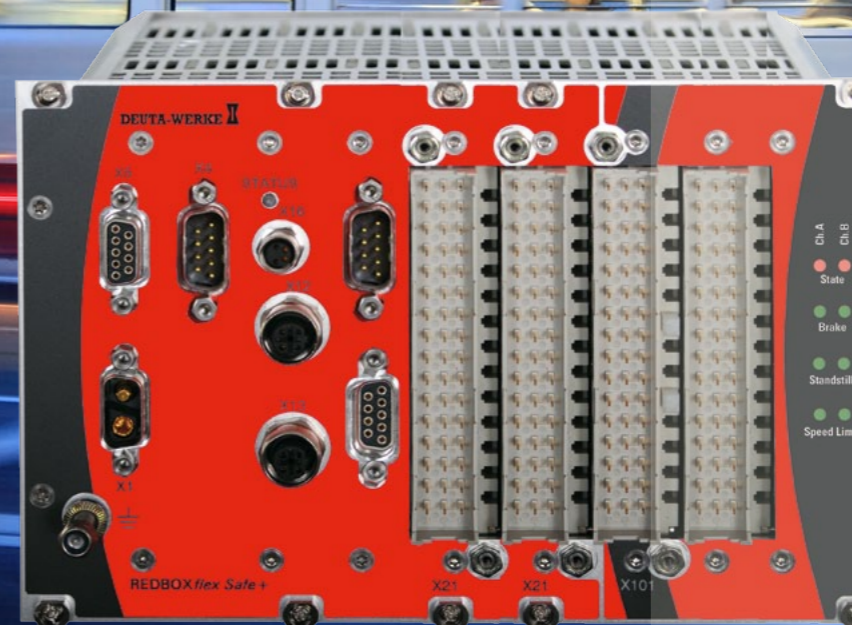


For Trams

*Detailed recording
and safety functions
acc. CENELEC*



DEUTA REDBOXflex safe+ for Trams

Travel Data Evaluation & Safety

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»Travel Data Recording and Safe Functions«

DEUTA-WERKE has long tradition in the supply of recorder systems for trams. Our product lines KWR 4, KWR 5, KWR 6 and KWR 21 are known all over the world with highest reputation and legendary reliability. DEUTA REDBOX® recorders are the latest mile stone in this long tradition.

DEUTA REDBOXflex safe+ for tram application

Two important functions must be covered in a modern tramway vehicle:

- The TRAVEL DATA RECORDING which allows to rebuild the travel data after an incident and permits studies for the optimization of the vehicle fleet

and

- the SAFETY FUNCTION according to the CENELEC SIL definition, where vehicle and passenger safety are positioned at the highest level.

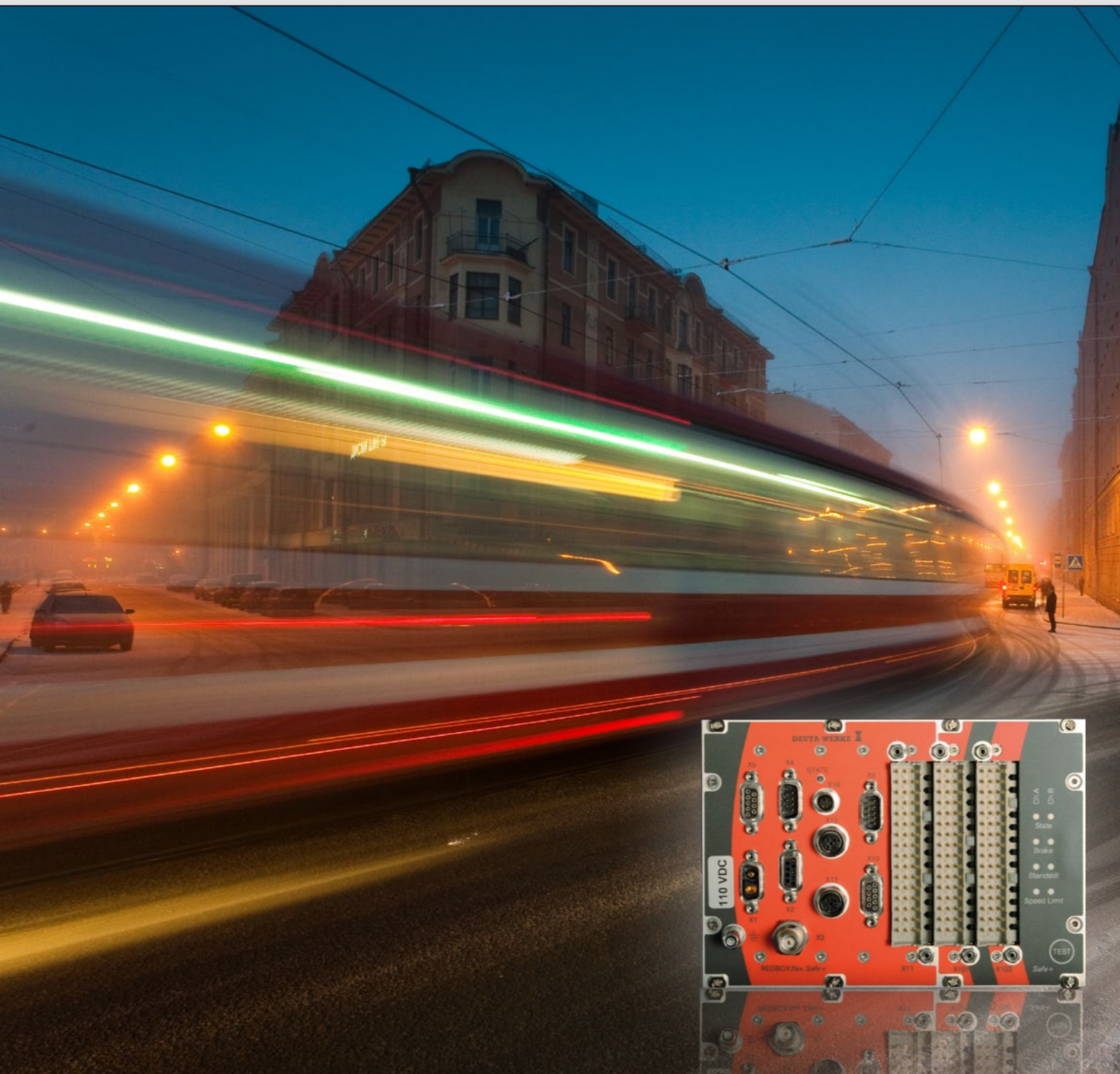
The DEUTA REDBOXflex safe+ combines these different parts in one compact unit:

- RECORDING: on a 2 GB Flash Card
- SAFETY: integrated in the module safe+



The Safe+ module is already approved for the integration up to SIL 3.

DEUTA supports the whole review process for new projects and customer specific integration.



Picture left side: SIL-Certified Safety - DEUTA REDBOXflex Safe+ | Picture above: SIL-Certificate - DEUTA REDBOXflex safe+

»Perfectly integrated

in any tram«

Overview of the RECORDER part

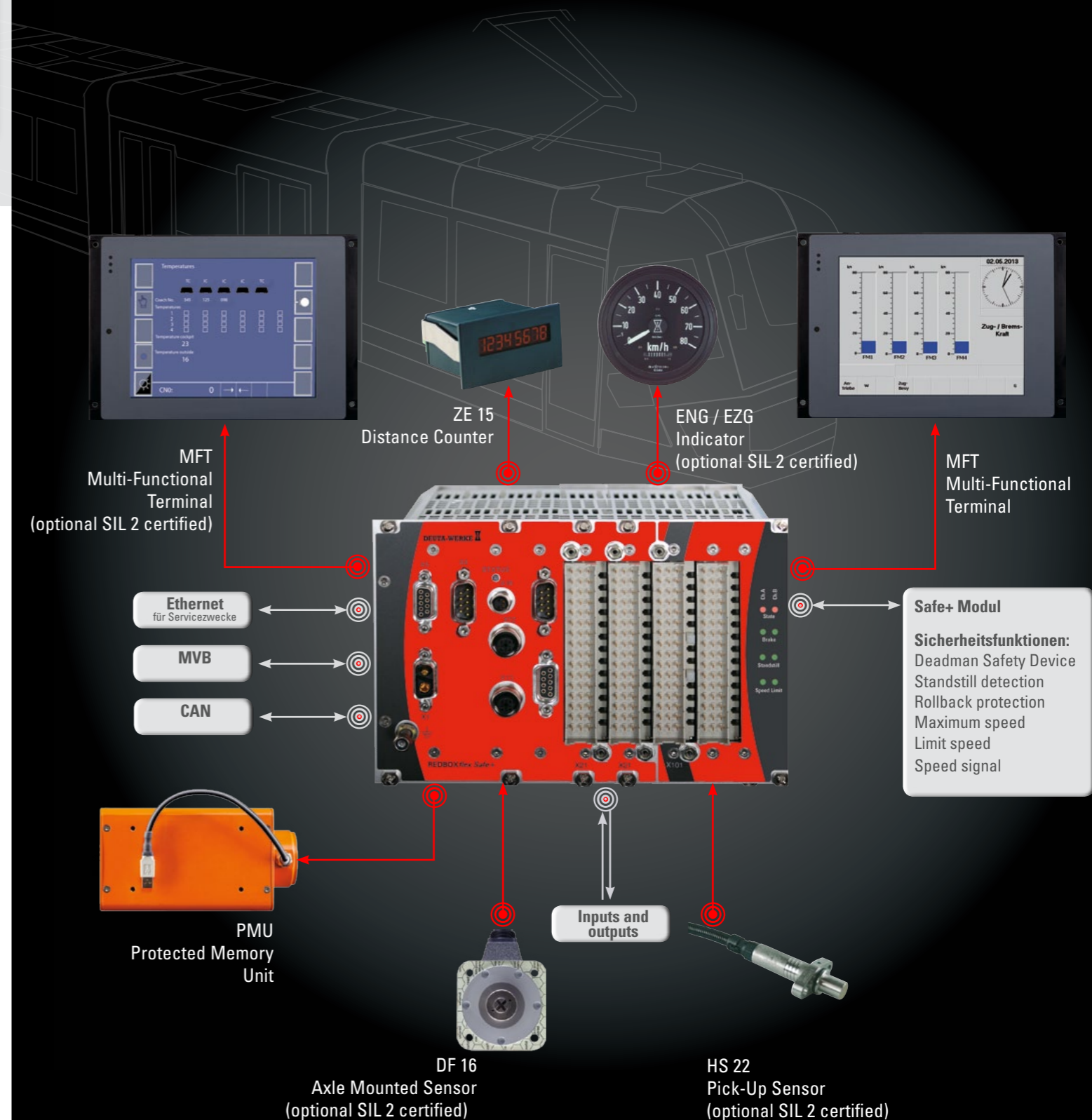
- Data recording up to 2 GB
- Bus communication via MVB and CAN (gateway function configurable)
- Direct cabling of information (24 or 40)
- Speed information via relays
- Data downloading via USB and Ethernet
- Connection to one modem for automatic data downloading
- Integrated web interface for service
- Direct GPS connection for time synchronization and vehicle position
- Crash Protected Memory Unit

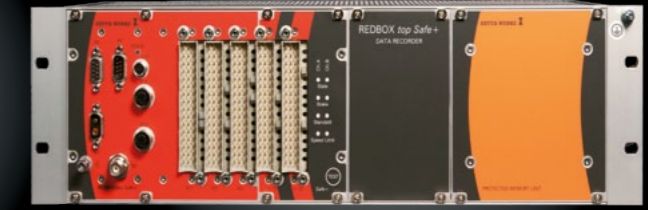
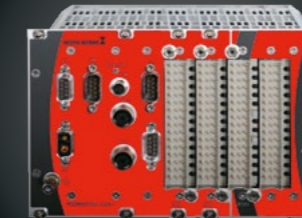
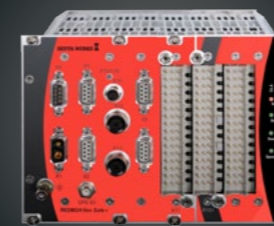
Overview of the SAFE+ module

- Safety according CENELEC EN 50126, EN 50128, EN 50129
- 3 safe information via relay
- 13 digital inputs for an optimized integration
- Suspend function for particular vehicle situation
- Flexibility through configurable parameters
- Customized application
- Complete status surveillance and communication
- Deuta support for the review process

Global system integration with DEUTA

Complementary to the REDBOX recorder DEUTA can integrate a complete system environment with speed sensors, man machine interfaces and speed indicators.





DEUTA REDBOXflex safe+ variants

ADS 4 - Evaluation Software

ADS 4 is Deuta's the forward-looking evaluation software.

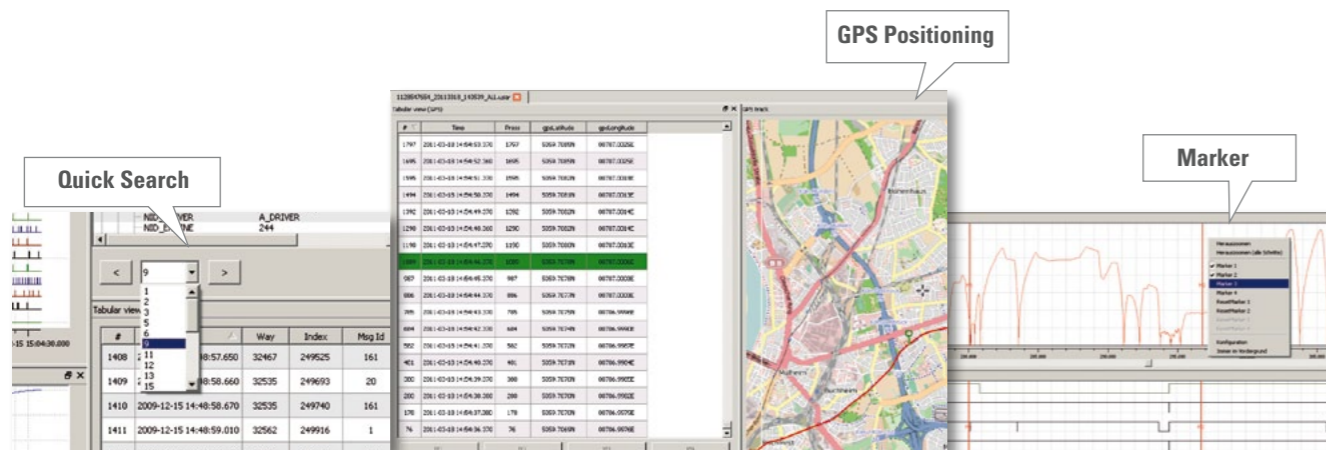
With the ADS 4 software you can evaluate travel data conveniently and efficiently.

Travel data simultaneously as graphics and tables in one screen

The innovative user interface of the ADS 4 evaluation software presents all data clearly and at a glance with freely configurable windows. Speed, analogue as well as digital tracks and train protection data are simultaneously displayed. The data can be displayed chronologically or across the journey. The tabular representation shows decoded signals and messages chronologically. Additional information such as vehicle number, operator and data volume are also displayed.

Optional GPS positioning and video data for an even better overview

With GPS and video data your travel data becomes even more transparent. On the rail map of the GPS screen you can virtually follow the course of the journey on a map. In addition, the camera video data give you a clear insight into the progress of the journey.



Technical specification	REDBOXflex safe+
Operating voltage	Nominal 24, 72 or 110 V
Power consumption	max. 30 W
Temperature range	-25°C to +70°C (operation) -40°C to +85°C (storage)
2 frequency inputs	square wave, f_{max} 10 kHz
2 analogue inputs	± 0 to 10 V or 0 (4) to 20 mA
24 digital inputs	high level +12 to +154 V DC low Pegel -150 VDC to +2 VDC
Recording raster	triggered by distance, time or event, compatible to VDV 165
Storage medium	int. CompactFlash 2 GB
2 analogue outputs	0 to 10 V or 0 (4) to 20 mA
2 frequency outs	square wave, f_{max} 5 kHz
Outputs	2 transistor outputs with Open Collector
Vehicle buses /	MVB, CAN or Ethernet
Serial interfaces	RS 422/485, IBIS
Service connections	1 Ethernet, 1 USB
Crash protected memory	Optional, PMU22 acc. GM/RT 24/72
Safety functions	safe+
For integration up to SIL 3	Deadman Safety Device DSD / SIFA acc. UIC 641 Standstill detection Rollback protection Monitoring of limit speed Monitoring of maximum speed with brake control Safe speed signal 4-20 mA
General Information	
Width	40 TE (202 mm)
Height	128.4 mm (3 HE)
Depth	169 mm
Weight	approx. 2.5 kg
IP protection class	IP 20
Connection	4 x F48 connectors, DIN 41612 for IP 20 2 M12 d round connectors, M8 round connector (Ethernet) 4 x Sub D-connector 9-pole (USB)
Standards	
Environment	EN 50155
EMC	EN 50121-3-2
Safety	EN 50126, EN 50128, EN 50129