Getting You There Safely

Control and Safety Systems

Safe Transportation All Along The line

HANNING & KAHL


RIVERFRONT


PARKER ROAD


METRO

Control and Safety Systems
Safe Transportation All Along The Line

Control and safety systems made by HANNING & KAHL set technical standards and are successfully deployed all over the world. Our partners are transport authorities, private and industrial railways, point manufacturers and consultants, none of whom are prepared to compromise on safety.

Competence since 1928

The technical superiority of HANNING & KAHL modules and systems results from almost a century of experience: the company has been producing components for rail-based transportation since 1928 and consolidating this core competence ever since.

We offer customers an extensive, systematic range of products for rail-based transportation, and have the right components, systems, techniques and equipment for your application.

HANNING & KAHL is certified according to all major standards: ISO 9001, ISO 14001, OHSAS 1801 and IRIS (International Railway Industry Standard).

The best solution for you

HANNING & KAHL control and safety technology is individually engineered and designed for each particular application. By accompanying you through the project-planning phase, we quickly learn your requirements and can apply our experience right from the beginning – to your advantage.

Before equipment or components are supplied, they are put through their paces in our Quality Assurance Centre, where a wide range of test environments and methods are available. On request, we also offer a Factory Acceptance Test (FAT) during which the product is assessed and tested in the presence of our customers. FAT also provides instruction in the use of the innovative technology.

HANNING & KAHL control and safety concepts are the result of successful symbioses of economically-efficient series production and individual design. This leads to technically precise and reliable solutions with fast returns for operators – another reason why our products are at home all over the world.

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1| SYSTEMCOMPONENTS

1.1 Control systems

The Vital Processor System HN-P is modular and tailored to customer requirements. At the heart of the system is two-channel microprocessor technology with an exemplary safety profile up to SIL 3.

Basic installations and complex requirements can be efficiently implemented with the Vital Processor System HN-P. Features like the electronic event recorder, connection of external systems and additional components, and integration into a networked communication structure ensure a high degree of flexibility.

Vital Processor System HN-P

Today, complex demands are made on vital processor systems as core components in control and safety technology, such as automatic train control and electronic interlocking, which call for safety integrity level (SIL) 4. To fulfil these tasks, we have designed the new vital processor system H***VIP,*** HANNING & KAHL Vital Interlocking Processor.

The concepts we have elaborated consider current and future market requirements, customer wishes and modern technology. The HANNING & KAHL Public Process Data Interface (PPDI) in conjunction with modern LAN interface technology ensures future-proof realisation of process visualisation and telecontrol. Complex installations are simplified by division into control segments with high availability. An adequate number of interfaces and data services has been defined and developed. Standard peripheral equipment can be connected via a special BUS.

In the HVIP, we have kept to the successful concept of modular design and flexible extension. The processor systems can be adapted to control requirements and scaled accordingly.

*HANNING & KAHL Vital Interlocking Processor H**VIP***

1.2 Vehicle detection

When it comes to registering vehicles, determining positions and securing routes, you have these processes safely under control with HANNING & KAHL systems for vehicle detection. To secure routes and passively detect rail vehicles, HANNING & KAHL adapts its own systems to project requirements.

HFP track circuit for detection of wheelshunt
When axles produce a short circuit (< 0.3 Ohm, max. 5 uH) in the track area, rail vehicles are recognised by the electronics. This way, the HFP track circuit detects the vehicle passively and does not require insulated rail joints.
The effective length of the HFP track circuit is limited solely by short circuit connectors from rail to rail. Double track circuits are constructed by adding another track circuit receiver in the track, to detect the driving direction of vehicles. Track circuit length can range from 12 to 400 metres.

HFK mass detector circuit for detection of vehicle mass
The robust system operates via an electric oscillating circuit, which indicates a change in frequency when a rail vehicle crosses the HFK mass detector coil with its metal mass. For safe protection against humidity and mechanical strain, mass detection coils and electronic components are cast in a plastic frame.

HSK blocking circuit for detection of combination of wheelshunt and vehicle mass
The HSK blocking circuit recognises the entry of rail vehicles passively by the wheelshunt (< 1 Ohm, max. 5 uH) produced and it recognises exiting vehicles by the reduction in vehicle mass detected. The HSK blocking circuit functions without insulated rail joints, its effective range is limited by short circuit connectors. Standard length can be 3 to 12 metres.

Axle counters
Wheel sensors before and behind the control segment count the axles of entering and exiting trains, ensuring that one train has left the section before another can enter. Untimely point setting (haste, lack of concentration, sabotage) or incorrect "Drive" signals are thus precluded.

Overhead line contacts
The HON system is a non-contact overhead line contact which is attached to the catenary wire and reacts to the carbon brush on the pantograph. The system includes a buffer stage for galvanic separation of voltages and an evaluating module.

Automatic train control
In areas where “Driving at Sight” is not possible, e.g. in tunnels or at speeds higher than 70 km/h (BOStrab § 49 Abs. 2.2), trains must be technically monitored and controlled in the event of dangerous irregularities. Inductive or magnetic immobilisers installed at the Drive/Stop signals are activated when a signal which indicates stop is passed. Brakes are applied automatically if driving errors occur.

HFP track circuit

Axle counters

Overhead line contacts

1.3 Event recorders

In order to be able to reliably reconstruct and document events on signalling installations or controllers in the event of a malfunction, an electronic event recorder which works independently of the rest of the controller logic is deployed. The event recorder can be deployed in all HANNING & KAHL controllers and also in other makes.

Memory capacity can record several hundred runs. Interrogation is possible via laptop on location or remote. Events can be visualised graphically.

Event recorders

1.4 Communication systems

HANNING & KAHL HCS communication systems are optimally tuned for information exchange between vehicles, the wayside and central control rooms. Performance profile ranges from transmission of manual setting commands to two-way exchange of information. Avail of the safety and convenience of HANNING & KAHL communication systems for the following applications, for example:

- Point setting
- Route setting
- Influencing of signalling installations (traffic acceleration)
- Passenger information
- CAD/AVL systems (ITCS)
- Data collection for diagnosis purposes
- Vehicle tracking

HCS wayside equipment

HCS-R communication system
The HCS-R communication system has proven itself in operation a thousandfold all over the world. With state-of-the-art microprocessor technology, the HCS-R system is extremely flexible and can be used in multiple applications. It allows wireless transmission of commands and information from vehicles to the wayside (one-way) and integration of the HCS-R system into networks and management systems.

HCS-V communication system
The two-way communication system HCS-V facilitates wireless transmission of information and commands from vehicles to wayside and vice versa. The HCS-V system consists of vehicle and wayside equipment and has the same performance characteristics as the HCS-R system described above. The state-of-the-art technology with two-way design offers many application possibilities and more advantages.

HCS-P communication system
The HANNING & KAHL HCS-P system is based on modern RFID or WPAN. In contrast to other well-known communication systems, HANNING & KAHL technology works with much higher frequencies in the microwave range. Thanks to the narrow band range and high carrier frequency, the system is interference-resistant, making communication between vehicles and wayside much more stable and safer than with conventional systems.

HCS carborne equipment

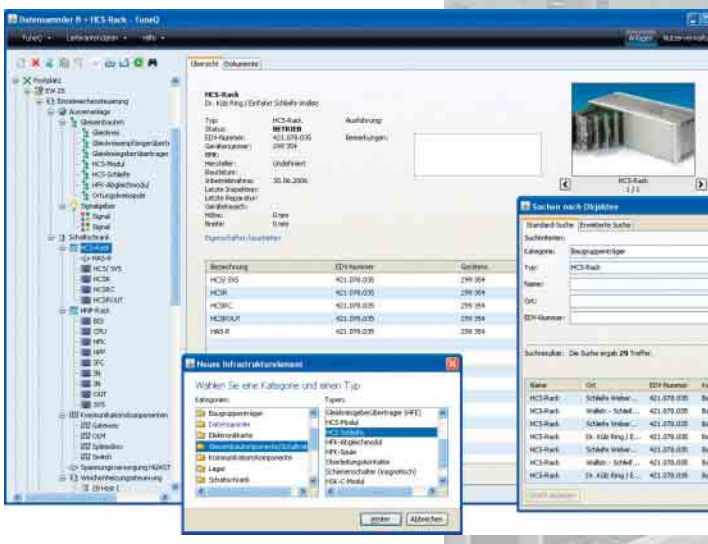
1.5 Diagnosis

To reduce service work to a minimum, HANNING & KAHL has developed a family of diagnosis systems.

FADIS – the route diagnosis system
When points and wayside/line equipment are equipped with FADIS®, you are always informed of point condition. Possible disruptive factors are signalled. You can react in good time and thus ensure the availability of your line network. FADIS® facilitates extensive remote diagnosis and provides unsurpassed transparency in infrastructure management – very useful when planning maintenance work. The data acquired can be stored in a database (network) and made available for other applications (e.g. TuneQ).

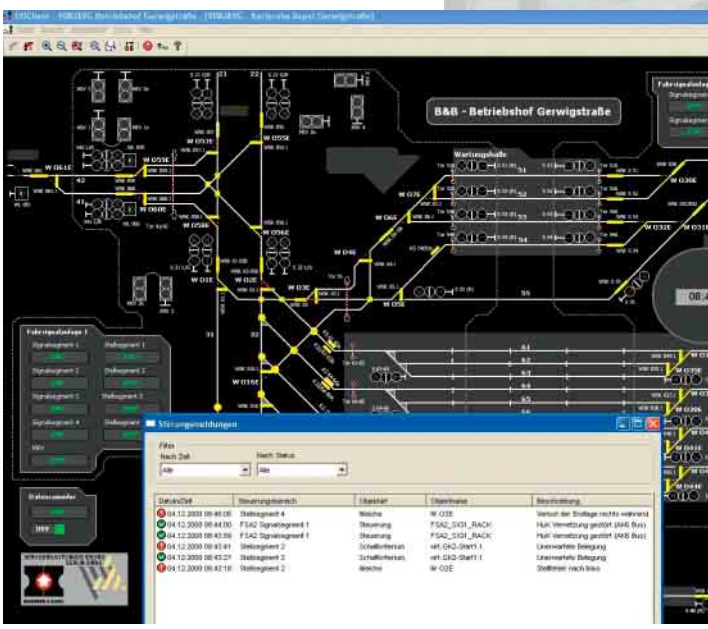
FADIS workstation

TuneQ – Tuning your Equipment
TuneQ profits above all from the fact that HANNING & KAHL as a supplier of infrastructural equipment is involved in development right from the beginning, thus laying the ideal foundation for successful infrastructure-data management. Time-consuming acquisition of infrastructure data is reduced to a minimum by qualified provision of equipment data, CAD diagrams, sub-assembly catalogues and parts lists in electronic form. TuneQ adheres to standard 456 of the VDV association of German transport authorities.
The TuneQ equipment manager is the core component of the system. In this component, all infrastructure objects to be represented are tracked from the beginning of the planning phase until write-off. Depending on type, objects can be divided into interchangeable sub-assemblies and also components. Evaluation of the history of installations and installation parts is a particularly important function of the system.
To administer all the information available on the equipment in the system, it is not sufficient to record equipment master data in the designated dialogues. Therefore, we have integrated a document management system DMS, via which all available documents can be stored with a link to the corresponding installation.
The malfunction data furnished by connected diagnostic systems and manual recording facilitate detailed TuneQ Analysis of the equipment, providing manufacturers and maintenance staff all the information they need to derive an optimal maintenance strategy.



Master data and picture and document administration with TuneQ

Event viewer
The event viewer is a higher-ranking event and malfunction memory, with which networked equipment can be visualised, giving an overall picture of events and malfunctions on several controllers. The event viewer is particularly indispensable on depots and networked systems.



Event viewer

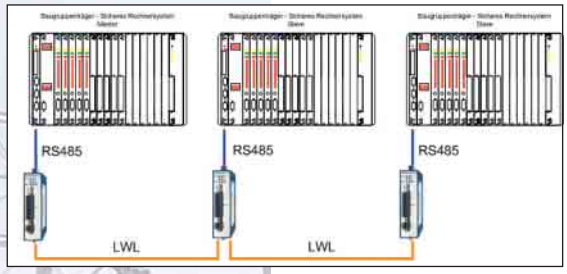
1.6 Interfaces

We use powerful, modern technology to exchange data between controllers.

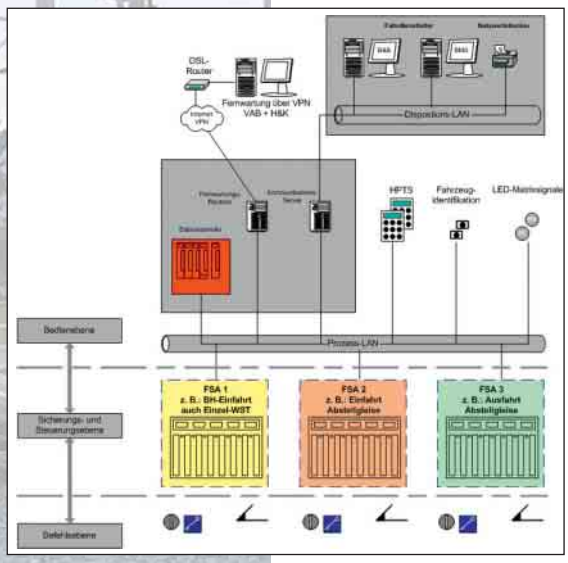
Ethernet networking
HANNING & KAHL deploys modern networking on the basis of industrial Ethernet. In particular when planning and designing depot controllers and wayside equipment, this technology facilitates maximum efficiency and flexibility. Connection to higher-ranking computer systems (Operate & Observe, control systems, depot management systems) is thus state of the art.

Controller networks
Local controllers are networked via LAN. A standard bus system guarantees safe communication and easy extension. Copper or fibre-optic cables can be used depending on customer requirements. Ring, star or redundant structures are possible.

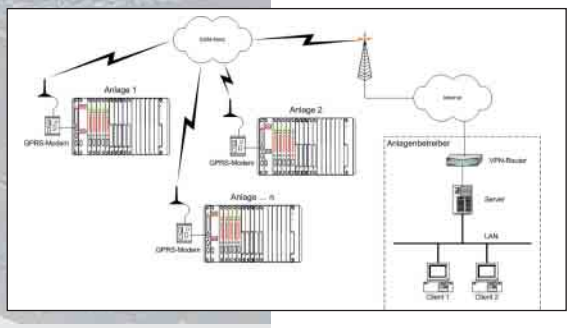
Telephone lines, GSM or GPRS
HANNING & KAHL uses networking via existing communication channels such as telephone lines, GSM or GPRS to read out event recorders remotely, relate malfunctions and transmit FADIS data to a central control room.
Advantage: Access via existing communication channels means cable investments are not necessary. Simple and at low cost.



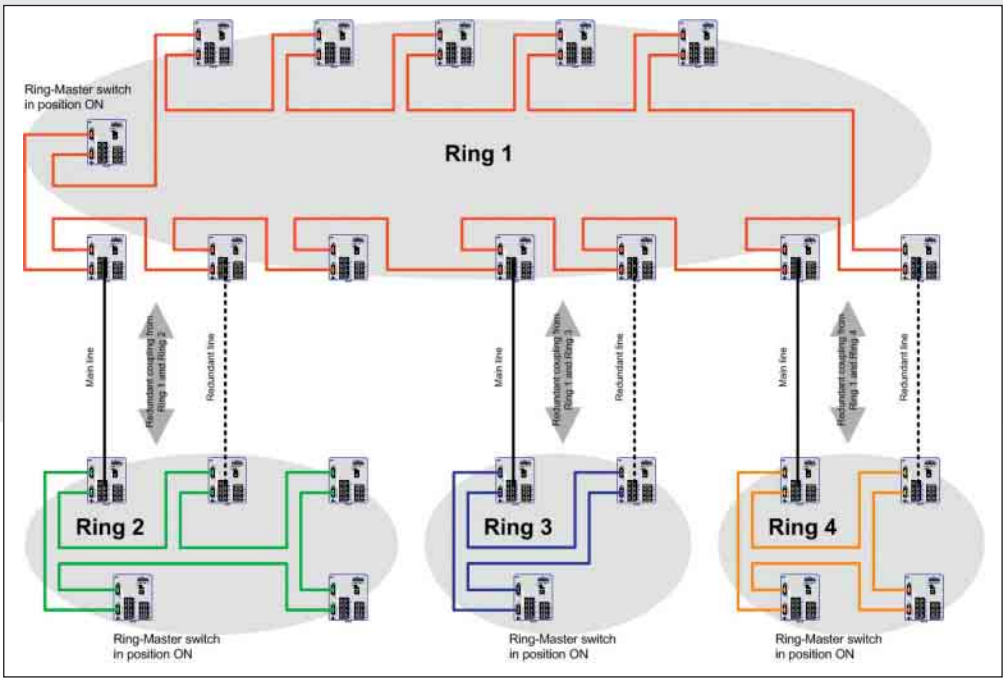
Controller networking



Depot networking concept



Networking via GSM or GPRS



Redundant ring structure

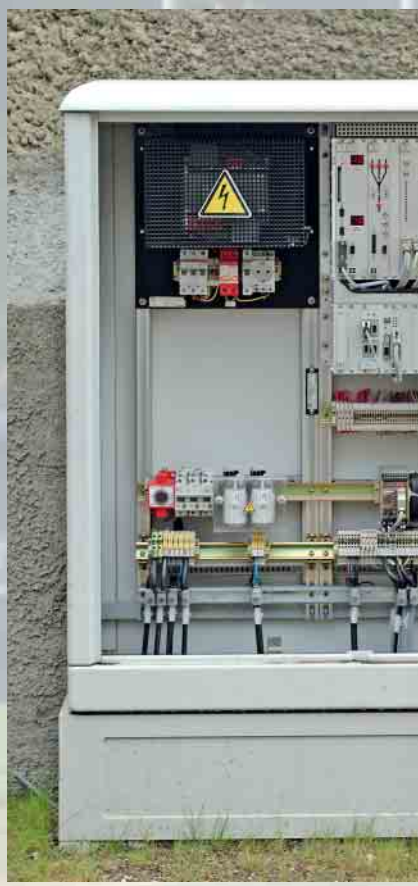
2 APPLICATIONS

2.1 Point controllers

HANNING & KAHL offers economically-efficient solutions in modular design even for the control of single points. After analysis of requirements, HANNING & KAHL configures customer-specific point controllers which function safely.

At the heart of each HANNING & KAHL point controller is the innovative Vital Processor System HN-P. This powerful and stable system works with unsurpassed reliability and can be supplied with each commonly available detection and communication system. The point controllers fulfil the requirements of the German BOStrab and all international standards.

The superior technology of HANNING & KAHL point controllers can also be deployed in multiple/sequence point controllers, which means that each unit can be extended by modules.



2.2 Signalling installations

HANNING & KAHL designs signalling installations for each individual application. HANNING & KAHL's exemplary safety level complies with current standards. User-friendly operation ensures error-free sequences. The advantages include:

- Easy installation and commissioning
- High availability with low maintenance
- Integrated event recorder with convenient evaluation software
- Networking via fibre optics, bus systems etc.

Single-line track safety devices
If two-track operation is not possible for technical reasons; if it is interrupted by construction work or not economically efficient, driving operations are regulated by single-line track-safety devices. All HANNING & KAHL signalling installations are customized right from the project-engineering stage. We can offer you stationary and transportable equipment for connection of different types of switching equipment:

Terminal loops
At terminal stations and on line networks, vehicles have to change driving direction or park. This normally entails driving onto the opposite track (oncoming trains). This area must be secured with signalling technology to prevent collisions.

Crossovers
Crossovers which require signal protection are generally at the beginning and at the end of the line. They consist of electric points and a number of Drive/Stop signals. The task of crossovers is to guide trains into and out of stop station tracks safely and without delay. Controllers prevent collision and derailing.

Crossovers

Single-line track safety devices

Sidings

Single-line track safety devices

2.3 Safety installations for level crossings (SILC)

HANNING & KAHL's modular SILC concept offers you solutions in different technical versions and price categories to provide safety at level crossings. SILC can be adapted to actual system environments while focussing on optimum cost-benefit ratio.

A further advantage of the modular system: each SILC safety system can be adapted when safety or convenience requirements change. All HANNING & KAHL system components are optimally tuned to each other.

The result is precision-engineered, objective-oriented solutions that only an experienced partner can offer. At HANNING & KAHL, you profit from decades of experience with consummate concepts and sophisticated solutions: logically-consistent, fully-fledged and functional equipment.

2.4 Depot controllers

You would like to reliably dispatch and move tram and light rail vehicles safely, and organise and control sequences? HANNING & KAHL systems for control of depots make complex sequences transparent and safe.

HANNING & KAHL depot controllers prove themselves in daily operation all over the world. Users benefit from the following advantages:

- Basis of design engineering "Driving at sight"(SIL 2, if requested up to SIL 3)
- Route selection central or/and local
- Automatic route cancellation
- Modern VDU workstation or conventional control panel
- Storage of several route entries and partial delocking
- Possibility to set single points
- Integration into depot management systems possible
- Distributed intelligence, LAN and fibre optic technology
- Realisation of all runs which the track geometry allows, side protection possible
- Vehicle identification via HCS-R, HCS-V, HCS-P, HCS-Z or other makes such as VETAG, VECOM, IMU, ZUB and many more, for automatic route selection

Individual and economic solutions are possible with the modular design of HANNING & KAHL depot controllers.

Depot controllers

Getting You There Safely

O&O workstation

2.5 HN-EOW electric locally-set points

On secondary lines and depots and on industrial and factory railways, line systems have to fulfil specific requirements. The electrical locally-set point HN-EOW streamlines rail operations and relieves the strain on drivers simply and efficiently. When "driving at sight", the train driver can set points without getting out of his cab. He simply has to push the pushbutton at an operating station directly beside the track. The points are set electrically and the setting command is displayed visually. Rail vehicle detection switches and point position indicators ensure a high level of safety. Further HN-EOW components are available for even greater convenience and functionality – when ordering or later.

Electric locally-set HN-

2.6 HWE61 Switch & Control

Technical equipment deployed in container terminals is exposed to extreme conditions. The HWE61 Switch & Control system was developed for the particular requirements of container terminals. Engineers and operators all over the world are convinced by the legendary stability of HANNING & KAHL point machines. For special requirements: all components, including the point controller and signals, are embedded in the ground and can be crossed by heavy road traffic. Embedded installation ensures free transportation routes and prevents vandalism and unauthorized activation. The system is applied where availability requirement is high but space is limited, and conventional installations cannot be implemented.

Point heater controller

HWE61 Switch & Control

EOW

2.7 Equipment for testing vehicles

Vehicle failures on the line or accidents caused by malfunctions are costly for transport authorities. With HANNING & KAHL's new testing equipment, transport authorities can now test vehicle systems on their depots – automatically, conveniently and economically. Precautionary vehicle inspection can be integrated into routine sequences, decisively enhancing the safety standard. HANNING & KAHL equipment for testing vehicle systems is an investment with rapid returns.
A number of measuring techniques are available to test technical parameters:

- Wheelshunt
- Communication systems
- Vehicle identification
- Automatic train control (ATC)
- Current collectors /pantographs

The technical parameters can be visualised via the route diagnosis system FADIS or a depot management system.

Equipment for testing vehicle systems

2.8 Point heater systems

HCP

HANNING & KAHL has a wide selection of point heater systems with different voltage ranges and capacities for wintery regions. Point heater controllers ensure that point tongues do not freeze up/are not blocked by snow slush in winter. The point heater controllers can work independently with their own temperature and humidity sensors or be controlled from a central control room. Interfaces to FADIS and HN-P are integral.

2.9 Depot management systems

Before trains begin their daily operations, detailed planning, dispatch and monitoring tasks have to be performed on depots. Vehicles, parking places and workshop appointments are allocated, allowing for the requirements of timetable provision, technical vehicle service and maintenance work.

Depot management

2.10 Passenger information systems

Modern and customer-oriented transport systems provide dynamic passenger information. In cooperation with Verkehrsautomatisierung Berlin GmbH (VAB), HANNING & KAHL offers a modular product range for the construction of visual passenger information systems. The main components are systems for recording process data, a control and operating level, system communication and display systems.

Passenger information systems

3 I ACCESSORIES

3.1 Signals and signal poles

When it comes to representing signal aspects, LED signals are the superior technical and economic solution.

A large number of signal aspects are available for safety and information purposes. We manufacture customer-specific signals for all order sizes – i.e. even if you just order 1. LED technology holds enormous potential for the future. LED signals are available in different colours. For multifunctional applications we use our innovative combi-signals.
Intelligent matrix signals are also available for representation of almost every desired signal. HANNING & KAHL LED signal transmitters fulfil SIL 3 and are compatible with all common housing systems.

HANNING & KAHL offers a wide assortment of metal and plastic poles from simple straight versions to mast-arms. All poles are prepared for easy and fast mounting of signal transmitter housings.

3.2 Vehicle detection

HFK mass detection coils
HFK mass detection coils are specially designed for track installation and HFK mass detection circuits. Different versions are available depending on the application:
- HFK coil with external tuning module
- HFK coil with external tuning module, mounted in concrete polymer
- Mounting kit for installation of HFK coil on sleepers in open track

HFK mass detection coils

HFP track circuit transformers
Transmitter and receiver transformers supplied by HANNING & KAHL have proven themselves in HFP track circuits over decades:
- Symmetric connection cable (installation in the centre of a track in a rail box)
- Asymmetric connection cable (one-sided installation in a rail box)
- Symmetric connection cable (installation in the centre of a track without rail box)

The transformers have protected connections for connecting cable to the controller.

HFK track circuit transformer

HSK blocking circuits
HANNING & KAHL supplies all track installation components required for operation of blocking circuit systems. The components have proven themselves in years of practical application and are available in numerous versions: insulated tie bars, short circuit connector cables, blocking circuit connector cables, rail boxes, tuning capacitors, input/output junction boxes, connecting cable.

HKS blocking circuits

3.3 Receiver loops for communication systems

HANNING & KAHL's receiver loops, coupling coils and antennas are tuned to receive. Available in different versions for all current communication systems, the equipment comes with appropriate mounting devices and attachment materials for installation in common permanent way.

3.4 Rail boxes

HANNING & KAHL's practical rail boxes protect electric connections on rails. The patented rail boxes can be screwed onto the inside or the outside of all rail profiles or welded on with mounting ribs. The cables are connected to the rail via independent contact screws inside the rail box. Rail boxes can also be supplied with a special coating for stray-current insulation on request. Depending on the requirement, different versions can be supplied for applications such as:
- Traction-current return-conductor and collector return-conductor connections
- Track connectors
- Connection of operating and protective earths
- Track circuit connections
- Connection of short-circuit connectors
- Protective box for track circuit components (transformers, capacitors etc.)
- Protective box for cable connectors and cable sleeve
- Insulated multi-connection

Receiver loops for communication systems

3.5 Insulated tie bars

Direct rail contact must be avoided when assembling track, mass detector or blocking circuits. In these track segments the gauge is held by insulated tie bars.

Carefully designed and manufactured, insulated tie bars supplied by HANNING & KAHL guarantee a high degree of functional safety. They are available for all gauges and rail profiles and also in special dimensions, if required. Insulated tie bars have a central insulation point and can be insulated full length against stray current on request.

Insulated tie bars

3.6 Local operating elements

Local operating elements ensure convenient setting of several points on the way to a destination track.

Route-setting boards
Route-setting boards provide more convenience when several points have to be set (e.g. point fans) on the way to destinations. Simple user guidance, e.g. self-explanatory display dialogues, allows staff to set one or more routes. These are defined and can be stored via starting track and destination track buttons. All points en route to destinations are automatically established and their setting and status is visualised. It is thus no longer necessary to set each point individually.

Route-setting boards

HPTS intelligent selection stations
The intelligent selection station HPTS facilitates selection of destination tracks by communication with the central control room. The train driver identifies himself with his PIN number and enters the code for the destination track.
An illuminated display allows representation of context-dependent, local-language texts. Entries are made via a hard-wearing ten-key keyboard with additional function keys. The components are in a UV-resistant plastic housing.
The following interfaces are available for data communication: Ethernet, CAN, RS485, RS232. HPTS is freely programmable and supports standard network services such as FTP, HTTP and SMTP.

Pushbuttons
The operating station is directly beside the track. Train drivers can set points per pushbutton without getting out of the cab. This saves time, relieves driving staff and makes rail operations a lot safer. Handling is clear and simple. Visual signals indicate whether the setting command has been executed.

HPTS intelligent selection stations

Pushbuttons

Pushbutton stations, key switches
Depending on requirements, pushbutton stations and key switches are manufactured in different versions:

- robust pushbutton stations with integrated illuminated pushbuttons
- electronic pushbutton stations with ten-key keypad
- fitted with electronic interface, which displays feedback and information to the operator via a built-in display
- individual designer solutions

Pushbutton station

3.7 Control cabinets and plinths

Customer and application-specific requirements with regard to size, finishing, accessibility, convenience and economic efficiency call for different types of control cabinets. Control cabinets made of glass-fibre reinforced plastic (GRP) are light and break-proof. Control cabinets made of aluminium offer advantages when exposed to direct sunshine and in tropic regions. They can also be equipped with a removable rear wall. Control cabinets made of sheet steel are stable and allow the use of swivelling frames.

Control cabinets and plinths

3.8 Pole fuses

To easily disconnect power from control cabinets, the power lines for controllers and point heaters are usually pre-fused before the control cabinet. These pole fuses (mains fuses) can be supplied with porcelain fuses or with circuit breakers which are mounted in weather-proof plastic housings.

Depending on the application, they can be designed for pole or wall mounting and for different voltages and currents.

Lightning arrester and pole fose

3.9 Lightning arresters

Where contact wire voltage is required for operation of point heater controllers and other types of controllers, lightning arresters protect the voltage supply lines from overvoltages (e.g. lightning). Installed with a clearance of max. 30 m, lightning arresters are usually installed on the line power poles with holders and mounting aids.

2.10 Cable and connecting materials

All cables which have to fulfil particular requirements are made especially for HANNING & KAHL. The special-purpose cables deployed in track, blocking and mass detector circuits ensure high levels of safety and availability. All other cables for signals and point machines can also be acquired from HANNING & KAHL.

4 I SERVICE

4.1 Project management

Meticulous project planning is essential for smooth execution of construction projects. It prevents technical and organisational errors from the word go, errors which can cause delays and have expensive consequences. Well-devised project management pays off. The HANNING & KAHL team provides competent and committed assistance with the following tasks:

- Calculation of braking and slip distances
- Analysis of track diagrams and proposals for optimal vehicle detection
- Determination of signal locations and request points
- Compilation of system requirement specifications
- Creation of schematic diagrams
- Creation of cable diagrams
- Processing of given CAD diagrams
- Compilation of documents for determination of driving operations
- Site supervision
- Project management
- As-built documentation for approval bodies

Benefit from our long years of experience in project management and in the execution of major construction projects.

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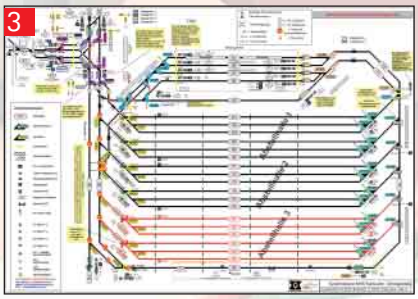

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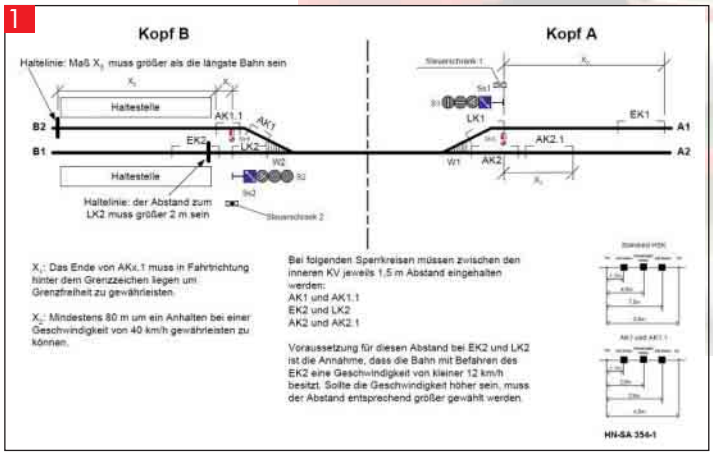

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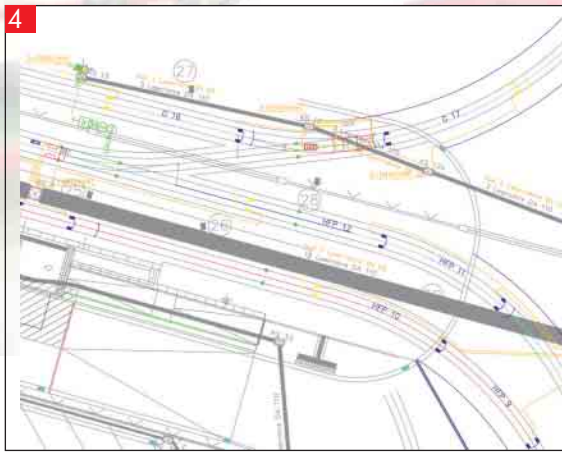

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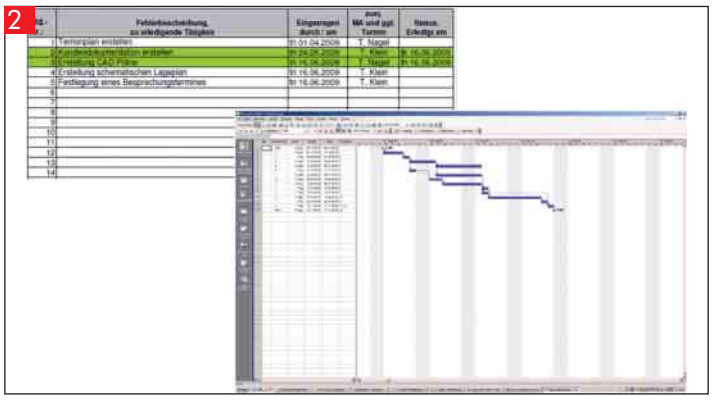


1. Calculation of braking and slip distances

2. Project and deadline monitoring

3. Creation of schematic diagrams

4. Processing of given CAD diagrams

4.2 Quality assurance

Quality assurance and final inspection are performed on HANNING & KAHL equipment with due diligence and attention to detail. HANNING & KAHL installations and components are subjected to extensive simulation in our test laboratories before supply.

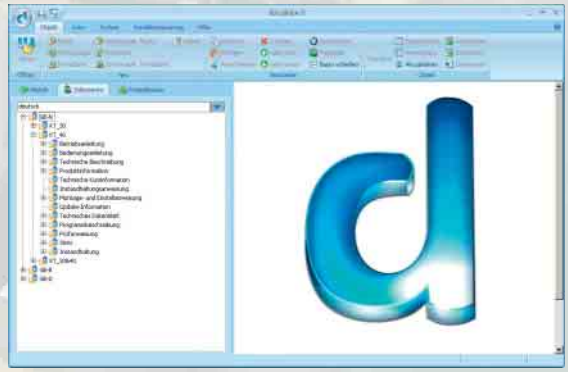
Different power supplies, network sockets, mobile test stations and PCs ensure variable and realistic test conditions. FAT is generally performed in the presence of customers, familiarising them with the innovative technology. The HANNING & KAHL team is also on hand to answer questions and advise.

FAT with customers at HANNING & KAHL

4.3 Documentation

In line with their high safety level, all HANNING & KAHL installations and components are documented thoroughly and precisely. Along with each product, our customers receive structured operating manuals with graphic representations and photos in the file format of their choice (e.g. PDF). Technical data and functional descriptions of the individual components are documented with precision. Setting, maintenance and service work are described in a clear manner with photos.

HANNING & KAHL product documentation contains:
- Installation drawings
- Electric circuit diagrams
- Final assembly inspection protocol
- Safety data sheet and certificate of conformity
- Spare-part catalogue



Content management

4.4 Workshops

HANNING & KAHL workshops combine theory and practice – the latter being particularly appreciated by our customers. Workshops are offered in different languages. On request, we design workshops on the particular units which you have installed. We would be pleased to submit a quotation.

You can find our seminar program on the Internet at:
www.hanning-kahl.de

Training on the customer's site

4.6 Testing and service equipment

Working closely together with its partners, HANNING & KAHL has developed practical testing equipment and service devices, specially aligned to the requirements of the light rail sector, e.g.: HN-P tester, HFP tuning device, HCS-R-PS testing equipment for wayside equipment, HCS-V-PS testing equipment for wayside equipment and HN power tool kit.

This equipment offers optimum support when trouble shooting, recording test results and planning service work.

Whether assembling or commissioning, inspecting or performing maintenance work, repairing or overhauling: HANNING & KAHL testing and service equipment and our on-site work help to avoid unnecessary costs by identifying malfunction sources at an early stage.

HCS-R-PS testing equipment for wayside equipment

HNP testing equipment

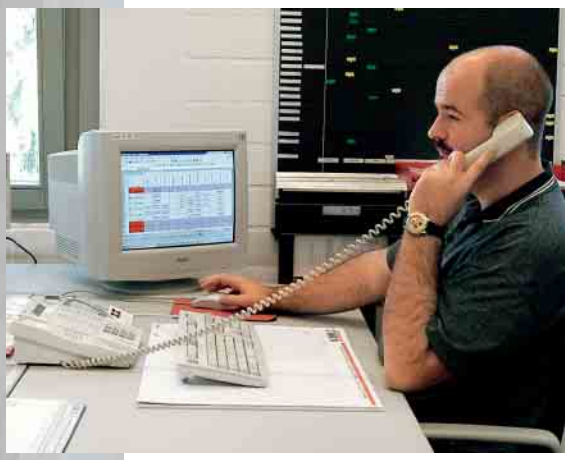
4.5 24-hour on-call service

Should problems ever arise with your HANNING & KAHL equipment, we won't leave you out in the cold. Please contact our malfunction management without delay! Email the details of the malfunction to:

service@hanning-kahl.com

for processing by our new malfunction-management system. Our staff have the expertise and experience to help you. And they are also at your disposal on-call outside of office hours! 24 hours a day/365 days a year.

Telephone +49 1713360360



Malfunction management

Developing the Future Together

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Getting You There Safely

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Control and Safety Systems

Safe Transportation All Along The Line

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09/2010