

# DEUTA DSD Safety System

## The Safe Product Package

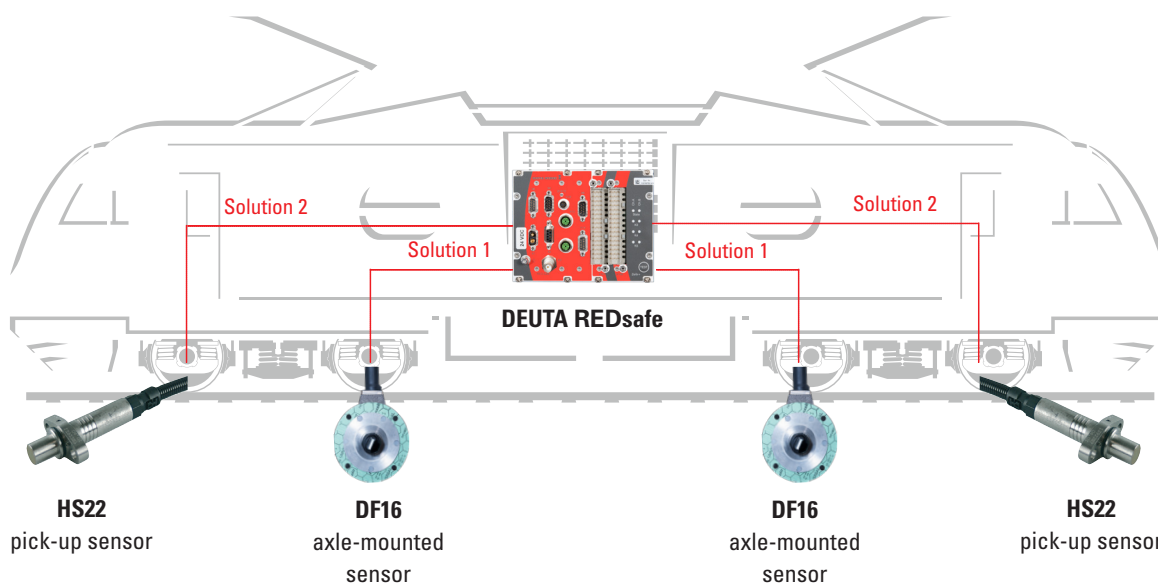


**DEUTA-WERKE**   
*Technology under Control*

# »DEUTA DSD Safety System

The safe product package«

The DEUTA DSD Safety System is a SIL certified product package, consisting of the safety unit DEUTA REDsafe and either two wheelpulse sensors or pick-up sensors. The standard SIL system is the on-board extension of track based safety systems such as intermittent automatic train control PZB, continuous automatic train control LZB and the European Train Control System ETCS. The system concept corresponds to the safety-related application conditions SIL 3 for DSD, with due regard of standstill detection, monitoring of maximum speed and monitoring of limit speed.



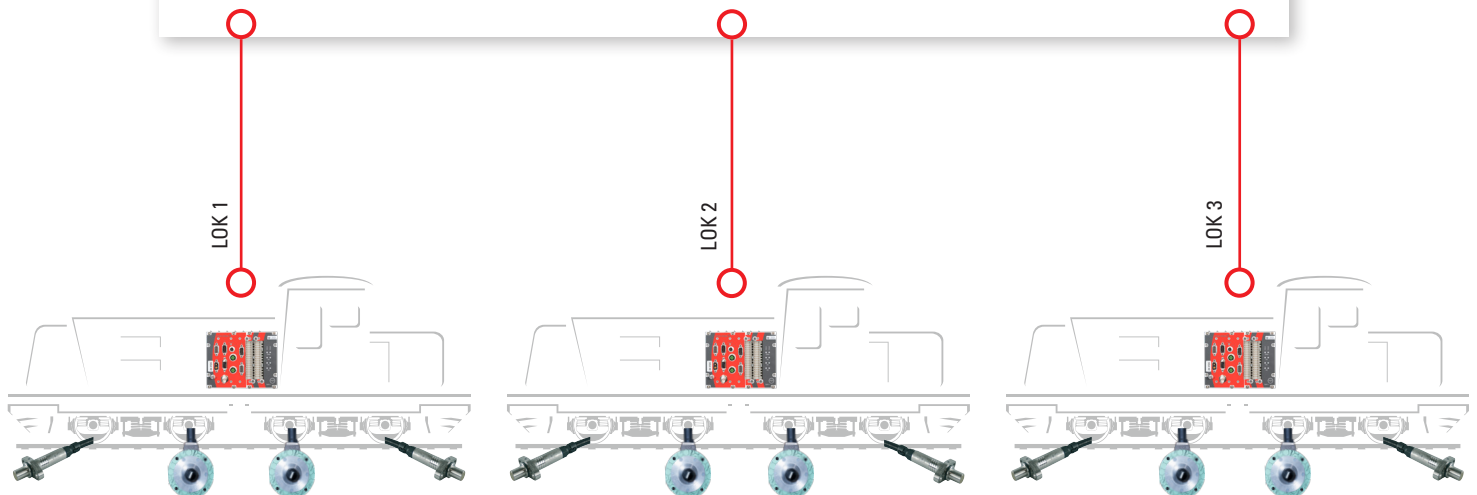
- » **Solution 1:** DEUTA REDsafe combined with DF16 axle-mounted sensors
- » **Solution 2:** DEUTA REDsafe combined with HS22 pick-up sensors

## »With SIL Certification«

The DEUTA DSD Safety System was assessed as a standardized, project-neutral product package. It can easily be implemented on trains up to 200 km/h as a finished product package without further development efforts and technical clarification.

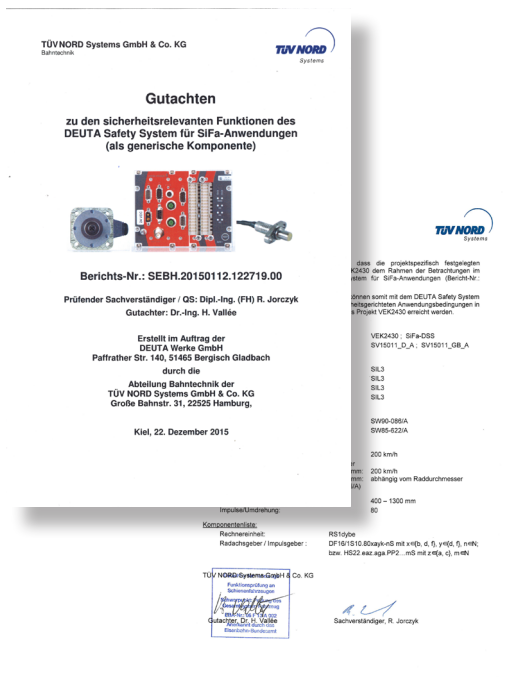
### Advantages of the DEUTA DSD Safety Systems:

- » Finished, defined product package
- » Available assessor certificate - up to SIL 3
- » Short engineering phases



# »Generically assessed...

...as safe system«



While project-specific assessments are individually reviewed and evaluated, DEUTA developed the DSD Safety System as a standard solution which is, on the device side, applicable without development and assessment effort for vehicles with a maximum speed of up to 200 km/h.

The assessment of the TÜV Nord confirms the range of the products.

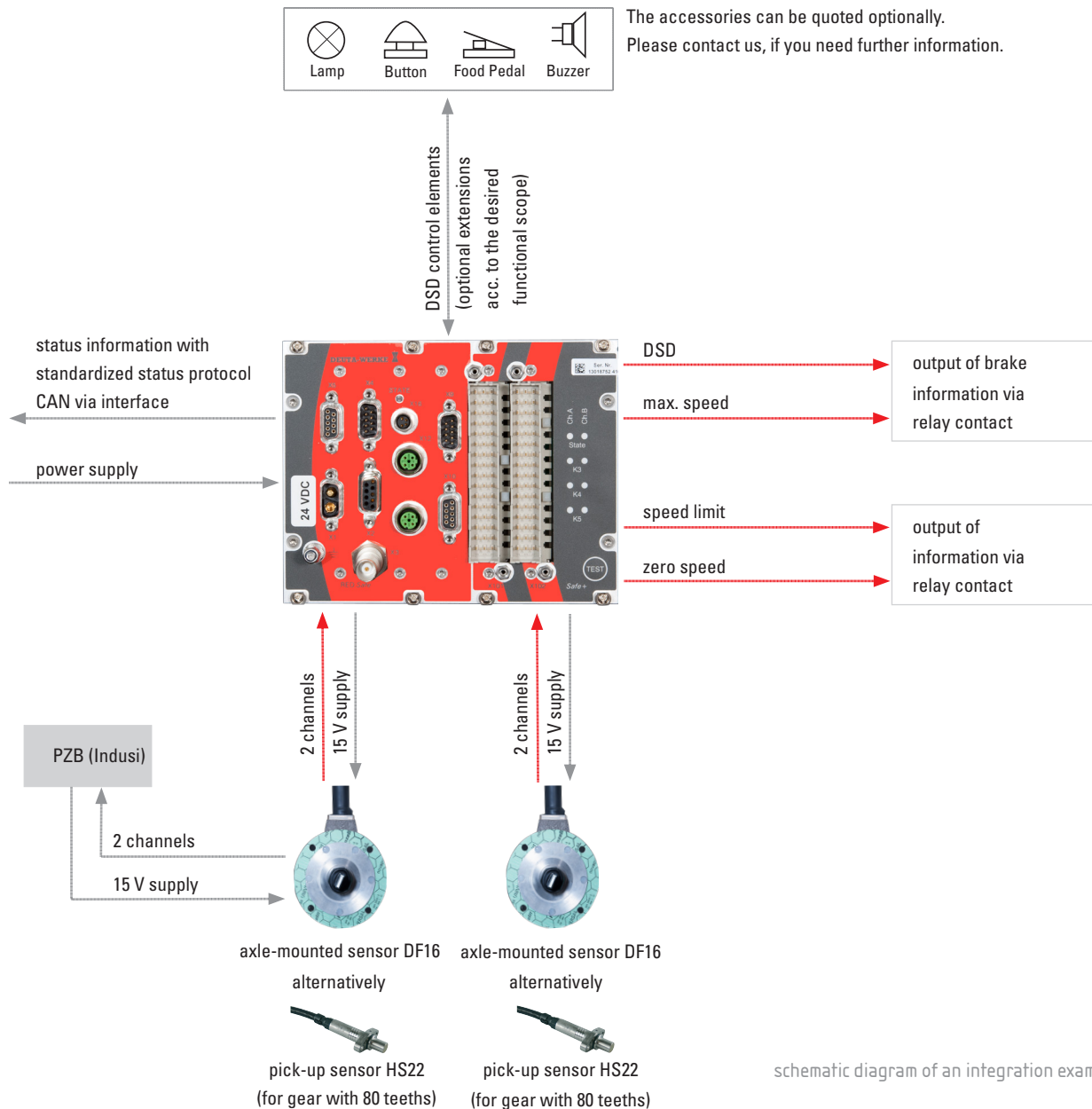
## Safety Level of DSD Safety Systems:

- » DSD according UIC 641 and DB specification SIL 3
- » Standstill detection SIL 3
- » Monitoring of maximum speed SIL 3
- » Monitoring of speed limit SIL 3

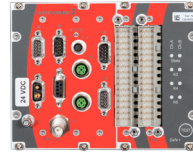
# »Systematically integrated«

The REDsafe is equipped with DSD-functionality, additional safety functions and various interfaces for the transmission of status messages to a higherlevel system. The Safe+ module of the REDsafe was designed in a two channel structure with independent processors and control relays. This allows SIL conformity of safety functions up to level 3.

The safety concept of the sensor integration bases primarily on the redundancy of the transmitted sensor signals depending on the input signals and functions of the safe+ module. Therefore, two sensors are required which must be installed on independent axles .



# »Technical Data«



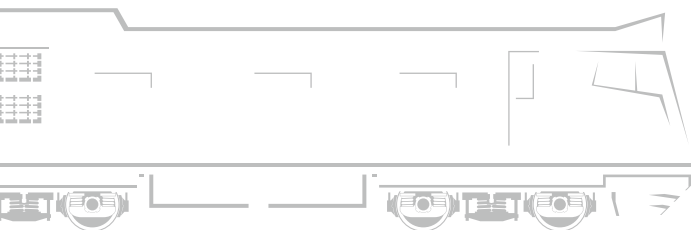
REDsafe 1 dybe

The REDsafe takes up the safety functions, offering high flexibility in the parametrization and works as time-time or distant-distance DSD. Die REDsafe consists of a safe+ unit (SCU) and a communication module including power supply. The REDsafe is developed according UIC 641 and EN 50126, EN 50128, EN 50129 and EN 50155 standards.

### Not the right solution?

If you prefer a project specific solution, we will be glad to configure the best solving concept beyond the DSD SiFa standard system.

	<b>DEUTA REDsafe 1 dybe</b>
<b>Operating voltage</b>	24 VDC, 72 VDC oder 110 VDC
<b>Power consumption</b>	typ. 23 W / max. 30 W
<b>Temperature range</b>	-25 °C bis +70 °C (operation) -40 °C bis +85 °C (storage)
<b>2 frequency inputs</b>	squarewave, $f_{max}$ 10,0 kHz, 2 channel
<b>13 digital inputs</b>	high level +12 up to +154 VDC
<b>1 analog output</b>	0 (4) bis 20 mA
<b>3 x 2 relay contacts</b>	for brake, standstill, limit speed
<b>2 relay contacts</b>	for DSD lamp and buzzer
<b>1 relay contact</b>	for failure output
<b>vehicle bus</b>	Ethernet, MVB, CAN
<b>Service PC connection</b>	1 Ethernet, MVB, CAN
<b>Safety functions</b>	Driving safety device DSD Standstill detection Rollback detection Monitoring of the maximum speed Monitoring of the limit speed
<b>Dimensions</b>	
<b>Width</b>	162.2 mm
<b>Height</b>	128.4 mm
<b>Depth</b>	169 mm
<b>Weight</b>	approx. 1.75 kg
<b>Protection category</b>	IP 20
<b>Connection</b>	2 x F48-plug, DIN 41612 for IP 20, 1 x USB 2 x MVB, 1 x USB, 2 x Ethernet M12, 1 x USB 1 x D-Sub plug 2-pins





HS 22...PP2...

The DEUTA pick-up sensors determine speed and direction of rotation. They are extraordinarily durable, as they operate contact-free and therefore almost wear-free. The measurement is made by scanning a gear or pole wheel, while the sensor is mounted in a defined distance over the wheel.



DF 16/1 S10.80 a, ac, ad, af, nf

Proven impulse sensors DF16/1S10.80  
Axle-mounted sensors are driven via a mechanical coupling on the axle of the vehicle. Impervious to dirt and vibration, they are virtually maintenance-free.

	HS...PP2...		DF 16/1S10.80 a, ac, ad, af, nf
<b>Working principle</b>	2 channel system	<b>Working principle</b>	up to 6 channels
<b>Frequency range</b>	0 to max. 20 kHz, depending on cable length and external load	<b>Rotational speed range</b>	0 to 2,000 min <sup>-1</sup>
<b>Operating distance, air gap</b>	0.5 to 2.0 mm	<b>Pulse p. rotation p. channel</b>	80
<b>Operating temperature</b>	-40° C to +120° C	<b>Operating temperature</b>	-40° C to +70° C
<b>Storage temperature</b>	-40° C to +85° C	<b>Storage temperature</b>	-40° C to +70° C
<b>Protection class</b>	IP67	<b>Protection class</b>	IP66 housing IP54 drive side
<b>Pulse duty factor</b>	50 % ±10 %	<b>Pulse duty factor</b>	50% ±20%
<b>Overlap safety</b>	at least 30°	<b>Overlap safety</b>	at least 18°
<b>Short-circuit-proof</b>	yes	<b>Short-circuit-proof</b>	yes
<b>Reverse polarity protection</b>	yes	<b>Reverse polarity protection</b>	yes
<b>Power supply U<sub>B</sub></b>	+5.5 VDC to +30 VDC	<b>Power supply U<sub>B</sub></b>	10 VDC to 30 VDC
<b>Insulation voltage</b>	500 V <sub>EFF</sub> / 50 Hz / 1 min	<b>Insulation voltage</b>	1500 V <sub>EFF</sub> / 50 Hz / 1 min
<b>Power consumption per channel</b>	<20 mA	<b>Power consumption per channel</b>	<35 mA
<b>EMC</b>	EN 50155, EN 50121-3-2, EN 61000-6-x	<b>EMC</b>	EN 50155, EN 50121-3-2, EN 61000-6-x
<b>Permitted mechanical load</b>	EN 61373, category 3	<b>Permitted mechanical load</b>	EN 61373, category 3
<b>Weight</b>	approx. 340 g with 1 m cable and open cable end	<b>Weight</b>	approx. 3.3 kg (without plug and drive)
<b>MTBF</b>	up to 2,015,000 h, ground mobile, depending on the version	<b>MTBF</b>	up to 335,000 h depending on the design
<b>Indication medium</b>	ferromagnet. gear wheel, module 2 - involute toothing acc. DIN 867 - 80 teeth	<b>Design drive</b>	a: cross slotted shaft ac: drive fork ad: drive tongue 20 x 7 af: driving disk nf: smooth shaft
<b>Gear wheel material</b>	steel, demagnetised St37, St50 or 10-10 DIN EN 10025, grade FE430A		

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