

PG 2000



Axle-mounted speed encoder

SPEED SENSING AND ODOMETRY

Rail vehicles are equipped with speed, direction, and distance detection systems to ensure safe and reliable operation on today's busy, centrally supervised networks. HaslerRail offers a comprehensive range of products to satisfy the most demanding detection requirements and applications.

ON-BOARD ELECTRONICS

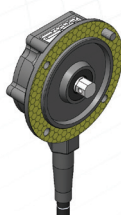
GENERAL INFORMATION

PG 2000 is designed around a unique rotational speed detection system that employs a code disc and a photosensor module. The code disc is etched with at least one circumferential pattern of equispaced vertical lines and this is "read" by the photosensor's diode array. As the code disc rotates with the axle, the fixed photosensor module generates square-wave output signals with frequencies directly proportional to vehicle speed.

The output signals are carried, along with power, by the integrated cable to an intermediate junction box and on to on-board equipment via field wiring.



PRODUCT CONFIGURATIONS



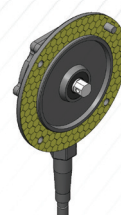
5.8200

Execution for outboard axle journals on a fixed axle box cover.
Fitting axle cover hole with Ø 115 mm.



5.8202

Execution for inboard axle journals on a rotating wheel with a torque support lever.



5.8204

Execution for outboard axle journals on a fixed axle box cover.
Fitting axle cover hole with Ø 140 mm.

MAIN BENEFITS

- Robust design for harsh railway environments
- Electrical phase shifting is pre-set on-chip obviating mechanical adjustments
- Integrates into ETCS and other signaling systems
- Suitable for SIL-certified functions

PG 2000 COMPARED TO PULSE GENERATOR & HE 2000

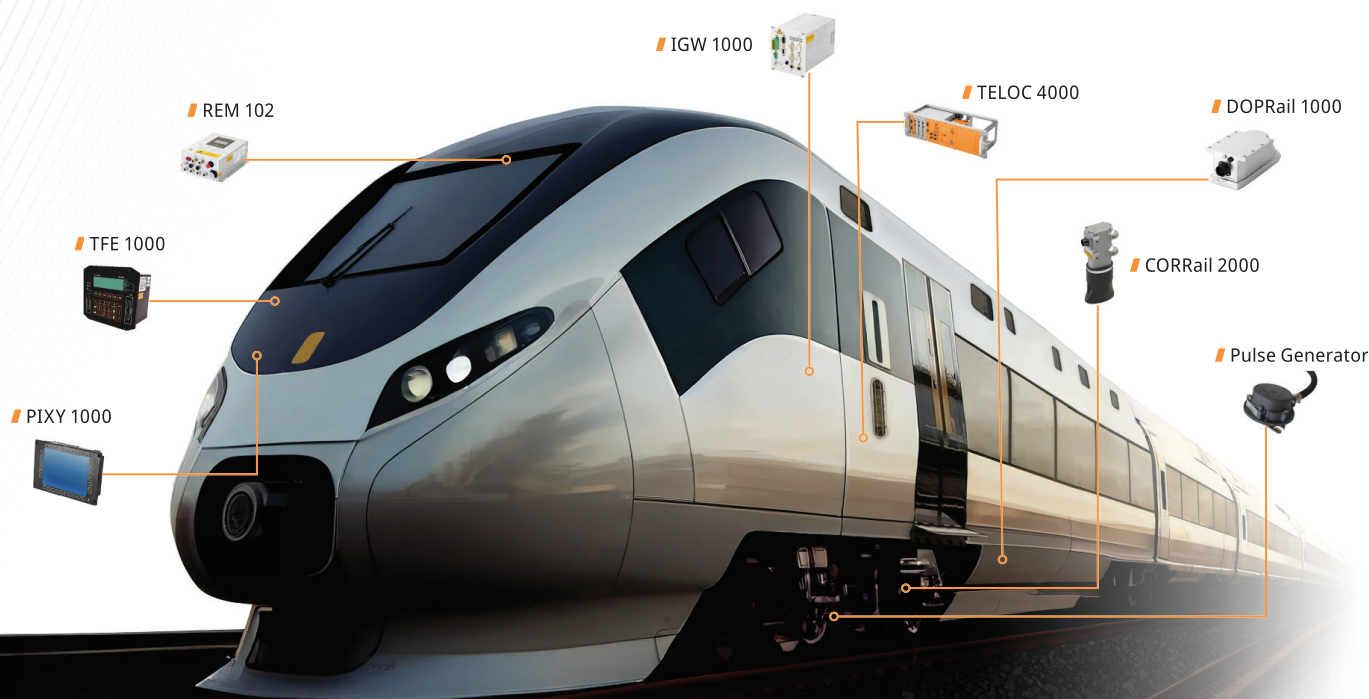
- Up to 8 galvanically isolated output channels
- Predefined phase shift (90° or 120°), electronically set (no mechanical adjustment)
- Predefined PPR values: 200 / 400 / 800 only (no intermediate values)
- Patented sensing chip (optical sensor array) ensuring long-term availability and obsolescence immunity
- High-resolution speed measurement suitable for modern safety architectures
- Compact mechanical design with reduced product height, enabling easier installation in the limited spaces

ODOMETRY SOLUTIONS

Our comprehensive portfolio of odometry solutions encompasses service-proven optical pulse generators and Hall Effect sensors to the latest developments in non-contacting speed sensing (CORRail and DOPRail) for measuring the true speed-over-ground (TSOG) of rail vehicles.

HaslerRail's odometry products are available in several variants to meet the most exacting needs of system integrators and rail operators. The complete sensor portfolio can be networked with our TELOC series of on-train monitoring recording systems (OTMR). The data from multiple sensors is processed and evaluated to ascertain the precise speed and position of the vehicle.

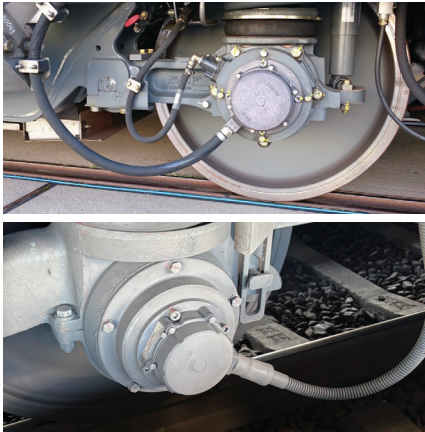
Our customers can specify the sensor type, configuration and data evaluation level to align with their requirements in terms of performance, maintenance schedules and cost.



INSTALLATION EXAMPLE

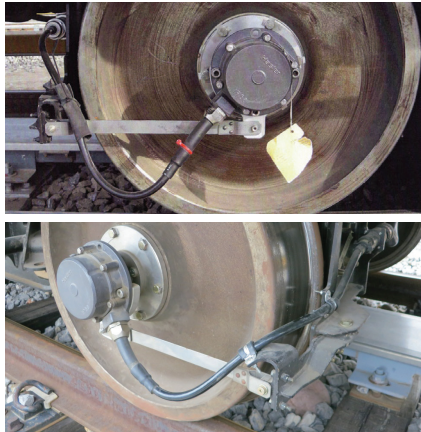
AXLE BOX COVER

OPG 5.860x (1st generation)
OPG 5.862x (2st generation)
PG 2000



ROTATING WHEEL

OPG 5.860x (1st generation)
OPG 5.862x (2st generation)
PG 2000 – under development



RUBBER TYRES

OPG 5.865 (1st generation)



MAIN CHARACTERISTICS

TECHNICAL DATA	VALUE
Speed range	0 – 3000 RPM
Frequency range	up to 40 kHz, depending on the sensor type/code disc
Electrical signals	Square wave signal with voltage 0 – 30 VDC or current output 7 – 16 mA
Duty cycle	40 – 60 %
Power supply	10 - 30 VDC
Operating temperature	-40 °C to +70 °C
Useful life	20 years
MTBF	> 500.000 h
Weight	approx. 2.4 kg to 4.5 kg (depending on type and cable length)
Protection class	IP68 / IP69K

STANDARDS

OUR PRODUCTS ARE FULLY COMPLIANT AND TYPE TESTED ACCORDING TO THE FOLLOWING STANDARDS:

EN 50155:2021 | Railway applications – Electronic equipment used on Rolling Stock

EN 50121-3-2:2016 +A1:2019 | Railway applications - Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus

IEC 60068-2-1:2007 | Environmental testing - Part 2-1: Tests - Test A: Cold

IEC 60068-2-2:2007 | Environmental testing - Part 2-2: Tests - Test B: Dry heat

IEC 60068-2-11:2021 | Environmental testing - Part 2-11: Tests - Test Ka: Salt mist

IEC 60068-2-14:2009 | Environmental testing - Part 2-14: Tests - Test N: Change of temperature

IEC 60068-2-30:2005 | Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)

EN 61373:2010 | Railway applications – Rolling stock equipment – Shock and vibration tests

EN 60529:2013 | Degrees of protection provided by enclosures (IP Code)

EN 45545-2:2020 HL3 | Fire protection on railway vehicles – Part 2: Requirements for fire behavior of materials and components

2011/65/EU (RoHS) | Restriction of the use of certain hazardous substances in electrical and electronic devices 2011

1907/2006EU (REACH) | Registration, Evaluation, Authorization and Restriction of Chemicals 2006

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