

P16800

Doubling, Conversion, and Isolation of Speed Sensor Signals



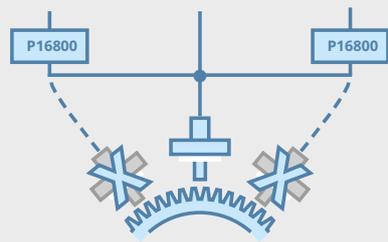
P16800 is the first speed signal doubler for safety-critical applications market-wide.

The pulse transducer carries out the non-interacting signal decoupling for one or two-channel speed sensors according to SIL 4 and transmits the identically duplicated signals to downstream devices in a functionally safe manner. A high level of isolation and the double-shielded optical signal transmission ensure extreme immunity and undistorted signal doubling. For the enhanced compatibility of the sensor and controller, P16800 optionally converts current signals into voltage signals (and vice versa) or reduces the frequency of the output signal in ratios 2:1, 4:1, or 8:1.



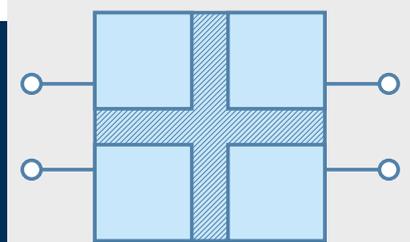
Functionally Safe

- Non-interacting signal decoupling in accordance with SIL 4
- Option of functionally safe signal transmission in accordance with SIL 2



Reduces Costs for New Vehicles and Simplifies Retrofits

- Reduction in the number of rotary encoders
- Signal conditioning by converting voltage signals into current signals and vice versa as well as by frequency division
- Reduction of assembly and maintenance costs



Provides a High Level of Isolation

- Ensures galvanic isolation between the rotary encoder and controller
- Protects downstream devices

Product Code

P16800	P	1	6	-	-	-	P	-	-	/	-	-
Input pulses/output pulses				8								
1 input → 1 output					1							
2 inputs → 2 outputs					2							
2 inputs → 1 output and DOT (direction of travel) with frequency division 1:1 or 2:1 or 4:1 ^{1) 2)}				9	0						3	
With non-interacting input (SIL 4 under preparation)					0							
With non-interacting input (SIL 4) and functionally safe signal transmission to the output (SIL 2)					2							
Modular housing ³⁾							3					
Two-tier terminals in push-in version, pluggable								1				
Frequency division 1:1 or 2:1											2	
Frequency division 1:1 or 4:1											4	
Frequency division 1:1 or 8:1											8	
Power supply/auxiliary power 12...24 V												0

Accessories

Wall-mount adapter	ZU1472
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Specifications (Excerpt)

1 Input

Waveform	Square
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1.1 Voltage Input

Voltage reference signal U_s	10 ... 33.6 V DC (max. 35 V)
Input level	Logical 0 (Low): < 27% of U_s Logical 1 (High): > 77% of U_s

1.2 Current input

Input level	
Low: 6/7 mA	Logical 0 (Low): ≤ 9 mA
High: 14/20 mA	Logical 1 (High): ≥ 12 mA
Error detection open cable I_{in}	Switching threshold at I_{in} < 1.8 ... 2.6 mA

1) Without middle voltage generation

2) Information about this product is available in a separate document: P16890P31/30.

3) for 35-mm DIN rail or ZU1472 wall-mount adapter (optional)

2 Output

Waveform	Square
Output types	Current or voltage signal The outputs of channel Out 1 and channel Out 2 may be configured differently.
Signal conversion options	Current → current Voltage → voltage Current → voltage Voltage → current

2.1 Voltage Output

Voltage level	Low ≤ 1 V U_B connected: High $\geq U_B - 1$ V, with activated standstill detection High $7.2 \text{ V} \pm 0.3 \text{ V}$ (middle voltage) U_B not connected: High ≥ 5.5 V
Reaction to the middle voltage at the input of P16800	Dependent on U_s and the prior input level

2.2 Current Output

Current level	Low 6/7 mA, High 14 mA: 12 ... 16 mA High 20 mA: 18 ... 22 mA
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3 Switch Output

Switch output: SW	Solid state relay, normally closed, normally closed contact, opens in the event of a detected fault
$U_{SW \text{ max}}/I_{SW \text{ max}}$	33.6 V/100 mA

4 Transmission Behavior

Rated frequency range	0 ... 25 kHz
Duty cycle of the speed sensor signals to be transmitted	20% ... 80%
Frequency division, factory set	P168****/2*: 1:1 or 2:1, switchable P168****/4*: 1:1 or 4:1, switchable P168****/8*: 1:1 or 8:1, switchable
Maximum duty cycle deviation output signal to input signal without frequency division	$\pm 10\%$
Duty cycle of the output signal with frequency division independent of input signal duty cycle	$50\% \pm 10\%$
Standstill detection	$f < 1 \text{ Hz} \pm 0.3 \text{ Hz}$

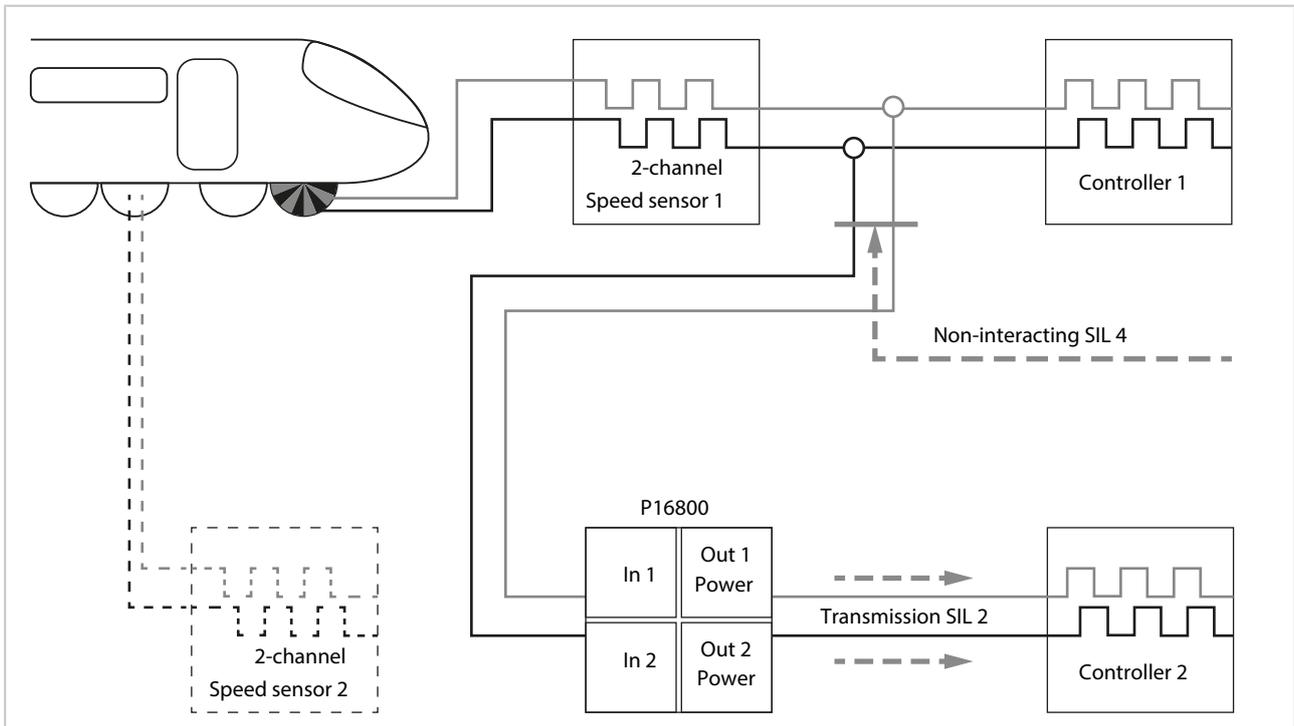
5 Auxiliary Power

Supply	V_S : Output circuit and input circuit (galvanically isolated from the output circuit) U_B : Output driver
Electrical safety	All connected current or voltage circuits must meet the SELV, PELV, or Section I requirements in accordance with EN 50153.
Readiness for operation (after switching on auxiliary power)	≤ 20 ms

6 Insulation

Galvanic isolation	Input circuits against output circuits, channel 1 against channel 2	
Type test voltage	Input against output	8.8 kV AC/5 s 5 kV AC/1 min
	Channel 1 against channel 2	3.55 kV AC/5 s 3 kV AC/1 min
Routine test voltages	Input against output	4.6 kV AC/10 s
	Channel 1 against channel 2	1.9 kV AC/10 s

Application Example



103593, TB-257.401-KNEN02 2024-09-20

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Subject to change.