

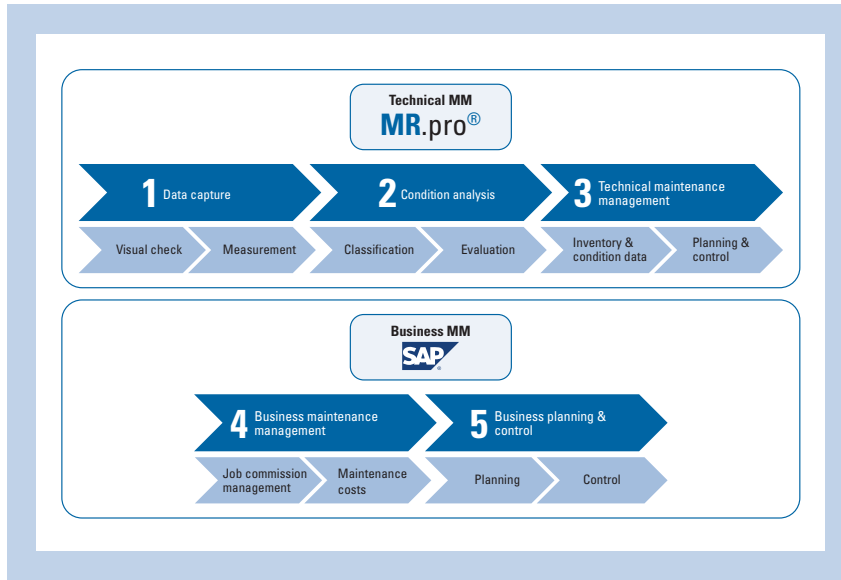


RHOMBERG SERSA
SERVICE

MR.pro[®] Maintenance Software



Rhomberg Sersa Service covers the complete range of services from all aspects of track as a multi-disciplinary full-service company – offering all services under one roof.



Two software systems for all tasks of maintenance management: Technical = MR.pro® Economic = SAP/PM. Further geographic information systems (GIS) provide a useful supplement.

Infrastructure data management

Maintaining the functionality of infrastructure counts as one of the most important and at the same time most complex strategic tasks of railway management. It also has a significant influence on the competitive edge of this mode of transport. To justify this increasingly complex task a systematical and structured management system is required which provides the necessary transparency for secure and economic management, planning and monitoring of railway tracks. It is essential to have a high level of quality and availability of information. The required quality of information can in the long run only be achieved with suitable IT support. In line with the increasing volumes of data and the fast pace of life, the topic of infrastructure data management becomes increasingly significant. Here solutions are required which provide transparency and an overview for traceable decisions and which can quickly and easily be integrated into the operational functions. Wide acceptance can only be found in a software product which apart from the above also combines efficiency and functionality in everyday use. An information system is most successful if as much of the currently collected data as possible can be used. For this reason the prescribed inspection runs are ideally suited for the capture of complementary information.

MR.pro® and ERP* software

The bidirectional interface between SAP/PM and MR.pro® allows for good task sharing: it is sensible to use MR.pro® as a technical information system and SAP as an economic management system. For this, a more or less complete image of the rail infrastructure has to be displayed in MR.pro® – to generate maintenance measures from faults, to prioritise and to make decisions. Subsequently, the individual measures to be taken are transferred from MR.pro® to SAP/PM.



The condition of railway infrastructure can only be clearly evaluated with the combination of both measurements and visual inspections.

Planning and control of maintenance

MR.pro® is a technical information and maintenance management system. It evolved out of the “everyday business” of inspecting track and turnouts. As such, it presents a practical combination of inventory and condition data capture (inventory, monitoring and visual inspection) and condition assessment (analysis, classification) and makes available processed and categorised information for the user, in a central infrastructure database, ready for the planning and control of the maintenance tasks. MR.pro® combines all technical tasks required for maintenance management and thereby considerably reduces the required number of software products:

- ▶ *Condition assessment*
- ▶ *Condition analysis*
- ▶ *Information system*
- ▶ *Planning and control system*

In the current version, MR.pro® offers the complete range of functions required for maintenance management of railway networks, such as:

- ▶ *Automatic condition analysis, evaluation and documentation*
- ▶ *RailMap, an interactive schematic plan for the representation of all, or part, of a network with direct database interfacing*
- ▶ *GoogleMaps™ has been integrated as an orientation and positioning tool*
- ▶ *Warranty and life span management*
- ▶ *Measurement of the wear margin (Kennziffer Abnutzungsvorrat KAV®)*
- ▶ *Maintenance and inspection management*
- ▶ *Fault management*
- ▶ *Maintenance calendar for the overview of schedules*
- ▶ *Order management with interface to SAP/PM*

Structured capturing of master and condition data

Besides the electronic measurement tasks, MR.pro® also provides a standardised module for the structured capturing of master data and condition data of tracks and all types of rail infrastructure. The ideal is a database-supported assessment, directly on digital user devices, during the visual inspections. Robust outdoor notebooks with touch screen and keyboard are ideally

suited for this. Through the use of a five-point harness, the inspection task is hardly affected, despite the notebook. (see photo). The quick location of the object to be tested is obligatory: for the selection of an object, a digital map (RailMap), an exact description of the object and a pass photo of the structure are of great help.



Inventory and condition data capture with MR.pro® – comfortably on site. Once captured the data is available for all maintenance processes.

Points measurement

MR.pro® complies with all requirements of a modern software solution for inspectors and simply provides more of point measurement results:

- ▶ *Evaluation*
- ▶ *Condensing*
- ▶ *Visualisation*
- ▶ *Collective printouts*
- ▶ *Documentation*

MR.pro® creates preformatted Excel file sheets (one file per object) for points from the raw data of the MessReg® measurement system. The saving and attachment of further measurement sequences has also been automated. MR.pro® creates single documentation and collective evaluations of the results of the measurements and visual inspections. A quick overview is guaranteed through the use of standard functions (filtering, sorting).

The structured capture of inventory data of track systems (points, crossings and crossing points) offers a variety of possibilities for describing the objects in different levels of detail – right from the acceptance in production through to its removal at the end of service.

For track systems, MR.pro® also offers comprehensive master data management which also includes neighbouring or integrated constructions like crossings, bridges and weighbridges, which are all uniquely stationed.

Maintain the overview with aggregated condition data

The condition assessment with MR.pro® is ergonomically designed for quick use. Sophisticated dialog management ensures that nothing is overlooked, while the plausibility check prevents any operator errors. The evaluation and classification of faults is determined in advance in consultation with the railway operator and linked 1:1 with the fault code of MR.pro®. The examiner automatically accepts the fault class during the assessment of the faults. This brings the visual inspection very close to an objective assessment. Digital photos can be directly assigned to objects and faults during the inspection to highlight important faults. Despite the structure and specifications of content, a certain amount of flexibility during input is ensured – for example, additional comments may be entered at any time. During the condition assessment, the examiner benefits from the results of the last inspection, which are shown in red.

MR.pro®

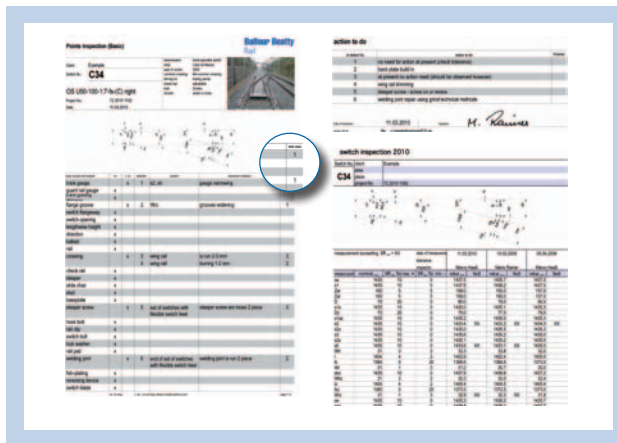
Predefined and coded wear conditions and their related maintenance recommendations considerably reduce the input effort because the examiner makes his selection directly from the dropdown menu on the touch screen.

Perfect documentation in no time

The condensed and evaluated inspection data immediately flow into the subsequent maintenance process, planning, budgeting and the realisation of tasks.

The documentation generated by MR.pro® is equally convincing for users, management and controlling authorities. It ensures the traceability of the infrastructure condition, and provides surety of action and a good understanding of decisions.

- ▶ *Reliable, reproducible results through clear procedures*
- ▶ *Meaningful, clear and understandable*
- ▶ *Transparent; can be interpreted without any special knowledge or support*
- ▶ *Detailed individual results, condensed overall results*
- ▶ *Traceability of the conditional development of the infrastructure*

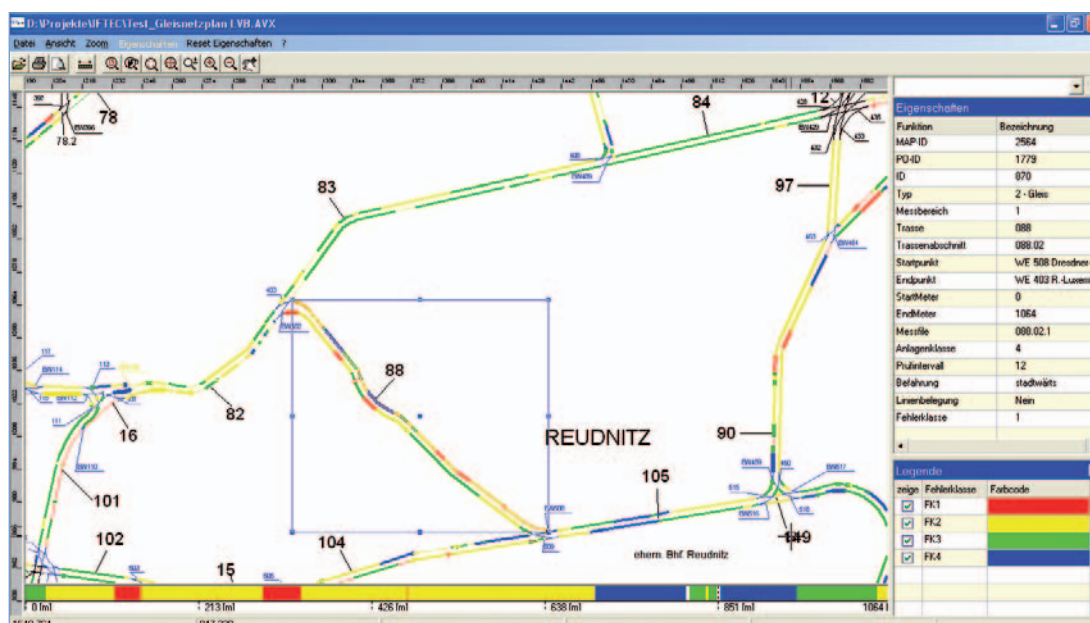


The standard documentation MR.pro® consisting of master data, an object photo, list of findings with error classes and maintenance recommendations as well as the printout.

Better overview through illustrative graphics

Complex maintenance tasks are inevitably related to large data volumes. To manage and display these in a simple and user-friendly fashion, a clear and simply designed graphical presentation of the infrastructure objects was created – RailMap.

This overview plan, integrated into MR.pro®, is linked 1:1 with the database and thereby delivers direct access to the respective object data. For example, the graphic display allows a visualisation in colour of the infrastructure conditions, loads, rail types and other freely definable properties. The multi-functional RailMap is based on CAD drawings with common data formats (dwg, dxf, plt, etc.).



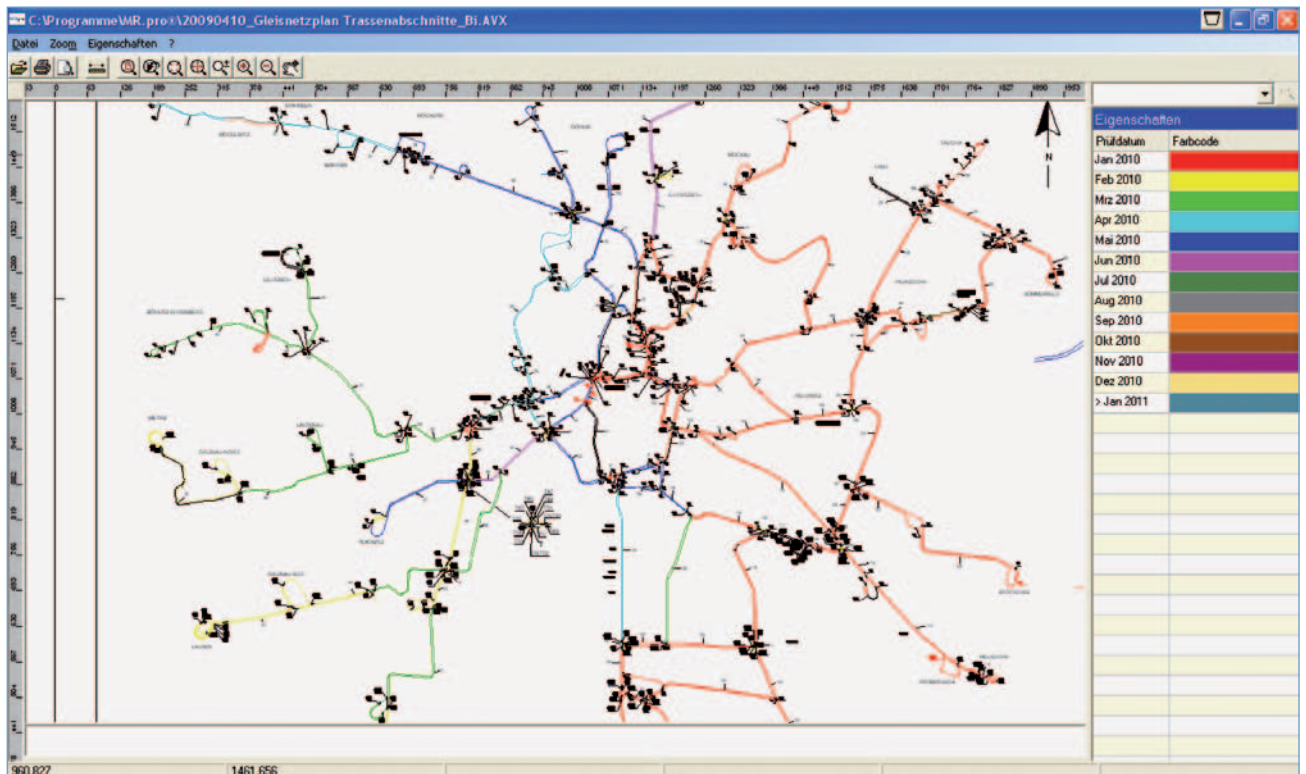
The RailMap of MR.pro® offers, besides the good overview of conditions, direct access to the inventory and condition data as well as all assigned documents. Marked in red are the currently conducted maintenance jobs being conducted in section 86. With the help of dynamic segmentation, sections can be subdivided into an arbitrary number of sub-sections and can be displayed very realistically. The condition bar at the bottom of the display (horizontal) displays the detail of the faults as well as the presently conducted maintenance measures.

(Source: IFTEC, Network of the Leipzig transport company)

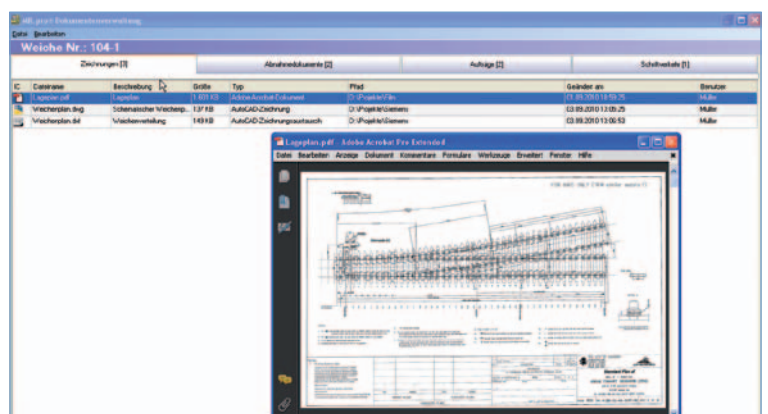


Conditions and dead-lines in current overview

Differentiating between the important and the less important is one of the daily tasks of management. To be able to recognise, at a glance, which objects have reached a critical condition and which have not. Preferably this should be done according to the traffic light sequence (red–yellow–green) according to condition. Thanks to the direct interface to the database, this is no longer impossible. With a click of the mouse, the user can navigate directly from the graphics to the condition and inventory data, as well as to the generation of repair sheets or feedback of completed maintenance.



All information linked to the rail plan can be displayed visually, e.g. inspection dates, expiry of warranties, site classes, specifications, etc.



Document management allows a comfortable, object by object allocation of all documents which occur during the life span of a site, right from the acceptance confirmation through to the drawings.

MR.pro® LT

Infrastructure operators who do not inspect their tracks and points by themselves have access to a comfortable planning and control tool in the form of MR.pro® LT. The continuous process chain requires a minimum of data input, because the captured faults are used as input in the overall maintenance process. Errors during transfer are avoided and a uniform data structure is ensured.

Simplify Database – an ideal combination of “doing, and letting somebody else do”

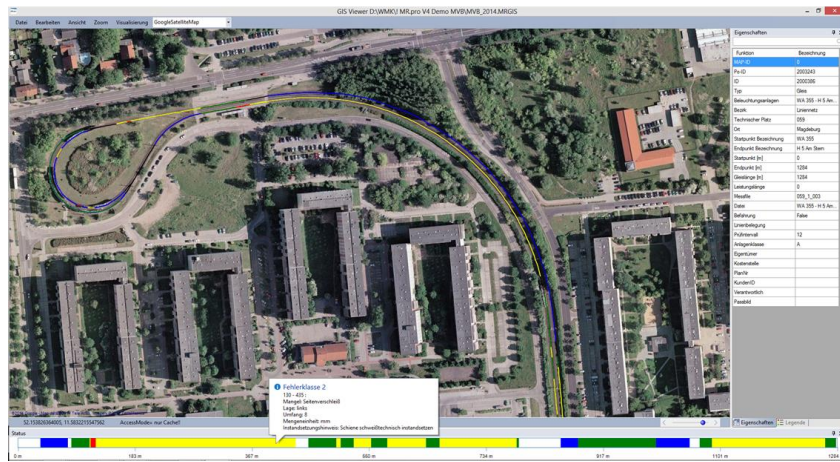
As a rule, one is therefore generally not familiar enough with the system to be able to quickly set up an information system that fulfils all the expectations and requirements of all concerned – on top of conducting all the daily tasks.



Based on the individual requirements and the operational environment we, together with the operator, work out the correct solution in view of the required information value and its usability within the framework of maintenance planning and control. Amongst other factors, we clarify:

- ▶ *The required measurement parameters and levels of detail according to cost-benefit assessments*
- ▶ *The quality of measurement results (reliability and repeatability, etc.)*
- ▶ *The interfacing and further processing and presentation in GIS or ERP planning systems*
- ▶ *The linking with primary measurement data-bases*
- ▶ *The update interval and storage in the system*

MR.pro® is installed ready for the customer with all inventory and condition data. The inspection equipment is handed over to the operator after intensive training and the "flying start" is professionally supported and taken care of. In this way the start into digital infrastructure data management will succeed from the offset – guaranteed!



The advantages of MR.pro® at a glance

- The software is further developed directly by the user – practical and with a high application value
- Reduction of the planning, control and documentation effort
- Saved documentation concerning the operational and functional safety of the site can be archived as a history file
- Automatic capture of inspection data avoids delays and transmission errors
- Graphic display of condition, loads, construction types and other freely definable properties
- Data availability for centralised and decentralised access as well as for long term analysis and traceability of condition
- Integrated monitoring of dates and warranties
- Support of decision processes and creation of priorities, up-to-date condition reports and statistical evaluations
- Fault management, condition monitoring and weak point analysis
- Individual support during software implementation right up to the ready-to-work full service
- Data maintenance and structuring according to the IDM-VU standard (VDV publ. 456, www.idmvu.org)

QM zertifiziert
Qualität, Umweltschutz,
Arbeitsschutz, SCC



Rhomberg Sersa Service GmbH
In den Kreuzfeldern 2
54340 Longuich (Trier)

Tel.: +49 6502 9941-66
mario.rainer@rhomberg-sersa-
service.de