MORE EFFICIENCY AND SAFETY IN FREIGHT TRANSPORT

Yard Solutions

SIEMENS
Today, the degree of automation in rail operations is taking on a key position with regard to the quality of all humping operations. The performance of yards, systems and processes has a considerable impact on economic efficiency for railway operators. That is why Siemens supports the effectiveness of freight transport with state-of-the-art, sophisticated technology, for example for simulation, humping operation control, dispatching and monitoring – for any requirement imposed on modern, market-based train and shunting operations.

**Intelligent solutions for more efficiency and safety in freight transport**

This is particularly relevant to individual car traffic in rail networks. Quality and safety are decisive in ensuring smooth operations in marshaling yards. A high level of automation – from train arrival to departure from the marshaling yards – simultaneously optimizes all transport services. As global market leader in cargo automation, Siemens is repeatedly setting new benchmarks with intelligent and high-performance process control systems.

Siemens thus enables freight transport operators to make extensive use of their track and vehicle resources. Siemens’ specialists have been applying their competence in the field of marshaling systems to the development of information and control systems for many decades. State-of-the-art technology from Siemens ensures efficiency, safety and high-level availability in operations in many marshaling yards throughout Europe and the rest of the world.

High-quality performance, a focus on the customer and modern project management ensure that budgets are adhered to, commissioning takes place on schedule and projects are adjusted to the customer’s individual requirements.

**Your benefits at a glance**

- Optimized transport services through the optimal use of resources
- Increased transport safety and quality
- More effective process design
- Improved information quality
- Continuous flow of information in the transport chain
- Investment security through simulation and studies
Yard Solutions international

Train formation yards in Europe – controlled by Siemens

Selected examples

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Hallsberg Marshaling Yard, Sweden

5
Malmö Marshaling Yard, Sweden

9
Kijfhoek Marshaling Yard, Netherlands

7
Süderelbe Marshaling Yard, Germany

8
Maschen Marshaling Yard, Germany

10
Seelze Marshaling Yard, Germany

11
Antwerp Marshaling Yard, Belgium
Kouvola Marshaling Yard, Finland

Luzhskaya Marshaling Yard, Russia

Škirotava Marshaling Yard, Latvia

Vaidotai Marshaling Yard, Lithuania
Selected examples

12 Mannheim Marshaling Yard, Germany
15 Basle Muttenz 1 Yard, Switzerland
16 Limmattal Marshaling Yard, Switzerland
18 Chiasso Marshaling Yard, Switzerland
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YARD SOLUTIONS INTERNATIONAL

Basle Muttenz 1 Yard, Switzerland
Limmattal Marshaling Yard, Switzerland
Chiasso Marshaling Yard, Switzerland
Munich Marshaling Yard, Germany
Villach Marshaling Yard, Austria
Vienna Central Marshaling Yard, Austria
Efficiency for train formation operations – Trackguard Cargo MSR32

Automatically safe: humping operations
From the approach movement to the grouping of cars on classification tracks – after activation of the control system, the entire process operates independently. The system ensures control of the humping locomotive so that the cars of the incoming train approach the hump and are humped at the correct speed. By simulating all humping operations, the humping speed is effectively varied taking into account the topography and the physical conditions of both the surroundings and the cars.

Efficiency and safety characterize the marshaling process with the Trackguard Cargo MSR32 system. The correct points are thrown at the right time so that cars can reach their predetermined classification tracks. Automatically controlled retarders reduce the speed of the cars so that they are humped without mutual hindrance or damage in the classification zone. If required by the topography and car properties, the system controls the propulsion equipment which pushes the cars into position ready for coupling on the classification tracks.

Many protective functions in the system ensure that this highly complex control process enables humping operations taking into account the required safety level. Brakesmen are no longer deployed here.

Hump control systems
The Trackguard Cargo MSR32 hump control system from Siemens auto-mates humping in marshaling yards. The operator can start, stop and modify automatic humping at any time. The system provides optimal operator guidance for this purpose.
Capacity-compliant speed control with the same technology – Trackguard MSR32 TB kompakt

The Trackguard MSR32 TB kompakt lower main retarder controller comprises the basic and protection functions of the MSR32 retarder controller. In the case of gravity-control marshaling yards with low capacity requirements, it is therefore a cost-optimized control system solution for humping operations.

It can be a first step towards a fully automated high-capacity hump yard. Based on the MSR32 technology, it can be upgraded to a full-scale MSR32 hump control system without any loss of investment.

The system is designed for all requirements governing lower main retarder controllers. It offers high marshaling quality and helps to reduce marshaling damage. Little maintenance is required. Installation, modification and commissioning take place during operation.

Points setting in marshaling operations – MSR32 RaStw marshaling yard interlocking and Switchguard DPC

Trackguard Cargo RaStw and Switchguard DPC are designed as system components for the automation of marshaling yard operations both with protected shunting routes and with decentralized and centralized electric points. Thus, these systems offer a basis which can be integrated and expanded from a small-scale solution to a high-performance system, from a simple terminal to a complex marshaling or stabling yard.
Retarding systems

Trackguard Retarder TW-F/TW-E and Trackguard Retarder TKG

To provide the customer with a perfect, optimized solution, specific retarder elements are used for very different applications. By combining innovative, precision-forged retarder elements and optimally matched control technology, marshaling yards’ operating and maintenance costs can be optimized. The different retarder systems have been in rugged operation for many years now and thus form the backbone for smooth operations.

Trackguard Retarder TW-F/TW-E – the variable clasp retarder system for speed control in marshaling yards

At humps in marshaling yards, retarders function as important elements for controlling the speed of humping operations. Retarders in the classification zones permit spacing between the differently running cars and in this way boost hump performance.

Retarders have various applications and are also subject to very different requirements. Conditions at humps vary considerably. That is why, in terms of their performance, the retarders used should be of modular design. The basic elements best remain identical whereas their number and the length-dependent components vary.

This design principle is consistently applied to Trackguard Retarder TW-F/TW-E retarders.
Lower main retarders and classification track retarders feature the same basic elements. They can be fitted to one or two rails and also vary in their overall length.

These numerous possibilities combine to make up the wide range of performance features available, simplifying the planning procedure by resorting to the modular system and thus enabling optimally dimensioned systems to be implemented. The modular system comprises identical parts, thus considerably cutting down on costs for spare parts stockage and maintenance.

**Benefits of Trackguard Retarder**

**TW-F/TW-E**
- Large range of performance features
- Low operating costs
- Good controllability
- Low-level emissions
- Good operational and on-site adaptability
- Scalability to the respective application
- Low noise levels due to the use of special retarder pads
- Low level of maintenance
- Elimination of hazardous workplaces

**Trackguard Retarder TKG piston retarder and TKG gradient compensation retarder – efficient speed control in marshaling yards**

On classification tracks, piston retarders are primarily used for deceleration and coasting in speed control systems. Their effectiveness can be adjusted depending on the speed involved.

Trackguard Retarder TKG piston retarders are automatically controlled by a hydraulic valve system in the damper and need not be supplied with power. The hydraulic damper is the active retarder element and is based on a speed-controlled valve system. Hydraulic dampers can be permanently set to different response rates and damper forces.
Yard Management System (YMS)

Yard Management System – more efficiency and safety at maintenance centers and depots

Punctuality, safety and efficiency in passenger and freight transport require the necessary locomotives, cars and multiple units to be available in line with the relevant needs. This is the job of maintenance including on-time train make-up. Vehicles and trains are subjected to corrective and preventive maintenance and cleaned at maintenance centers and depots.

As implemented in several reference projects, the combination of Trackguard MSR32 RaStw with the Yard Management System results in a compact and efficient solution for depot operation.

Maintenance is performed in accordance with the planned vehicle schedules at closely planned, stipulated intervals. Operations management computers enable efficient implementation with the required high safety standard.

In terms of their overall complexity, the relevant processes have to be planned, scheduled and mapped with sequences, occupancies, make-up and resources. The use of yard management system boosts quality in the overall train make-up process, including the required level of safety and punctuality, and thus altogether supports the optimization of operations.

Benefits

- Optimization of the entire maintenance process
- Increase in reliability and operational safety
- Increased availability (preventive maintenance and service)
- Standard reporting and evaluations
- Complete, consistent network integration
- Official approval by the Federal German Railways Office (EBA)
Systems for state-of-the-art marshaling operations

Simple, fast, cost-effective – Controlguide DPC

Applications

- Control of points and routes (DPC)
- Use in interlocking-free parking areas
- In areas without “round-the-clock” operational personnel support
- As a way of non-discriminatory access to railway facilities

Controlguide DPC mit dem Yard Management System für integrierten Rangierbetrieb

IntelliYard is a framework for integrated marshaling operations. It serves to optimize operational processes through to control at small- to medium-sized hubs as frequently encountered on industrial and dock railways.

Its modular design on the basis of stand-alone individual components means that Controlguide DPC can be suitably scaled or configured to match any specific application.

The Controlguide DPC can also be used as a stand-alone solution primarily in medium to low-traffic parking and track yards.

- Wireless connection of wheel detectors
- Reduced cable and installation costs
- Easier multiple usage of wheel detectors e. g. for:
  - adjacent points
  - car tracking
Check-up for infrastructure and operations

Investment protection and continuation of production

Three main service areas are covered by our process control systems: planning and dispatching, hump control, and the optimization of operations. All process control systems have an open, modular structure which allows their seamless integration into existing environments and the combination of different systems. Another of these systems’ assets is their far-reaching migratability.

Check-up for infrastructure and operations

Intelligent simulation tools enable Siemens’ employees to simulate operations in their entirety based on individually defined specifications – from the arrival of a train to its departure. The simulation of operational sequences offers several advantages. It can be applied to detect potential savings, step up yard productivity, and detect in advance and thus prevent any possible problems.

Before a marshaling yard is built or modernized, Siemens’ specialists can clarify whether the targets set can be adhered to. They check whether the yard and the associated systems can be implemented in such a way that the desired performance data is achieved with an optimized infrastructure and operations sequence.

Siemens’ specialists also remain available to the railway operator after commissioning, offering a variety of maintenance support services along with new ideas to make operations even more efficient and economical.

The active system offers further useful functions for optimized maintenance and servicing.

Requirements and materials in rail freight traffic are subject to continual change. We use state-of-the-art software tools in order to establish the optimum systems and technical parameters. We check and dimension marshaling equipment and the hump and track profiles of your yards. The result is more safety, greater operational efficiency and a higher level of performance.

There is always a possibility of increasing the efficiency of rail operations even more and tapping potential savings. We use a simulation system to check your operating procedures and track infrastructure fast, thoroughly and cost-effectively. On this basis, you can speed up transport and transshipment times, boost operational reliability and punctuality, or specifically invest in modifications and modernization measures.