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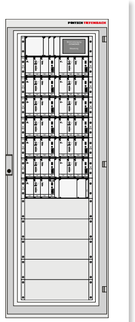
Representative TMC-RaStw cabinet layout with the following advantages

>> Modular design, therefore easy to extend and to scale to satisfy operational requirements

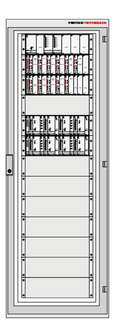
>> Maintenance-friendly design using 19“ plug-in card technology, reduction in cabling requirements

>> Option of decentralized configuration in multiple control cabinets by networking e.g. via optical fiber cable

>> Event logging with diagnostic option and reporting



Points control



Clear track signalling

Activation of shunting signals and route computer

Central operating workstation

Options provided by this example configuration:

>> Processing / monitoring of 22 double wheel sensors and 8 axle counting circuits for clear track signalling of the associated shunting routes

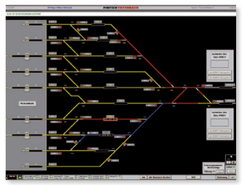
>> Control / monitoring of 13 points

>> Switch-on / monitoring of 18 shunting signals using the signal aspects:
Hp0, Sh1 and marker lights

>> Day/night reduction of the shunting signals

>> Connection of a screen workstation for operating the TMC-RaStw centrally

>> Technology can be scaled over cabinets and can be extended as needed



Procedure protected message screen of central operating workstation

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PINTSCH TIEFENBACH
A Schaltbau Company

PINTSCH TIEFENBACH Micro Computer - Marshalling Yard.

TMC-RaStw.

PINTSCH TIEFENBACH Micro Computer - Marshalling Yard

TMC-RaStw

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Applications

- >> Secondary areas in which shunting is carried out using signal-equipped preset routes (shunting routes)
- >> Yard tracks, yards for loading/unloading or maintenance plants (depots)
- >> Factory railways, industrial railways and port railways (for goods traffic only)

Product advantages

- >> Approved by the Federal Railways Agency (Eisenbahnbundesamt, EBA)
- >> Approved by Deutsche Bahn AG (DB AG)
- >> Only minor operational differences to the ESTW
- >> Mapping of the procedure protected message screen for the central operating workstation based on the applicable DB AG directive
- >> Decentralized operation using self-service control panels for requesting shunting routes, to support the operating staff at the screen workstation
- >> Integrating external technology using reaction less interfaces (e.g. for track gates)
- >> Controlled interfaces to other interlocking techniques (e.g.: E43, L90, SpDrS60, Simis D)
- >> Interface for train identification systems
- >> Software parameterization to satisfy operating requirements, e.g.:
  - > Automatic preferred point positions
  - > Remaining and partial route releases

The electronic Marshalling Yard

The electronic Marshalling Yard allows all shunting routes to be controlled and monitored, including all associated track-installed switches, points and signals, in areas in which freight traffic is shunted (max. speed of 40km/h). Optionally, the train director can grant the locomotive driver and the shunting staff the authorization to control shunting routes by themselves, for example by using self-service control panels, after being allowed to do so by train director.

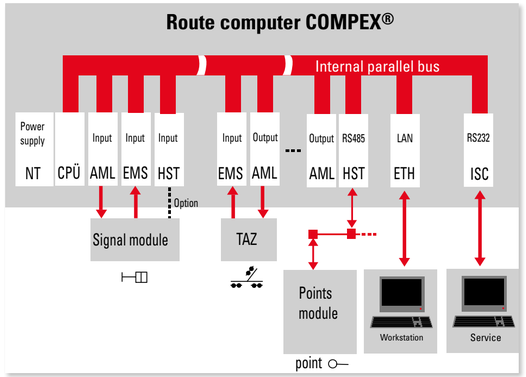
The TMC-RaStw, featuring graded security levels in accordance with requirement class AK5, has been approved by the Federal Railways Agency (Eisenbahn-bundesamt) and has also received approval from Deutsche Bahn AG. It provides a cost-effective solution for areas in which no train routes are required and there is no risk for passengers.

Shunting signal

Option:
Decentralized operation with one destination

System structure TMC-RaStw –>

Double wheel sensor



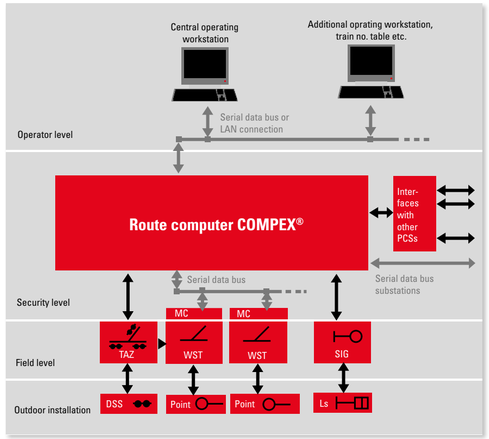
Module structure

>> **Clear track signalling system**
- > Registering of occupancy information from the double wheel sensors connected, and processing within an electronic axle counting system
- > Monitoring of an axle counting section to determine occupied and clear states

>> **Points module**
- > Processing of reverse commands requested by route computer
- > Controlling / monitoring of three-phase current points machine *(reliable 4-wire circuit)*
- > Safe reverse protection using relay contacts which have been directly integrated from the associated clear track signalling system

>> **Signal module**
- > Switch-on and monitoring of shunting signals using the signal aspects (directive of Deutsche Bahn AG): Hp0, Sh1 and (optional) marker lights
- > Day/night reduction of the shunting signals

>> **Route computer**
- > Single channel computer with various back-up procedures at process level



Block diagram

- > Processing of operating requests with automatic route setting following prior inspections for plausibility and a route logic
- > Formation of secured routes (locking of points) with automatic release of partial routes
- > Real-time event logging of operating activities, auxiliary operating activities and alarms

>> **Central operating workstation**
- > Standard commercial industrial components used for PC and the screen
- > Mapping of the procedure protected message screen based upon the directive of Deutsche Bahn AG to prevent errors made by operating staff
- > Long-term event logging with diagnostic options and reporting

Option:
Decentralized operation with multiple destinations