Cactus Traffic Management System

Smart and more efficient railway systems?
Say hi to your smooth operator.

CACTUS RAIL

Our focus: making rail infrastructure run. And run.

Efficient traffic management lays the foundation for better punctuality, more frequent services and more efficient operation. Because disruptions directly affect traffic, the quality of the equipment is critical to the operator.

Planning and operating rail traffic is a complex process, however. A traffic manager must be able to make correct decisions – fast. The trend in traffic management systems is therefore towards greater automation and more decision-making support.

Cactus Traffic Management System

Cactus TMS is a modern, tried and tested traffic management system adapted to the customer's needs.

At Cactus Rail we have been developing and supplying traffic management systems for over 20 years. Together with our customers, we have adapted the systems to ensure that the functionality is user-friendly and meets demanding requirements.

The system is therefore both tried-and-tested and complete.

Everything an operator needs, and a bit more

Cactus TMS comprises the following elements:

- Centralised Traffic Control (CTC).
- Communication with ancillary systems (traction power system, timetabling system, etc.).
- Automatic route setting.
- Train describer system
- Timetabling tool.
- Train graphs.
- Conflict detection and decision-making support.
- Logging, alarm and event playback function.
- Communication with interlocking.
- SCADA functions.

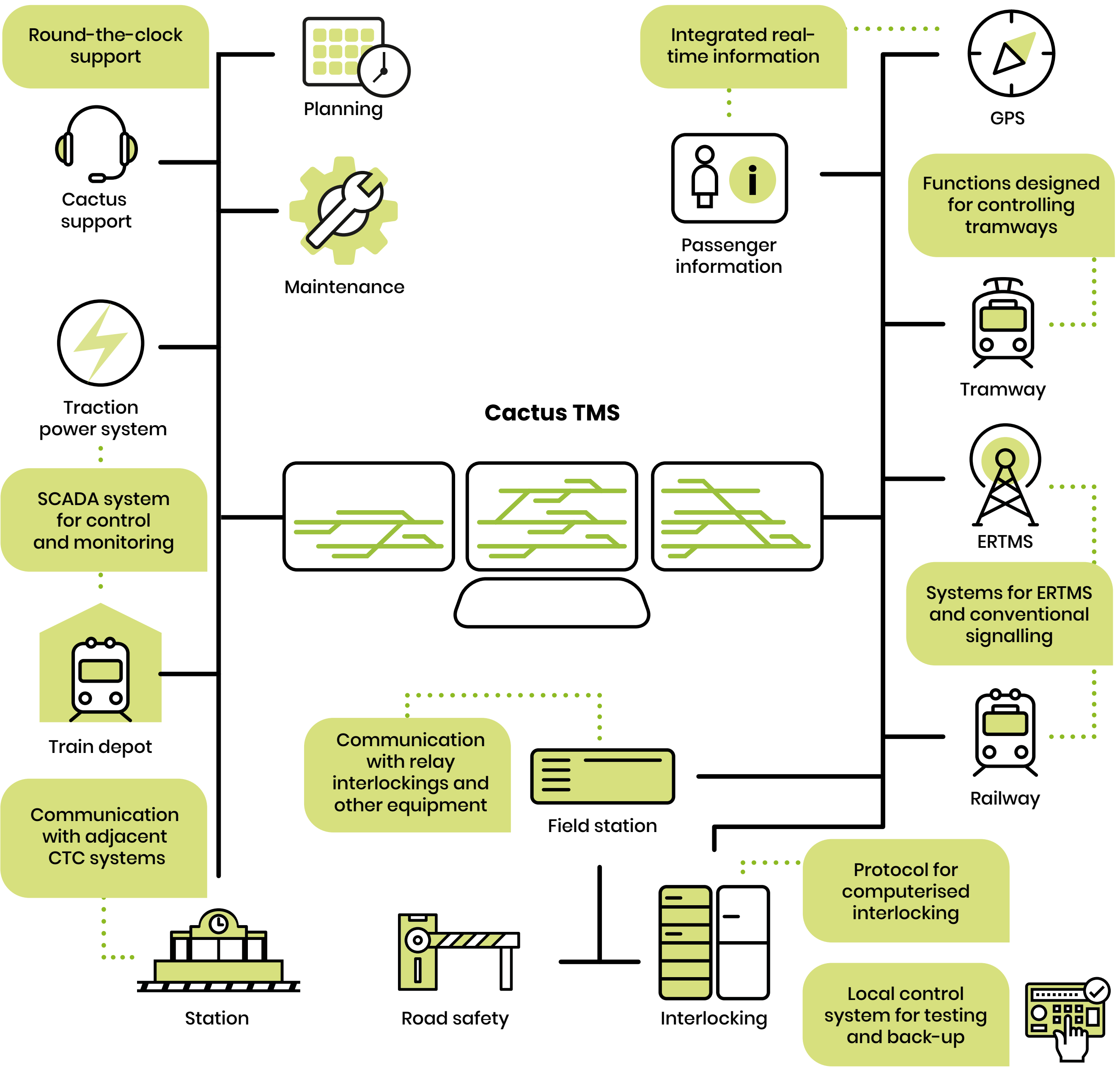
A system for every need

A Cactus TMS has sufficient capacity to centralise the management of a large number of lines. But it is also sufficiently scalable to act as a local control system to manage individual interlockings.

Because we develop all the software ourselves, we can easily adapt and add functions to meet our customers' various requests and needs.

Ready for Europe

Cactus Rail also supplies traffic management systems for the Swedish roll-out of the new European standard ERTMS L2. The system is suitable for the new generation of interlockings and can also communicate with RBCs and other ancillary systems.



Operational reliability – it goes without saying

We have many years of experience of building reliable and safe systems, and our existing traffic management systems are a good example of this. Cactus TMS is based on a redundant architecture with dual servers and at least two workstations. For extra security, the servers can also be placed in different geographical locations.

We can adjust the number of workstations and their locations completely to your needs and preferences. Even if hardware or communication links should fail, the redundancy in the system will keep it operational.

Requirements and standards

Cactus Rail is certified under ISO 9001:2008. In our development, we follow the standards and norms that our customers specify for their projects, such as the European standards EN50126, EN50128 and EN50129.

Your expert partner. Available all around the clock.

At Cactus Rail we offer expert know-how to help optimise rail traffic. We have been supplying traffic management systems to Nordic railway operators since the early 1990s.

Over the years our speciality has been to replace the control of regional railways with Cactus TMS. Our experience of different systems and communications solutions means that we can also act as a respected subcontractor and partner to other suppliers.

Optimise operations with existing infrastructure

A major advantage of using Cactus TMS is that you do not need to replace existing infrastructure, such as interlockings, planning systems and other ancillary systems, to optimise and rationalise the operation of the line.

By switching to Cactus TMS you get a modern user interface with functions for automatic route setting, train number handling and supervision of traffic.

All tailored to your individual needs

Because the system is easy to reconfigure, you can decide for yourself when and how you want to make future investments in the line.

From system deliveries to pure consulting assignments

Our long experience as systems integrators means that we can quickly take on various types of assignment. That is why we are constantly looking for projects where we can act as subcontractors to the international operators.

The jobs we do range from system deliveries to pure consulting assignments, where we can take responsibility for system design, configuration, testing, commissioning and support. We also have expertise and products to fit out control rooms.

The Nordic market faces massive investments in the coming years.

We are equipped to help, and we are ideally placed – at the heart of the Nordic region.

What customers appreciate most of all

The "Cactus spirit" has become something of a byword among our customers. It includes carrying out projects in the designated time and within the agreed budget, and doing that little bit extra to satisfy the customer.

Compared to the large systems suppliers, Cactus is a small company. This has many benefits for you as a customer:

- Flexible organisation with short lines of communication.
- Genuine customisation at a reasonable cost.
- State-of-the-art systems, based on the latest technology.

Our gem. Our smart traffic management system.

Cactus TMS contains all the parts you expect from a traffic management system. Constant development of our customer systems means that Cactus TMS is both new and tried-and-tested.

The system includes all the essential functions for centralised control and monitoring.

Easy to integrate into your existing infrastructure

Over the years, the people at Cactus Rail have become expert at adapting the system to our customers' needs, their existing infrastructure and neighbouring systems.

In our projects, it is a matter of course for us to produce the communication protocols required to integrate with other systems. The protocols are always supplied with detailed logging functions, giving complete control over the interfaces.

Poor connections, long distances?

We have extensive knowledge of establishing communication with other systems, even over poor connections and long distances.

This gives us an excellent foundation for streamlining operations as the control centre can be located wherever the customer wants – in one or more places.

Exchanging information with other systems

Examples of external systems that we interact with in our deliveries:

- Interlockings (computerised or relay-based).
- Passenger information.
- Timetable planning tools.
- Train positioning systems (GPS, RBC, AVL, AVI, etc.).
- External and neighbouring CTC systems.
- Trackside equipment.
- Freight yard objects.
- Traction power system.

By coordinating the information in Cactus TMS we can limit the number of systems while providing greater user-friendliness and improved transparency.

Making railways smarter, bit by bit

Unlike most, we view system modernization as a gradual process, integrating smart software with existing infrastructure to offer future-proof solutions at a fraction of the cost.

In several projects where we have modernised the traffic management system, there has been a mixture of different types of interlocking, with demanding requirements for integration between old and new technology. Computerised interlocking is connected via the interlocking supplier's protocol. There are such ready-made protocols for several interlocking types, such as:

- Alstoms Ebilock family.
- Hitachi Rail STS, Microlok II.
- Hitachi Rail STS - M11.

To communicate with relay-based interlocks, we use our own field stations or a field station specified by the customer.

Portable local control system for testing and back-up

To make it easy to control new interlocking configurations, Cactus Rail has also developed a portable local control system in a laptop computer.

The computer can be connected to the interlocking either directly or via a network. This is an ideal tool when a new configuration needs to be tested when the interlocking has been modified, or as a back-up system.

New or updated data can easily be imported into the system by docking the local control system to a configuration server via the network.

All types of control room equipment

Cactus also has the know-how to help you fit out the control room. We can offer all the equipment you need, adapted to your own needs and preferences. The delivery includes everything from operator desks, chairs and display screens and associated equipment.

Our range of solutions extends from large video wall systems to small LCD/LED systems, CCTV solutions with controllers and software.

Because we are used to working with systems that demand extremely high availability, we can offer solutions with perfect image quality 24 hours a day, 7 days a week.

Increased monitoring with SCADA

Cactus TMS also allows you to integrate SCADA functionality to gather and monitor analogue values such as temperatures, operating times, etc.

These values can be threshold-monitored with alarms or presented to the customer in some other way.

To handle more complex SCADA systems we have produced a special platform, Cactus Eye. This can be used to manage and monitor systems such as traction power systems and depots, and to link systems together at an overall level.

Please see our website for more information.

A user interface to suit everyone.

Cactus TMS offers modern window management where the traffic manager can adapt the workstation to suit the area to be monitored.

Examples of images that the traffic manager can choose from are:

- Overview track layout.
- Station track layout.
- Panoramic track layout.
- Mosaic track layouts.

Configuration tools

The system always includes tools for configuration, making it possible for authorised staff to create new track layout pictures and objects or modify existing ones.

The customer can always decide which symbol system to apply. The track layouts are usually based on a 'macro object', normally a whole station. The object then forms the basis for creating the various images types that arise.

Different users and access rights

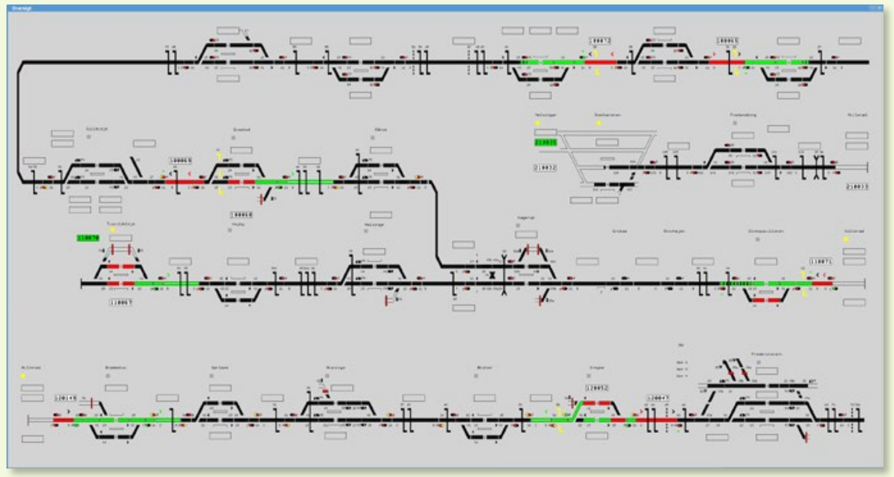
Cactus TMS is designed to manage and monitor a large number of lines, where traffic managers, engineers, maintenance and administrative staff depend on concurrent access to information in the system.

When you log into the system, it displays the functions that your user group has access to.

Within the system, the traffic managers can choose the levels of access to be controlled and monitored. The choice may be by station, by sub-section, or for whole lines.

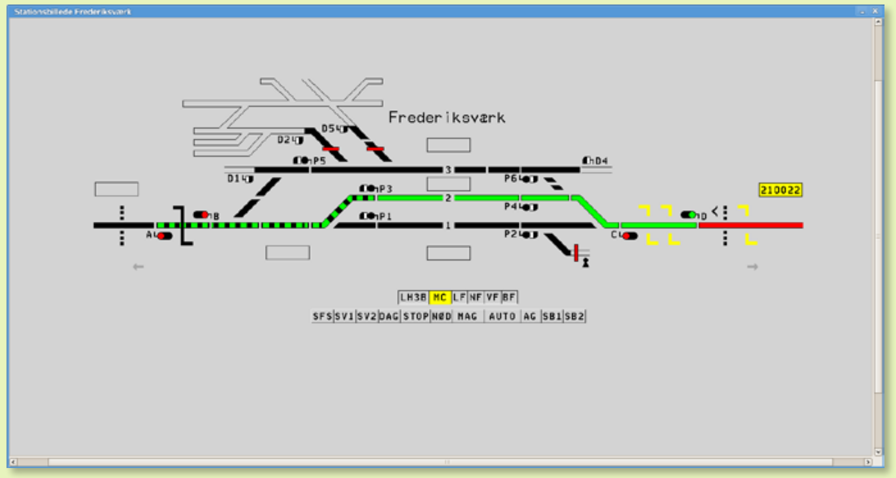
Overview track layout

Give the traffic manager an overview of the whole traffic situation.



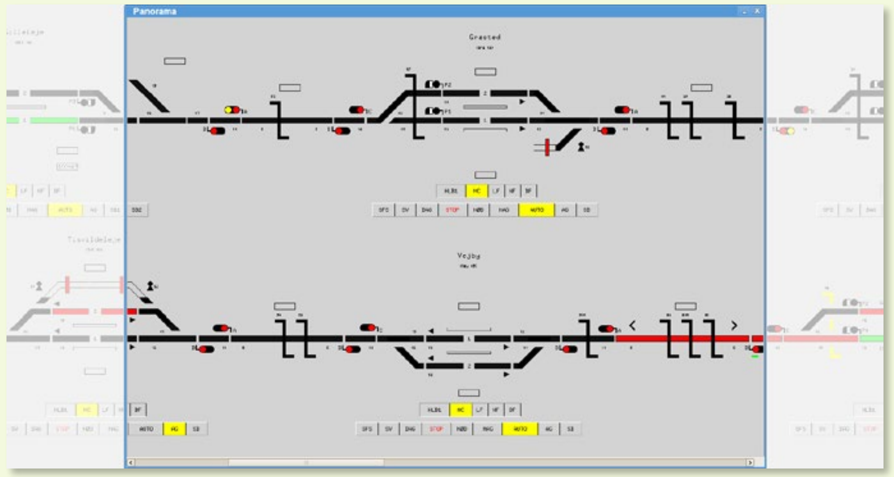
Station track layout

The traffic manager can obtain more detailed information for a given station.



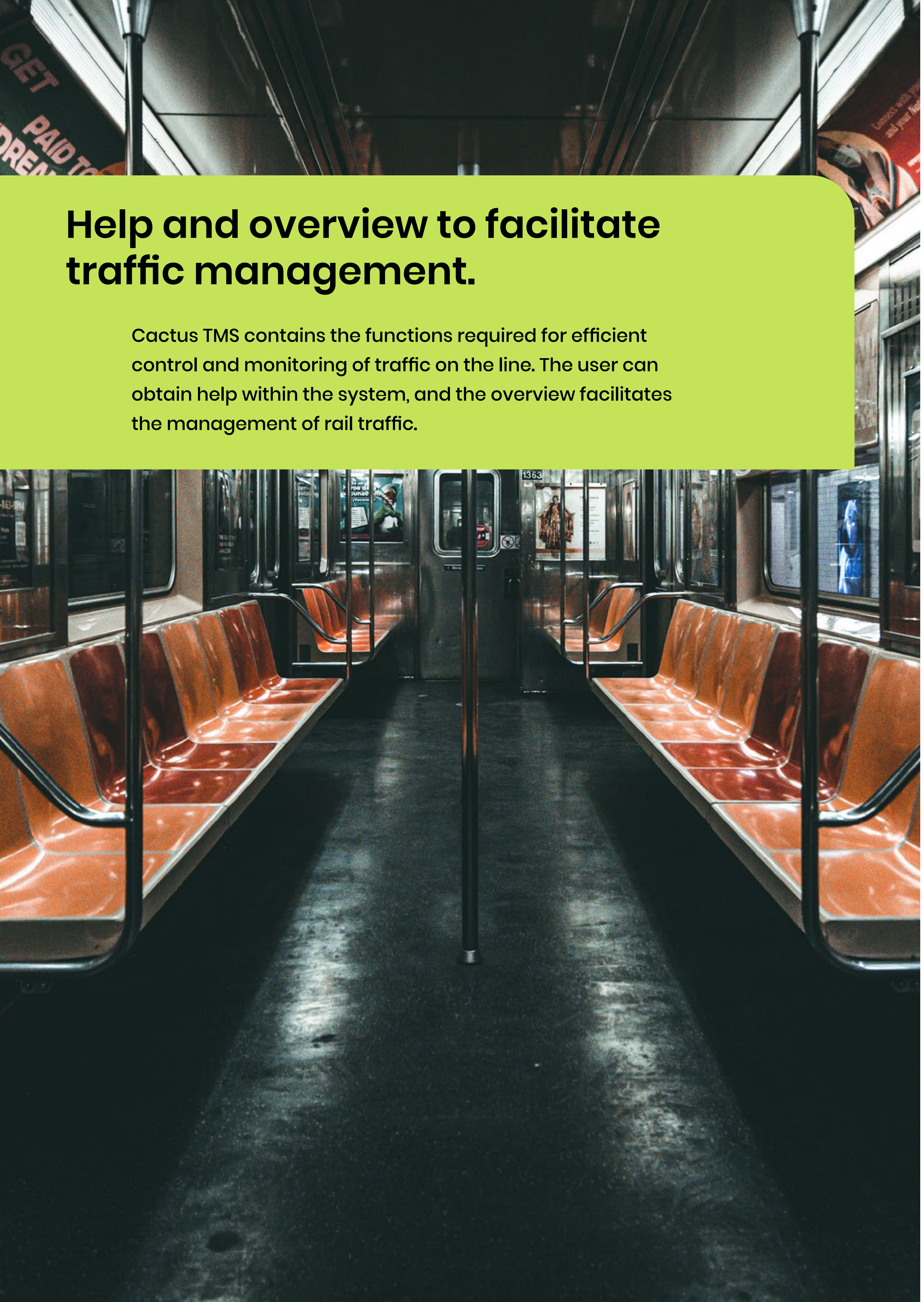
Panoramic track layout

Follow the whole length of the line, station by station, with no breaks.



Mosaic track layout

Quick detailed station track layout for a sub-section of the line.



Help and overview to facilitate traffic management.

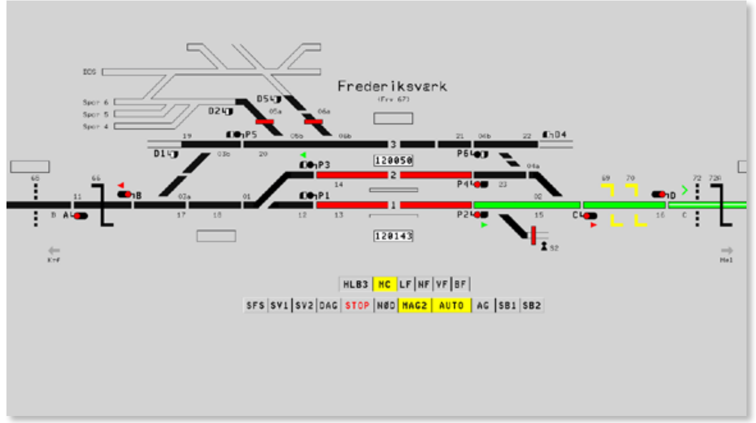
Cactus TMS contains the functions required for efficient control and monitoring of traffic on the line. The user can obtain help within the system, and the overview facilitates the management of rail traffic.

Automatic operation delivers many benefits

In normal operation, Cactus TMS manages the traffic completely automatically. Train routes are set with the aid of information from the timetable. Automatic operation gives train managers time to carry out other tasks or concentrate on any problems.

In automatic operation, the system can make changes to reflect the current traffic situation. The traffic manager also has access to several modifiable parameters to trim the automated system where necessary.

Manual management of route setting can take place in various ways, by mouse or keyboard commands – the operator decides.

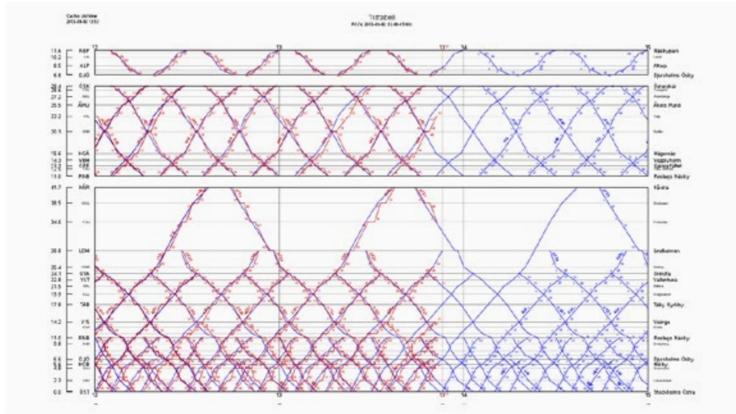


The train graph provides an improved overview

The train graph is a key tool for the traffic manager. It shows train movements in relation to the relevant timetable, along with past movements and forecast changes in traffic.

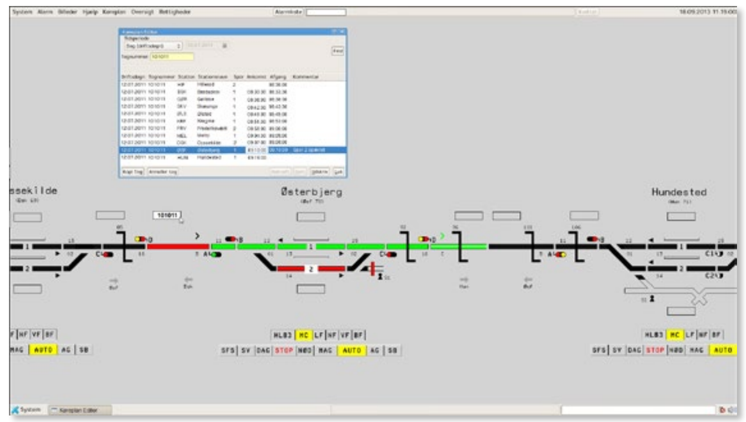
The train graph is an important tool for detecting and resolving future conflicts. It can also be used as an aid to study the utilisation of track capacity. The traffic manager can zoom vertically and horizontally for a higher degree of detail.

With one click the traffic manager can view detailed information on each train and enter notes. It is also possible to launch various kinds of customer application or link directly to the relevant station track layout, timetable or other information.



Simple handling of timetables and train numbers

Cactus TMS constantly monitors the traffic and compares it with the timetable. We adapt technology for importing timetables into your operation. Colour-coded images mean that the traffic manager is immediately provided with information about variances and can take swift action. In the track layout, the traffic manager can gain direct access to a detailed timetable for every train by selecting the train number. This also provides details of punctuality at stations passed so far. The traffic manager can enter comments in the timetable as an addition to the punctuality report. The system also allows the user to create new timetables or make changes to existing ones.

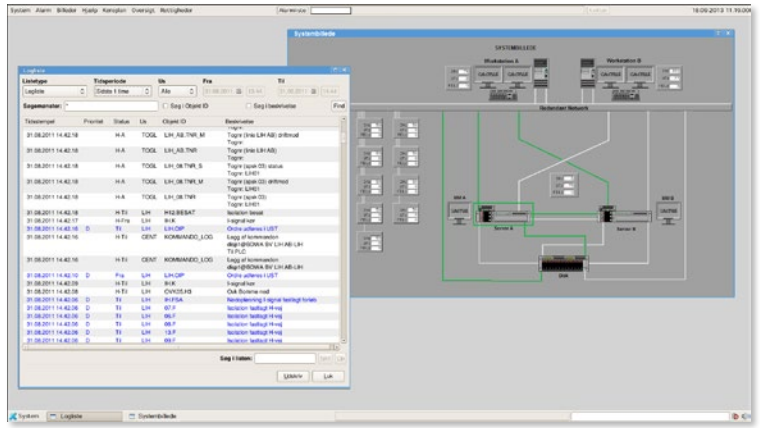


Simple and fast monitoring of operations.

Different users have different needs for information on the operation of the system. Cactus TMS can satisfy everyone's wishes.

Logging of incidents and alarms

Cactus TMS continuously stores everything that happens in the system. A typical log file contains several million events. The log files are archived automatically every day and data can be saved for as long as you like. It is easy to search for the relevant information by alarm class, intensity, line section, etc. In Cactus TMS there are alarms defined both to monitor system functions and to monitor traffic. All alarms are clearly indicated in system and track track layout and can be easily identified in the log files. The alarms are classified by severity and have to be acknowledged by either the traffic manager or maintenance staff.

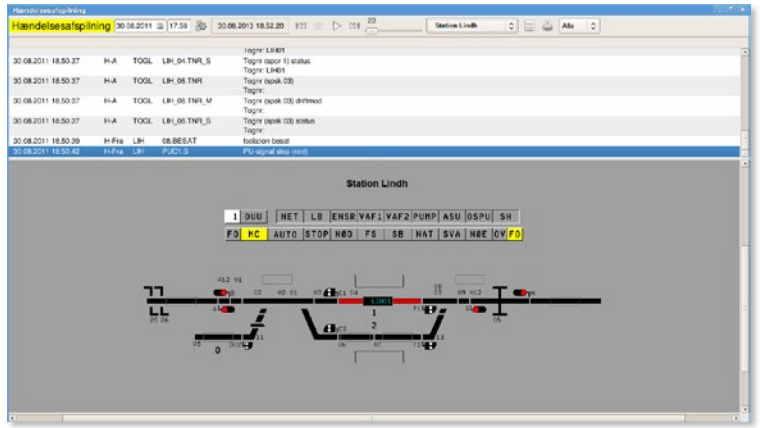


Event playback

Event playback is a powerful tool whereby stored events and alarms can be played back against the relevant track layout. The traffic manager can easily analyse what happened at the specific time.

In the event playback function the traffic manager can play back the sequence of events one by one or continuously, at different speeds. The information is shown in the track layout and the log. This is an indispensable tool in incident analysis and trouble-shooting.

Playback and analysis can be handled on the traffic manager's normal workstation or from a remote workstation, which means that Cactus Rail can always provide support for fault analyses and investigations.



Follow-up and reports

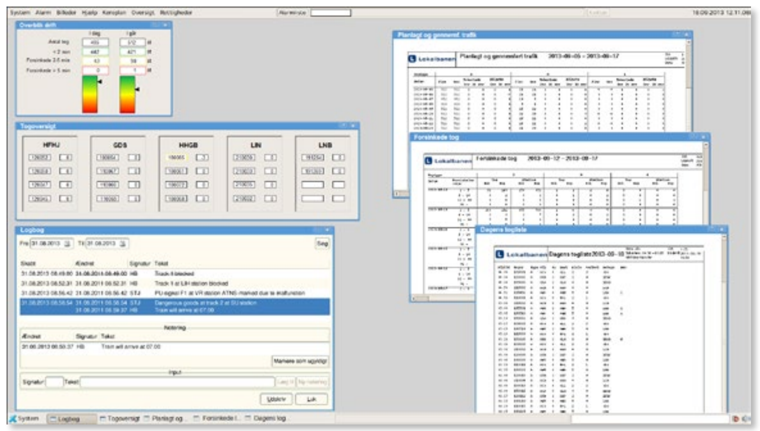
All the parties involved – railway owners, traffic managers and passengers – want the best possible punctuality. Here too, Cactus TMS can provide follow-up reports and indicators to show the actual flow of traffic.

In Cactus TMS it is easy to produce statistics on how the traffic has been running.

Examples of reports:

- Planned and actual traffic.
- Delays in relation to the timetable.
- Alarm statistics.

It is also easy to export data for further analysis.



Separate substation with added value.

With Cactus TMS we also offer our own substations which are completely integrated. This means, for instance, that configuration modifications can take place directly and online – even over poor and long-distance connections.

With our substations you can easily communicate with relay-based interlockings.

Computerised interlockings

Communication with newer computerised interlockings takes place over networks using the interlock supplier's protocol.

Interlockings with relay technology

For older relay-based interlockings, the interface to the traffic management system is wired, signal by signal (input and output signals), with a number of relays in the interlocking. Then we link up with the aid of a substation equipped with I/O cards that connect to the relay interface in the interlocking. This technology can be used for practically all variants of relay-based interlockings.

Free choice of substation

As a customer, you can choose to use one of our own substations or equipment from a different supplier.

Cactus C20 – for small to medium-sized installations

The Cactus C20 is a compact, cost-efficient substation. Despite its small size, it is a fully fledged Cactus substation.

A compact housing, low power consumption and space-saving assembly options on a DIN rail are other valuable characteristics.

Approximately 200 I/Os can be connected to a Cactus 20, making it ideal for remote control of relay interlocking for a smaller station with 2-3 platforms.

Cactus C200 – for large systems

For supervising large stations, we can offer the Cactus C200. Approximately 2,000 I/Os can be connected to this substation via Profibus DP.

The C200 can be equipped with a display for local control options. The C200 can also be programmed to accommodate a variety of protocols, such as IEC60870, or older protocols such as Comli or Modbus.

Encrypted communication using SSH over TCPO/IP and a safer restart after a power failure are also included.

Support and training on your own terms.

Delivery and commissioning of a traffic management system are important, but they are only part of the story. At least as important are support and training.

We are able to offer 24/7 support all year round. To meet your specific needs and demands for service and maintenance, Cactus Rail offers three different service level agreements: Bronze, Silver and Gold. All three levels include:

- A dedicated contact person.
- Telephone advice.
- Simple fault reporting by phone, e-mail or fax.
- Remote assistance.

Training is a natural part of every project

Training is always included in our projects.

A new TMS is a big change for you and your staff. Training is therefore essential if you are to gain acceptance for a new system and assure quality and security. There are no ready-made course plans here.

Instead, we tailor the training to the individual TMS, the installation, the needs of the staff and your own preferences.

Gold

Service round the clock, all year round. The agreement is adapted to your needs.

Silver

Includes service during office hours and at weekends as well.

Bronze

Service during office hours.

In your industry and ours, experience is invaluable.

We delivered our first traffic management system to Storstockholms Lokaltrafik and the Roslagsbanan line in the early 1990s.

Today our reference list covers everything from the Haparandabanan line in the North to Denmark in the South.

Stockholm Metro (SL)

A new control system for the red and blue subway lines in Stockholm, along with 25 years of support, are the highlights of the agreement between us and Stockholm Public Transport (SL). In a few years, we take on the responsibility for the traffic control system for 250 million passengers annually.

The new system is not only necessary to ensure the continued operation of the subway; it is also crucial for the implementation of the major expansion plans that are currently underway within Stockholm's subway network. Extensions of current lines and new routes are in the pipeline.

The Haparandabanan line

Cactus Rail has supplied a completely new CTC system which is compatible with ERTMS L2. The system is being used by the Swedish Transport Administration to roll out the new European standard. The first CTC system has been installed at the traffic management centre in Boden and controls traffic on the Haparandabanan line.

For this delivery, we are subcontractors to Hitachi Rail STS. In the development work, Cactus Rail has followed the CENELEC standards EN50126, EN50128 and EN50129.

Lokaltog A/S

Cactus TMS manages five railway lines on Zealand in Denmark. The lines are operated and monitored from a common Operations Centre at Hillerød with the Cactus TMS.

Lokaltog A/S opted to retain existing interlockings and upgrade its traffic management system. This gave the train operator a cost-effective modernisation with better punctuality and safer and more efficient operation.

Several leading suppliers took part in the tendering process.

Cactus Rail won the contract because it offered the best price performance, excellent references and a flexible, powerful traffic management system.

National Traffic Control System in Sweden

2015 Cactus Rail received a contract for a sub-system to the National Traffic Control System (NTL). The contract also covers development and maintenance of the system. The delivery is a sub-contract to Alstom Transport with the Swedish Transport Administration as the end-customer. The NTL is an important part of the Swedish Transport Administration's project to improve punctuality, customer communication and capacity utilisation in the rail network all over Sweden. The engagement of Cactus is part of the roll-out of ICONIS, the new traffic control system from Alstom Transport.

Scan the QR code to stay on track with our exciting journey with SL!

A small enterprise with colossal aspirations

We'd like to call ourselves a soft company. Why? Because soft values run thick through our veins. We're not just selling secure software for railway systems that challenge the market; we also believe that personality matters.

If you work in the railway industry we share your passion for socially essential infrastructure with demanding requirements for operational reliability.

From the beginning...

We've come a long way as a company. Once upon a time, we developed systems for water, nuclear and district heating. In 2015 we decided to be all about rail. Cactus Rail was established, focusing on creating traffic management systems for railways. We remain committed to innovation, sustainable excellence, and providing exceptional customer service – and our sights are set on redefining the industry.

A fresh, cost-efficient view

In a sustainable world, the need for future-proofed mobility solutions is central. Railway transportation is at the heart of it – illuminating the important role we have to play. We are a dynamic tech brand, offering a fresh view on railway traffic control systems. Yes, our dedicated team takes your aging railway and revamps it into a modern efficient system. And, more importantly: we do it swiftly, cost-efficiently, sustainably and always on time.

What makes us unique

At Cactus Rail, we see the modernization of railway systems as a gradual process. We develop our smart and secure software systems to go hand in hand with existing equipment as much as possible, and never default to summarily replacing infrastructure like interlockings, planning systems, or other ancillary systems.

This is what makes us unique – and, as an added bonus, it is also what enables us to offer future-proof solutions at a fraction of the cost that a more extensive overhaul would amount to.

Smartening up our railways

Are you an infrastructure owner? Is punctuality, comfort, cost-efficiency and sustainability important to you? Welcome aboard. Unlike most, we view system modernization as a gradual process, integrating smart software with existing infrastructure to offer future-proof solutions at a fraction of the cost.

A bit smarter, one might say.

cactusrail.se

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