

# P16890P31/30

## Doubling, Conversion, and Isolation of Speed Sensor Signals (Preliminary Data Sheet)



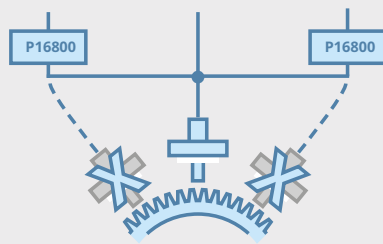
**P16800 is the first speed signal doubler for safety-critical applications market-wide.**

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, P16890 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.



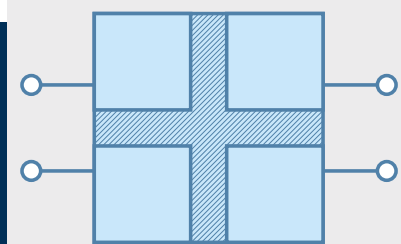
### Functionally Safe

- Non-interacting signal decoupling in accordance with SIL 4



### 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 <sup>1)</sup>				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 <sup>2)</sup>							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

<sup>1)</sup> Without middle voltage generation

<sup>2)</sup> 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 $\leq 1\text{ V}$ U <sub>B</sub> connected: High $\geq U_B - 1\text{ V}$ U <sub>B</sub> not connected: High $\geq 5.5\text{ V}$
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### 2.2 Current Output

Current level	Low 4 ... 8 mA, High 14 mA: 12 ... 16 mA High 20 mA: 18 ... 22 mA
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### 2.3 Switch Output

Switch output: SW	Solid state relay, normally closed, normally closed contact, opens in the event of a detected fault
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## 3 Transmission Behavior

Rated frequency range	0 ... 25 kHz
Overlapping time t <sub>OL</sub>	$\geq 1\text{ }\mu\text{s}$
Flow time	t <sub>p</sub> $\leq 10\text{ }\mu\text{s}$
Duty cycle of the speed sensor signals to be transmitted	25 % ... 75 %
Frequency division, factory set	See nameplate for factory settings, adjustable

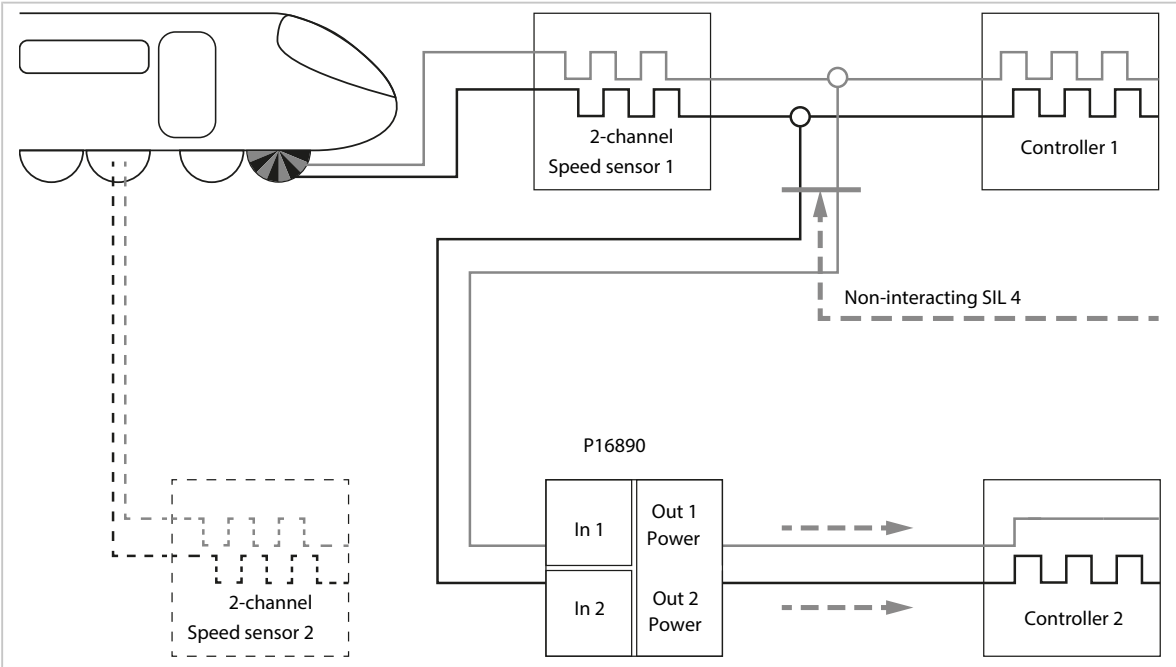
**4 Auxiliary Power**

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)	$\leq 50$ ms

**5 Insulation**

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

**Application Example**



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Subject to change.