

AUTOMATION SOLUTIONS FOR CEP HUBS AND DISTRIBUTION CENTRES

INTRODUCTION

The growth of e-commerce has changed what is asked of distribution centers. Handling mail used to be the main objective. Today, many of the world's biggest logistics companies reshape their operations to handle an increasing number of parcels.

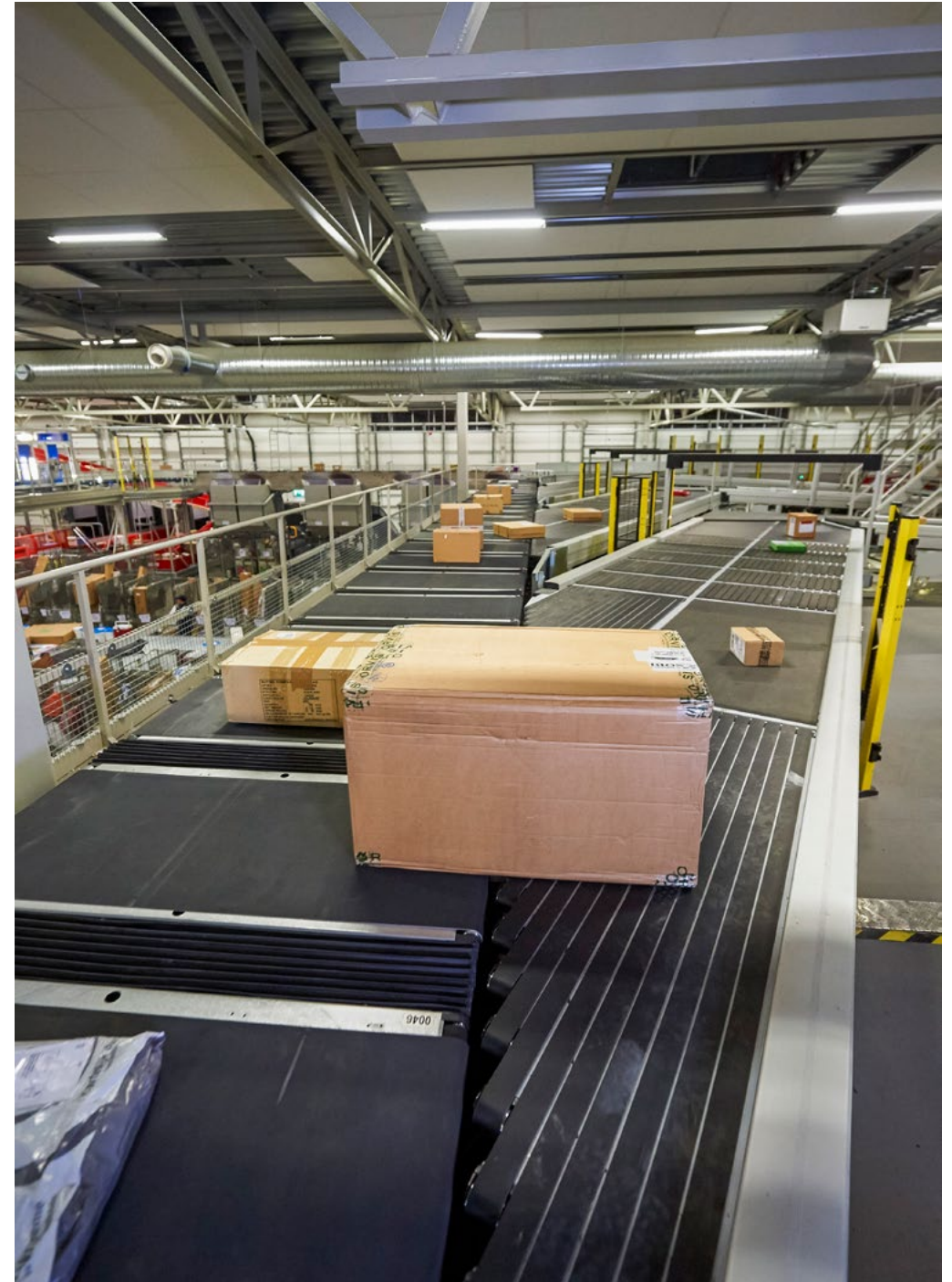
In this e-book, we set out to give you some of the best and most interesting case stories of how this can be done.

By learning from the experiences of PostNord, Hermes, UK Mail, and Austria Post, we hope your company will be sufficiently inspired to succeed with its own transition into an age of e-commerce.

The four companies we look at are quite different. They operate in different markets, they have different backgrounds - in terms of strategy and technological advancement. They have different objectives. What they have in common, though, is a shared realisation that to maintain an efficient and high-speed operation, they need automation.

We are certain that at least one of these stories will remind you of your own company. And in reading that story, we're confident that you'll find inspiration for how to succeed with your own automation.

Enjoy reading





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Three reasons why a parcel distribution centre should consider automation

Automation is a winning strategy. It allows you to future-proof your distribution centre and make it operate more efficiently. It helps you create a working environment that is much more comfortable and less physically demanding for your staff. And it allows you to lend a helping hand to the climate, by adding to the optimisation of your yard and fleet management and general reduction of carbon dioxide.

In this e-book, we introduce you to four major logistics companies that decided to go further with automation. Not because they were told to but because they realised that there was no better way to achieve their objectives.

After becoming familiar with the backstory of each company, you will understand why automation has such a broad appeal. Automation is not just a solution that makes sense for just one type of company in the field of Courier, Express, Parcel (CEP) logistics, though. Automation is a potential game changer for all companies - no matter if you process 50,000 or 1,000,000 parcels a day.

That's because the key objectives you achieve with automation are desirable to almost every company on the planet. Sound intriguing? Let's take a closer look at three objectives that automation is best at helping you achieve:

1. Shorter handling time and higher capacity

In this e-book, you will learn of a company that went from manual handling with a powered conveyor and sorting done by hand, to automating its way to a 20,000 parcel per hour sortation capacity. The same company was able to improve its customer service by extending its cut-off time for accepting parcels into its hub for next-day delivery.

How was it possible? By adopting a custom designed, fully automated sortation system for parcel handling.

2. Increased scalability

In one chapter, we take a look behind the scenes at a site, which through the use of automation was able to push its peak capacity to 50,000 parcels per day with a very limited footprint.

The same company achieved the ability to automatically process parcels of a large variety of different shapes and sizes.

This allowed the distribution centre to not only handle its day-to-day operations much more efficiently but also helped them to manage peak periods, such as Christmas and Black Friday. With this sortation solution, peaks no longer posed a threat or forced extended delivery times.

3. Higher productivity

One company was able to achieve a 20 percent improvement in productivity and a 30 percent increase in outbound trailer fill, all while also massively reducing the number of manual handling accidents and achieving overall better staff engagement.

The end result was a site with large capacity and a small footprint.

Are these achievements similar to some of the objectives of your company? Then take a deep dive into the following chapters, and learn more about the difference that automated sortation can make.

30%

One company was able to increase its outbound trailer fill by 30% and to fully integrate their hub fleet

20,000

In this e-book, you will learn of a company that went from manual handling - with a powered conveyor and sorting done by hand - to automating its way to a 20,000 parcel per hour sortation capacity.



WHY YOU SHOULD READ THIS CHAPTER

If you want to learn how to transform your parcel distribution centre to handle everything from loose load to containerised and odd-sized items with as little manual intervention as possible

Adopting a high-speed system while also going green

The Scandinavian CEP logistics giant, PostNord, found itself in a tricky situation: How do we improve our services and fulfil our environmental responsibility in one single move? The answer was a new sorting system, based on the industry's most energy-efficient sorter. A solution that emphasised how increased competitive performance and thinking green don't have to cancel each other out. In this chapter, we take you behind the scenes on how PostNord did it.

THE BUSINESS OBJECTIVE

Optimising the parcel handling process with less reliance on manual intervention.

Improve customer service and cut down on delivery time.

Reduce the amount of traffic going through the centre of Stockholm

Reduce fuel costs and carbon dioxide emissions.

Let's say you run a major logistics organisation.

A logistics company whose primary objective is to deliver mail and parcels over a large geographical area.

You have to reduce the average delivery time of each parcel. This is your competitive edge. But a huge shift in consumer behaviour has prompted a dramatic increase in the number of parcels that your distribution centre needs to handle on a day-to-day basis. You also have to handle an increasing amount of odd-sized parcels. The game has basically changed. You need to come up with a plan.

The most obvious solution is to send a higher number of trucks into the street, right? No. In today's world, logistic headaches are rarely that simple to solve. Case in point: PostNord.

The Scandinavian logistics giant wanted to improve its product, by slashing delivery times and bolstering its customer service offering.

To achieve this goal, they would need an operation designed for flexibility and efficiency. An operation invented for increasing volumes of parcels, while reducing truck movements. However, improving the efficiency of its operation wasn't the only goal that PostNord had.

Thinking green

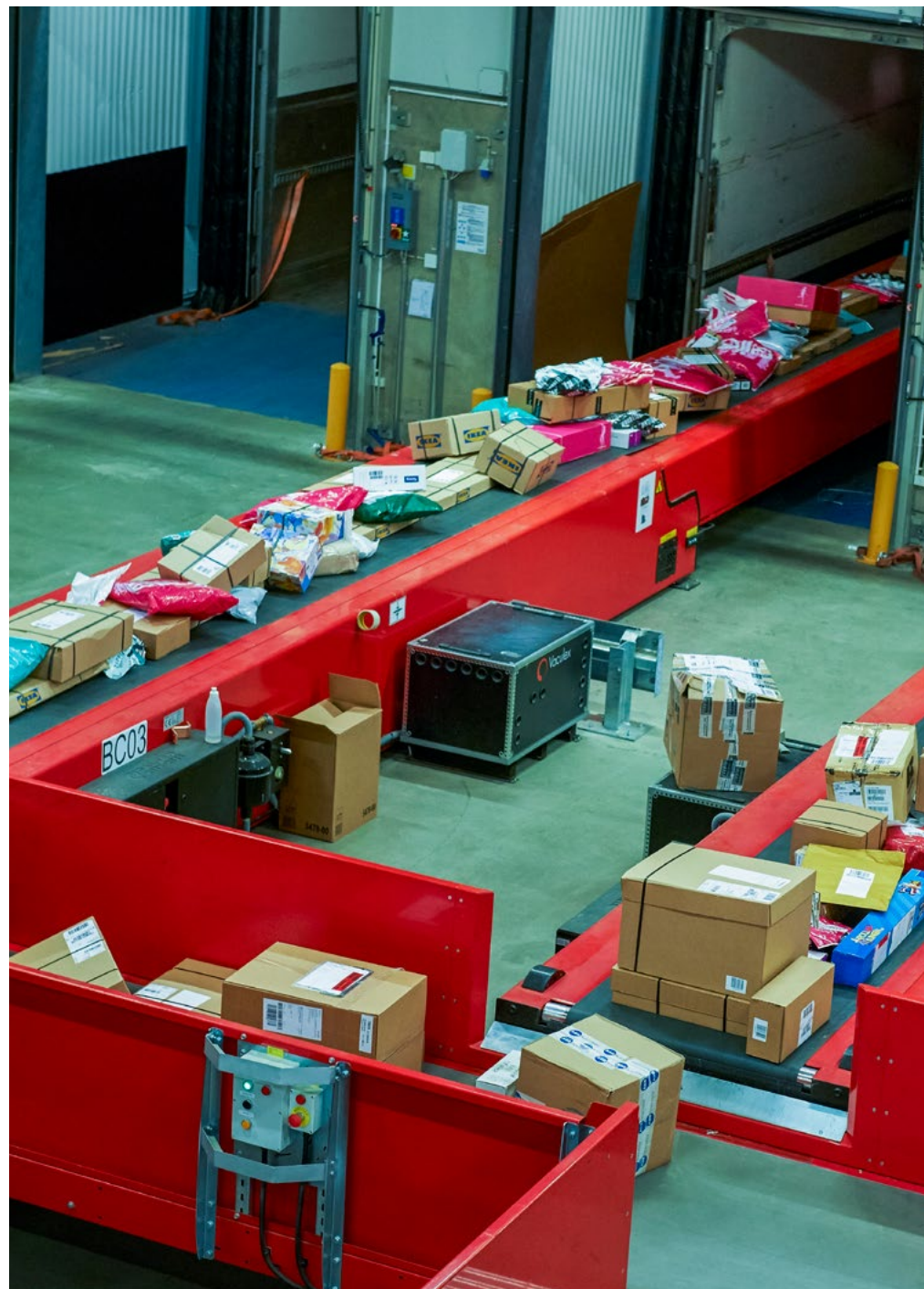
Being environmentally responsible is something that companies all over the world have to get used to.

In Scandinavia, the corporate sector is legally obliged to act in a climate-friendly manner. This adds a green dimension to any logistics challenge.

To achieve its business objectives, PostNord needed to come up with a more innovative solution than simply increasing the number of trucks in their network.

THE ENVIRONMENTAL GOALS OF POSTNORD

- > It is the ambition of PostNord to reduce CO2 emissions by 40% during between 2009 and 2020.
- > By 2017, the company had achieved a 32% reduction.



So what the company did was adopt the industry's most energy-efficient high-speed sortation system. An investment in improving future business operations, while also assisting the green ambitions of their company.

The system

In order to achieve all of its objectives, PostNord needed to equip its Veddesta distribution centre - located just outside Stockholm - with the most advanced high-speed sortation technologies.

PostNord based its new system on BEUMER Group's cross-belt sorter. The result: A high-speed solution, designed with conveyors, automated inductions, scanners and automated parcel singulators to increase the efficiency of the parcel sorting process.

The system's ability to automate the receipt of parcels and deliver them to appropriate dispatch points creates extraordinary operational flexibility, with as little manual intervention as possible.

Was there an environmental element to it? Absolutely.

The use of Linear Synchronous Motor (LSM) technology enables the sortation system to cut

energy consumption by up to 75% compared to sorters with conventional motor technology.

A streamlined process

Adding automatic singulators to the system played a key part in streamlining the sortation process.

As parcels arrive at bulk in-feed areas, using a combination of fully-automated container tippers and boom conveyors, the parcels are grouped and fed into the singulators.

Parcels enter the singulator's in-feed module in bulk. Then, they travel through a set of skewed roller conveyors onto a section of individually-controlled belts. This dynamic process automatically conveys parcels into a single stream of evenly-spaced items, which are conveniently ready to enter the automatic induction to the cross-belt loop sorter system. All of this results in a time-saving, automated sortation process of items which have been brought in as loose load, cages and pallets.

In addition, the singulator detects any double parcels, such as those which are side-by-side or overlapping, as well as any that are too long, too high or too thin. These items are diverted to a separate conveyor line for re-introduction to

THE SOLUTION

Automatic parcel singulation, to streamline the entire sortation process.

Sortation system designed for maximum flexibility and efficiency with automated handling of loose and containerised items.

Veddesta Terminal business case, based on minimising manual intervention of the entire inbound to outbound process.

the parcel stream. This feature is absolutely vital in today's landscape of odd-sized parcels from e-commerce.

The bottom line

The business case for investing in the new Veddesta Terminal was based on minimising the manual intervention, while also maintaining high levels of customer service and speed. The new system has enabled PostNord to increase the flexibility of its sorting process, while drastically reducing the cost and environmental impact.

A completely satisfying solution for the Scandinavian logistics company.

THE SPECS

594m cross-belt sortation system with up to 75% savings in energy-consumption

Two groups, each consisting of:

- > 4 fully-automated tipper containers
- > 2 Automatic Parcel Singulators/conveyors
- > 4 inbound boom conveyors
- > 3 induction units
- > 52 spiral chutes, directly onto roller lanes
- > 20 spiral chutes, directly onto boom loaders
- > 40 direct chutes
- > Spiral chute for no-read items
- > Spiral chute for reject handling
- > Overweight discharge

BEUMER Group SCADA and software controls for system-wide optimisation

System, integrated with 6-sided ID camera scanning and OCR

Capacity: 11,250 items/hour.

WHY YOU SHOULD
READ THIS CHAPTER

If you want to learn how a state-of-the-art automation distribution hub was the right fit for increased capacity of a European delivery specialist



Hermes has 1.000.000 reasons to celebrate its automated mega-hub

How often can a company say that any of its possessions are the second-largest of its kind in the entirety of Europe? Not very often, but this was exactly what the German logistics specialist achieved when in 2017 the doors opened to the new Hermes Midlands Super Hub. Located in Rugby in the UK, the sensational distribution centre has set a towering standard for productivity and efficiency in the CEP industry. The daily processing capacity finds its ceiling somewhere beyond one million parcels. That is roughly 60.000 items per hour. What does it take to reach such astounding numbers? As Hermes would tell you, it's all about the right system. Learn more right here.

45%

The new sortation system has improved the company's capacity in the UK

THE BUSINESS OBJECTIVE

An automated system built to thrive in an era of massive increase in parcels from e-commerce

Ability to handle a wide range of parcel shapes and sizes to serve the multi-channel online retail market

Achieve a high level of flexibility and adaptability through the use of advanced sortation solutions

Depending on perspective, the meteoric rise of e-commerce is viewed quite differently.

Some logistics companies have spent the past ten years observing the increase in parcels mostly with dread. They have experienced what it feels like when the strength and focal point of your operation was designed to navigate a much different landscape than the present one. Perhaps a landscape where letters, in particular, played the key part.

Others have been able to approach the changing waters much more opportunistically. And with some fine-tuning and investments, perhaps even take advantage of it. Few logistics companies represent this trend more emphatically than Hermes.

Super is the right word

Driven by the past decade's increasing e-commerce in the UK and overseas, the German

consumer delivery specialist has been no stranger to double-digit growth on a yearly basis. So in 2017, the company revealed its boldest investment yet. That year in August, the opening of the Hermes Midlands Super Hub in Rugby took place.

In this instance, the use of the word "super" was not hyperbolic. Far from it in fact.

As the gates opened to the 140,000 m² distribution centre, it represented what has turned out to be an increase in processing capacity by a staggering 45 percent in the UK for the company.

How come? The answer was found in a new automated system.

Flexibility and similarity

In order to capitalize on the growth of e-commerce and also build on the potential already available from its original UK site in Warrington (30 kilometres away from Liverpool and Manchester), Hermes wanted to establish a new sorting hub of exceptional capacity. One that could take the company to the next level.

The new hub needed a system to serve the multi-channel online retail market, which includes parcels in a wide range of shapes and sizes. Flexibility and adaptability were key parameters.

To ensure some similarity in the operational process Hermes also wanted the new system to have commonality with the one in place at the Warrington Hub. BEUMER designed and



constructed the Warrington site and was able to build on that system in Rugby.

How the system works

When arriving at the hub, parcels and polybags are loaded onto the inbound conveyor system, through 60 doors. There are ten induction lines for each sorter.

The boom conveyors can extend into trailers to offload parcels. The sizing range goes all the way up to 1200mm in length, 800mm width, 600mm height and weighing up to 30kg. The

three-level sortation system is designed with reserve capacities for the busy peak season over Christmas. Talk about flexibility and adaptability.

All the newest technology

The feed-ins onto the main sortation system use the latest scanning, volumetric and weighing technologies to identify and then accurately profile parcels. Automatic checks are carried out on each parcel to ensure they have been labelled correctly before being they are transferred onto the sortation system itself.

Inside the automated sortation hub, parcels can be loose loaded or containerised using a standard fleet. This allows Hermes to fully integrate their hub fleet and operate as a single, centrally- planned network.

Finally, parcels exit down 60 spiral chutes to the delivery trucks, at any of 174 docks. The entire sorting process, with all its different stops and checks, is completed in just two or three minutes. This makes the Hermes distribution centre extreme - in terms of both production, quality and speed.

THE SOLUTION

A system where items are loaded onto the inbound conveyor system through 60 doors, with ten induction lines for each sorter

Three-level sortation designed to achieve maximum capacity

Boom conveyors that can extend to carry parcels up to 1200mm in length, 800mm width, 600mm height and weighing all the way up to 30kg

The result is an automated super hub with the capacity to handle one million parcels a day at a rate of more than 60,000 items per hour

THE SPECS

- > 140,000 m2 exterior and 25,000 m2 interior space
- > Capacity to handle one million parcels a day (at more than 60,000 items an hour)
- > 60 entry and exit doors for loading in and out
- > 174 docks
- > Three-level sortation system
- > The entire sorting process is completed in two to three minutes



WHY YOU SHOULD READ THIS CHAPTER

If you want to learn how a renowned, traditional parcel logistics company transformed its main distribution centre into an automated and future-proofed hub operation

From traditional handling to high-speed automation in one big move

How does a company react when an entire industry is changing? UK Mail, a leader in the UK mail and parcel delivery market, began to realise that what they were seeing was not just an unusually large blip on the radar. A growing volume of parcels represented a paradigm shift for their business. In order to meet future growth forecasts and satisfy the need for day-to-day delivery flexibility, the company had to change its operation. Radically. What they came up with was a fully-automated system solution that would take the organisation – and its customers – further in the battle for e-commerce services.

SINGLE SORTER SYSTEM

By adopting a single sorter, with the capacity to handle everything from a jiffy bag to parcels weighing up to 49 kg and reaching up to 1,395m in length, UK Mail improved their efficiency by allowing a high percentage of parcels to go through their new automated sorting system.

THE BUSINESS OBJECTIVE

Increase the distribution hub capacity with a shift from conveyor-based to loop sorter-based sortation

Guarantee a fast and flexible response to future demands from increasing e-commerce

Increase ability to handle parcels of all shapes and sizes

An integrated yard management and hub control system for unloading and loading trailers

Despite being a leader in its field, UK Mail knew that greater use of automation was essential to maintain a high level of operational efficiency and customer service.

The company has long been a cornerstone in UK logistics. With a shift in the market – e-commerce providing a rapidly increasing influx of parcels - a new approach to distribution center technology was needed. The game was changing, and UK Mail had to transform with it. The company recognised that.

This insight into their own strategic position is probably the reason why UK Mail today can display a distribution hub that is built for the future—armed with a system devised to thrive in an era of roaring e-commerce.

In today's hyper-competitive landscape, where next-day delivery is vital, odd-sized parcels are the new normal and an increasing number of commercial holidays are the new Black Friday, it takes a solid operation to handle explosive spikes in parcels.

The UK logistics giant needed a new system. So they decided to go with automation.

On the move

For UK Mail, transforming their main hub into a future-proof operation meant moving on to new pastures.

The first thing UK Mail had to do was reposition its national hub from Birmingham to Ryton-on-Dunsmore near Coventry.

Being the company's main hub, it was essential to find the ideal location for shipping parcels to regional centres. But that was just the first step. In order to achieve maximum speed and efficiency, UK Mail needed the right system. That was exactly what they got.

The system

UK Mail had a number of different objectives that the new system needed to fulfil.

The company wanted a sortation system that could handle parcels from a wide range of shapes and sizes. By adopting a single sorter, with the capacity to handle everything from a jiffy bag to parcels weighing up to 49 kg and reaching up to 1,395m in length, UK Mail improved their operational efficiency by allowing

a high percentage of parcels to go through their new automated sorting system.

The company also wanted to achieve faster processing of incoming parcels. This was achieved with a fine-tuned control system and a one-stop concept for unloading and loading trails.

A high number of loose loads, combined with fewer cages and pallets, helped the company achieve faster shipment to its various regional centres—a key feature for any main hub in CEP logistics. The ability to unload all incoming parcels from a trailer into a single dock significantly reduced the number of shunt movements, resulting in faster processing and lower operational costs.

All in all, the combination of a fully automated sortation system and more streamlined unloading has resulted in an extended cut-off time for accepting parcels into the main hub for next-day delivery. A key parameter in today's competitive market, allowing UK Mail's customers to offer a later cut-off time to their e-commerce customers.

Automating parcel handling

In the new automated parcel handling system, inbound parcels are discharged from trucks into the hub using boom conveyors. The parcels are manually singulated; Standard items are accepted into the sortation system, whilst out-of-size and out-of-weight items are automatically discharged for manual handling.

The hub features four inbound conveyor sections, feeding five inductions for each of the two sorters. The sortation system is designed as a two-tier configuration, with the lower, hammer-head style sorter being used to sort parcels for delivery to the local Coventry postal area. If a parcel for a Coventry destination enters the hub via the upper sorter, it is automatically discharged to a conveyor and fed to the lower sorter to be taken to the chutes for other destinations.

Every aspect of the system is built around the idea of automation. What it all means is that UK Mail has taken its top-notch quality and service and combined it with advanced technology. The result is improved customer service and a solidified position in the market. Both today and in the future.

THE SOLUTION

System design built around automation that allows UK Mail to extend its cut-off time for accepting parcels into its hub for next-day delivery

New sortation technology to achieve a fast and more flexible process, which also contributes to the use of fewer trucks and an overall return on investment

Integrated control system optimises the parcel flow to reduce operational costs and help increase the efficiency of the overall hub operation

THE SPECS

- > 187,000 ft² (17,400m²) hub
- > 17,000 ft² (1,600m²) offices
- > 34,500 ft² (3,200m²) local depot
- > Parking for over 130 tractor/trailer combinations
- > 20,000 parcels per hour sortation capacity
- > 24 in-feed boom conveyors
- > 72 out-feed boom conveyors
- > 28 local depot chutes
- > 30 cross-dock doors

UK Mail's yard management is integrated with the sorting system's SCADA overview, to optimise trailer and shunt movements. UK Mail takes particular care to optimise these movements to minimise empty infeed sections. On the floor, process managers use the BEUMER Group software suite statistics program, CIS, as well as the SCADA overview, to generate updates on operational performance.

Handles a wide range of parcel shapes/sizes

| Size | Minimum | Maximum |
|--------|---------|----------|
| Length | 155 mm | 1,395 mm |
| Width | 105 mm | 800 mm |
| Height | 10 mm | 700 mm |
| Weight | 100 g | 50 kg |



WHY YOU SHOULD
READ THIS CHAPTER

If you want to learn how a high-capacity distribution centre can fit into a fairly small site with the help of the right sortation system design

Small site, **gigantic output**

Austria Post found itself in a bind that CEP logistics companies all over the world can relate to: Enormous increases in online orders were presenting a challenge they simply weren't prepared for, to the point where previous systems and facilities could no longer get the job done. While the stack of parcels grew taller by the minute, the physical surroundings weren't able to keep up. The company had to find a new and more efficient system. Here's what they did.

5,000

The new installation keeps a footprint of 5,000 m², despite the fact that it operates in a facility with a total 12,000 m² of floor space.

GIGANTIC OUTPUT

Even with a fairly small site, you can still adopt an extremely efficient sortation system for your distribution centre

THE BUSINESS OBJECTIVE

Adopt a new parcel sortation design to handle an enormous increase in online orders

Fit an efficient and flexible system on a relatively limited footprint

Establish a distribution centre with a sortation system than can handle parcels in a variety of different sizes and shapes

Find a solution that is both energy-efficient and provides for a pleasant working environment

Austria Post had a problem. A problem that was bound to rear its head sooner or later.

Parcel shipping was growing in Austria. In fact, it was exploding, just like it has in most regions this past decade. The facilities of the company were becoming insufficient, at rapid pace.

The Austria Post distribution centre – located in St. Magdalen in Northeast Austria – could no longer keep up with a constantly increasing influx of parcels from e-commerce. The distribution centre had to move somewhere else. That much was clear.

The decision was made to move to Weinberg, in Austria's southernmost state of Carinthia. A convenient location between two big cities,

Villach and Klagenfurt, with easy access to and from the nearest motorway. A perfect solution, in theory. There was just one challenge: The distribution centre in Weinberg was still a fairly small site within the Austrian postal service. Bigger than St. Magdalen for sure, but big enough? That was the question.

Austria Post needed a new system that could operate at high capacity, but in a comparatively little space. Let's see what they came up with.

A high-capacity sorter

Austria Post decided to build its new distribution centre around a high-capacity tilt-tray sortation system. The result: A new installation with a footprint of just 5,000m² to leave as much free floor space as possible in a facility with only 12,000m² of floor space. To make use of the available square metres that efficiently is a spectacular feature in its own right. On top of this, the system handles parcels of various sizes and shapes - particularly common today due to online shopping - with both care, speed and accuracy.

Let's dive a bit deeper into the specifics of how the system really works.

Advanced and reliable

When a truck docks at the Weinberg hall for unloading, an employee places the parcels on a horizontally and vertically adjustable telescopic belt conveyor. The belt conveyor transports the parcels with mixed sizes and shapes onto a belt conveyor, where the weight of each package is precisely calculated and registered.

The shipments then progress onto the sortation system, where each parcel is assigned to the correct destination, through the use of barcode recognition. There is also a laser system that continuously detects each parcel's volume and reports to a high-level control system. If a barcode cannot be read, the parcel will instantly be routed to a manual handling station, where an employee inspects and processes the parcel before returning it to the sortation system.

Once they reach the chute, each parcel automatically transferred onto telescopic belt conveyors into swap bodies to be loaded onto trucks, the whole thing playing out like clockwork.

A green perspective

The new sortation system is equipped with energy-efficient drives. The servo-drive based OptiDrive reduces both power consumption and CO2 emissions.

The contact pressure of the drive wheels is adjusted automatically, according to the required driving power – even for braking – which extends the service life of the wheels and therefore also lowers maintenance and operating costs.

The ability to adjust the driving power can boost energy efficiency all the way up to 90%. The BG Sorter is equipped with carrying wheels that are larger than those used in comparable systems. This results in a 25% reduction in rotation frequency, with the added bonus of less wear and tear as well as noise. This contributes to a much more pleasant working environment for staffers.

The conclusion? Even with a fairly small site, you can still adopt an extremely efficient sortation system for your distribution centre. A system that is also environmentally acceptable and pleasant to work in for your staff.

THE SOLUTION

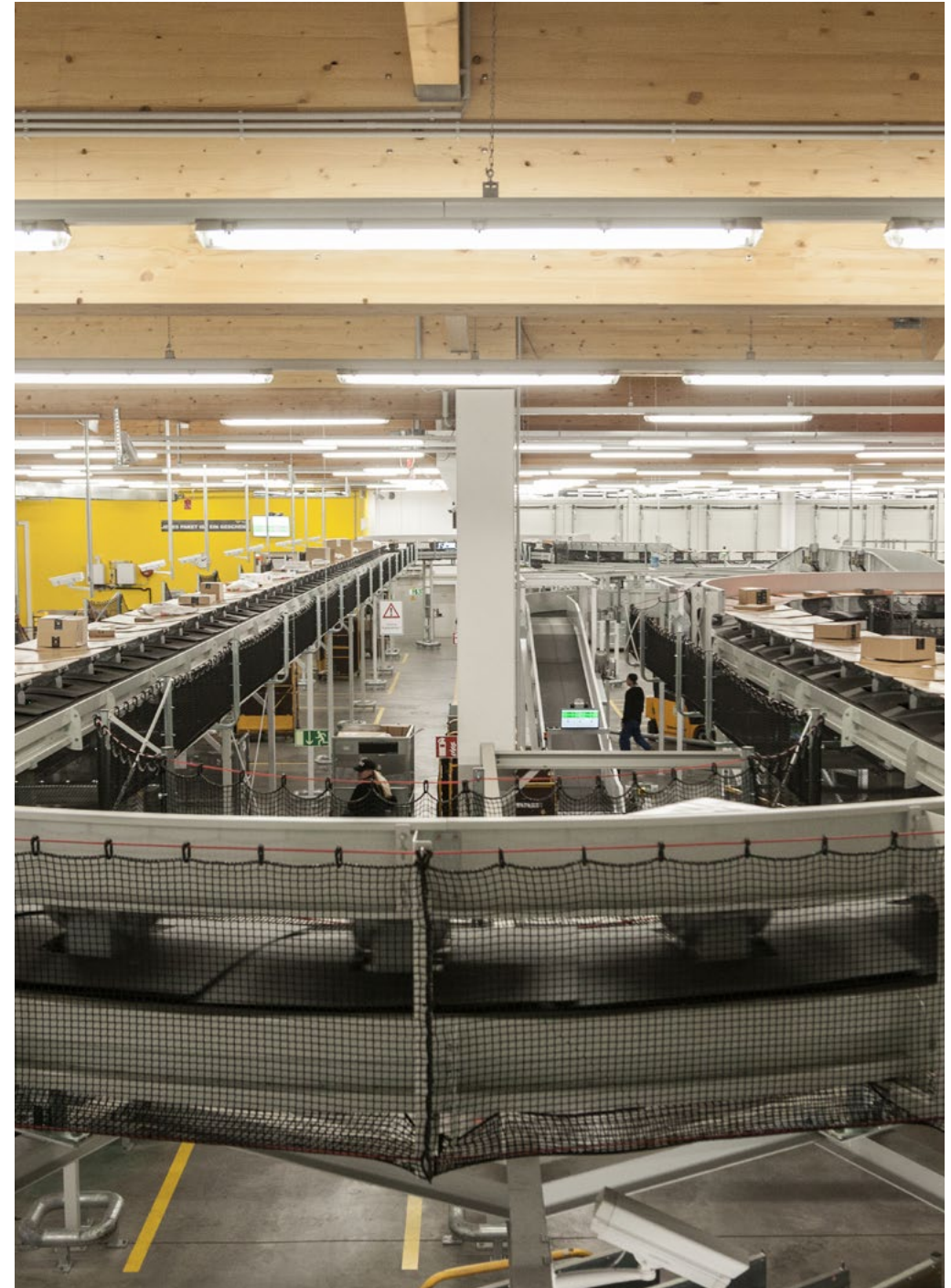
A high-capacity, space-saving sortation system design

A full-blown installation with a footprint of just 5000 m², leaving plenty of floor space in a facility with a total of 12,000 m² floor space

A system with a capacity up to 50,000 parcels per day, that equals 6,000 parcels per hour during peak operational times

THE SPECS

- > Sorter speed: up to 3m/s (590ft/min)
- > Drive systems: OptiDrive
- > Power supply: Contactless energy supply
- > Real-time wireless communication system
- > Maximum item length: 1,000mm (39.5in) single tray; 2,000mm (79in) spanning two trays
- > Maximum item width: 1,000mm (39.5in)
- > Maximum item weight per tray: 60kg (132lb)





Want to know more about automation?
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