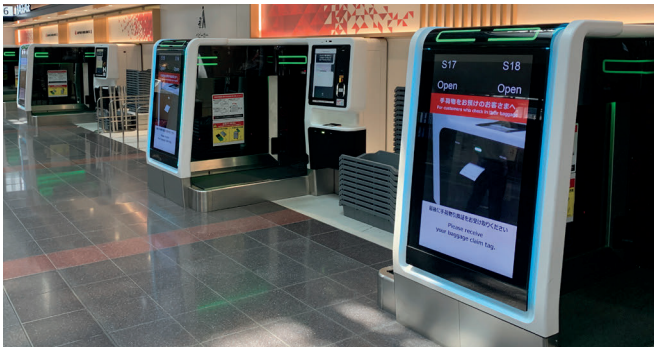
- 17“ Touchscreen, barcode reader, passport reader, payment device, biometrics
- Automated bag tag barcode reader with AI, camera ATR and 3D scanner
- Integrated dual mode swivel desk
- Generation 5 design

N Series

Haneda Airport T1

Tokyo, Japan | 38 Units

- 24" Touchscreen, barcode reader, passport reader, biometrics ready, dual printers, integrated tub holders
- Automated bag tag reader, baggage
- AI analysis and 3D sensor with tub detection
- Customised software, cloud platform and signage



Chitose Airport Domestic

Chitose/Sapporo, Japan | 6 Units

- 24" Touchscreen, barcode reader, passport reader, biometrics ready, dual printers, integrated tub holders
- Automated bag tag reader, baggage
- AI analysis and 3D sensor with tub detection
- Customised software, cloud platform and signage

Okinawa Airport

Naha, Okinawa, Japan | 14 Units

- 24" Touchscreen, barcode reader, passport reader, biometrics ready, dual printers, integrated tub holders
- Automated bag tag reader, baggage AI analysis and 3D sensor with tub detection
- Customised software, cloud platform and signage

BagDrop© V8

Schiphol Airport

Amsterdam, Netherlands | 63 Units

- BagDrop operational in Terminal 2 since 2008
- First to use Linerless labels
- Common-use agent support since 2015
- 1 and 2-step operation implemented
- Supports CUWS and ACRIS
- Carry-on (hand luggage) drop off in operation

All Nippon Airways

Japan | 80 Units

- First BagDrop V8 installed at HND in 2015
- 80 BagDrop units operational across five different airports
- Most compact unit on the market
- One step process including voice guidance
- Easy bag tagging with Linerless labels

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Daifuku Common Use Platform

Member of IATA Common Use Working Group

Daifuku is an IATA Strategic Partner, and member of the IATA Common Use Working Group, focusing on the industry standards including Common Use Self Service (CUSS), Common Use Passenger Processing System (CUPPS), AEA - now IATA Technical Peripheral Standards (ITPS) and Common Use Web Services (CUWS).

- Device/Component Manager
- Application Manager
- System Manager
- Multi Airlines

Global experience

Daifuku's Common Use Platform combines our extensive experience in common use environments and our global bag drop installations with our BAGgate and Drop-UX platform and our native software and web services environments used globally.

Single touch

Daifuku's CUSS platform allows you to run multiple airline applications simultaneously, with the ability to quickly switch between them through a common launch screen. The common launch screen presents the various airline logos/applications available to passengers allowing them to select and launch the app by touching the relevant airline logo.

One platform, many uses

Provides a single basis for both kiosks and bag drops to run white label application or CUSS compliant applications and interact with the peripherals and other devices in the kiosk or bag drop unit in a consistent and controlled manner.

Timed to suit

Applications available on the launch screen can be configured on a per unit basis; and timed to fit airline /flight schedules so they are only available when a relevant flight is open.

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Daifuku's CU Platform contains three main elements on the kiosk or bag drop unit.

1

Device / Component Manager

Controls access to the physical hardware devices and monitors status.

2

Application Manager

Controls the launching and closing of airline applications on-screen.

3

System Manager

Provides the Common Launch Application (CLA where you see what airline apps are available) and provides local testing and control of the unit.

These three components provide the functionality to standardise the access to peripherals and run multiple airline applications in parallel on the same kiosk or bag drop in a controlled and secure environment.

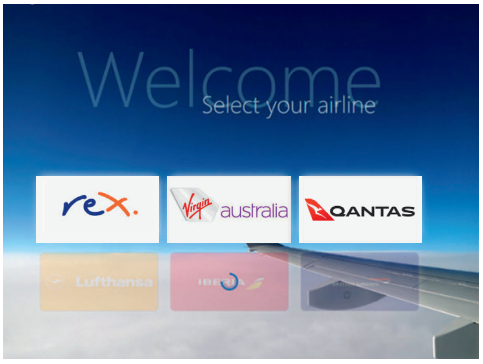
The Common Launch Application (CLA) presents the available applications and can be controlled by the management platform. Applications that are unavailable are dimmed out or not shown. The available applications can be controlled through the management platform or via AIDX/AIDM data feed from a FIDS, AODB or Resource Management System.

Our kiosks and bag drops have a built-in proximity sensor that is integrated with the CLA. Whilst the system is not in use, the CLA can switch to an "attract" or standby screen where it can show videos or animations to attract passengers to use the unit. When a person gets close to the unit, the proximity sensor will detect the person and switch the airline selection screen or launch a preconfigured application.

Device / Component Manager

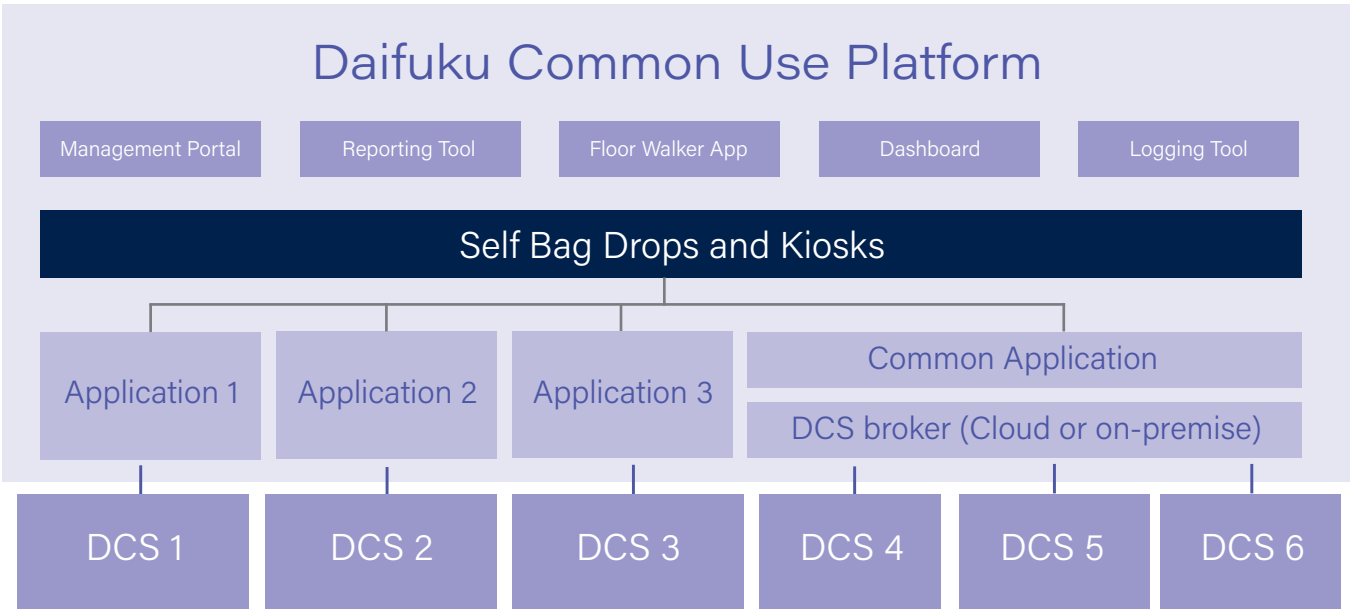
White Label Application

The optional Check-in Kiosk and SBD Airline White Label Application runs on the passenger interface to guide the passenger through the check-in or bag drop process. It is customised to the airport/airline requirements such as branding and local/airline business rules.



Interface to the airline DCS is typically done via a Common Use Web Service (CUWS) API. Other interfaces can be made if the airline DCS does not support CUWS.

When used for multiple airlines in common use, (CUSS or native), the white label application provides a common format application with the ability to connect from back end to multiple airlines. The airline code is read from the passenger boarding pass, allowing the application to switch to the matching airline's branding and business rules.



Application Manager

Platform Management

Daifuku's CUSS Platform Management system is a cloud-based solution, hosted in Microsoft Azure. This provides a robust, scalable, and highly secure environment that can cater to almost any current or future requirement.

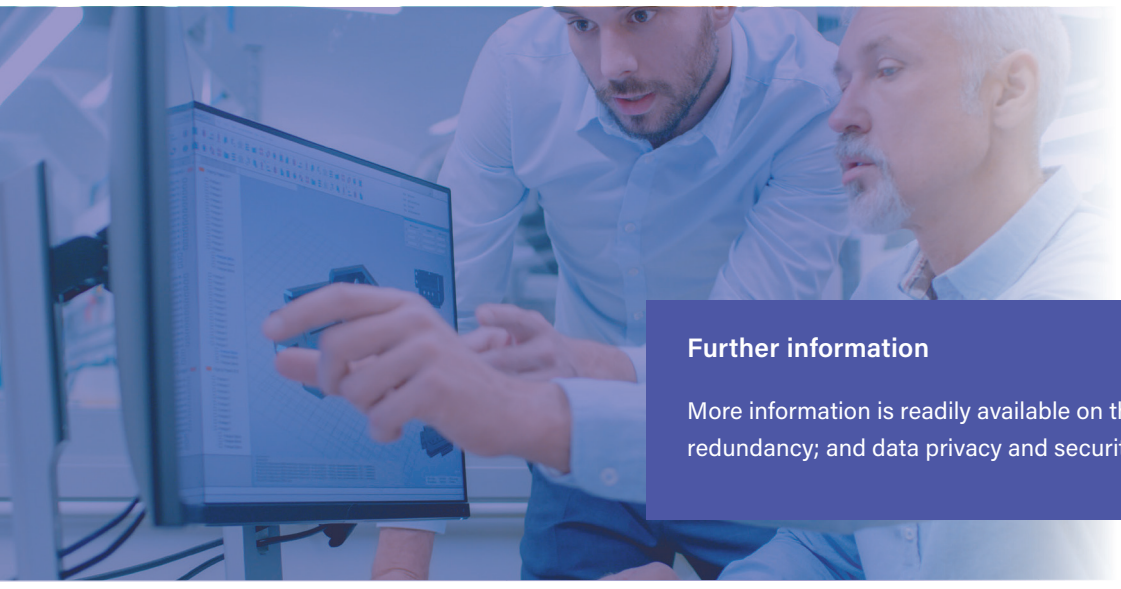
Due to the design of our architecture, we only require an Internet connection from the airport SBD or Kiosk units to the cloud service, and the airline DCS CUWS interfaces or CUSS interfaces. This allows for rapid deployment and ease of scalability. Legacy airline host connections and WAN circuits may also be used if preferred for CUSS services.

The use of Internet based connections also provides for additional redundancy vs traditional host-based connections. Our global traffic managers allow for re-routing of traffic to other geographical zones should there be a major failure in a local region. Within our local regions we also have automated load balancing, fail over and scaling based on preconfigured limits. The design allows for real time deployment of new features and services without interruption as it waits for the existing transaction to finish then switches across to the new service.

Our cloud platform is distributed across a number of global zones to provide for geographic redundancy and latency reduction. Additional zones can be rapidly spun up if required to address data sovereignty challenges or latency issues, however it is important to note that we do not store personal data and our overall application / bag drop performance is not affected greatly by data center location.

In order to manage the environment and provide support, a VPN service is used to provide remote access the SBD or Kiosk units for assistance in managing and supporting the on-site applications and services. This may be via the same Internet connection and network that the units are using for access to the management platform and DCS broker, or an alternate connection to provide out of band management.

The technologies in use within our solution leverage the latest advances and are designed "cloud first" with the ability to also run on-site for specific environments.



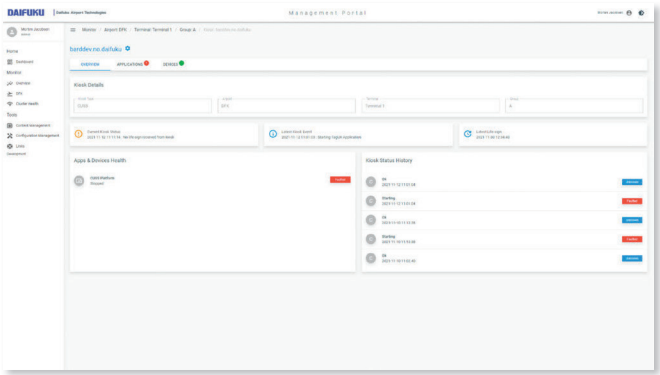
Further information

More information is readily available on the Azure platform security and redundancy; and data privacy and security for the Daifuku platform.

System Manager

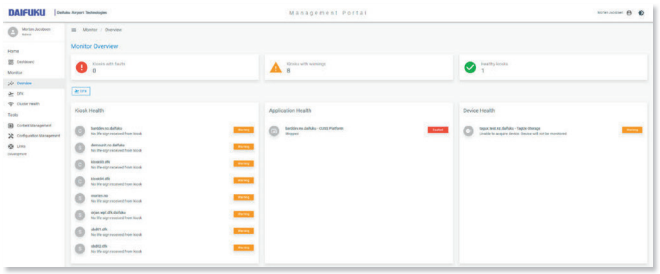
Management Portal

Daifuku's Management Portal provides complete control of all self service assets across all terminals or even multiple airports. The dashboard gives an immediate view on the status of each unit as well as interconnected network (such as cloud services), ensuring that support teams can resolve any issue before it impacts operations.



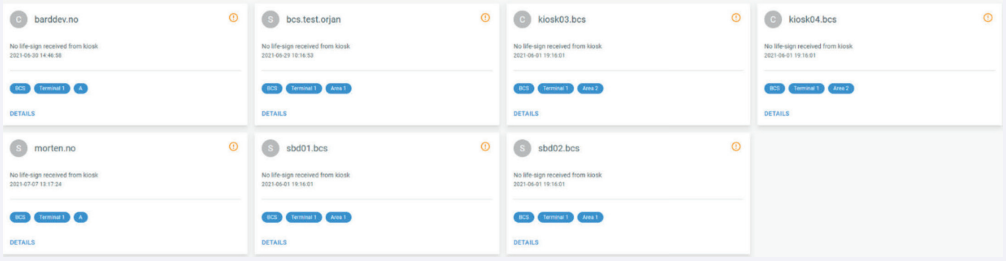
System Management Dashboard

In addition, all system and unit configurations can be updated with one-touch across all units or a specific selection of units. Changes such as language translations or operational parameters can be made without on-site resource updating each unit manually meaning continuous improvements can be immediately utilised by passengers. This portal also allows the deployment of application updates enabling quick and easy addition of new features and security management thus lengthening the life of the hardware assets and ensuring passenger's data is managed safely and securely.



Kiosk / SBD Device Management

At a device level, faults and complete history are recorded ensuring Daifuku's remote support team can identify and resolve issues immediately



Device Status

Advanced Reporting

Reports available include:

Bags Checked-in

In this report, we display the general information regarding how many bags are checked in with basic filtering options.

Bags rejected

This report provides data relating to baggage rejections and the reason why they were rejected and how these rejections are divided through the system.

Delivery Times

To get an overview of time passengers and the system uses to process a bag, this report is particularly insightful. The difference for the system time which is the time used by the system to verify each step, e.g. booking, analysing bags, etc. and Passenger time which is the time needed by the passenger to perform the requested task/action.

Destinations

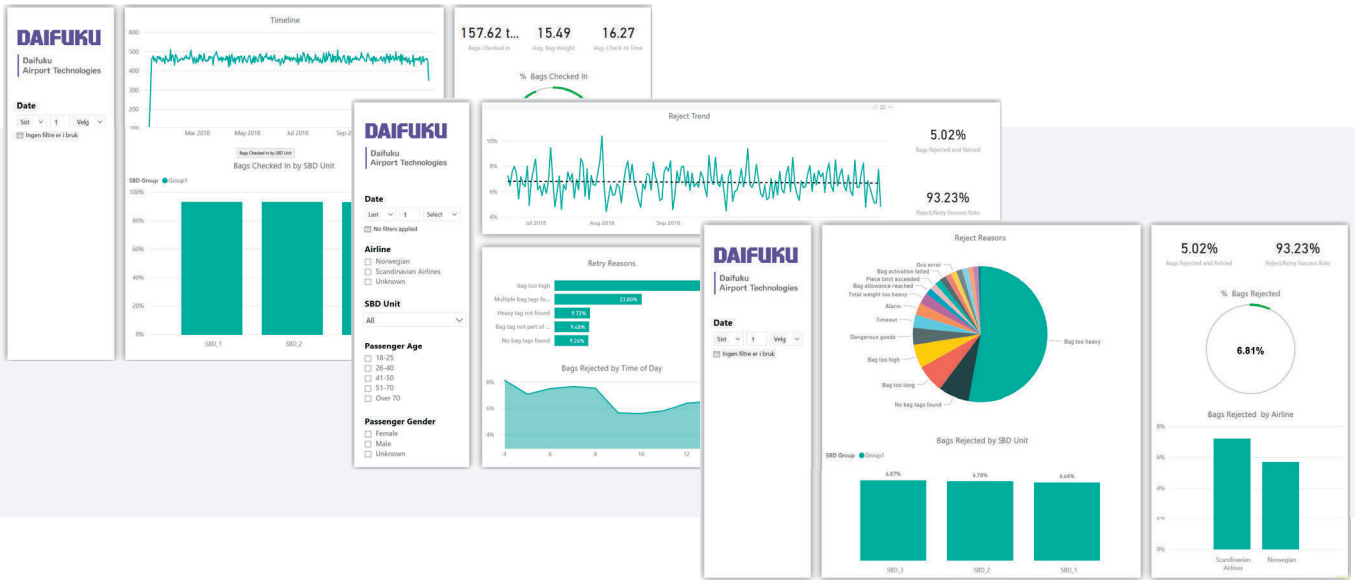
Since an airport is a key hub for travel, the "Destinations" report provides information on where people are traveling, what language they prefer to interact in and how much baggage they are bringing to each destination.

Demographic

The demographics report is complementary to the Destinations report and allows for a deeper understanding of "who" is using the bag-drop system and how they behave.

System Load

This report is a combination of historical load across the system, or individual units and also provides a predicted future load.

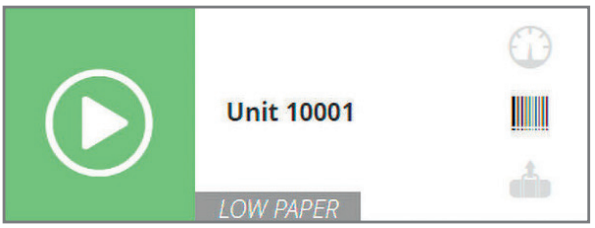


System Manager

Drop-UX Floorwalker Application Features

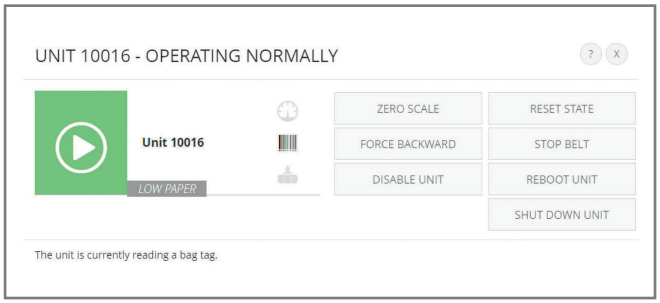
Daifuku has an optional tablet-based web application available to allow supporting airline staff at the bag drop to monitor the bag drop units and passengers using them. The application runs on a tablet and connects to Drop-UX Manager via Wi-Fi.

On one page, the airline agent assisting the self bag drop (SBD) process can see all the SBD units or just the units in one zone. Each SBD cell shows the SBD status and the progress of the passenger in their transaction.



If one transaction is longer than usual, the cell color will change color to attract the agent's attention. The agent can then go to the passenger requiring assistance.

When clicking on the Drop-UX icon, a popup image shows more details and controls on this particular unit.



A help menu assists the agent to perform basic operations

System Manager

Daifuku Advanced Logging

Daifuku's cloud hosted logging service receives live log streaming from bag drops, kiosks, and other Daifuku Self Service devices including Bag-UX AI analysis engine. The cloud service receives millions of log lines daily and provides an interface to search, parse, sort, and monitor the results and operations of devices in the field.

This cloud service is intended to be used by Daifuku or other approved support personnel to aid in diagnosis and resolution of issues arising from units in the field.

Log View

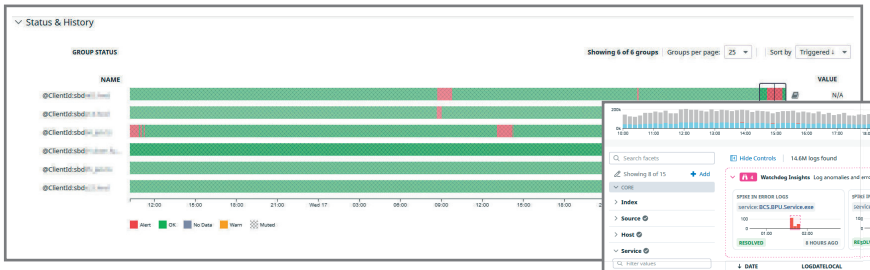
The main log view allows a view of all logs from all connected bag drops and other devices. These logs can be searched and filtered in a variety of ways:

- By time period
- By software package
- By client site
- By individual unit
- By log severity
- By custom search term

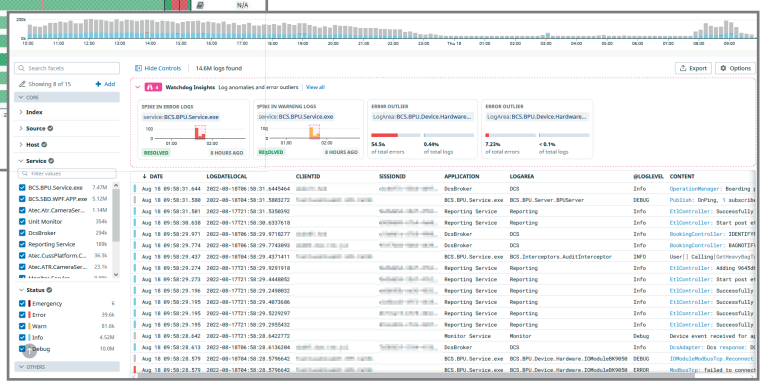
In response to an event, or to get a proactive view of real-time operation, logs can be filtered on demand or the filter saved as a view for easy reference. This allows immediate information on any area of investigation.

Live Monitoring and Alerts

Just as logs can be filtered for viewing and analysis, these filters can be configured as real-time monitors of status and trigger when a pattern is matched.



Status and recent history of a configured monitor



Main log view

System Manager

Daifuku Advanced Logging

These monitors can be assigned a severity and send customised email reports to allow for either critical incident response, or to log a required point of maintenance to be performed by on-site maintenance staff.

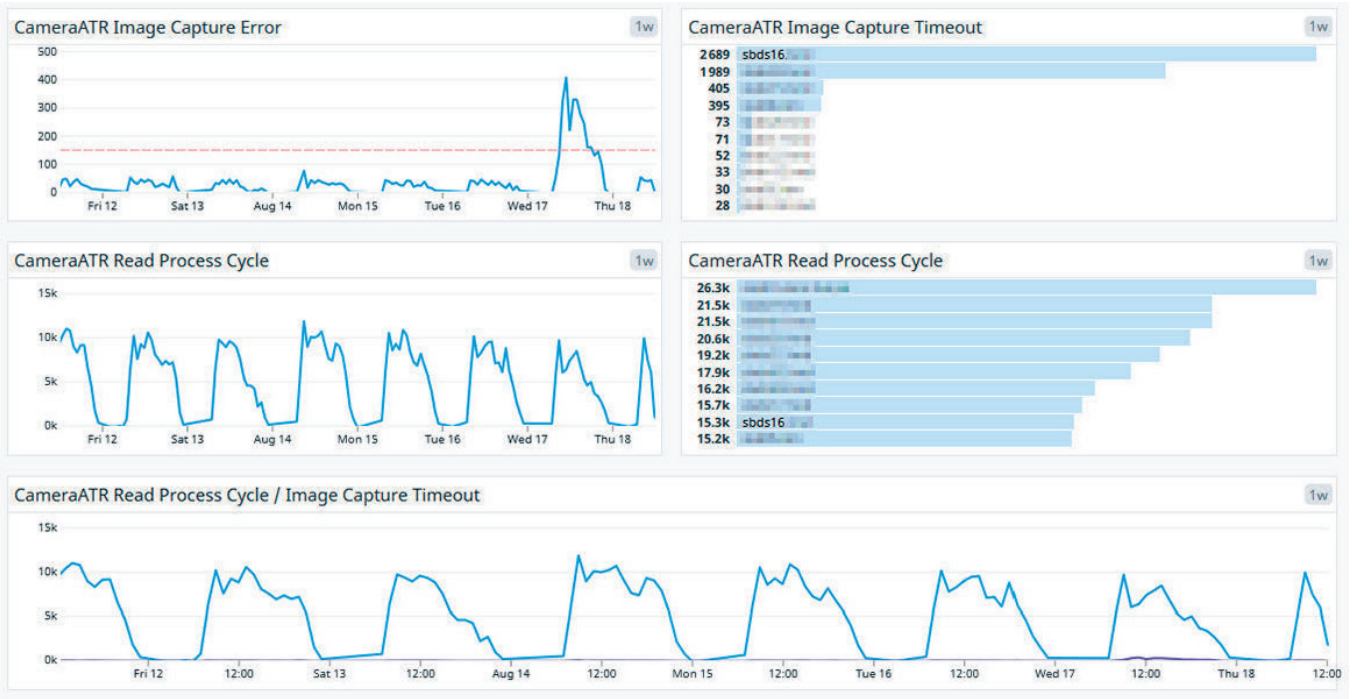
Reports and Trends

Daifuku's cloud logging service includes powerful log analysis tools allowing any query to be captured and plotted as a core metric. These metrics may then be analysed in real time and triggered by the automated monitors to be actioned, or plotted on a report for historical review of these metrics.

As a case study example, Daifuku Drop-UX units featuring the Camera ATR would capture metrics around camera image failures but also balance this raw count against total read attempts to get a failure rate.

This allows for multiple actions:

- Any SBD unit or camera which dips below a set performance metric can trigger a monitor alert to be sent to operations staff by email.
- A weekly summary report on ATR performance can be generated and emailed, or viewed at any time.
- This report can clearly display the trend and overall performance of SBD ATR readings.
- This report can be easily drilled down to identify any SBD, or individual SBD camera, which is performing poorly and requiring maintenance.



Camera ATR Performance Metrics

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Baggage Handling Systems

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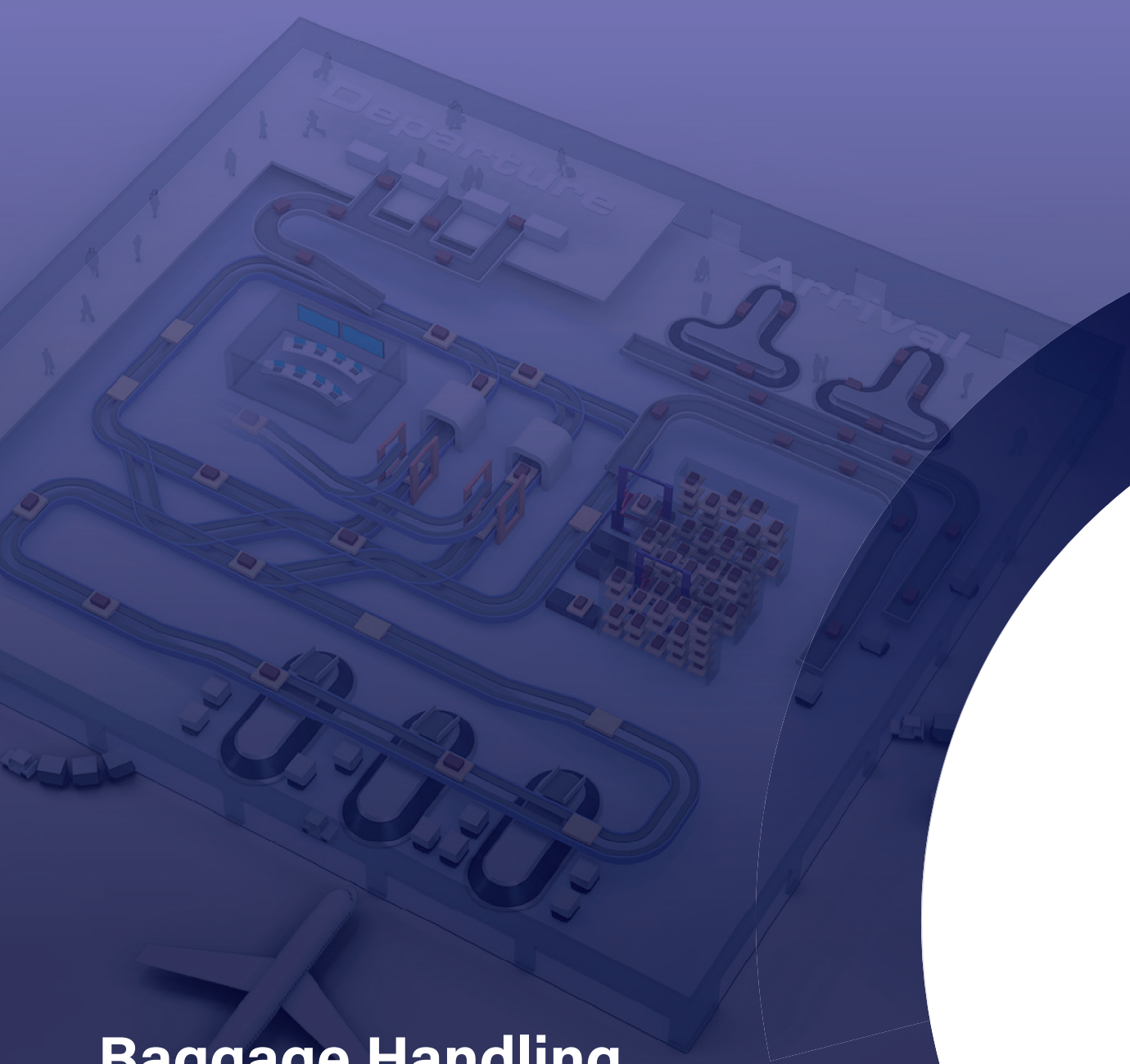


Baggage Handling Systems

Daifuku Airport Technologies is a leading global provider of end-to-end Baggage Handling Systems, offering an unparalleled network of expertise and support from project conception through system maintenance.

Our leading-edge technology continues to revolutionize airport operations around the world, enhancing the productivity, accuracy, and passenger service levels of our partners, and creating a seamless airport journey for their passengers.

End-to-end Airport Solutions

DAIFUKU

Self-Service Technologies

Baggage Handling Systems

Airport Operating Systems

Checkpoint Security Screening

Operations & Maintenance

Baggage Software Solutions

Baggage Check-In

Bag-UX | Baggage Hygiene

Bag-UX is the first solution of its kind

Baggage jams, throughput issues, and items requiring further identification for IATA Resolution 753 are all common issues resulting in delays or the misplacement of bags.

Bag-UX analyzes individual bags by shape and hygiene before being introduced to the baggage handling system. This crucial step prevents incorrect items from being directed into the system or other vital locations within the airport.

Bag-UX leverages Daifuku's Self Bag Drop vision technology for baggage analysis. Combining a deep learning artificial intelligence model to quickly and accurately analyze bags in motion on a collector conveyor, Bag-UX can detect unwanted items entering the Baggage Handling System (BHS), significantly reducing downstream issues.

Features

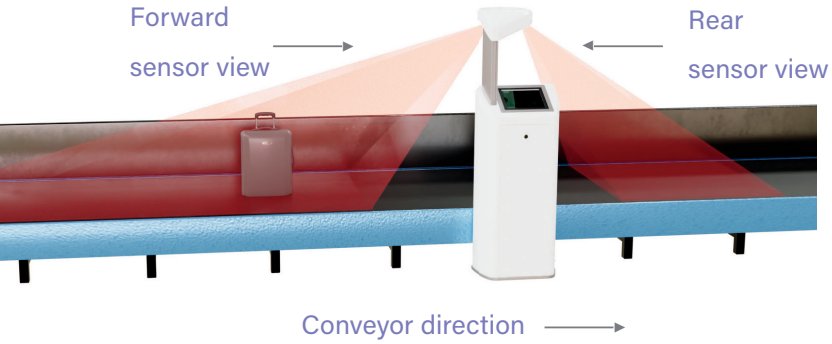
- 10" touch screen
- Flip out panel for easy maintenance
- Built-in maintenance application
- Modern design and small footprint
- Adjustable Sensor pod height
- Dual cameras sense baggage moving toward and away from the unit
- 3D and AI sensors for baggage orientation and dimensioning

Optional peripherals

- Additional cameras for bag tag data capture and images

Functionality and smart design

- Bag-UX's imaging capabilities allow a bag's condition to be seamlessly compared pre-departure and on arrival for loss/damage waivers
- Bag-UX has the ability to classify bags in accordance with the IATA Baggage Identification Chart providing improved tracking and identification of baggage
- Bag-UX can pause the collector conveyor, allowing staff to remove or reorient the bag, or the system can redirect or automatically handle the bag
- Bag-UX can be used for inbound baggage analysis to identify baggage types



Identifiable baggage issues:

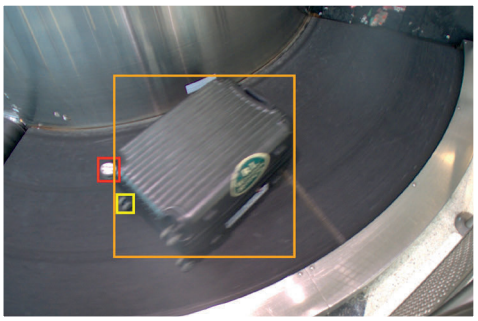
- Bag conveyability - orientation, position, handle extended
- Multiple bags/baggage spacing issues
- Tray/tub detection/usage
- Upright bag
- Images of bags for loss/damage
- Bag tag presence and location *
- Detection of documents left on baggage *
- Open or spilled baggage *
- IATA Baggage Classification Type *

* Under active development with industry

> 26 M bags were mishandled in 2019, costing the industry $2.6 billion

> 66% improvement in global bag delivery rates for airlines that track bags at check-in and arrival

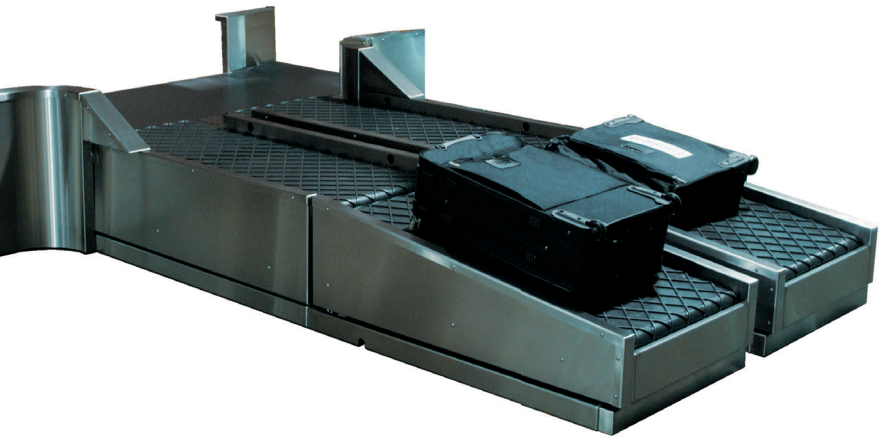
Source: SITA 2020 Baggage IT Insights Report



DAIFUKU

Baggage Check-In

Check-In Conveyors



The check-in conveyor is the primary hardware unit between passengers and the baggage handling system. The integrated scale belt is used to weigh and label baggage while the dispatch conveyor is used to induct baggage onto the main collector conveyor.

Reduced on-the-job injuries

About 10% of all airline customer service agent's injuries occur at the ticket counters due to lifting of heavy bags. This number drops significantly with our check-in conveyors due to reduced manual handling of bags by airline employees. The reduced on-the-job injuries will attribute to increased profitability and employee satisfaction.

Features

- Automatic bag weighing and dispatch onto take-away systems
- High quality stainless-steel finish
- Eliminates trap points for fingers, straps, and labels
- Tamper-proof weighing scales
- Removable side panels and roll-out system provides easy access for cleaning and maintenance
- Adaptable operation to suit remote and self-service check-in
- Integrates seamlessly with both Daifuku-based and third party self-bag drop devices
- Integrated controls are adaptable to different systems needs

Fully integrated controls

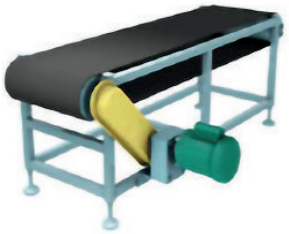
- Easily serviceable connected solution
- Works with different controls architecture systems - Ethernet, ControlNet, DeviceNet, Profibus, Profinet, Asi, etc.
- Merge logic can run from either the main BHS PLC or within the Check-UX PLC

Integrated drum motor

- Maintains slim profile of the overall unit
- Available in IE3 and IE4 motor efficiency ratings
- Safer and more efficient than traditional belt motors

Drum Motor

Conventional Drive



Easy access

Daifuku's scale dispatch units have hinged conveyors that can be propped open to access the internal controls and drive packages underneath each unit for easy serviceability.

Modular conveyor design

Conveyor bed sections are removable with quick disconnects to easily remove a conveyor section and replace it within minutes.

Drum motors

The Daifuku scale dispatch units utilize drum motors, which allow the design to be modular and easily replaceable. A drum motor is a one-component conveyor drive where the motor, gear drive, and all moving parts are enclosed inside the drum.

Conveyors

The general transport conveyor is a straight belt conveyor used to transport all types of standard baggage and can be supplied with high side walls or stainless steel cladding to accommodate various uses throughout the airport.

This style of conveyor is designed to transport in a straight line and can be programmed to provide a variety of functions such as merging, accumulating, inducting, and sorting baggage.

General transport conveyors can be supplied as a horizontal surface or at any degree of incline or decline to a maximum angle of 20 degrees.

Metering Conveyor

The metering conveyor is a short straight conveyor used for metering or queuing bags, or it can be used for creating bag separation.

This unit is implemented before conveyor junctions, merges, or places where accumulation or separation is required. For this reason, the conveyor is designed with robust components to cope with a high number of stops/starts.

Merge Conveyor

Highly functional in design, this conveyor features an angled edge where two conveyor lines meet. This allows merging baggage to move from one conveyor line to another at either low or high speeds. The merge conveyor can be programmed in a variety of configurations so that the merge priority is given to the appropriate conveyor line.

Daifuku merge conveyors are typically used in standard baggage systems, and can be integrated with other queue type conveyors, power turns, or standard horizontal conveyors. They are available in forward and reverse operation modes, and various center line lengths.

Collector Conveyor

The collector conveyor performs a specific function of collecting baggage at the check-in area. Bags can be loaded directly onto the conveyor by the check-in operator or, if used with check-in conveyors, bags can be injected automatically.

Most typically constructed with a stainless steel rim, it can be used as a stand-alone belt conveyor or to collect bags that are transferred from the check-in conveyors.

Our conveyors are capable of discharging baggage at a continuous rate of up to 40 bags per minute

Carousels

Daifuku's baggage carousels require minimal maintenance and are designed to operate continuously and quietly, ensuring consistent, reliable performance.

As one of the few providers that make both flat plate and slope plate carousels, Daifuku provides flexible alternatives to accommodate the various demands for any airport.

Friction drive carousels with rubber slats are also available, providing energy efficiency.

- Versatile design, capable of handling virtually any shape and size of luggage
- Designed to operate continuously and quietly, ensuring reliable performance and minimal maintenance
- Solutions are designed to withstand high-volume BHS operations
- Flexible alternatives can accommodate variations in height and configuration to meet the BHS demands

Flat Plate Carousel

Slope Plate Carousel

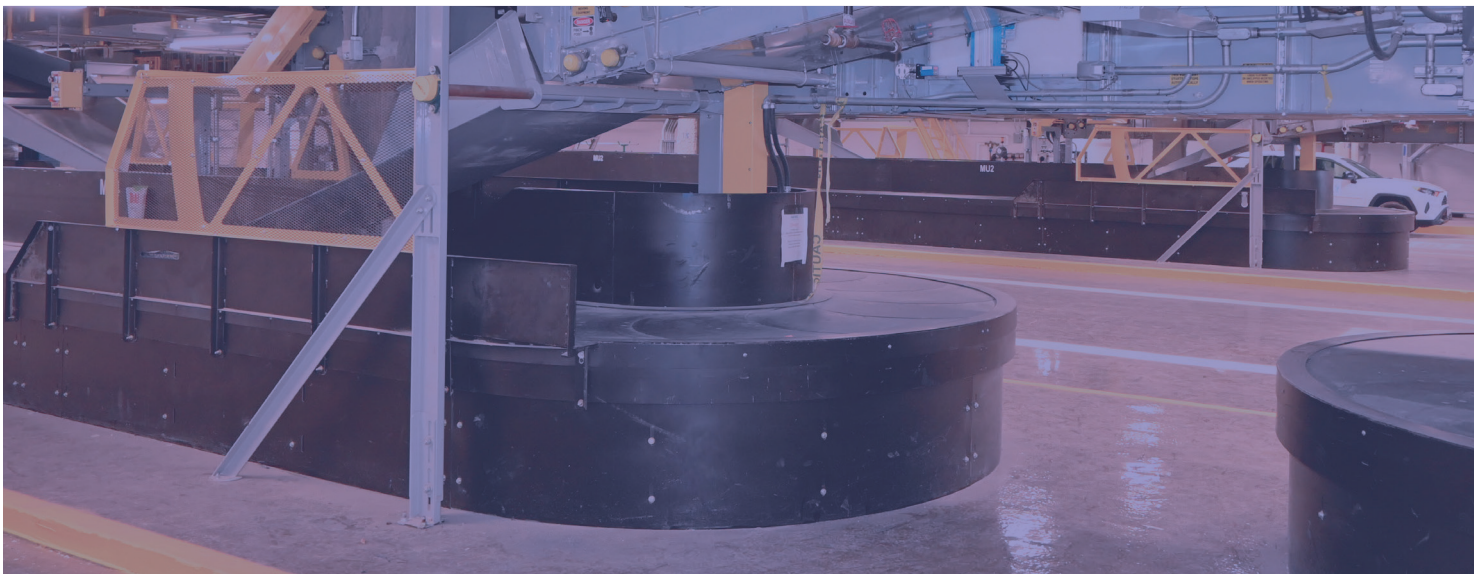
Flat Plate Carousels

The Flat Plate Baggage Carousel is a high-capacity, motor-driven, crescent plate closed-loop device that can function as an inbound baggage claim device or an outbound baggage make-up device. Both functions feature high capacity and reliability with smooth, quiet operation.

This baggage carousel has been designed using modular construction, allowing pre-fabrication and pre-assembly at the factory. The modular construction also offers design engineers the flexibility to accommodate tight space requirements and single or multiple feeds at a variety of locations.

The flat plate carousel's standard direction of travel is counterclockwise to allow comfortable baggage removal for passengers and baggage handlers. Clockwise travel is also available to accommodate other considerations.

Make-up units are provided with flat black (or a customer-specified color) painted trim and cover panels, while passenger baggage claim units are provided with 12-gauge stainless steel trim and cover panels for a uniform, pleasing appearance.



Slope Plate Carousels

The Slope Plate, also known as an Incline Claim, baggage carousel is a high capacity, motor driven, closed loop device that can function as an Inbound Baggage Claim Device or an Outbound Baggage Make-up Device. Both functions feature high-capacity reliability with smooth, quiet operation.

This baggage carousel has been designed using modular construction, allowing pre-fabrication and pre-assembly at the factory. The modular construction also offers design engineers the flexibility to accommodate tight space requirements and single or multiple feeds at a variety of locations.

Carousel pallets are designed to be reversible, allowing pallet installation with the overlap opposite the direction of travel. The standard direction of travel is counterclockwise to allow comfortable baggage removal by most passengers and baggage handlers. Clockwise travel is also available to accommodate other considerations.

These reversible pallets minimize the possibility of baggage, bag straps, or tags from wedging into the overlap in the event of a jam. This feature is not available from most other domestic suppliers of carousels.

The standard Baggage Claim Carousel is provided with 14-gauge stainless steel pallets and 12-gauge stainless trim for excellent functional characteristics as well as appearance. Make-up Devices are provided with flat black painted trim cover panels in lieu of stainless steel.

We offer two pallet materials to meet the needs of make-up or baggage claim devices

Stainless Steel Pallets

Rubber Pallets

Our carousels come in a variety of configurations to meet the needs of any environment

DAIFUKU

Early Baggage Storage and Sortation

Baggage Tray System

Daifuku's Baggage Tray System (BTS) is among the world's fastest systems providing transportation and sortation of passenger bags from check-in counters to baggage make-up areas with the use of individually trackable trays.

Early Baggage Storage

The Early Bag Storage (EBS) system is primarily used to store and release bags that have been delivered to the airport early, with the capacity to hold bags indefinitely, enhancing operations at the makeup stage.

In addition to standard Lane-Based storage, Daifuku also offers high-speed Automated Storage and Retrieval Systems (AS/RS). AS/RS can utilize either a combination of cranes and shuttles or automated guided vehicles to meet the storage and performance needs of any airport.

Sortation

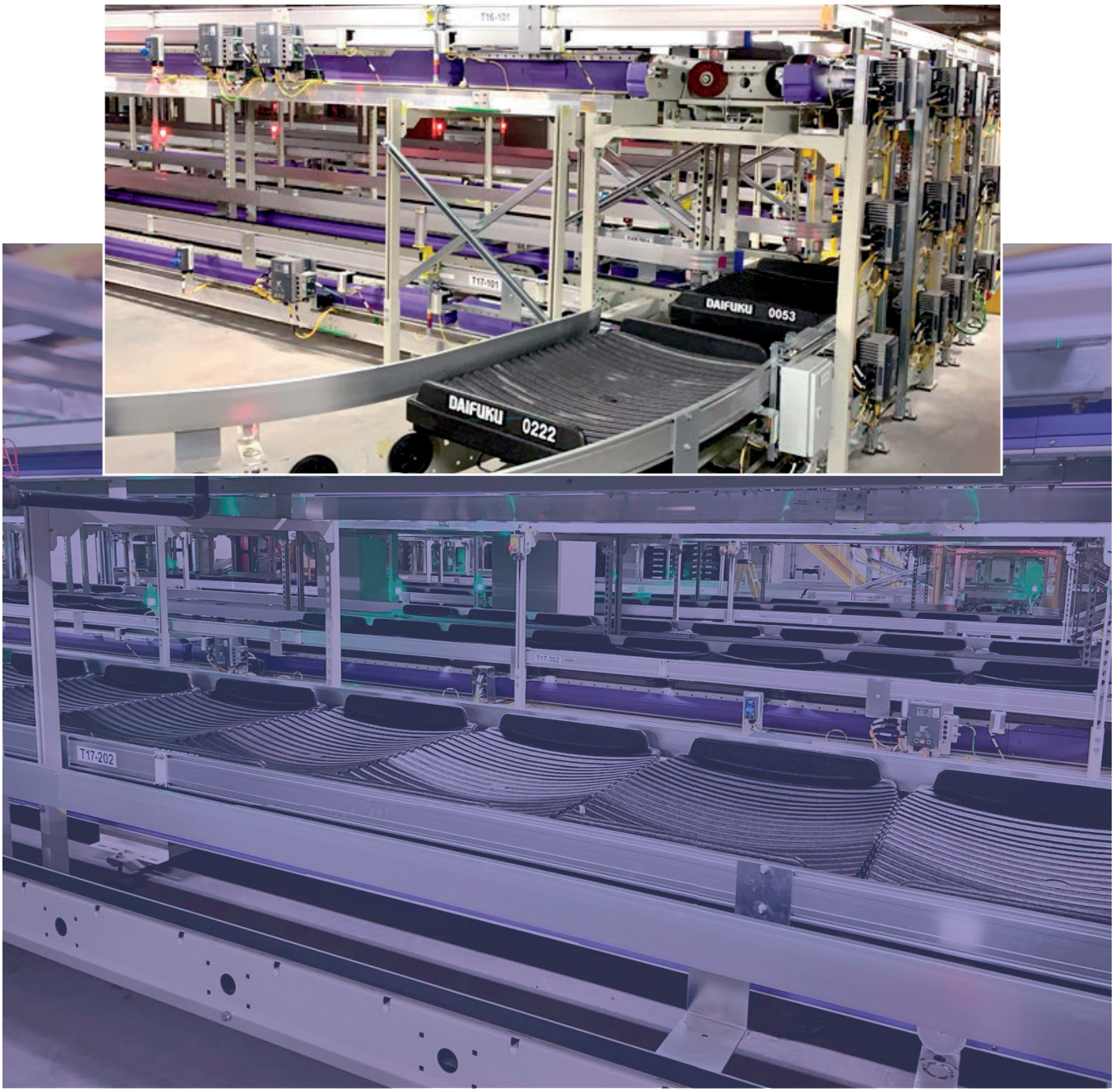
Daifuku is a leading global provider of efficient, high-speed solutions for the transportation and sortation of passenger bags from check-in counters to baggage make-up areas. Our dynamic solutions are among the world's fastest. They have the unique ability to mix standard and oversized baggage, offering a range of operational benefits to our partners.

From planning to installation and ongoing support, our dedicated team works closely with our airport partners to develop solutions that are tailored to meet the unique operational needs of their terminal environments.

Lane-Based Storage

Lane-based storage is a conventional storage system where bags are grouped with related bags according to the flight they will be on or by the time they will need to depart. Lane-based storage requires groups move together. When it is time, bags are released as entire lanes and then resorted as necessary.

Our lane-based storage solutions can be integrated into both conveyor systems and our Baggage Tray Systems (BTS) solutions, facilitating buffer applications for bag storage in small-to-medium sized airports.



Automated Storage Retrieval System Based Storage

Daifuku Automated Storage Retrieval System (AS/RS) solutions allow for the high-speed vertical storage of individual bags. They are used in conjunction with Baggage Tray Systems (BTS) for large terminal environments. AS/RS support 100% tracking and traceability, so the location of each bag can be found at any given time. Daifuku AS/RS solutions are fast and reliable with a longstanding history of use since 1966 in a variety of industries. Daifuku offers two configurations for AS/RS based storage for maximum flexibility within any airport footprint.

Crane based storage

We have developed over 40,000 cranes worldwide across a myriad of industries and offer multiple configurations for our AS/RS technologies to suit the operational needs of our airport partners. Redundancy measures of two cranes per aisle can be provided. The crane-based systems provide more efficient use of make-up space and ground operations.

Shuttle rack storage

Each rack level in the system is serviced by a dedicated shuttle vehicle. They utilize leading-edge technology to store individual trays with bags. These high-speed shuttles can quickly store and retrieve bags as needed with rates of up to 33 bags per minute.

Features

- Flexible design can accommodate various airport footprints
- Utilizes leading-edge AS/RS technology to store individual trays with bags
- 100% tracking control and traceability of all bags
- Longstanding history of use
- Flexible and fast carrying for any amount of airport traffic
- Faulty cranes/shuttles can be replaced with little disruption to the system while others continue to operate

The shuttle rack system can store bags at rates of 30-33 bpm

Shuttle rack storage

DAIFUKU

20,000+ AS/RS based storage solutions installed worldwide

Baggage Tray System/ Individual Carrier System

Daifuku's Baggage Tray System (BTS), also known as Individual Carrier Systems (ICS), is among the world's fastest and can convey bags at speeds of up to 10m/s (36 km/h or 22 mi/h). It offers an efficient solution for the transportation and sortation of passenger bags from check-in counters to baggage make-up areas. Unlike conventional systems where bags are placed directly on conveyor belts, our BTS solution transports bags in individual trays and offers a range of operational benefits.

It can also be integrated with Daifuku's Automated Storage and Retrieval Systems (AS/RS), as well as other automated storage systems, to provide temporary bag storage for passengers who check-in early or have extended layovers at large airports.

Trays are equipped with individually identifiable RFID tags that allow 100% tracking and traceability of baggage throughout the Baggage Handling System. This dramatically reduces the operational issues caused by low tracking performance, a common problem for conveyor-based systems.

Features

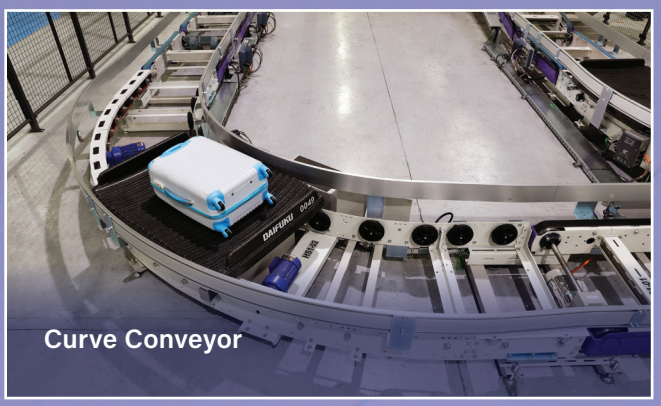
- 100% tracking control and traceability of all bags
- One of the world's fastest high-speed carrier systems
- Flexible design can accommodate various airport footprints
- Capable of handling a variety of baggage sizes

Our BTS conveys bags at up to 36 kph (22.4 mph)

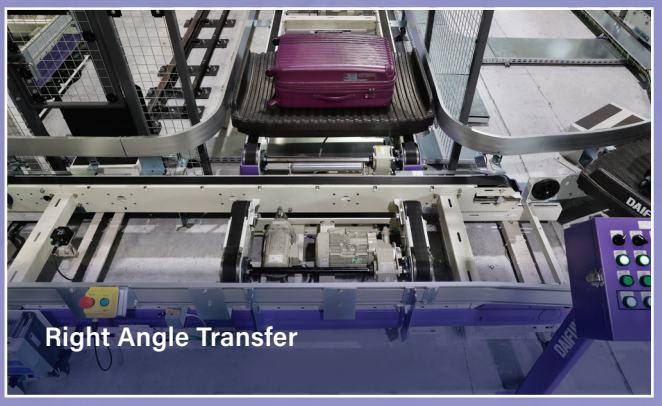
Discharge

Top Loader


Merge/Diverge


Curve Conveyor


Straight Conveyor


Right Angle Transfer

DAIFUKU

Vertical Sorting Unit

The Vertical Sorting Unit (VSU) has the ability to divide the baggage flow into two vertically separated paths, based on individual tray or route selections. A compact design allows it to be incorporated within the Baggage Handling System of any airport, accommodating both regular and fragile items on any type of conveyor line.

Description	Key Operating Parameters
Length	3130 mm (123.2 in)
Height	1340 mm (52.8 in) Minimum
Speed	1.2, 1.5, 2.0 m/s (1.3, 1.6, 2.2 yd/s)
Motor Size	0.75 - 2.2 kW (conveyor)
Throughput	1800 trays/hr

DAIFUKU

Tilt Tray Sorter

The Tilt Tray Sorter (TTS) is a component of the Baggage Handling System (BHS), tasked with controlling and discharging bags for a variety of applications, such as pre-sortation, final sortation to make-up locations, and early bag storage; it can also be used for screening applications within the overall BHS.

The TTS operates at a high-speed, with intelligent features to maximize baggage throughput at very low operating costs. Our patented technology delivers a high degree of efficiency, preventing bags from being inducted together or in between trays. By ensuring bags are inducted into the center of the tray each time, it reduces the need to be tipped into a common chute and then double-handled by baggage handlers.

Daifuku's TTS utilizes dynamic speed change technology to reduce component wear and energy consumption. With features including built-in maintenance attributes with condition-based monitoring, this reduces the lifetime costs of the system.

The tilting trays can be accessed remotely to provide intelligent operating information and connection for remote upgrades.

All TTS hardware features a lightweight build and ergonomic, low-profile design, making it suitable for installation within any airport environment. This also facilitates simple system flexibility to meet passenger growth and increased baggage demands.

Features

- Easy maintenance
- Real-time communication enabling speed changes and baggage rerouting
- Advanced fault monitoring allows for fast recovery times

Checked Baggage Security Screening

Mobile Inspection Table

The Mobile Inspection Table (MIT) is designed for use inside airport Checked Baggage Reconciliation Areas (CBRAs), and is implemented as a replacement for traditional belt conveyors and static search tables. Utilizing leading-edge robotic technology, the MIT has revolutionized operations throughout CBRAs globally and offers a range of benefits for both airports and airlines.

Autonomous, functional design

Bags are loaded automatically onto the MIT unit, which autonomously delivers them to Transportation Security Officers (TSOs) by natural feature or magnetic tape/bar guidance navigation. TSOs can then search the bag directly on top of the MIT unit, which is equipped with a stainless steel table top that meets all PGDS 7.0 requirements. Upon search completion, the MIT delivers bags back to the appropriate conveyor to proceed onwards.

DAIFUKU

Built using proven technology

The MIT solution has been developed using technology found inside our 100ST SmartCart® Automatic Guided Vehicle (AGV). We have been making AGVs since 1962 with a current install base of over 13,000 globally.

Throughout this period, the AGV has demonstrated itself to be an extremely reliable solution within high-intensity manufacturing environments where maximum uptime is demanded; much like baggage handling systems.

Integration with any OEM

MITs are designed to be a standalone system able to integrate with any OEM mechanical equipment provider and/or any controls provider for Baggage Handling Systems (BHS).

As a result of this design, MIT systems have been successfully integrated with outside providers and the product is well suited to continue this success on future projects.

There are two connections that occur with the BHS when implementing an MIT system. For bags entering the CBRA, there is an interlock to the BHS system starting at the Daifuku-provided top loader area. There is also an interlock to the BHS system at the unload points to start the conveyors.

Equipment provided for all MIT installs:

- MITs and associated equipment (charger and guidance requirements)
- Inspection stations and all associated equipment (excluding the secondary viewing stations)
- Top loader and two upstream queue conveyors
- Equipment associated with tipping mechanism (tipping bar and transfer plate)
- All MIT-related electrical devices (PLC cabinet, wireless access points, MIT server, control panels, photocells, and other miscellaneous field devices)

Easily integrates with outside providers to suit all airport needs

Airport Operating Systems

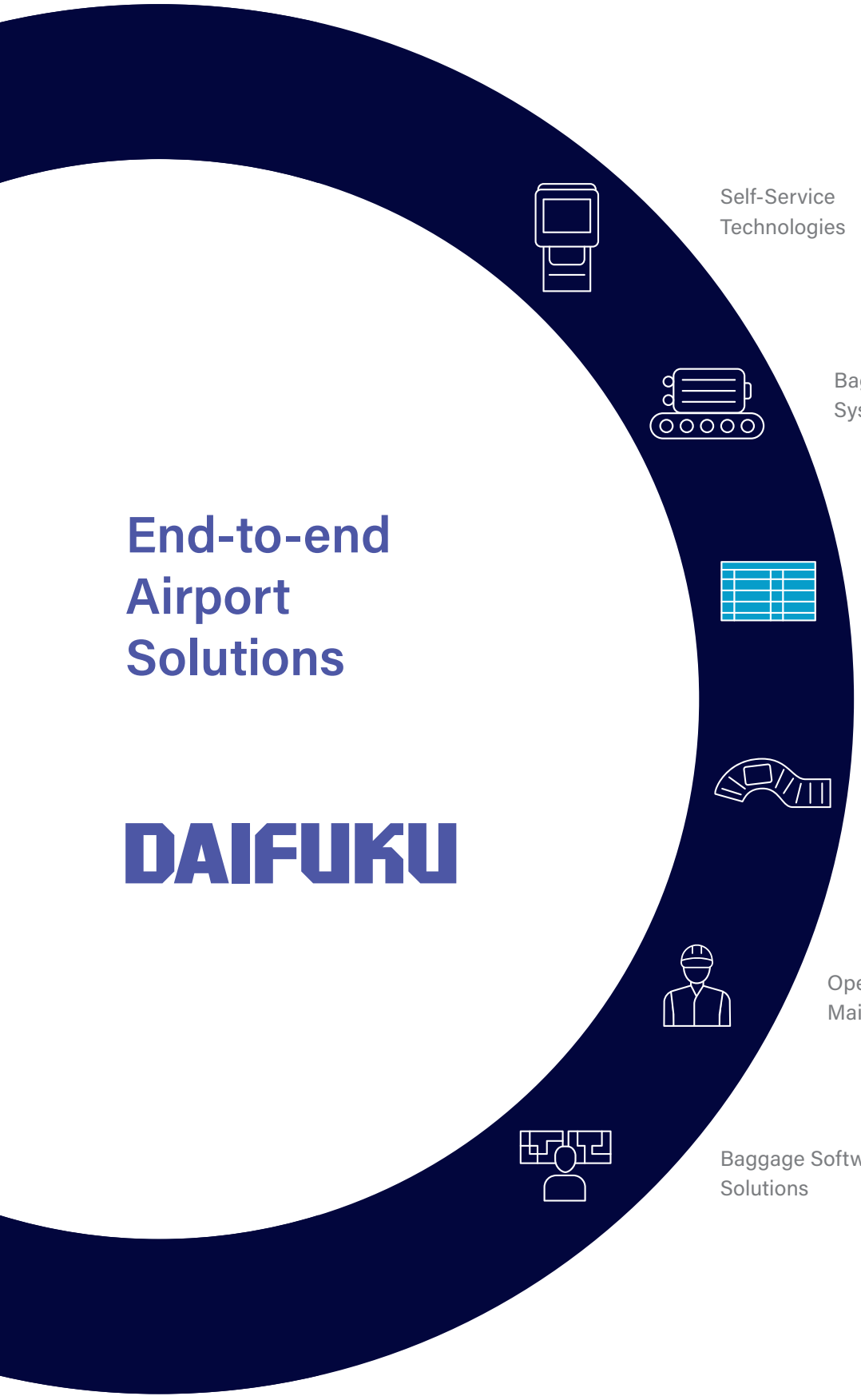
DAIFUKU

Airport Operating Systems

This dynamic suite of integrated digital systems offer a range of operational benefits ensuring that high-value information can be communicated faster to operate airports, improve efficiency, reduce errors, and collaborate.

End-to-end Airport Solutions

DAIFUKU



Self-Service Technologies

Baggage Handling Systems

Airport Operating Systems

Checkpoint Security Screening

Operations & Maintenance

Baggage Software Solutions

An industry-leading suite of airport operation services

rapidsuite

Unified user for whole suite

Open the systems securely to all stakeholders. Users are created based on roles and responsibilities. Users can utilise the same login for all modules, and can be extended to any airport operations stakeholder/entity.

Optimising airport performance

Gain a competitive edge with tools designed to adapt from regional airports to large hubs for analysing and improving airport performance, contributing to achieving high customer satisfaction.

Adaptive hosting solutions

rapidsuite is available as an on-premise, cloud or hybrid solution. Depending on airport requirements and existing infrastructure, rapidsuite can integrate with partner data centers, or the SaaS rapidsuite which can be accessed via an internet connection. The Daifuku Cloud option may include local cache for a hybrid model to reduce Internet connectivity impact.

50+ years of proven experience

Benefit from this extensive industry knowledge and a track record of five decades, achieving excellence in the aviation industry delivering successful major airport operational system projects.

rapidsuite

- **rapidhub** — AODB
- **rapidfids** — FIDS
- **rapidengage** — CMS
- **rapidplan** — RMS
- **rapidinsight** — Analytics

Additional benefits:

- 24/7 global hotline
- ISO 27001 and 9001 certified*
- Cyber security & compliance
- Hardware warranty replacement
- Consulting
- Page design and UX experience

* ISO 27001 certification is a credential that validates a business's fulfillment of requirements relating to quality process and Cyber Security standards as defined by the International Standards Organisation (ISO).

Compile operationaldata into comprehensive insights for commercial, marketing, financial systems and more

DAIFUKU

Passenger, flight, and retail data hub

rapidhub

rapidhub is an airport operational database and the core of Daifuku turnkey airport management solutions, featuring real-time flight and terminal data display, broadcast services and statistical analysis.

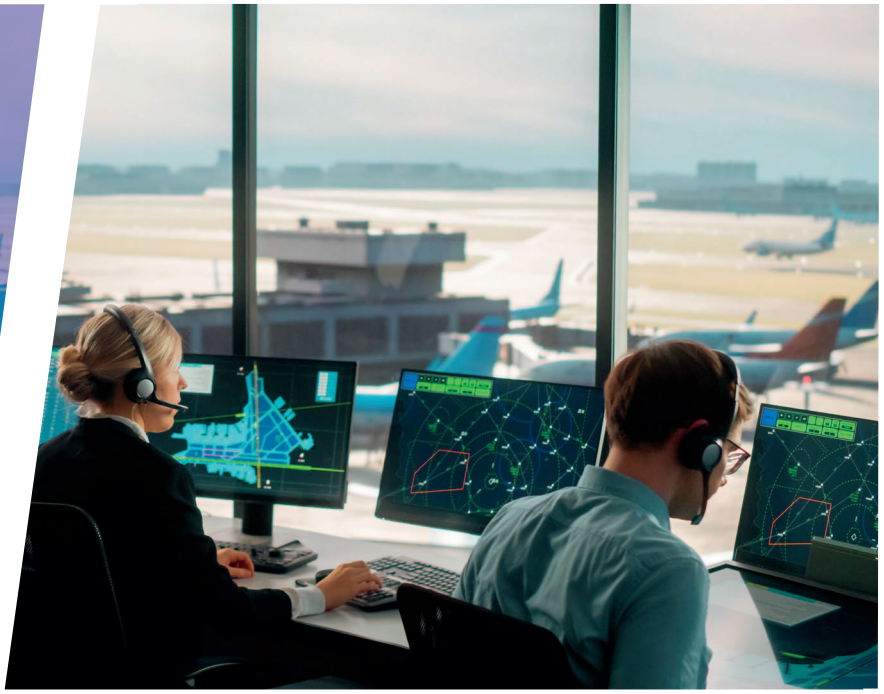
The rapidhub database collects, stores and distributes data collected from a myriad of data sources, including airline scheduling systems, airline detail tables, terminal resource capacity and capability tables, immigration statistics, active measurements of passenger flow, facility usage recordings and archived statistical data.

The database serves as the central operation, administration and management utility, essentially building the administrative infrastructure for the airport as a whole. The database integrates flight scheduling, resource allocation, airline billing, retail marketing research, advertising displays, passenger information displays, and so on, depending on the needs of the specific terminal.

As the single point of interface for each of the integrated subsystems and data sources rapidhub is able to simplify interfacing requirements for airport subsystems, streamline data flow models between various dependent subsystems, remove duplicate data, validate competing data sources to form a single version of the truth and optimise airport operational data flow by transmitting real-time data updates out to the various sub-systems.

Features:

- Operates seamlessly with other rapidsuite solutions
- Fully automated flight feeds
- Ability to add additional modules as needed
- Industry leading database



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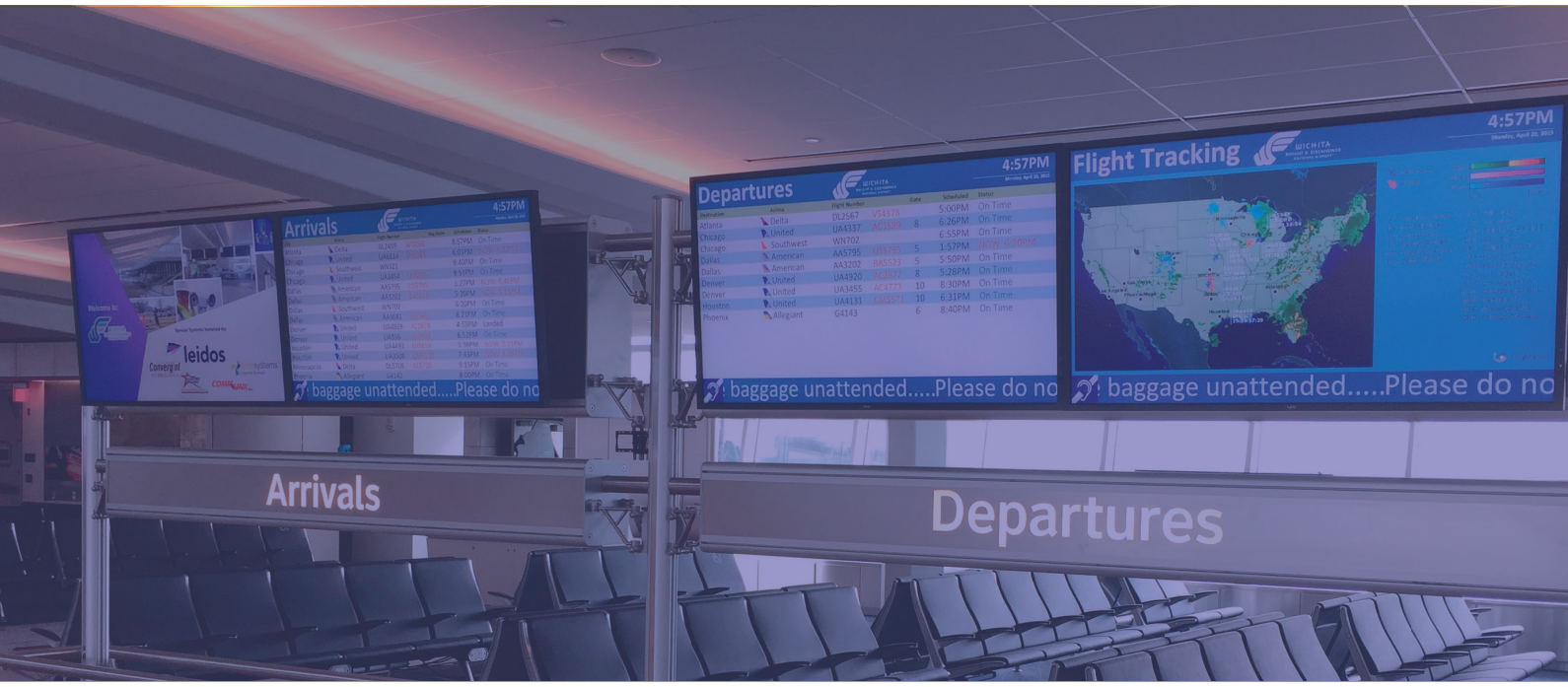


Flight data anywhere, anytime

Experience flexibility and accessibility with this web-based application. Manage operations and access data from any location with an Internet connection.

Fully-automated data feeds

Subscription available for flight data feeds with 99.5% coverage of real-time scheduled flights, including ETD updates, which are integrated with all the major airports/airlines in the world.

Central flight data management

Ensure smooth operations with a robust flight data management system. rapidhub streamlines the handling and processing of flight information for enhanced efficiency.

Flexibility of integrations

Designed to connect with any third party systems to streamline data flow and enhance communication between different systems, ensuring a cohesive and integrated aviation management solution.

Customisable reporting

rapidhub allows airport management and key stakeholders to store and analyse data throughout the airport to drive efficiency and maximise revenues.

Extending the rapidsuite database to include support for commercial, marketing and financial system data inputs, rapidhub can transform rapidsuite's operational reporting system into a comprehensive insights tool.

> rapidhub can be scaled to suit any size of airport and offers industry-leading flight integration, passenger and retail data, with secure accessibility for use by all stakeholders

Flight information display solution (FIDS)

rapidfids

rapidfids is an industry-leading flight information display solution (FIDS), offering real-time display of information across flights, check-in counters, boarding gates, visual paging, carousels and more. With advanced rich-media capabilities, rapidfids gives Daifuku partners complete control over what they communicate to passengers and when—enhancing the passenger experience.

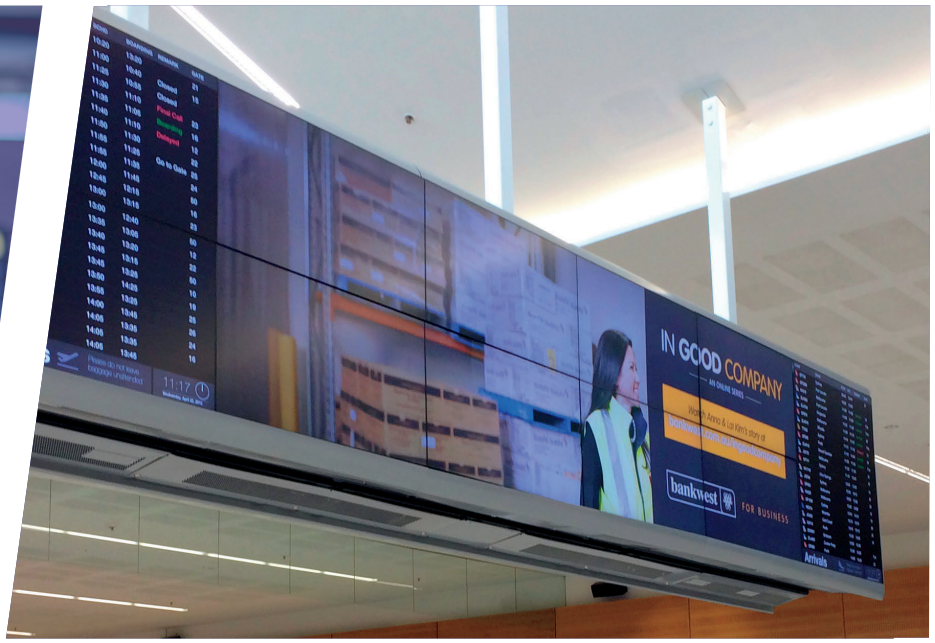
rapidfids is the most advanced solution in the market, offering real-time display of information across flights, check-in counters, boarding gates, visual paging, baggage carousels, in addition to other passenger and operational information.

With advanced rich-media capabilities, rapidfids gives complete control across the information communicated to passengers and when it is delivered, providing a true add-value experience.

Features:

- View, insert and delete flights and their associated schedules, codeshares and ticket counter allocations
- Monitor and maintain the hardware and software through the entire network
- Format data appearance to be displayed including flight, gate and check-in information, airline logos, text messages and other dynamic and static images
- Manage operational functions with iDesk/iGate such as opening, closing and signage of check-in desks and gates

> More than 10,500 active displays worldwide



Empowering travelers with information

Daifuku understands the importance of keeping travelers informed and up to date. These solutions prioritise real-time updates, ensuring a seamless and informed travel experience.

FIDS with WebFIDS competence

This solution liberates systems from the dependency on SDM/OPS, providing a direct and cost efficient pathway for smart display compatibility through the innovative WebFIDS concept.

Easy to configure, customise and maintain

rapidfids offers the monitoring and maintaining of hardware and software through the entire rapidfids network, preventing system failures and ensuring high-quality service.

Map FIDS layout

Upload any unique airport layout to enable all FIDS devices to be maintained and monitored from the design platform with a single click.

Real-time planning and decision support software

rapidplan

Features

- Provides airlines and airports with up-to-date resources planning for seamless aircraft entry and exit
- Real-time updates
- Schedule changes
- Allocation conflict detection
- Automatic notifications
- Smart scheduling

Offers strategic planning and decision support in real-time for critical activities including; allocation of gates, parking positions, check-in counters and baggage carousels.

rapidplan allows airport and airline personnel to plan and maintain the scheduling, allocation and real-time status of airport resources, including check-in counters, gates, bays, and baggage reclaims.

Powered by real-time data from rapidhub (AODB), rapidplan provides accurate, immediate information for operators to work with. Tight integration means that as changes are made in rapidplan, they are synchronised within rapidsuite, or to the AODB, ensuring that changes affecting passengers and operational staff are communicated in real-time. In addition, real-time data sychcronisation reduces risk of error through redundant information and centralised validation, which improves efficiency and reliability.

Simplified resource allocation and visualisation

The Gantt chart feature offers users a comprehensive view of flight allocations, allowing for easy visualisation and customisation based on user preferences.

Flight data management

This solution is strongly coupled with flight data updates, allowing users to access flight information from the module with real-time updates in AODB.

Business rules

rapidplan offers a rule management functionality to ensure all operations are met with the allocation. Soft and hard rules can be defined within the system based on numerous criteria such as adjacent, overlap, exclusion, scoring and ranking, and maintenance.

Alerts and warnings

Reminders, conflict, and alert lists provide greater detail on things users need to resolve. When toggled on, the various lists can give users quick, single-click access to assess and action.

Complex flight allocation made simple

DAIFUKU

Advertising information system

rapidengage

rapidengage is a revolutionary way to boost airport revenues. Leveraging the existing flight information display solution (FIDS) network, rapidengage brings a fresh approach to targeted revenue generation for airports, airport vendors and airport service providers.

rapidengage is used by operators to add or modify content, playlists and schedules that are either active or scheduled for future display. In addition, rapidengage maintains a history of past, active and future playlists scheduled for display making ongoing reference and reporting easy.

rapidengage's content management system distributes tailored content to both highly-viewed FIDS devices (which provide critical flight related information) or dedicated devices, giving the flexibility to show different content types - advertisements, infotainment and entertainment - to captivate audiences in intelligently zoned areas of the airport.

Features

- Fresh approach to targeted revenue generation for airports, vendors, and service providers
- Rich media content for great passenger experience
- Maximise use of any display with scheduling of advertising, FIDS, and wayfinding content anywhere

More than 550 million active passengers reached per year

Toggle flight information with any content

Daifuku's solution offers the functionality to couple flight information with any advertising promotion, video or images.

Simplify airport wayfinding

rapidengage supports wayfinding specifications and design, which can be easily toggled with flight information and dynamic signage.

Generate revenue

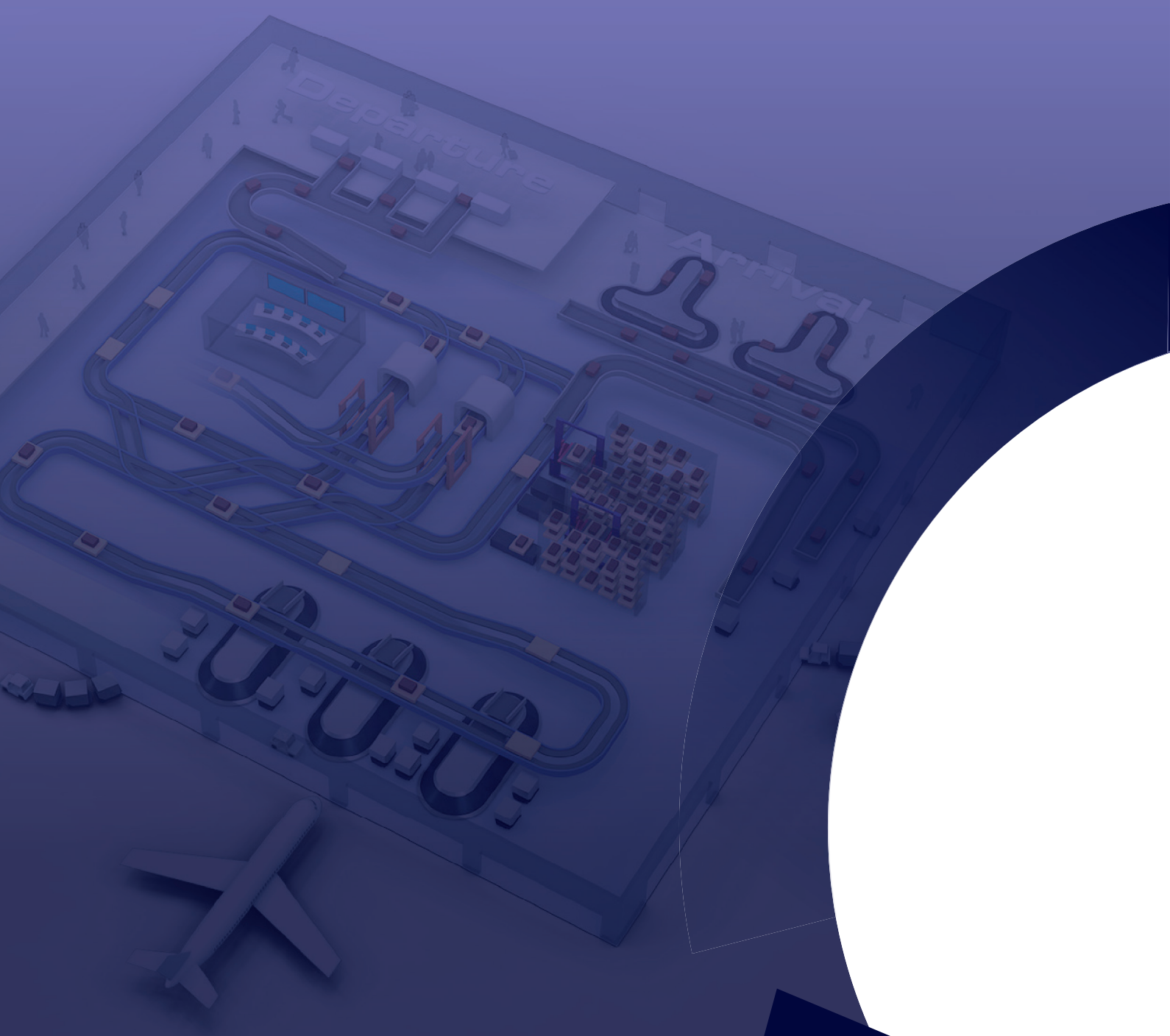
Maximise revenue opportunities with the platform's capabilities, enabling strategic revenue generation through targeted advertising and promotional initiatives.

Schedule commercial content

This solution allows businesses to schedule and display content across a network of internal screens. Dynamic scheduling provides flexibility and control to set specific start and end dates and times.

Checkpoint
Security Screening

DAIFUKU



Checkpoint Security Screening

Flexible, secure, future-proof solutions that are capable of handling growing passenger volumes, while providing a smooth experience.

End-to-end Airport Solutions

DAIFUKU

Self-Service Technologies

Baggage Handling Systems

Airport Operating Systems

Checkpoint Security Screening

Operations & Maintenance

Baggage Software Solutions

History of the

Smart Security Lane

2015

The original concept Smart Security Lane (SSL) was developed with Amsterdam Airport Schiphol. At the beginning of 2016 more than 85 SSLs were installed at the airport.

2017

SSLs are installed in different airports around the world including Bristol U.K, Johannesburg South Africa, Chitose Japan, Cologne Germany and others.

2018

The first screening lanes in the US go live at Houston International Airport.

2019

Scarabee, the company considered the creator of the original screening lane concept, becomes part of Daifuku.

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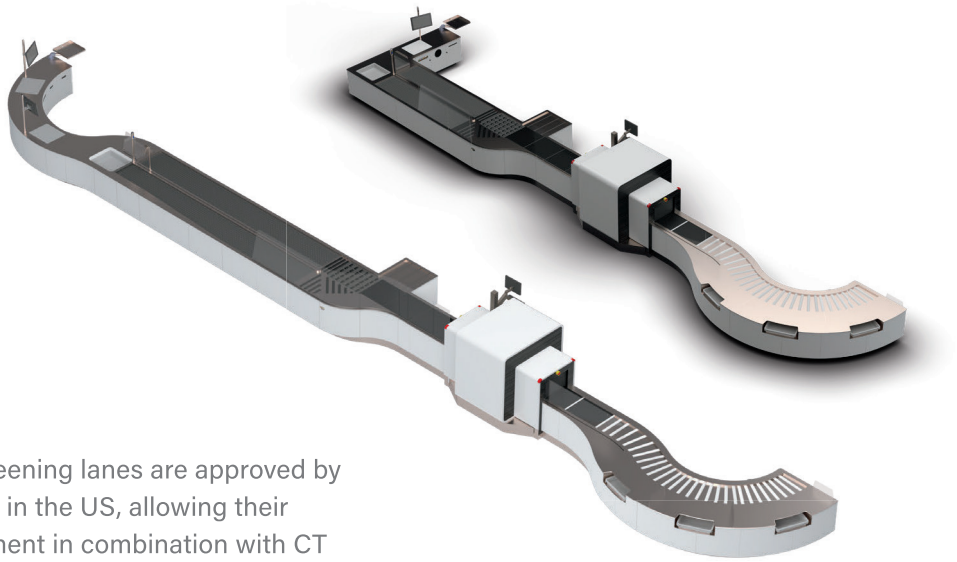


2023

The screening lanes are approved by the TSA in the US, allowing their deployment in combination with CT scanner equipment. The SSL is approved in a Full-size and Mid-size configuration.

2021

New features continuously added to the screening lane system.

Present

A new US production line for screening lanes is set up in collaboration with Daifuku Airport America's production in Boyne City, Michigan and final assembly in Louisville, Kentucky.

Features of the

Smart Security Lane

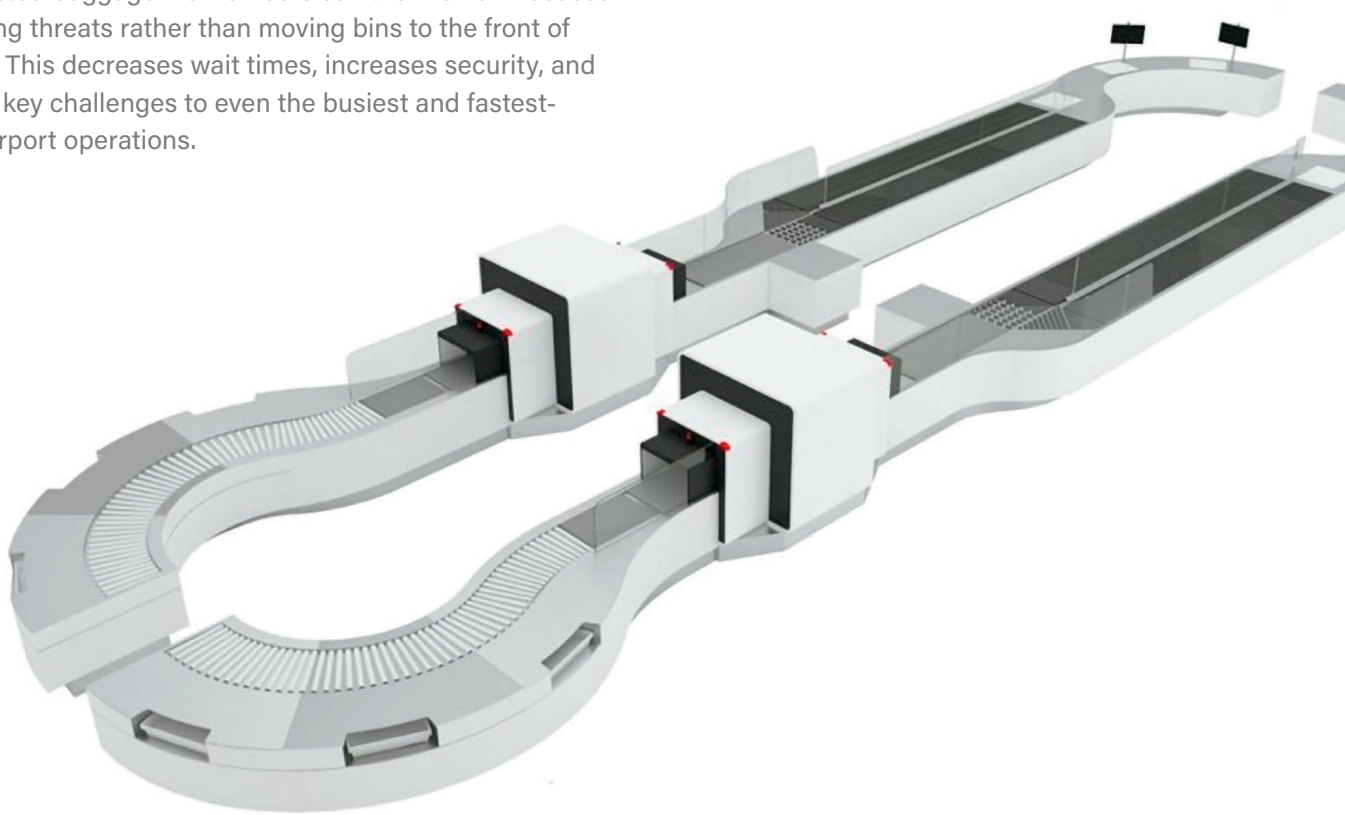
As passenger volumes continue to increase globally, airports are faced with mounting pressure to implement more efficient and accurate solutions across all passenger touchpoints, while prioritising the passenger experience. For many passengers, the security checkpoint is the most stressful part of the airport journey and, at the same time, the most physical and personal touchpoint. Therefore, it is of utmost importance to provide a pleasant atmosphere for both passengers and staff. The feeling passengers have at this checkpoint will strongly influence their perception towards the airport.

The Smart Security Lane (SSL) is designed to optimise the security process with a human-centric approach. By providing the right tools and working environment for staff and making the process more intuitive for passengers, both process and passenger experience are enhanced while complying with the latest security standards.

Passengers can divest at their own pace and present their baggage in two parallel flows, while conveyor belts automatically return bins to the front of the divesting area and divert rejected baggage. TSA officers can then remain focused on detecting threats rather than moving bins to the front of the queue. This decreases wait times, increases security, and addresses key challenges to even the busiest and fastest-growing airport operations.

Features

- Integrated with multiple major CT scanner solutions
- Optimised design with reduced footprint in both mid- and full-size lanes
- Oversize handling capability
- Space productivity of five passengers/m^2/hour



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Throughput of up to 660 passengers per hour can be achieved with just two mid-size lanes and 11 staff members

Photo ©Alex Tino Friedel/Munich Airport

DAIFUKU

Seamless screening integration

A variety of Computed Tomography (CT) technology options integrate seamlessly with SSL and remote screening solutions including: Smiths Detection's CTiX, Leidos ClearScan, Analogic ConneCT, Rapiscan 920CT, and IDSS Detect1000.

Architectural Integration

Successful terminals are designed to create a unique sense of place. A checkpoint is a key part of that design and leading architects have shown how to incorporate the lanes into their architectural expression.

Tray Presentation

The empty trays are presented to the passengers at an ergonomically effective height which reduces the time needed to retrieve empty trays, resulting in increased overall throughput of the system.

Each of the dual-divestment positions has an automatic tray dispenser which helps prevent "tray starvation".

Scalable screening

Efficient staff scaling is achieved with remote screening and cross-lane alarm resolution.

Photo © Alex Tino Friedel/Munich Airport

> Schiphol is 100% equipped with CT, having one of the world's largest checkpoint installations comprised of 35 lanes

Alternate Viewing Station

The integrated Alternate Viewing Station design improves working conditions for the operator by reducing manual handling of rejected trays.

The operator can easily slide the rejected tray from the conveyor belt to the viewing station, minimising walking distance and lifting heavy trays.

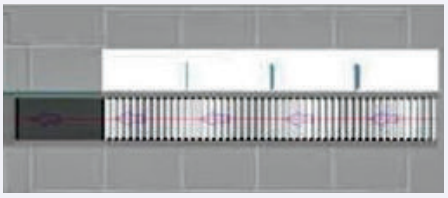
Oversize Handling

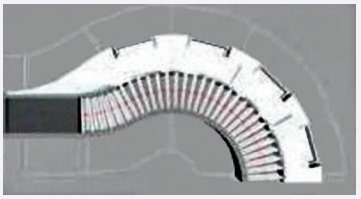
Oversize handling on all lanes is achieved by diverting rejected items to the reject side in a straight line. Oversize bags can be processed alongside standard bags on the same lane, eliminating the need to have dedicated security lanes for oversized handling.

Curved vs. Straight

The curved divestment area is optimal for the operator to engage with passengers from a central point, minimising travel time and walking distance.

This design allows more space for passengers. The curve also creates an overall smaller footprint compared to the straight design of traditional lanes.

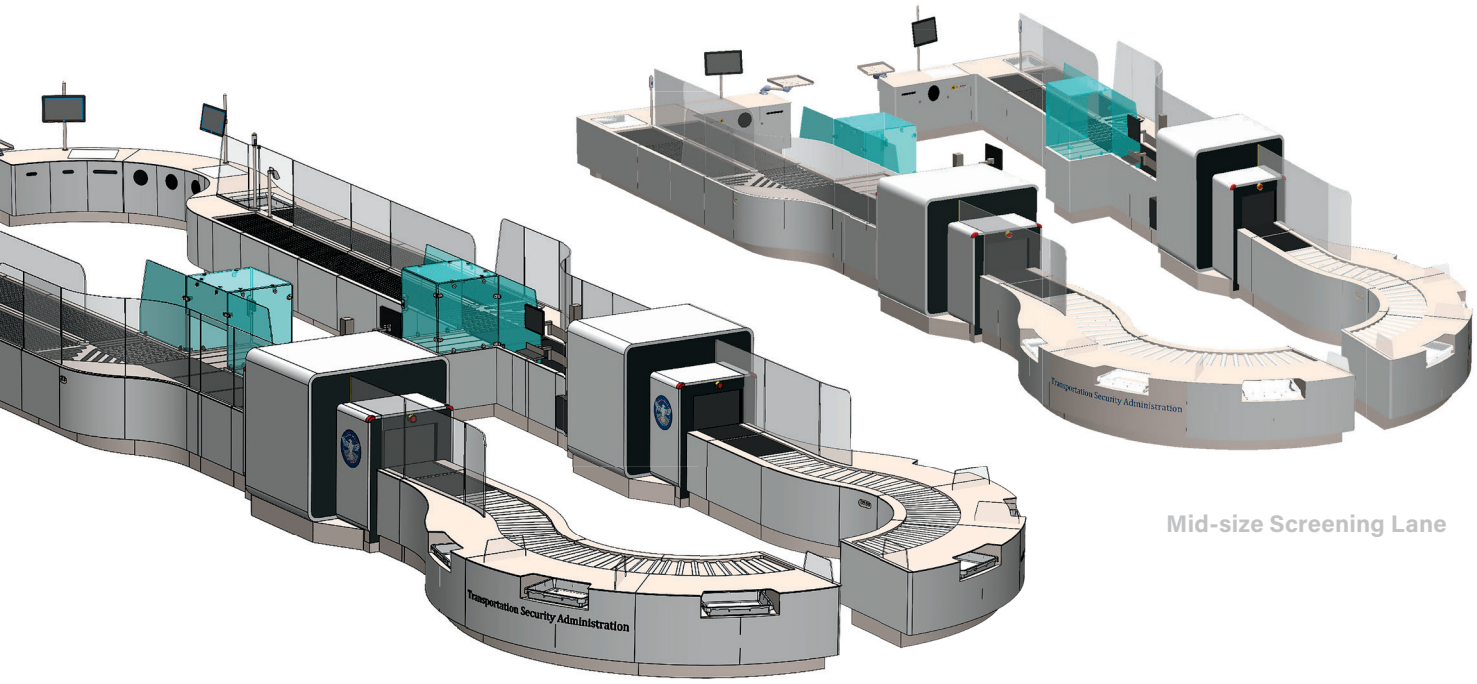




DAIFUKU

Checkpoint Property Screening System

TSA-Approved for the US Market



Mid-size Screening Lane

Full-size Screening Lane

The Checkpoint Property Screening System (CPSS) lanes have been qualified by the TSA in combination with the latest screening standards*. Along with Smiths Detection's HI-SCAN 6040 CTiX, CPSS lanes offer optimal image quality and advanced screening algorithms for improved overall performance.

The system qualification applies to both the full-size and mid-size lanes configuration. This ensures a flexible solution for every type of checkpoint and airport, no matter the space available.

* TSA Checkpoint Property Screening Systems (CPSS) Increment 1 Qualified Product List (QPL).

Features

- Integrated with Smiths Detection's HI-SCAN 6040 CTiX
- CPSS manufactured in the US
- Mid-Size and Full-Size lanes listed on the TSA's CPSS Increment 1 Qualified Product List (QPL)
- The only mid-size lane on the TSA's QPL with an automated tray return (ATR) system

DAIFUKU

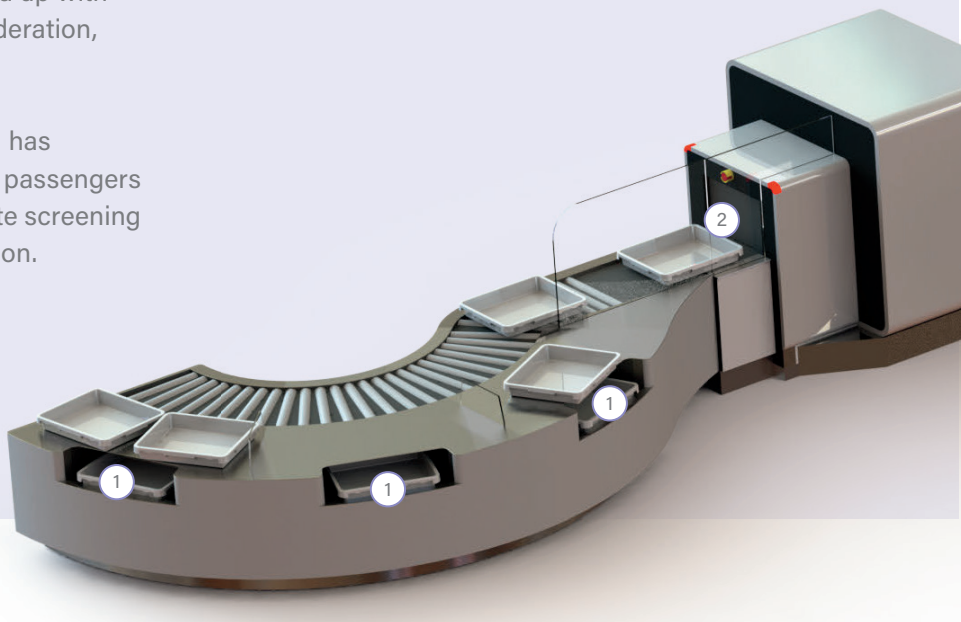
Walking through the

Smart Security Lane

A faster and more efficient process

These lanes were designed from the ground up with passenger and operator ergonomics consideration, ease of use, and aesthetics in mind.

The optimised design supports scaling and has allowed for proven peak levels of up to 330 passengers per hour at existing installations with remote screening configuration and cross-lane alarm resolution.



Step 1 | Parallel Divestment

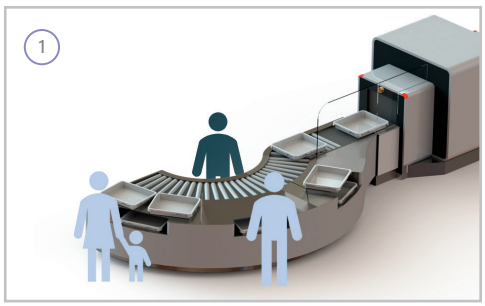
Passengers put their belongings in a bin. Multiple passengers can do this at the same time, while also having their own space to take the time they need.

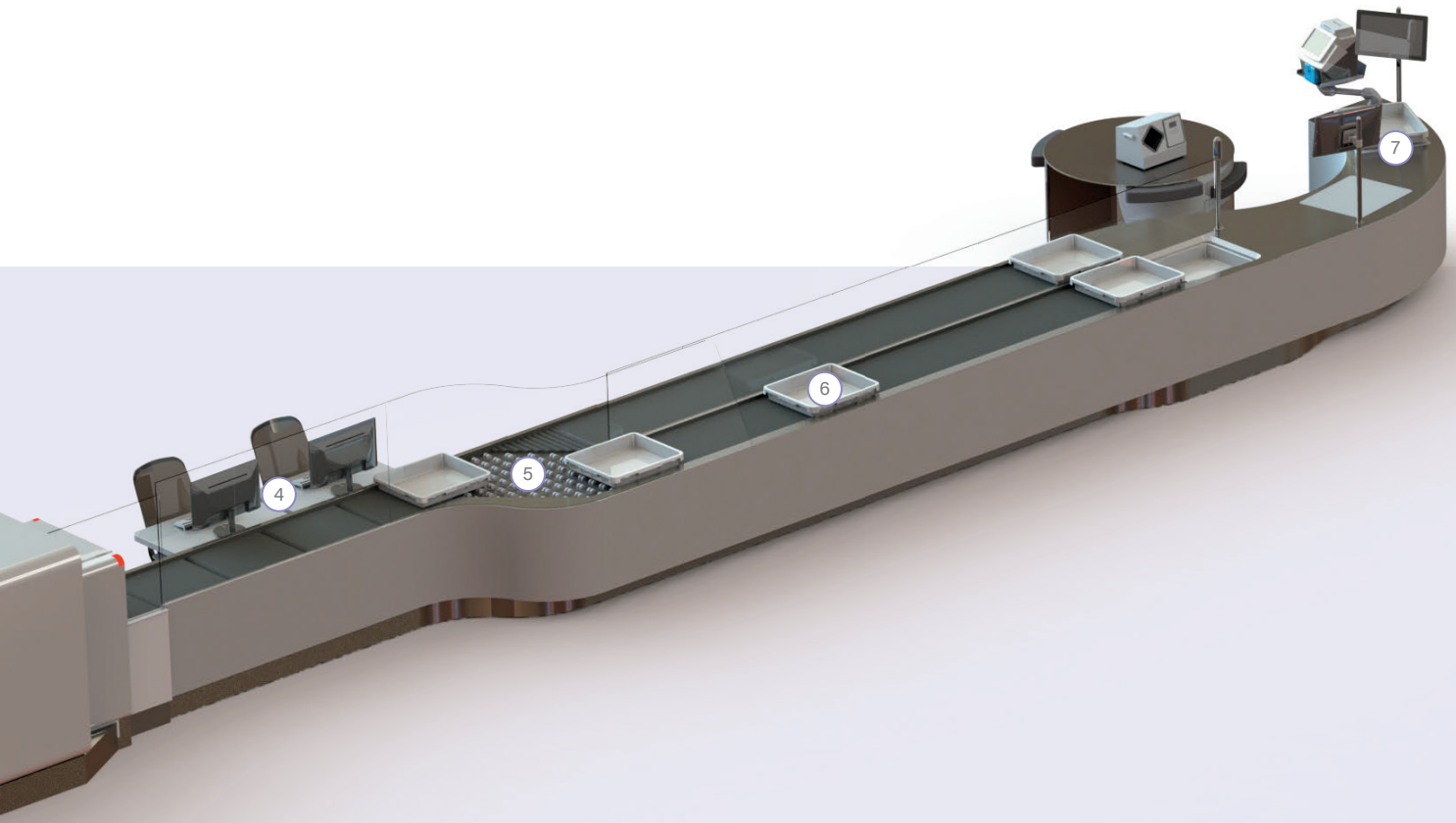
Step 2 | CT Scan

Bins are transported through the CT which creates a 3D image.

Step 3 | Passenger Screening

While their belongings are transported through the lane, passengers move through passenger screening adjacent to the unit.





Step 4 | CT Evaluation

X-ray images from the CT are evaluated by operators and decide if the belongings can be returned to the passenger or need a second look by an operator.

Step 5 | Diversion

The diverter will transport the bin to the “reclaim” or “reject side”.

Step 6 | Retrieval

At the recompose side, passengers can retrieve their belongings. Multiple passengers can do this at the same time.

Step 7 | Secondary screening stations

At secondary screening, TSA operators will take a second look at any passenger belongings which were rejected. The secondary screening stations show the X-ray image and store axillary equipment for further testing.

Around the world

Screening Lane Installations

Amsterdam Airport Schiphol

Schiphol, Netherlands | AMS | 85 Lanes

- Integrated with Leidos Clearscan CT
- Implementation process within 12 months

Munich International Airport

Munich, Germany | MUC |13 Lanes and counting

- Integrated with Smiths Detection's CTiX and Rohde & Schwarz's QPS 201
- Reduced tray slippage
- Image evaluation in a remote screening room
- New functionalities such as agent-based divest position allocation and additional light indications for both agents and passengers
- Improved look and feel through seamless design

Photo ©Alex Tino Friedel/Munich Airport

George Bush Intercontinental Airport

Houston, Texas | IAH | 14 Lanes

San Francisco International Airport

San Francisco, CA | SFO | 15 Lanes and counting

Denver International Airport

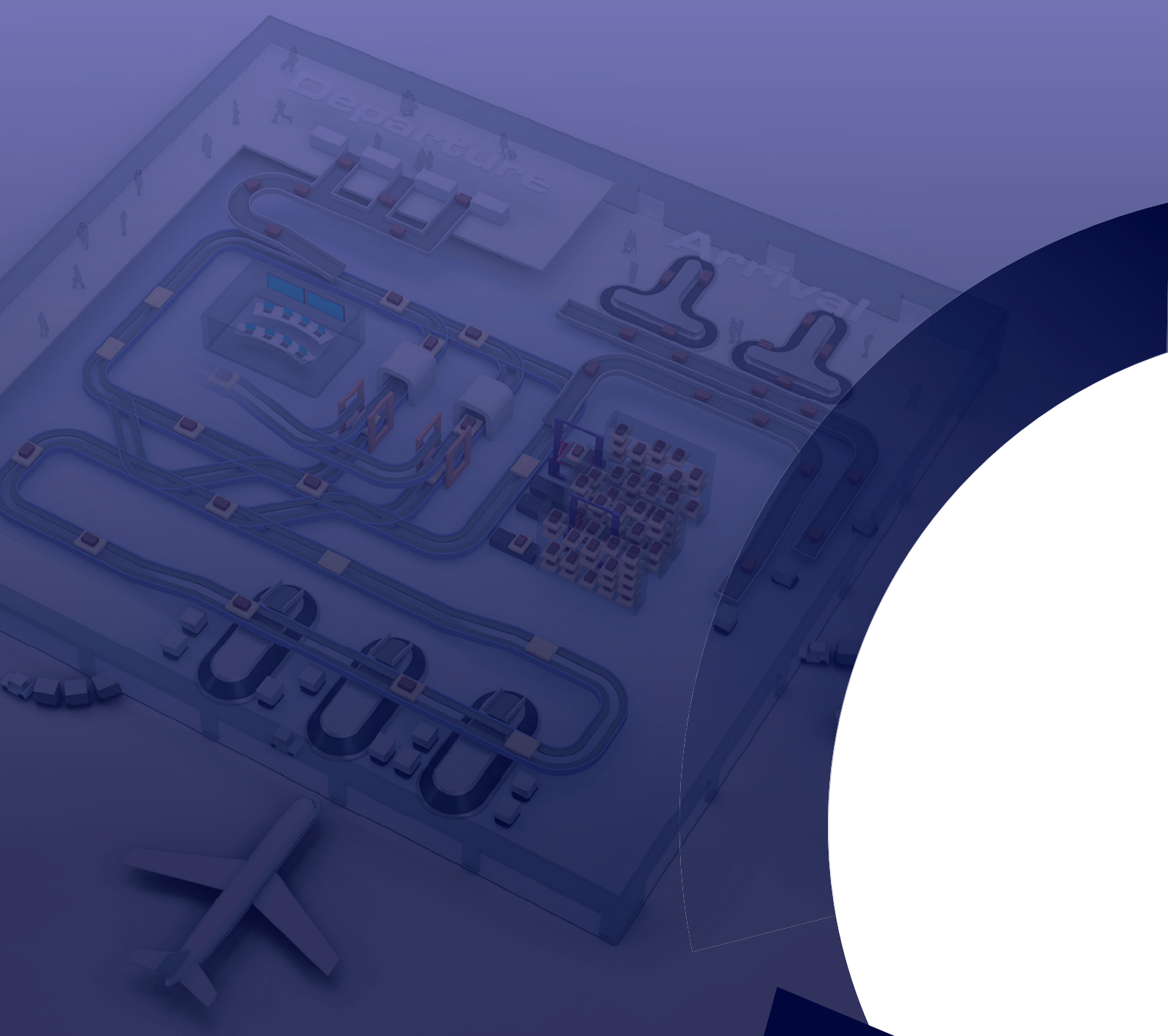
Denver, CO | DEN |19 Lanes and counting

- Provides passengers with an improved security checkpoint experience
- Includes improved technology and a queuing concept that will provide more effective and efficient security

> Enables the airport to add more screening lanes, increasing capacity by more than 60%

Operations & Maintenance

DAIFUKU



Operations & Maintenance

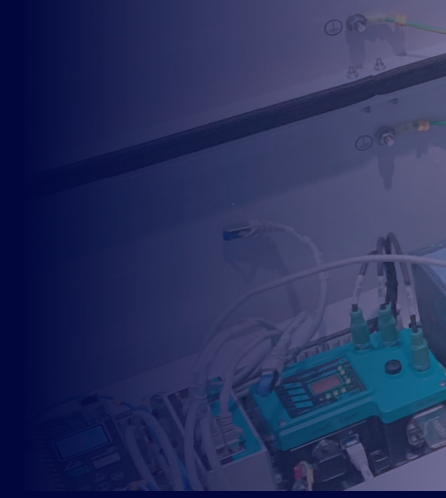
Daifuku Services has a proven track record that demonstrates our ability to provide exceptional services that are essential for airport operations.

By selecting Daifuku as your provider, you retain a passionate and committed maintenance partner that is an extension of your operation and stands ready to support you with whatever operational issues you face.

End-to-end Airport Solutions

DAIFUKU

We **deliver** the lowest total operating cost over time, while others “promise” the lowest quoted price



The Daifuku Services maintenance methodology represents a comprehensive solution for the operation and maintenance of specialized airport equipment.

In doing this, we add value and quality through improved service and lower cost, an approach that is fundamentally different from many companies in the industry that simply offer a lower price at the consequence of safety and quality.

There is a difference between the quoted price and the total cost over time, and we support our customers with an innovative approach that protects the best interests of our partners.

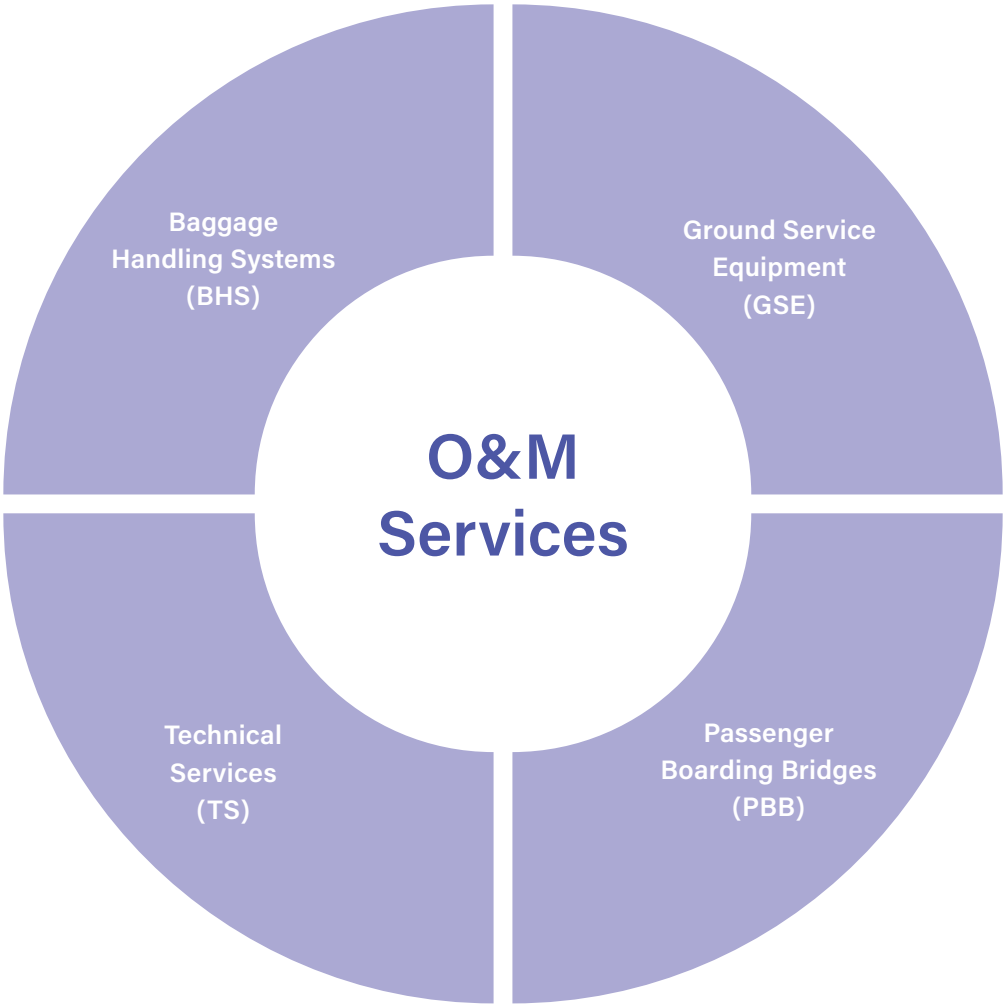
Your priorities represent our priorities, and we will treat your equipment with the highest attention, as if it were our own.

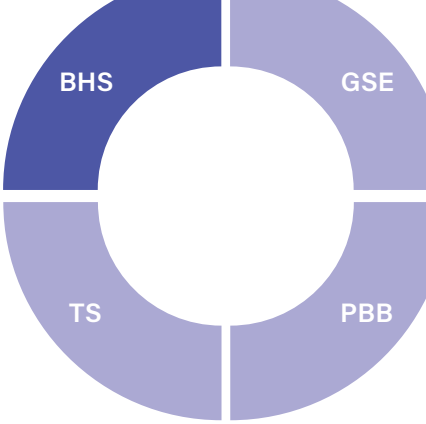
Our Promise

A clear benefit of joining the Daifuku network is the sharing of data and lessons learned so that we can continue to build a program that evolves not only through its own data, but that also ensures we deliver on our continuous improvement agenda. As a result, your operation will never be isolated, but will instead be part of an extensive organization.

By actively listening to our customers and seeking feedback, we develop maintenance programs that match the specific needs of the location. It is this very process that enables our operations to exceed the performance metrics of the previous maintenance provider at every contract we have won by improving service levels and reducing the total operating cost.

Each airport program integrates our company's best practices with those of our customers and delivers on our commitment to provide maximum operating performance and distinct values.





Baggage Handling Systems Maintenance

Our 24/7 operations and maintenance programs satisfy the most rigorous standards for system throughput, programmable logic controls (PLC), inventory management and energy conservation.

We have over 29 years of experience in the industry, and our Baggage Handling Systems (BHS) maintenance programs range in size from relatively simple, point-to-point conveyors, to the latest technology large capacity in-line Explosive Detection System (EDS) sortation systems. In 2000, we were awarded the maintenance contract to support the first in-line EDS BHS commissioned system in the US when the San Francisco International Terminal opened.

Regardless of the level of system complexity, we approach each airport requirement with the same objective to deliver a high level of service that draws upon our customized selection of program options.

We support our customers and improve passenger experience by delivering improved safety, security, accuracy, capacity, baggage processing speed and operational efficiencies. This provides a cost-effective solution designed to meet our customers' maintenance expectations.

- Maintenance evolution through continuous improvement
- Continual educational assistance programs for employee training and development
- Efficiencies that enhance energy conservation, reduce parts usage and lower spares inventory
- Safe programs (OSHA compliance), industry best goals and achievements and the incorporation of lessons learned

Daifuku was awarded the maintenance contract to support the first in-line EDS BHS commissioned system in the US

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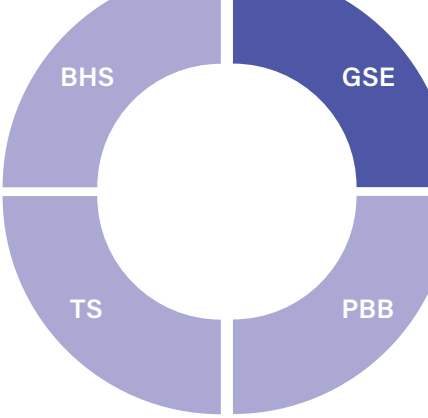


Ground Service Equipment Maintenance

Our first Ground Service Equipment (GSE) maintenance contract began in 2003 and our hard work continues to be rewarded with additional contracts. Daifuku Services now maintains a variety of GSE, including many electronic vehicles and charging stations for GSE across our network of operations.

Daifuku GSE maintenance programs have been developed within the high-pressure airport environment, where all equipment is considered essential to meet the daily aircraft operations and where the consequences for a failure in service can be catastrophic.

We understand that our partners have high expectations when it comes to quality standards and the efficiency of operations while maintaining cost efficiency. Equally, Daifuku recognizes that poor service of airline equipment, no matter how inexpensive, results in exponential expenses through aircraft departure delays and/or accelerated deterioration of expensive equipment.

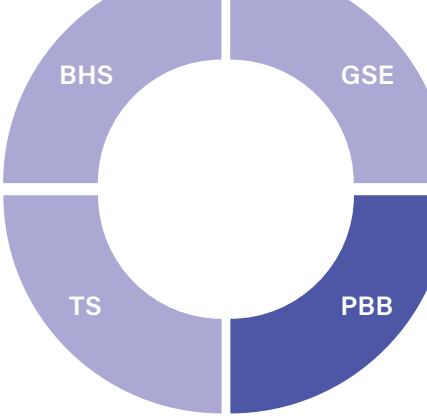
Our maintenance programs are an essential service at many of our customers' key airport hubs and go a long way towards ensuring they stay competitive in today's challenging arena.

- Warranty administration and volume purchasing for best selection and pricing of equipment spare parts
- Highest customer satisfaction levels in the industry, verified by an independent third party
- An established network of knowledge, skillsets and important industry contacts spanning North America to call upon at a moment's notice
- Proven capability and experience

Our specialties include:

- Cost justification and technical support for retrofitting and refurbishing older equipment
- Adaptable maintenance programs that keep pace with changing airline operations
- Robust preventative maintenance programs and rapid response times
- Scalable programs for customers with small operations to large hubs

Our skilled technicians receive ongoing training to ensure you stay competitive in today's challenging arena



Passenger Boarding Bridge Maintenance

As a recognized expert in the field of Passenger Boarding Bridges (PBBs) maintenance and repair, customers have selected our services at locations where high equipment utilization is essential to meet today's complex airline schedules. With our proven maintenance approach, we reduce the total cost of PBB ownership while extending the useful life at any stage – from a new bridge to mature.

Since the award of our first PBB contract in 1995, we have worked tirelessly to enhance our proficiency in bridge maintenance. Our dedication and extensive knowledge base is virtually unsurpassed.

Our data-driven Operations department improves bandwidth and provides greater support to our customers' operation. Our commitment and expertise is at your fingertips. Whether the requirement is manufacturing adapters to install new generation motors and drives on older bridges or replacement/ refurbishment of heavy equipment, we keep the passenger's entry to the aircraft serviceable and operational.

Our specialties include:

- Proven maintenance approach to reduce total cost of ownership while extending total use of life
- Experience servicing all bridge manufacturers including JBT, TK, Stearns, and DEW
- Service for all ancillary equipment including PCA, GPU, and PWC's among others
- Service and support for bridges in all stages from new to 30+ years
- Coordination of overhaul and major refurbishment services

Superior quality standards through ISO 9001-2015 (airport level certification)

Committed to employing and retaining a highly skilled and stable workforce

Our team operates, maintains, and repairs over 400 PBBs, including those located at the busiest airports in the country

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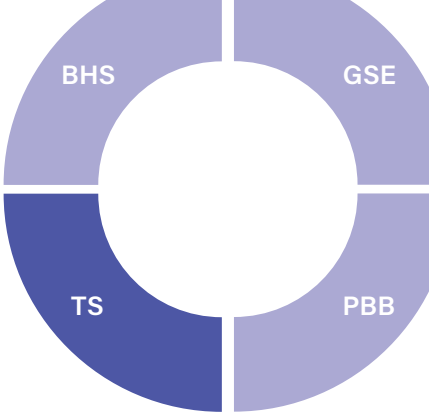

Technical Services Maintenance

Daifuku has always prioritized improvements that support our customers and their operations, whether scheduled or in a critical moment of need. The Technical Services Group was created to ensure this value remains at the forefront. Comprised of Subject Matter Experts (SMEs), the Technical Services Group draws upon extensive experience at multiple levels within the Daifuku organization to support the implementation of new programs.

Our expertise includes preventive and predictive maintenance, root cause analysis, and other techniques that maximize equipment performance. These highly-skilled and knowledgeable professionals also use data-driven decision making to monitor, assess, and optimize operations, ultimately improving system efficiency and minimizing downtime.

The expertise of Technical Services is critical to ensure operational success throughout the Daifuku network. They provide invaluable guidance, training, and resources to less experienced technicians, imparting knowledge that has been developed through years of experience in the field.

- Maximizing equipment life and reliability with strict adherence to proactive/predictive maintenance
- Guaranteed PM compliance with optimal scheduling and knowledgeable use of CMMS
- Maintain in-line screening systems to perform at peak system availability, read and sort accuracy
- Balanced planned maintenance, using OEM real-world experience

Our services include:

- Refurbishments
- Electrical conversions and upgrades
- Contract management
- PLC Troubleshooting
- Equipment training
- Equipment health checks and assessments
- Equipment installation and upgrades

Our experience spans projects at 23 of the 25 largest airports in North America, as well as many regional ones

Baggage Software Solutions

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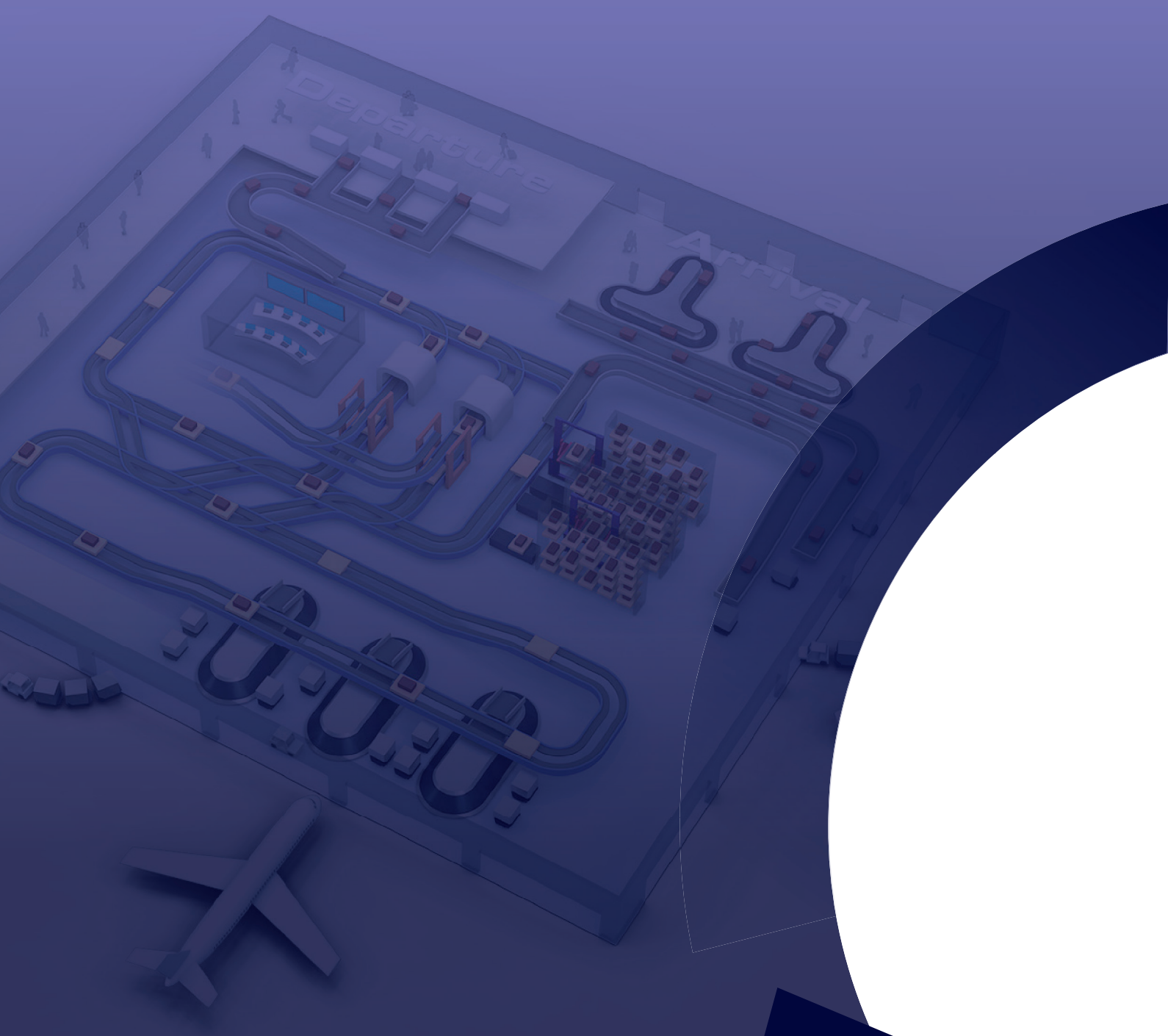

Baggage Software Solutions

Daifuku's dynamic suite of integrated digital systems offer a range of operational benefits ensuring high-value information can be communicated faster and more efficiently.

End-to-end Airport Solutions

DAIFUKU

Self-Service Technologies

Baggage Handling Systems

Airport Operating Systems

Checkpoint Security Screening

Operations & Maintenance

Baggage Software Solutions

Daifuku's advanced management suite for baggage handling systems

Baggage Software Solutions

Daifuku's Baggage Software Solutions suite is among the world's most advanced, featuring our Sort Allocation Controller, Airflow, and WebbView baggage handling control system. These products include all modules necessary to manage both simple and complex baggage handling solutions in full compliance with IATA 753, the resolution requiring airlines to track baggage at four mandatory points throughout the journey.

Daifuku's active routing system ensures optimal performance under all conditions, with features such as live bag redirection, continuous path assessment, dynamic baggage tray system routing and empty tray management. This easily facilitates the delivery of baggage on conventional conveyors, tilt tray sorters, baggage tray sorters, and hybrid sortation systems.

Integrated redundancy architecture

Our scalable design can be adapted to any BHS with established protocols, helping avoid single points of failure.

Comprehensive business intelligence

Intelligent reporting and BI allow operators to view a range of web-based reports, monitor critical metrics via real-time dashboards and conduct in depth analysis of historical data.

Sym3 integration

Airflow and WebbView® integrate seamlessly with Sym3 to show real-time bag drop volumes, allowing operators to visually assess system load.

Flexible sortation options

Facilitates bag sortation, including flight, sort assignments, carrier sorting and automatic rerouting of late baggage.

Graphical reports

Comprehensive reporting allows operators to view data based on a wide range of critical metrics and custom reports.

Flight schedule application

Facilitates baggage sortation based on daily schedules, enabling operators to address contingent events or automatically manage system scheduling.

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Sym3™

Sym3 provides an end-to-end SCADA/Maintenance Diagnostic System (MDS) package, specifically designed for use with Baggage Handling Systems (BHS). Sym3 visualises a 3D render of the BHS in real-time, allowing them to accurately track bags through BHS hardware live.

With Sym3, operators can dramatically reduce levels of lost baggage and system downtime. Standard features include equipment monitoring and animation, integrated reporting system, system error notifications and full authentication/auditing,

Sym3 options include real time bag tracking, mobile access, documentation repository, and Sym3 replay to allow a true investigation into BHS faults to identify root causes.

Sym3 Integration

WebbView® integrates seamlessly with Daifuku's Sym3 3D Graphics Package. This software separates Daifuku from all other BHS providers in that it is capable of showing real-time bag volume on the screen. This allows operators to visibly understand system load for the first time ever.

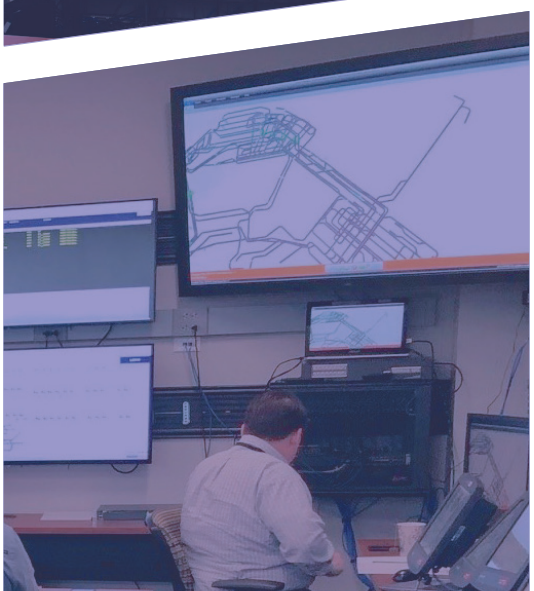
Enhanced tracking accuracy

Sym3 Operator combines a live 3D render of the BHS with a real-world display of the baggage present within it, allowing all bags to be visually tracked throughout the system. Operation staff are able to fi lter, search and highlight individual bags within the BHS based on a range of criteria, including barcodes/PAX, carrier, flight number, EDT and makeup destination.

The system automatically records the last 48 hours of data, giving operators the ability to review footage for the purpose of troubleshooting failures, staff training and ongoing improvement.

Features:

- Bag location and size of bag is displayed on the 3D virtual system
- Ability to reduce system backups through informed decision making
- Custom user accounts
- Mobile application integration
- Control room monitoring
- Bag jam and alarm response
- Encoding and bag alignment



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Reduce lost baggage

Highlight individual bags during critical flight closure periods.

Proactively manage staff

Avoid congestion in baggage carousel and screening areas.

Efficiently troubleshoot issues

CCTV integration, secure mobile SCADA access, and 3D BHS rendering in real-time.

Screen suspicious baggage

Highlight bags from specific threat flights and passengers.

Avoid system failures

Access to live data to detect abnormal behaviour early, avoiding issues before they happen.

3D baggage information display system

Avoid chute-full scenarios and view bag makeup destinations.

Simplified maintenance procedures

Sym3's open interface and scripting capabilities allow for simple integration with third-party software, including computerised maintenance management systems (CMMS). The system can be used to automatically populate events, historical data and failures in the CMMS, display work order history and/or schedule new work orders from the 3D equipment view. Sym3 also comes standard with CCTV integration, which instantly links jam alarms in the BHS to the appropriate CCTV feed, giving operators complete visibility with access to live video.

WebbView®

WebbView is the most advanced integrated Baggage Handling System (BHS) software throughout airports worldwide. This comprehensive solution ensures optimal baggage throughput and tracking accuracy while minimizing downtime, by incorporating the following four key elements of a control system:

1. Supervisory control

- Bag tag translation
- Sortation logic control
- Flight schedule management
- Email reports and alerts
- BSM and flight information interfaces

2. Equipment control

- Motor sequencing for energy savings
- Bag tracking and sorting
- Bag tag scanner interface
- Performance data collection

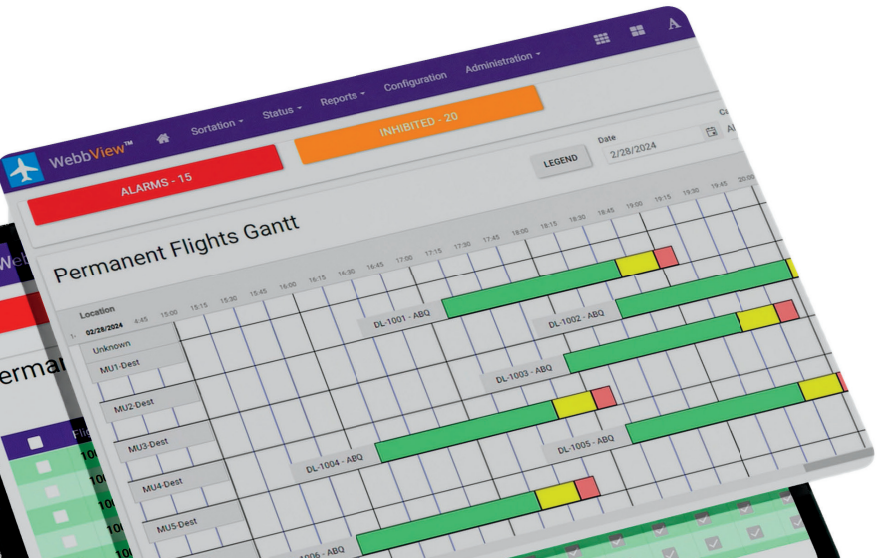
3. Manual encode

- Local fault annunciation
- Touch-screen terminal
- Stand alone sortation
- Re-tag capable
- Integrated graphics display

4. User interface

- Browser access
- Customizable
- System level status display
- Data analytics
- Alarm and reporting functions

WebbView features a comprehensive reporting system that allows operators to view data based on a wide range of critical metrics, through an easy-to-use dashboard interface. Custom reports can be generated based on operator preferences to highlight correlations between specific data points.



Features:

- Fully customizable
- Email capable
- Quick bag tag lookup feature on every screen
- Hyperlinked cross-reporting for quick access to information
- PGDS 8 compliance
- 400 day data retention
- Multiple format generation (pdf, excel, csv)

Key tools include:

- ✓ Multiple view options, including list or GANTT formatting
- ✓ FTP schedule download
- ✓ Import/export using Microsoft Excel
- ✓ Multiple name schedules can be activated and supported

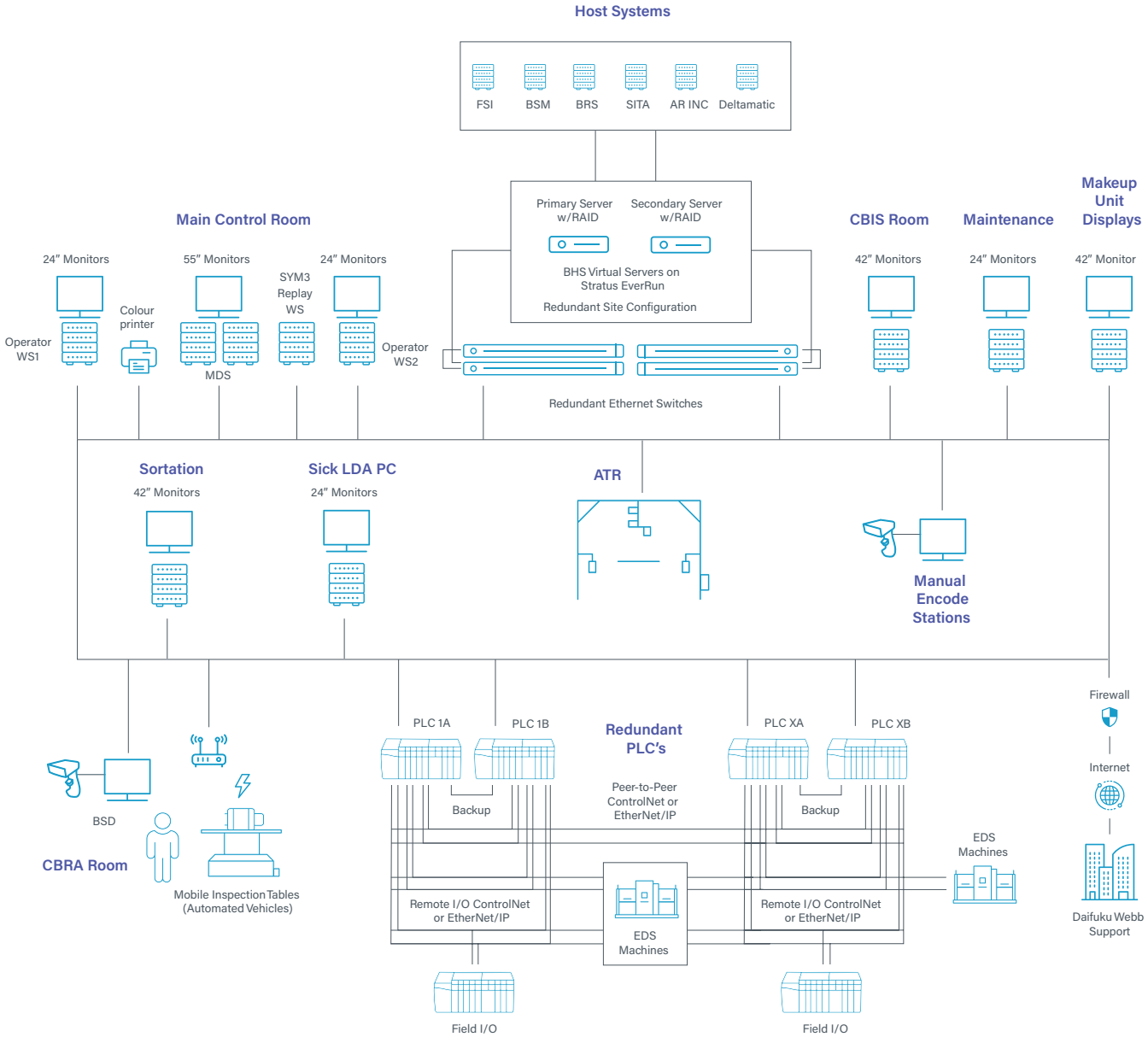
Familiar interface compatible with Windows tablet devices

System architecture

The figure below shows a typical system architecture diagram for a baggage handling system with WebbView incorporated. In a WebbView system, the main goal is operational redundancy across all platforms.

Redundant systems include:

- Virtual server hot backup
- Programmable Logic Controller (PLC) hot backup redundancy
- Cloud-ready virtual environments
- Network switch redundancy



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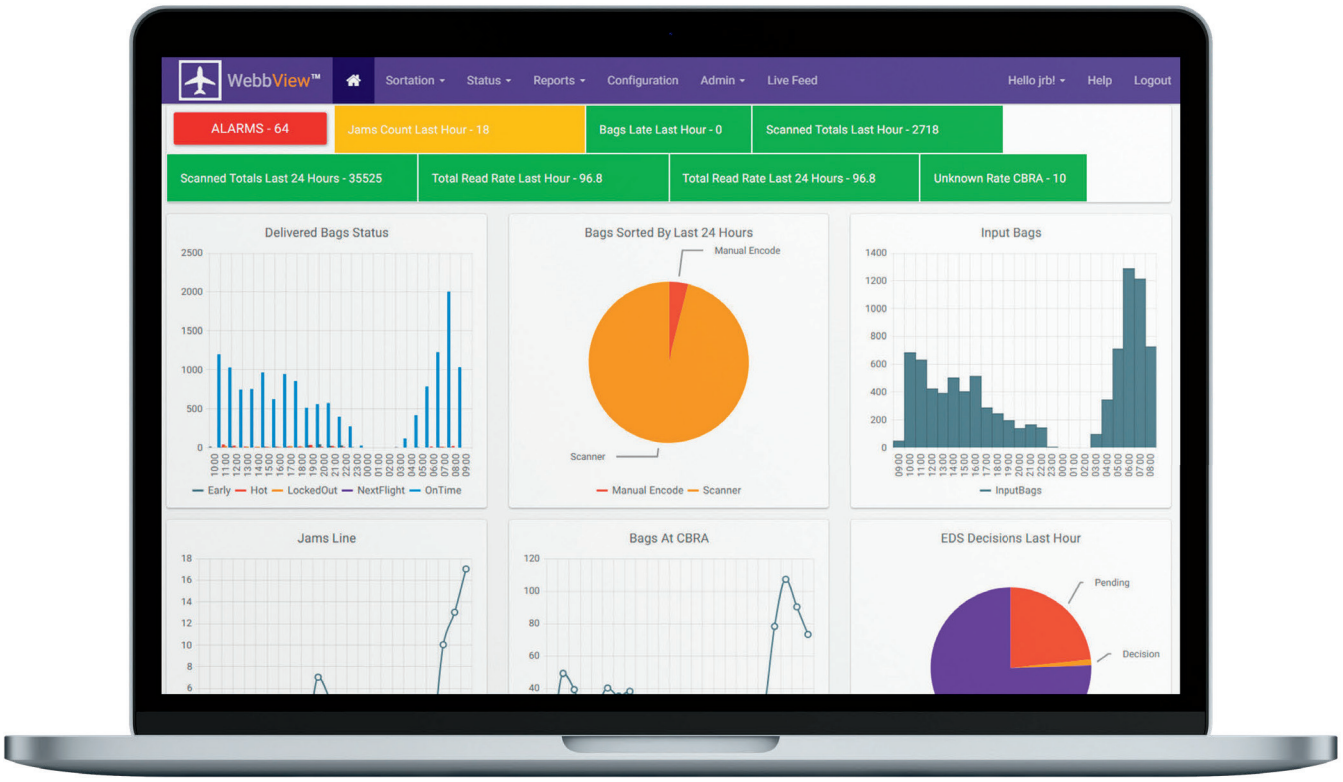


Integrated redundancy protocols

WebbView's control system architecture features integrated redundancy protocols in processing and networking components, in order to avoid single points of failure.

The system is also scalable, allowing it to be adapted for use in baggage handling systems (BHS) of any size, and suitable for use within airports globally.

Host network interfaces

The airport and/or airline host network sends baggage source message (BSM) information that contains critical data to the BHCS, allowing bags to be routed through the sortation system. The interface is also tasked with exchanging BSM information and baggage processed message (BPM) information, allowing users to check on individual bag status in real-time. The flight schedule interface also communicates with WebbView, allowing flight information to be exchanged between the control system and host network, and updated in real-time.

Flexible sortation options

WebbView facilitates bag sortation based on multiple variations of the standard ten digit IATA bag tag. These include 'flight sorting', which uses a combination of BSM and flight schedule information to sort bags to location assignments, and allows users to select from a wide range of sort assignments based on service class, standby status and early or late arrival. The system also provides a 'next flight' option for late bags, which are automatically routed to the next available flight headed to the target destination. Alternatively, 'carrier sorting' assigns a sort location based on the carrier.

Flight schedule application

WebbView's integrated flight schedule application facilitates baggage sortation based on the daily passenger flight schedule, which is automatically updated from the long-term schedule. Administrative operator accounts have the ability to modify, prepare and manage both the daily and long-term flight schedule at their discretion to address contingent events, or allow the system to automatically manage day-to-day scheduling.

Browser-based applications

WebbView features a range of applications that allow system operators to monitor and control all components of the baggage handling system, including an intuitive user-interface, graphical SCADA system and text-based alarm viewer.

All applications feature a familiar, browser-based interface that presents new system operators with a familiar look and feel, and short learning-curve. Operators have quick access to a range of system key performance indicators (KPIs), and can configure their dashboard to display any number of these according to their preferences.

Sortation capabilities include:

- ✓ 4 digit pier tag sort
- ✓ Sort assignments based on service class, standby status, and early/late arrival
- ✓ Automatic re-route of late bags for nextflight headed to target destination
- ✓ IATA resolution 753 compliance
- ✓ IATA 10 digit flight sort
- ✓ Carrier Sorting
- ✓ PLC fallback sorting
- ✓ 2 digit pier tag sort

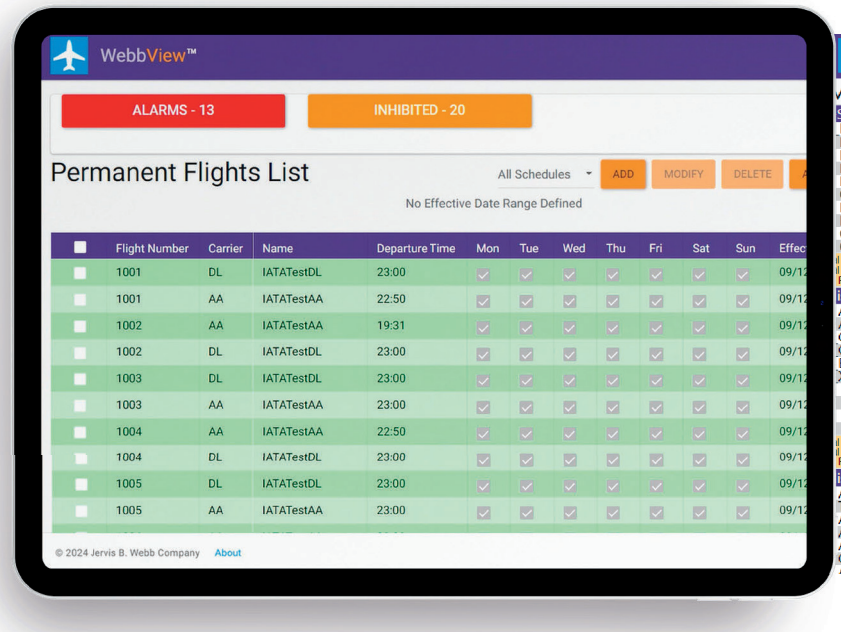
Convenient access

WebbView's revolutionary browser-based applications can be accessed from any Windows based tablet, allowing system operators to check baggage status, troubleshoot alarms and review overall system status from any location, at any time. This presents an unprecedented level of flexibility and system access for all airport staff, from bag room operators through to executive management.

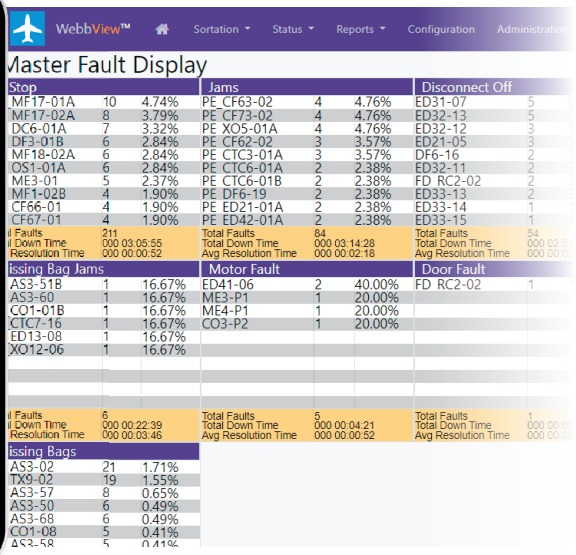
Graphical reports

WebbView features a comprehensive reporting system that allows operators to view data based on a wide range of critical metrics, through an easy-to-use dashboard interface.

Custom reports can be generated based on operator preferences to highlight correlations between specific data points, with all reports able to be previewed on screen, printed, archived or automatically scheduled. Key reporting areas include system function, history, security and a range of graphical options.



WebbView Permananent Flights List View



WebbView Master Fault Display

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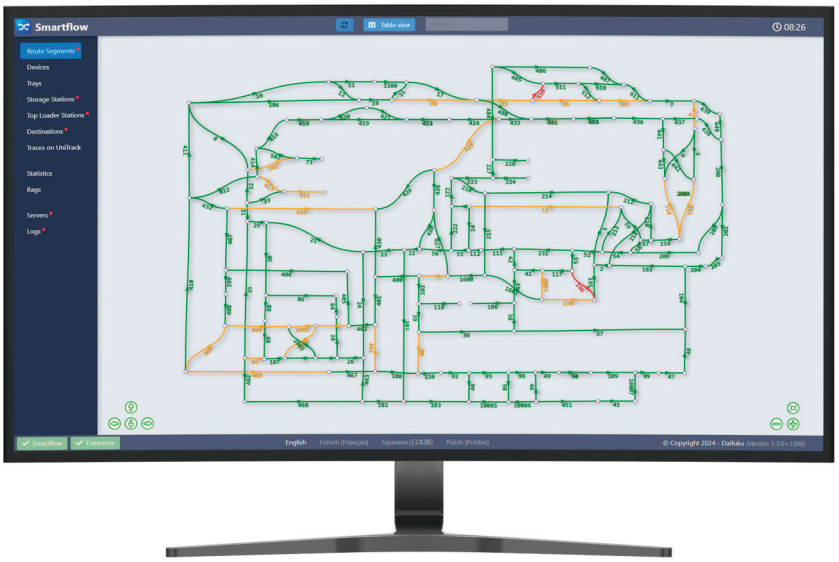
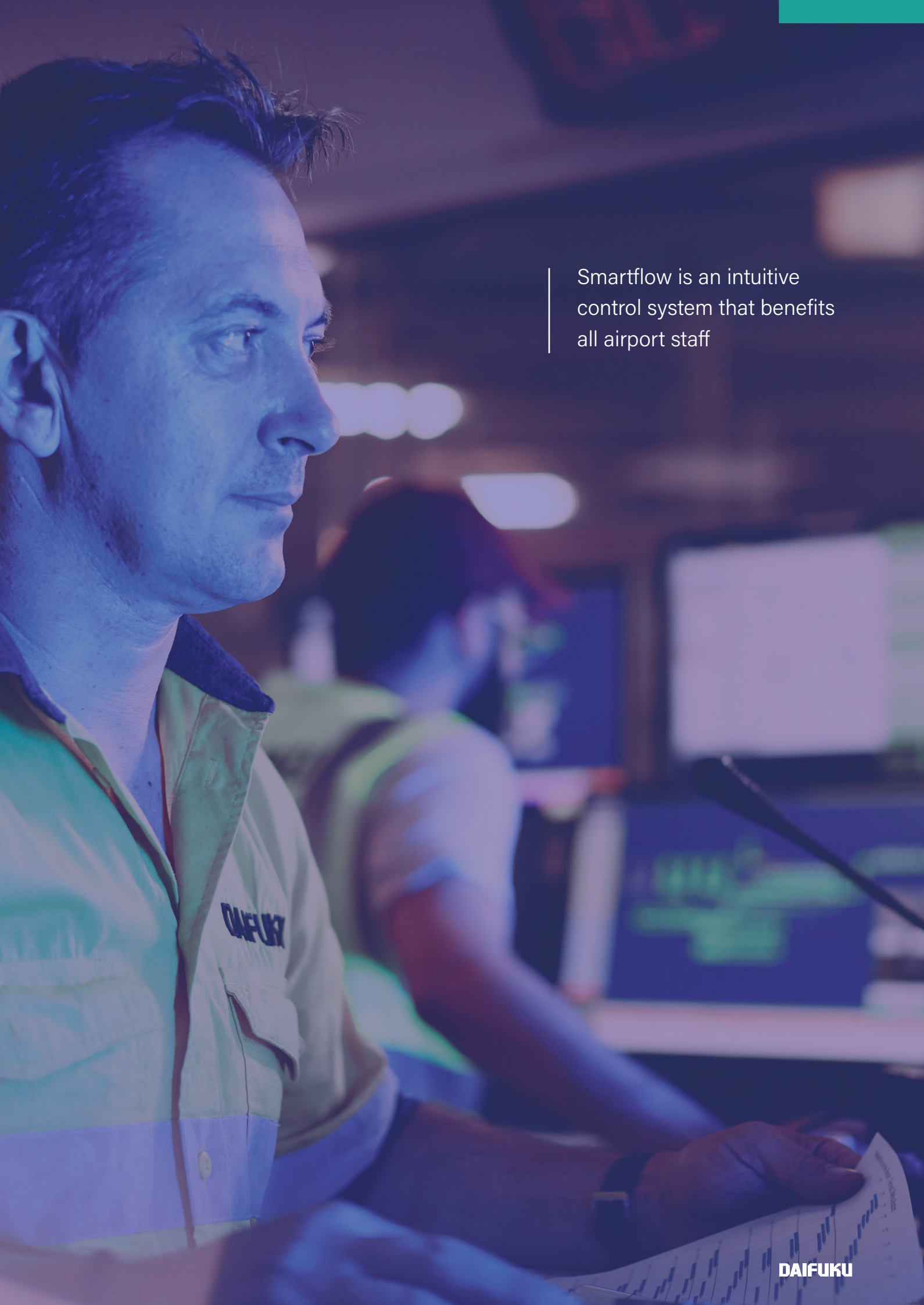
Smartflow

Smartflow is Daifuku's Routing solution for both Individual Carrier Systems (ICS) and traditional belt systems. It is a site wide solution that can perform routing and optimisations that individual PLC/Sub-systems cannot perform.

Main functions:

- Empty Tray Management - Replenishment / Storage
- System Wide Routing
- System Wide Load balancing
- System Wide Grid Lock management





Smartflow is an intuitive control system that benefits all airport staff

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Airflow

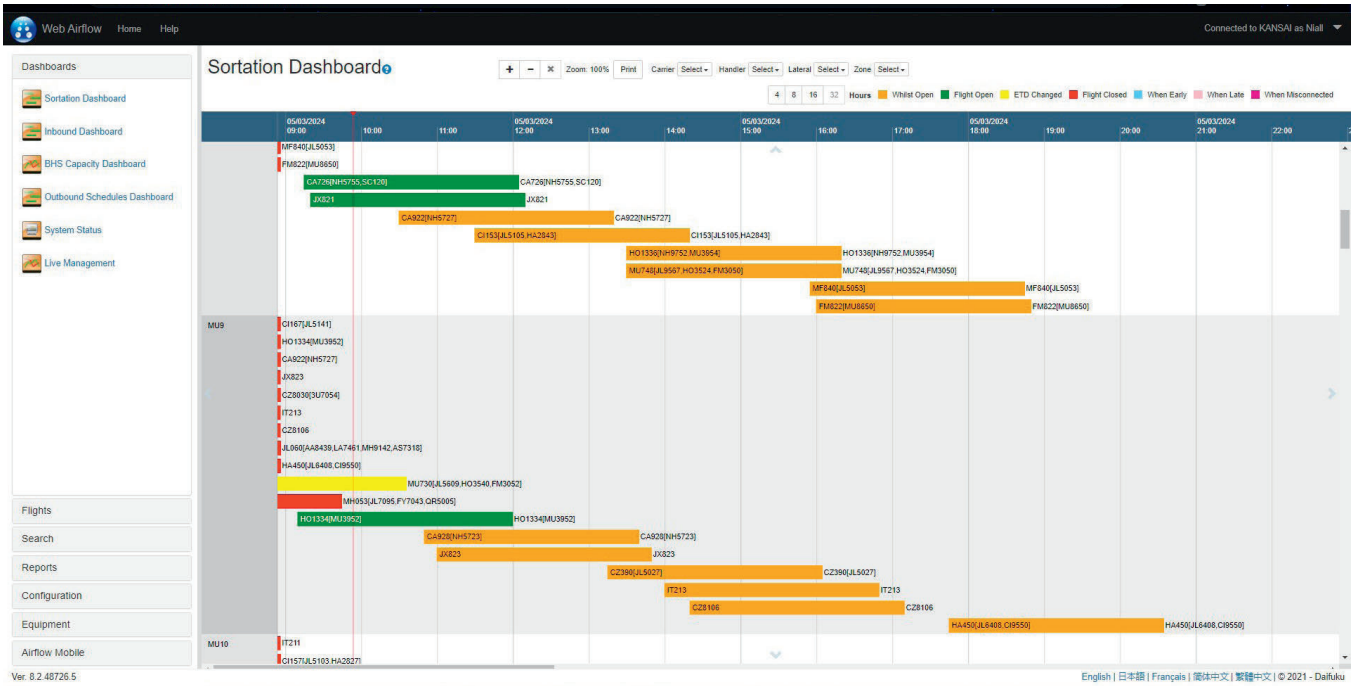
Airflow is Daifuku's Baggage Handling System (BHS) management suite, and includes all modules necessary to manage both simple and complex BHS solutions, in full compliance with IATA 753.

Airflow's flexible sortation engine can facilitate the delivery of baggage on conventional conveyors, tilt tray sorters (TTS), baggage tray sorters (BTS) and hybrid sortation systems with ease. Its active routing system ensures optimal performance under all operational conditions, and features live bag redirection on a TTS, continuous path assessment, dynamic BTS routing and empty tray management and storage.

Intuitive, flexible user-interface

Airflow features a browser-based user interface (UI) that can be easily accessed from PC, touch panel and mobile device, offering rapid deployment capabilities and configurations to suit all site requirements.

The UI is multilingual, allowing operators to change language settings at their discretion, and features user authentication that is compatible with Active Directory. This allows administrators to manage an individual operator's access to system features based on their role, and provides full tracking and traceability of operator actions throughout the day.



Comprehensive business intelligence

Airflow's intuitive reporting and business intelligence features enable operators to view a range of web-based system reports, monitor critical system metrics through real-time dashboards, and perform in-depth analysis of historical data. Custom reports can be developed based on user preferences, and all data can be presented through Microsoft's Power BI which provides an interactive, visual format, maximising user comprehension and enabling fast, informed decisions to be made. All reporting and analytical functionality is driven by an independant SQL data warehouse, ensuring it has no impact on system operations when accessed.

Integrated redundancy architecture

Airflow's comprehensive redundant software architecture offers hot backup capabilities, database replication and automatic fail over with no loss of data.

It can also be deployed on virtualised platforms to include both software and hardware redundancy, making it an incredibly resilient system to ensure maximum availability of this mission critical system.

Customizable sortation rules

Airflow allows system operators to set a broad range of sortation rules based on various criteria, including flight, carrier, BSM fields, pier tags and automated early bag stores.

Multiple rules can be applied based on conditional criteria, providing comprehensive functionality to meet complex sortation requirements. Flight-based rules, for example, can be set according to early, late, open and miss-connected bags; whether or not the system has an early bag store.

System peripherals

Airflow includes the peripheral systems necessary for complete management of BHS of any airport globally. This includes touch-screen applications for Manual Encode and baggage screening, and applications for mobile PC scanners used for baggage tray management, bag identification, encoding and screening.

Ready for IATA 753

Airflow features plugin software modules with interfaces to all major baggage source message (BSM) and baggage processed message (BPM) providers, and can support custom feeds for specific airline or airport interfaces.

Modules include BSM, BPM, BIDS, BRS and First Bag/Last Bag. Its web-based BIDS module can be easily deployed on smart monitors and displays outbound flight information in makeup areas, as well as inbound flight information in passenger reclaim areas and breakdown laterals. Upon integration of the first bag/last bag module, passenger-side displays can indicate the arrival of first and last bags in passenger reclaim areas.

> Airflow drives value through the use of industry-leading technology

Integrated flight scheduling

Airflow's internal flight scheduler allows operators to manage both inbound and outbound flight schedules while integrating with third-party flight information display systems to automatically update a flight's ETD, ETA, ATD and ATA.

The user interface features simple drag and drop functionality, and offers clear flight information pop-ups. This provides operators with an intuitive, easy-to-use platform that facilitates more efficient BHS management.

Video coding

Video coding of no-read bag tags can be added with Airflow's video coding module, greatly improving read rates and baggage flow. Outgoing bags can be encoded while they are conveyed and screened prior to the Manual Encode (ME) area, reducing the requirement for ME resources and improving bag-in-system times.

Video encoding of inbound bags enhances the rate of bag tag retrieval and notification, and assures compliance with IATA 753 arrival tracking requirements. This module also enables remote operators to service multiple BHS simultaneously, which sharply improves the resource utilisation of our client partners.

Early Bag Storage

Airflow's Early Bag Storage (EBS) module works with cage, lane and tray-based systems, and integrates seamlessly with Daifuku's Crane and Rack based EBS. The system manages the automatic storage and retrieval of Early Bags, giving operators the ability to batch baggage, and supports pull functionality.

This allows handlers to optimise their operation by managing individual batches of bags, reducing overall baggage makeup time.

> Airflow reduces overall baggage makeup time and enhances operational efficiency

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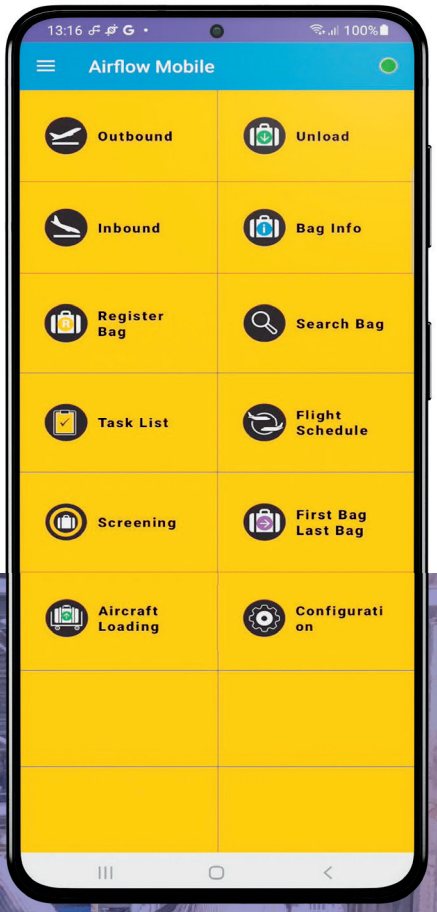
Airflow Mobile

Airflow Mobile is a full Baggage Reconciliation System, with BHS specific functionalities that add great value to BHS operations. The App runs on any Android mobile phone or ruggedized BRS scanners.



Main functions:

- Track bags anywhere (including outside of the terminal), and store the trace in the SAC Bag trace
- Get bag details / trace
- Mobile Screening : set bag screening status (Mobile screening station)
- First Bag / Last bag management

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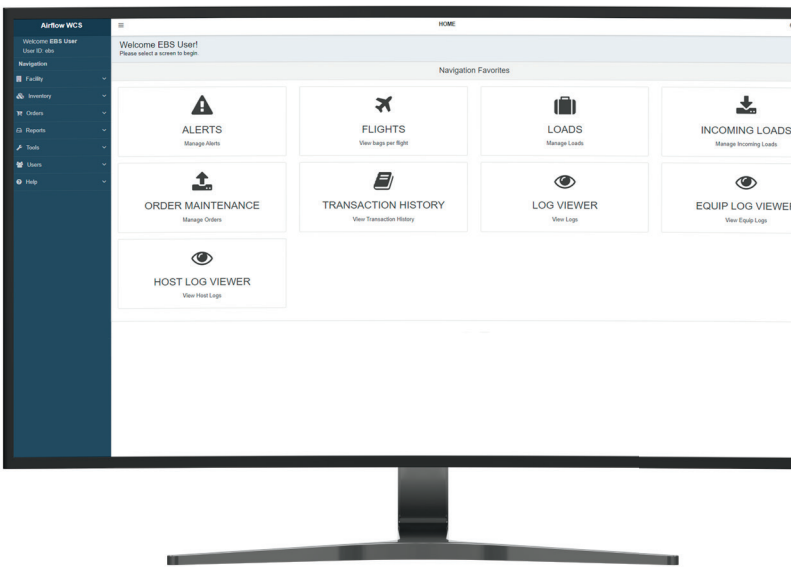
Airflow WCS

Airflow WCS is Daifuku's Bag Storage management system.



Main functions:

- Manage inventory of bags in storage, including Bags, Empty Trays and any item on a tray
- Supports Conveyor lanes, Automated Storage and Retrieval Systems, or Shuttle Rack Bag Stores
- Enables Bag batching and "Pull" mechanism
- SAC Agnostics, it can be used with 3rd party SAC systems

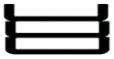

Bag in Tray


Bag on Belt


Empty Tray

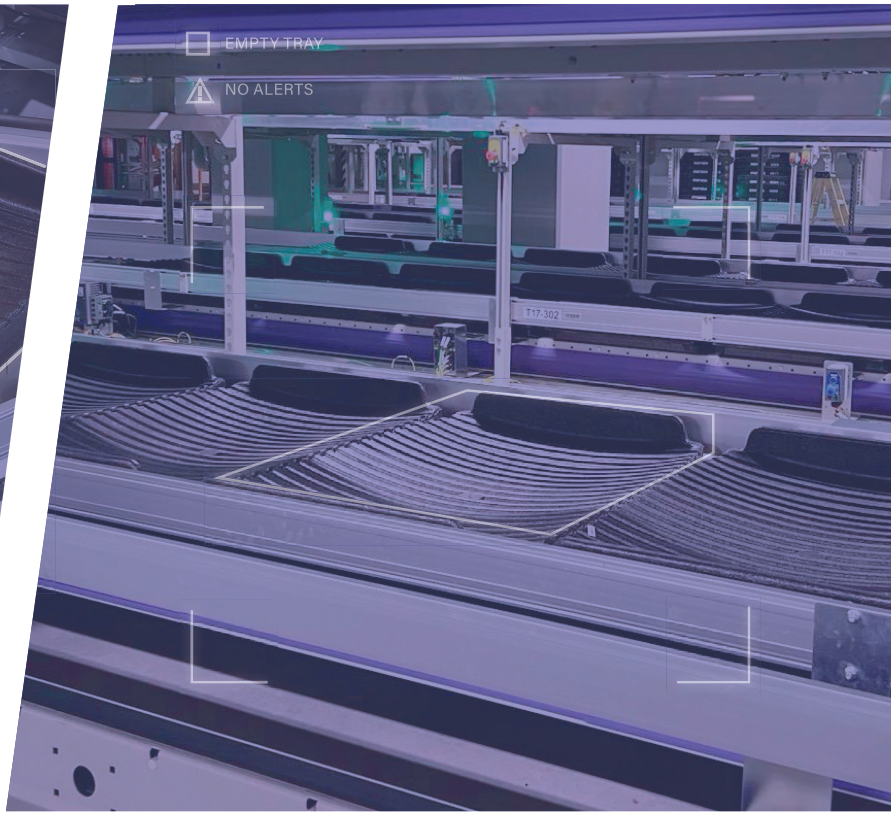

Tray Stack


Empty Long Tray


Long Tray Stack


OOG Bag on Tray


Product on Tray



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