Baggage Handling Systems

Innovative products and intelligent software boost speed and efficiency
Automation and Digitalization: Meeting the challenges of change

Siemens: Your one-stop shop for baggage handling systems

VarioBelt: The sky is the limit

VarioSort TTS 1100: For a quick turnaround

VarioTray: Premium solution with an impressive installed base

Software Solutions: Lightening the load

First-class customer services: Keeping performance up

Spotlight on our capabilities: Ongoing projects and major references
The world’s population is growing at an astounding pace. And so is our desire for mobility. These global megatrends have a huge impact on airports and airlines. According to the International Air Transport Association (IATA), passenger numbers worldwide will reach seven billion annually by the year 2034. At the same time, airports and airlines are striving to ensure the highest level of passenger comfort possible – for example by ensuring minimum connecting times (MCT) at hub airports. Efforts are also underway to offer lounge shopping services, or smart apps that help passengers quickly navigate their way around an airport.

All the while, airports and airlines need to ensure that they adhere to the many guidelines in effect for the airport sector, such as IATA regulations, security standards and environmental regulations, to name just a few. As airports rise to these challenges, they often find that their baggage handling systems need to be modernized and expanded. Flexibility has therefore become a crucial requirement: the flexibility to grow, to adjust check-in layouts, to move loading positions, or to adapt to new screening requirements.

But how can the aviation sector best address these challenges? The answer lies in automation and digitalization. These forward-looking approaches improve processes and increase efficiency – both of which help customers enhance their competitive position. Siemens is a proven expert in automation and digitalization, and the partner of choice for innovative and flexible equipment as well as intelligent software. Partnering with Siemens means getting the best solution for today and tomorrow.

Siemens’ customers include 14 of the top 20 passenger airports worldwide, serving almost 900 million passengers every year – more than a quarter of all global passengers.

Dubai International trusts on Siemens’ expertise in innovative and flexible baggage handling equipment as well as intelligent software.
Siemens: Your one-stop shop for baggage handling systems

Siemens supports all airport end-to-end processes - from check-in to baggage reclaim.
Headquartered in Constance, Germany, Siemens Postal, Parcel & Airport Logistics GmbH (SPPAL) is a fully owned subsidiary of Siemens AG. SPPAL is a leading provider of innovative products and solutions in the fields of baggage and cargo handling as well as mail and parcel handling. SPPAL’s customers include postal and parcel providers worldwide as well as prestigious airports on every continent – from small domestic airports to regional and international transport hubs.

With the capability to support all airport end-to-end operational and functional processes, the company offers a comprehensive portfolio for airlines and airports to deal with the challenges of today and tomorrow. We provide all types of baggage handling solutions – for example check-ins, belt or tray conveyor systems as well as efficient sorting and baggage reclaim facilities. State-of-the-art airport software solutions round off our broad range of unrivalled products.

Our customers benefit from a complete range of services, from planning, design, installation and commissioning to training, maintenance, upgrades and modernization throughout a solution’s life cycle. Our 3,000 employees worldwide provide these services from our own regional subsidiaries in Europe (Germany, France, Italy, Portugal, Spain, Switzerland and UK), Asia (Dubai through the local joint venture SD Middle East LLC, Singapore, India, China and Hong Kong), the United States and Canada. SPPAL is also represented with its own employees in Turkey, Taiwan, Malaysia and South Korea. Wherever you may be, our Siemens experts are close at hand.

When you place your project in Siemens’ hands, you are working with a trendsetter and market leader in airport logistics. Our experienced specialists start by examining your business requirements and then – together with you – determine which technology to use. Decisive factors include the number of passengers and the complexity of the business processes. While purely domestic airports normally use belt conveyors, regional hubs often have additional sorting technology installed. Large international airports with a high number of transfer passengers increasingly favor the faster and more flexible tray technology. We are able to cater for all your needs – big or small. With our excellent delivery times and optimized processes, we keep your project moving along so that you can start operating your new facility as quickly as possible. But we don’t stop there: Siemens is a partner for the entire life cycle, including a complete service portfolio to protect your investment. Our experts accompany your project at every stage, drawing on experience gained from our installations worldwide.

We offer the most reliable baggage handling equipment on the market, according to left behind index (LBI) statistics.

Customer benefits

**Extensive system engineering:** From the first sketch, using simulation and emulation tools, to the installed, ready-to-operate baggage handling system

**Process improvements:** Decades of airport experience combined with our innovative and flexible equipment and proven software to boost your processes

**Comprehensive project management:** Crucial for the successful and timely delivery of any infrastructure project, greenfield and brownfield projects alike

**Reliable system integration:** Bringing it all together for our customers, providing them with a state-of-the-art baggage handling system that can grow and adapt as needs change

**Life-cycle partnership:** Safeguard the performance of baggage handling systems over their entire lifetime and, if required, the supply of upgrades and modernization
No two airports are alike – and the same goes for baggage handling systems. With VarioBelt, Siemens takes modularity to a new level to provide airports with a conveyor system that is tailor-made to fit their operational requirements. Whatever the layout may be, VarioBelt components can be assembled to form the optimal solution, with no limit to the possible combinations of inclines, lengths, etc. What’s more, with VarioBelt’s modular setup, a system can be easily redesigned should an airport need to expand.

Tailored to the customer’s needs
A major strength of VarioBelt is that customer-specific add-ons such as scanner gates and X-ray machines can be easily integrated. It is also possible to operate VarioBelt as a metering belt that precisely positions and sorts baggage with high-level metering frequency and short accelerating and braking distances, for example in front of inducts, at carousels or loading stations.

Life-cycle costs in mind
Airport operators worldwide stand to gain from the lowest possible life-cycle costs. We start by integrating energy-efficient technology into the different VarioBelt models we have on offer. Depending on the VarioBelt solution you choose, energy requirements are up to 70 percent lower compared to conventional installations. The VarioBelt design is also extremely maintenance-friendly. For example, a very limited number of spare parts are needed: the entire conveyor requires only seven spare parts, and these are standard in all VarioBelt conveyors, no matter what their length may be. To top it off, repair times are very short, as all parts can be changed in less than 30 minutes.
Higher passenger numbers mean more bags to handle. But over the course of a day, demands change, with peak periods posing a special challenge in view of minimizing connecting times. On top of this, the sorting area has to cover various additional functions: for example load balancing for X-ray screening areas as well as feeding early bag stores and tray systems.

The ideal solution to get the job done is the tilt-tray sorter VarioSort TTS 1100 from Siemens. Twenty years of experience gained in the airport and parcel logistics world have been rigorously integrated into our innovative sorter product family VarioSort. The solution’s track record is impressive: Over the last five years alone, 12,000 meters of VarioSort sorters – including 14,000 carriers, 200 inductions and 1,500 discharge chutes – have been installed in sorting systems all over the world. The sorters have proven their reliability in over 100,000 hours of productive operation.

**Low life-cycle costs**
VarioSort TTS 1100 features a very maintenance-friendly design. Energy-efficient linear motors help keep life-cycle costs down. The power supply of the carrier is provided by multi-point power induction via an industrial standard bus bar system. The control of the tilt-trays is operated via I-WLAN. And because the sorter is exposed to only low levels of wear and tear, it has a long lifetime, which in turn secures investment costs for airport operators.

VarioSort TTS 1100 is equipped with solid components. The trays, for example, are constructed from very robust, high-pressure laminate, so the material retains its friction coefficient for accurate sorting results. Customers benefit from a fast, efficient and above all reliable system.

With VarioSort TTS 1100, high sorting performance remains stable – at all times of the day.
The advantages of tray technology from Siemens

**Speed**: Siemens trays are fast – they can reach top speeds of up to 10 meters per second. With a sorting speed of 2.5 meters per second, they are the high-flyers in the industry. During peaks, the Siemens systems achieve the industry’s highest throughput rates.

**Cost efficiency**: The belts beneath the Siemens trays run over rollers to prevent dynamic friction between the belts and conveyors, thereby considerably reducing energy consumption and material wear.

**Accuracy**: Trays from Siemens are accurate. Our unique lateral guidance system ensures that our trays travel safely and precisely through the baggage handling system at all times. Moreover, all trays are equipped with radio-frequency identification (RFID). This enables them to reach their intended destination with an industry leading accuracy of nearly 100 percent.

**Scalability**: To cover a wide range of customer requirements, we offer different tray sizes: small, medium, and out of gauge.

**Robustness and reliability**: Siemens trays are very reliable and have proven their dependability and efficiency for decades. A guiding roller and the steel running surface ensure an extraordinary long lifetime.
Siemens boasts an impressive installed tray base of several hundred kilometers at international airports all over the world. With 19,200 baggage items per hour, Beijing Capital International is a prime example of our peak system throughput. Since the early 1970s, when Siemens pioneered trays in baggage handling systems, the company has considerably enhanced and extended its entire tray portfolio for baggage handling.

Our innovated tray system portfolio offers more functionalities and reliability than ever before. For example, our screenable tray enables the integration of ultramodern X-ray devices. The new Siemens tray weighs only half as much as the predecessor model, leading to even lower energy costs. The belts beneath the Siemens trays run over rollers to prevent dynamic friction between the belts and conveyors, again reducing energy consumption.

Siemens has also further refined all other components of the VarioTray system and offers several important new elements. Examples include our TilterPlus for medium capacities, the SmartTilter for extremely high throughput rates, a rectangular transfer and a line stacker to store excess trays. VarioTray offers customers a proven baggage-handling solution that has undergone continual optimization to stay the leading provider for large international airports with a high number of transfer passengers.

The world’s fastest baggage handling system is made by Siemens, reaching top speeds of 10 m/s. By comparison, belt conveyors transport baggage at a maximum of 2.5 m/s.

Fast and highly accurate Early Bag Store

An Early Bag Store (EBS) is an essential asset for airports with a high number of transfer passengers, as well as at airports that offer passengers the possibility to check in baggage early. The baggage is held in the EBS until the respective flight is ready to be processed.

Siemens’ new EBS goes under the name of Baggage Warehouse. Baggage Warehouse uses the so-called Lift & Run system to transport bags within a high-bay warehouse. Vertical movements are executed by hoists, and horizontal movements by shuttles. The system is highly accurate and much faster and more cost-efficient than comparable solutions.
Software solutions: Lightening the load

With increasing passenger traffic on one hand and limited airport capacities on the other, airport operators often find themselves up against great challenges to keep airports running reliably and stably. Help is at hand with Siemens’ solutions across the entire automation pyramid: from low-level hardware and controls to high-level information technology. We ensure situational awareness at all times.

For example, our innovative Baggage Base IT is an integrated, component-based IT solution for airports of all sizes. Since 2003, Baggage Base IT has been successfully implemented at airports in Beijing, Dubai, Incheon, Madrid and Munich, among others. With Baggage Base IT, baggage handling processes are operated by dedicated software components for sort allocation planning, hold baggage screening, early bag storage control and plant visualization. All main processing rules are configurable, thus making it easy to adapt to new or changed processing requirements, for example in the context of changing security regulations. Even third-party handling equipment can be enhanced by Baggage Base IT.

**Retrofits made easy**

Baggage Base IT can be employed to retrofit IT systems. Our experts start with a comprehensive analysis of the existing IT infrastructure in order to get a deep understanding of the current control system and to develop a migration master plan. The corresponding Baggage Base IT components are then rolled out in well-defined steps. The old IT and the new Baggage Base IT run in parallel for a certain period to ensure safety as well as to provide an adequate means of testing and fallback strategies. Each migration step concludes with an observation period.

**Cloud-based solutions**

Siemens is able to take digitalization at airports to the next level: Siemens Postal, Parcel & Airport Logistics, together with its subsidiary AXIT, offers the cloud-based logistics platform AX4, which integrates all processes and data from all partners in a supply chain. This integration helps save time, reduce sources of error and lower project costs.

For Siemens, software and processes are interdependent: customer processes drive the development of the company’s software solutions. In turn, Siemens’ solutions enable customers to continue improving their processes.

**Baggage Vision System**

Frequent loading and unloading can subject bag tags to a great deal of wear and tear, causing them to be torn or twisted. Once a bag tag can no longer be read, the baggage item has to be diverted to manual coding stations. This often results in delays. Siemens offers a unique solution that uses digitalization to solve the problem: The Baggage Vision System combines barcode reading with optical character recognition (OCR) to identify the flight number and destination airport shown on the label. For customers, this means better recognition rates and also helps lower the left behind index (LBI). At the same time, the workload at manual coding stations is reduced considerably. Any baggage handling system can be enhanced with the stand-alone, easy-to-install Baggage Vision System.
Intelligent data management and monitoring

Siemens’ new intelligent data management and monitoring system provides for information-based decision making, improved operational reliability and continuous operational improvement. The solution has been optimized to be securely accessible through web-based portals using mobile devices of any kind as well as standard PCs. With transparent information at their fingertips, operators receive assistance to improve staff deployment and equipment utilization. What’s more, the intelligent data management and monitoring system can also be used to measure key performance indicators (KPIs), for example as part of performance-based operation and maintenance contracts.
First-class customer services:

Our customer services are available 365 days a year, 24 hours a day, and offer service-level agreements to meet all needs of baggage handling systems.
Keeping performance up

For decades, Siemens has been delivering excellent value for its customers. In addition to a reliable and efficient system, quality services are a further major value-adding factor in the total cost of ownership and the fastest-possible return on investment. Siemens therefore supports the performance of systems over their entire lifetime – covering the whole spectrum including upgrades and modernization. Services are also available for non-Siemens systems.

Around 40 airports worldwide cooperate successfully with Siemens on the basis of long-term contracts. In many airports, such as Dubai International, Munich Terminal 2 and Madrid-Barajas, Siemens’ own teams of operation and maintenance (O&M) experts ensure that baggage and material handling systems operate smoothly and at maximum energy efficiency.

Customers have 24/7 online access to the Siemens spare parts orders system.

Tailored to your needs
Successful service contracts are based on a genuine win-win partnership with our customers. With this in mind, we offer a wide service portfolio to enhance system performance as well as optimize operational and maintenance efficiency.

Our Maintenance Services are targeted at supporting your in-house O&M organization to best achieve their goals, for example through on-call service agreements, maintenance engineering, spare parts management and supply. These services primarily address the technical aspects of O&M, but always consider the potential for cost optimization while ensuring the required system availability and reliability.

Our Business Based Services address the strategic aspects of managing airport logistic systems throughout their life cycle, such as the outsourcing of O&M activities, enhancing system performance as well as optimizing operational and maintenance efficiency.

CapacityPlus: Fast-track terminal solution

As accurate as mid- and long-term forecasts of passenger numbers may be, airports do sometimes need extra capacity – for example during special events or during airport expansion projects. Siemens’ CapacityPlus is the optimal solution when short implementation time as well as function and cost efficiency are essential success factors. Depending on customer needs, CapacityPlus terminals are housed in solid constructions or special tents. Inside the terminal, standard subsystems are used for baggage handling, passenger information, security screening and building technology. The solution has proven its capabilities in different regions worldwide.
Spotlight on our capabilities
Ongoing projects and major references

United States – Los Angeles International Airport – Terminal 1
• Layout, engineering, assembly, commissioning and integration of a new outbound baggage screening system and a new inbound baggage handling system
• Extension and conversion work performed during ongoing operations
• More than 1,400 m of conveyor belts, over 300 energy-efficient drives, 5 vertical sortation units and 6 high-speed diverters

United States – San Diego International Airport – Terminal 2
• Operation and maintenance (O&M) of a baggage handling system and more than 50 passenger boarding bridges, including corrective and preventive maintenance of all related technical equipment
• All O&M services from a single source
• Contractual term of several years with an extension option

United Kingdom – London Heathrow – Terminal 2
• Delivery and implementation of a new state-of-the-art, intelligent baggage handling system capable of processing up to 4,800 bags every hour
• 116 new check-in desks, more than 1,500 single belt conveyor drives and lifting devices, automatic tag reader scanners, over 5 km of conveyors
• Smallest footprint of any operation of its kind all under one roof

Ireland – Dublin Airport – Terminal 2
• Baggage handling system with 56 check-in counters, 5 make-up carousels, 6 arrival carousels, a 250-m sorter loop and 5 km of belt conveyor
• Designed to serve 15 million passengers per year and handle 4,800 bags per hour in peak periods
• Low energy consumption, for example through the use of state-of-the-art drives

France – Paris Charles de Gaulle Airport – Terminals 2E and 2F
• Implementation of a baggage handling system using belt, tray and sorter technology; the Siemens tray system alone measures 18 km in length
• Current processing capacity of up to 64,000 bags per day
• Extensive maintenance contract, also covering equipment from third parties
Spain – Madrid-Barajas Airport – Terminal 4, main building and satellite
- A combined belt and tray conveyor system for up to 16,500 pieces of baggage per hour
- Baggage speed of 10 m/s between the main building and the satellite via a 2 km-long tunnel
- Long-term operation and maintenance (O&M) contract

China – Beijing Capital International Airport – Terminal 3
- 330 check-in counters linked to a 68 km-long conveyor system, including 34 km of trays;
- A high-speed tray system connecting Terminal 3C with Terminal 3E via a 2.2 km-long tunnel, transporting baggage at a speed of 10 m per second
- Baggage handling system control by Siemens’ own complex control and software solution

China – Guangzhou International Airport – Terminal 2
- Baggage handling system consisting of tray technology and conveyor belts with intelligent software applications to control the system
- 340 state-of-the-art check-ins, 28 self-check-in and bag-drop counters, 42 carousels in the make-up area and 21 reclaim carousels for passengers
- Early Bag Store with two high-bay warehouses for 4,000 bags, using the Lift & Run system

South Korea – Incheon International Airport – Satellite A
- Tray system for baggage transport via a 1 km-long tunnel between Terminal 1 and Satellite Terminal A
- Transportation of both out-of-gauge (OOG) baggage and normal baggage on the same tray conveyor line
- Current implementation of a baggage handling system in the new Terminal 2

United Arab Emirates – Dubai International Airport – Terminal 3
- More than 90 km of conveyor lines designed for a maximum speed of 7.5 m/s and 15,000 bags per hour
- Continuous expansion and modernization of the baggage handling system, including a fast, economical and environmentally friendly Early Bag Store (EBS) using a high-bay warehouse
- Long-term operation and maintenance (O&M) contract

Angola – Dundo, Luena, Saurimo and Soyo Airports
- Installation of CapacityPlus terminals to increase the capacity of four regional airports in Angola
- Short delivery as a result of the modular setup and fast implementation time of CapacityPlus
- All standard subsystems such as baggage handling, information systems, security screening, CCTV, access control and fire detection