P16800

Doubling, Conversion, and Isolation of Speed Sensor Signals

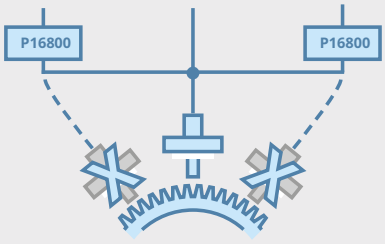
P16800 is the first speed signal doubler for safety-critical applications market-wide.

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.

5 year warranty

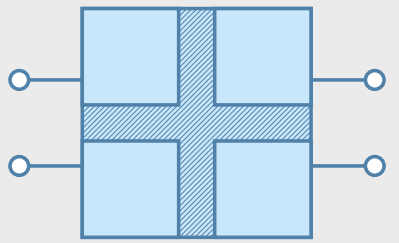
Functionally Safe

- 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 Product Family	P	1	6	_	_	_	P	_	_	/	_	_	_	_	_	_	_
Input pulses/output pulses				8													
1 input → 1 output					1												
2 inputs → 2 outputs					2												
2 inputs → 2 outputs, configurable as DOT (direction of travel), frequency division 1:1 or 2:1 or 4:1 with retention of 90° phase shift[1) 2)]					9	0					3						
With non-interacting input (SIL 4, certification in preparation)						0											
With non-interacting input (SIL 4) and with functionally safe transmission of signal to the output (SIL 2)[3)]						2											
Modular enclosure [4)]								3									
Two-tier terminals in push-in version, pluggable									1								
Frequency division 1:1 or 2:1[5)]											2						
Frequency division 1:1 or 4:1[5)]											4						
Frequency division 1:1 or 8:1[5)]											8						
Power supply/auxiliary power 10…33.6 V												0					
Special types													-	S	x	x	x

Specifications (Excerpt)

Excerpt from the user manual. Detailed information → *knick-international.com*

1 Input

Input signal	Voltage U or current I
Waveform	Square
Input frequency f_{in}	0…25 kHz
Sensor	Speed encoder, speed sensor, position encoder, or pulse generator

1.1 Reference Voltage

Reference voltage U_s	10…33.6 V
Error detection open cable U_S	< 8…10 V; typically 9.45 V

1.2 Voltage Input

Input voltage range	0…U_S
Input switch level	Low: Min. 27 % of U_S
	High: Max. 77 % of U_S

1) Without middle voltage generation

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

3) No functionally safe transmission of signals to the output (SIL 2) when middle voltage detection is activated

4) For 35-mm DIN rail or ZU1472 wall-mount adapter (optional)

5) The phase shift is lost for P1682*P**.

1.3 Current Input

Input current	6…20 mA
Input switch level at Low = 6/7 mA	Low: Min. 9.025 mA
Input switch level at High = 14/20 mA	High: Max. 12.075 mA
Error detection open cable	< 1.8…2.6 mA; typically 2.2 mA

2 Output

Output signal	Voltage or current
Waveform	Square
Signal conversion options	Current → current
	Voltage → voltage
	Current → voltage
	Voltage → current

2.1 Voltage Output

Voltage level	Low: < 1 V (at max. 20 mA)
	High: U_B…U_B – 2 V (at max. 20 mA)
	High (U_B open): > 5.5 V (at max. 20 mA)
	Detected standstill: 6.9…7.5 V; typically 7.2 V (middle voltage) (at max. I = U_B – (7.2 V)/3 kΩ)

2.2 Current Output

Current level High level dependent on configuration	Low: 4…8 mA; typically 6 mA
	High = 14 mA: 12…16 mA; typically 14 mA
	High = 20 mA: 18…22 mA; typically 20 mA

2.3 Switch Output

Technical version	Solid state relay
	Normally closed contact, opens in the event of an error
Fault response time	< 1 s

3 Transfer Characteristics

Functional characteristics	The output level follows the input level.
Setpoint standstill detection	0.7…1.3 Hz; typically 1 Hz
Response time standstill detection	Max. 3 s
Reaction of outputs to detected error:	
Current output	0…100 µA
Voltage output	Not inverted: High
	Inverted: Low

4 Auxiliary Power

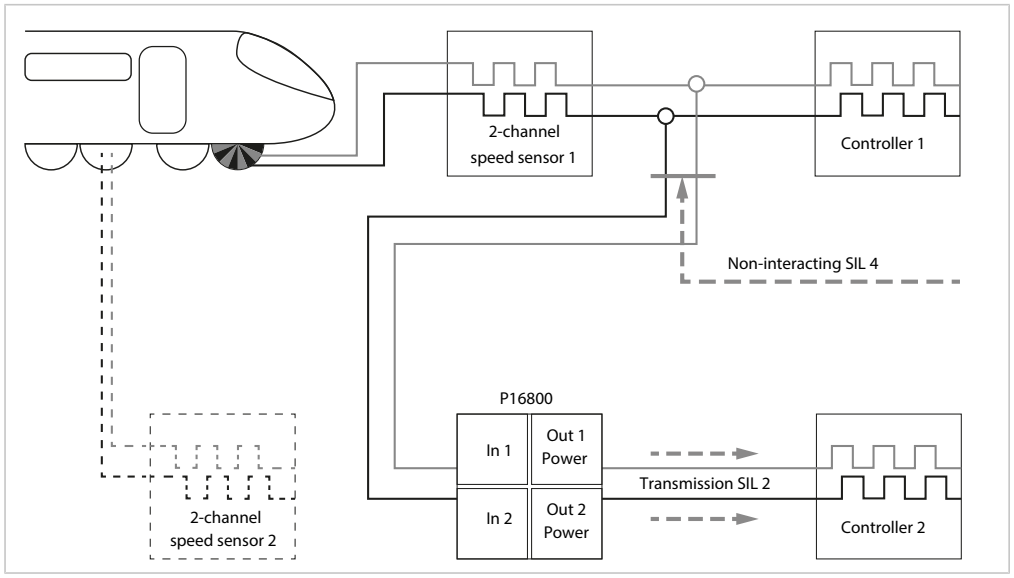
Electrical safety	All connected current or voltage circuits must meet the SELV, PELV or EN 50153 Section I requirements.

Supply of the output	V_S: Supply of the P16800[6]	
	U_B: Supply of output driver[7]	
Power supply	V_S: 10…33.6 V	
	U_B: 10…33.6 V	

5 Isolation

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
	Channel 1 against channel 2:	3 kV AC/1 min
	Output against outer shield of the output (screen):	710 V AC/5 s
		600 V AC/60 s
	Input against outer shield of the input (screen):	2,200 V AC/5 s
		700 V AC/60 s
	Input against DIN rail:	3,550 V AC/5 s

Application Example



6) The entire device, including the input stage, is supplied via V_S.

7) The output stage can be supplied separately via the U_B connection. Next, the output voltage levels are set via U_B.

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