

LUXACT Neo 1D



Slip-free, contactless speed-over-ground sensor for vehicle longitudinal dynamics

Second generation of LUXACT optical sensors provide engineers with a powerful and universal reference for contactless, slip-free longitudinal speed over ground enhanced with a full feature inertial measurement unit (IMU).

IMU makes it real to correct in real-time for all phantom optical speeds due to vehicle yaw, pitch and roll.

Measurements not affected by the environment disturbances like abrupt changing surfaces properties (reflectivity, material, medium) and heights to the ground variations, splashes of water, EM noise and objects crossing the field of vision. or testing neighborhood properties.

LUXACT meets the needs of modern time-efficient testing procedures due to easy mounting & setup and reliable results. The system is highly integrated in one compact and rugged IP67 protected sensor body. All signals are acquired directly by customer's data acquisition system without additional signal processing, which allows a quick and flexible integration in a modern testing or ECU infrastructure.

Technology

Unlike traditional **mechanical, optical, radar & GPS-based sensors** LUXACT is essentially based on two measuring principles, optical and inertial, using benefits of both. The high grade innovative optical system with a wide aperture enables clear signal even in rough environments. Precise inertia system improves optical signal if it is corrupted. The brain of the sensor is a high power DSP & FPGA combined with 24-bit ADCs. This intelligent system performs complex online calculations that integrate LUXACT optical and inertial technologies, getting benefits of both. This sensor synergy ensures true reaction to fast changes of speed as well as low-noise measurements of velocity, true start-up and standstill and measurements in zero speed vicinity.



Features

- speed uncertainty $\leq 0,2\%$ RMS
- any industry's typical surface
- big height dynamic range
- low & constant latency of 3 msec
- optical disturbances eliminated by integrated 6 DOF IMU
- up to 1000 Hz data output rate
- clear start-up and standstill
- direction detection
- hard real-time due to high-power DSP & FPGAs



Vertical Version



Horizontal Version

Applications

Automotive: brake test, ABS & ESP tests, coast down test, consumption, acoustic pass-by, IMU support, road profilometry

Rail: brake tests/commissioning, slip control, distance reference, high-speed applications

Agricultural: distance/speed measurement on the field, slip control

Typical surfaces

Automotive: asphalt, concrete, standing & moving water, splashes, fog, water dispersion, snow, ice, mud, dust, dirt

Rail: ballast bed, wood, concrete, snow, water, water & snow dispersion, steel, gaps

Agricultural: ploughed soil, fields

Specifications can be changed without notice.

Further information:

Berlin: +49 - 30 - 46 70 90 - 0

Frankfurt: +49 - 6172 - 59672 - 0

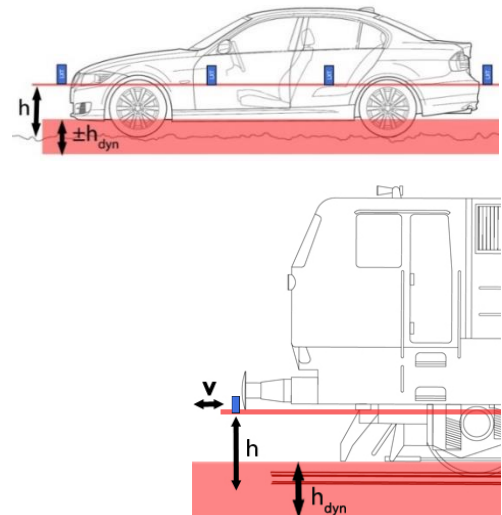
Zürich: +41 - 52 - 722 14 55

Performance Specifications

		Low speed	Standard	High Speed
Typical vehicles		fork lift, construction machines	cars, trains	High-speed rail
Speed ranges available	km/h	0,1-50	0,2-270	0,3-400 0,5-500
Nominal mounting heights available h	mm	150 / 300	300 / 500	500 / 700
Dynamic height working range h_{dyn}	%	± 30 of h		
Speed uncertainty 3σ	% FS RMS	$\leq 0,2$		
Distance uncertainty 3σ	%	$\leq 0,1$ at $s > 200m$		
Update rate	Hz	50 / 250 / 1000		
Filtering		none needed		
Latency Delay to physical events	ms	constant 3 @ 50Hz output rate 2 @ 1000Hz output rate		
Light source / MTTF		invisible LED, 100.000h		
Accelerometers 3x accelerometers in x, y, z axle		Range $\pm 16g$, Resolution $< 0,5$ mg Bandwidth 0-20 Hz, Noise $< 0,1$ mg/VHz		
Gyro 3x gyros in x, y, z axle		Range ± 2000 °/s, Resolution $< 0,02$ °/s Bandwidth 0-20 Hz, Noise < 0.004 °/s VHz		

Features & options

CAN bus	Intel/Motorola format, 2.0A/2.0B Baud rate: 500, 1000 kbit/sec
	Key parameters (Standard): longitudinal compensated ground speed v_L longitudinal compensated distance s 3x accelerations a 3x angular rates Ω optical signal quality k
	with DRC direction detection option: net distance s_n longitudinal speed v_L with sign
	with TRG trigger option: distance since trigger (for example brake pedal) relative yaw, pitch, roll since trigger distance between triggers velocity at trigger time (brake start velocity) time since trigger average deceleration/acceleration since trigger to 0 km/h basing on $a(v,t)$, $a(s,t)$, $a(v,s)$, MFDD
Pulse output <i>TTL option</i>	TTL 0-5V pulses for speed & distance data 100Hz per 1 km/h. 1 pulse = 2,77mm In combination with DRC option: quadrature A/B TTL output. Scope: SW option and cable: DSUB 15 male, 5m
Trigger <i>TRG option</i>	Highly accurate event-based internal calculations. Any potential-free NO trigger, power supply integrated. Scope: SW option and cable: M12 female 4 pin, 2m



Environmental & physical

Size	L x W x H: 280 x 92,5 x 60 mm
Weight	1000g
Protection	IP67
Operating conditions	-40...+85 °C, 10 – 90% relative humidity, without condensing
Shock	50 g Half-Sine, 6ms
Vibration	30g, 10 ... 150Hz
Power supply	9...36 VDC inverse- polarity protection, EMI protection
Power consumption	12W @ 12V

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Ordering information

1. Select your model

standard housing





horizontal housing



	<i>Model code</i>	<i>Part Nr.</i>	<i>Model code</i>	<i>Part Nr.</i>
Standard speed	1DN	L10120	1DNF	L10124
High-speed	1DNH	L10121	1DNHF	L10125
Low-speed	1DNL	L10122	1DNLF	L10126

2. Select your options

Option code	Part Nr.	Description
DRC	L20101	Detection of speed direction. Speed and distance signals signed. Net distances calculated automatically. Phantom speeds due to brake pitch are subtracted in auto mode.  Highly recommended in combination with TRG option for high-accuracy brake testing applications.
TRG	L20102	Direct connection of brake pedal, light switch or simple NO switch to trigger events and highly accurate internal calculation. Inevitable for high-accuracy brake testing.
TTL	L20103	TTL 0-5V output for speed and distance information (additionally to CAN bus).  If ordered together with DRC option, A/B phase shifted quadrature output is provided
LC...	L20120 – 10m L20121 – 20m	CAN Cable length in meters (std. 5m). Max. value: 20m *others on request
LT...	L20122 – 10m	TTL Cable length in meters (std. 5m). Max. value: 10m *others on request

3. Define your full product code

	model code	nom. height [mm]	speed range [km/h]	output rate [Hz]	option codes	cable length LC=CAN LT= TTL
LXT	- 1DN	- 500	- 270	- 250	/ TRG / DRC / TTL	/ LC20 / LT10
LXT	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	- <input type="text"/>	/ <input type="text"/> / <input type="text"/> / <input type="text"/>	/ <input type="text"/> / <input type="text"/>

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