PRELIMINARY

GEMAC Motus® BLACKLINE

The FIRST POWER-IMU for Mobile POWER-Machines

GEMAC Motus® ***BLACKLINE*** expands the portfolio of the GEMAC Motus® sensor generation with additional high-precision sensor variants.

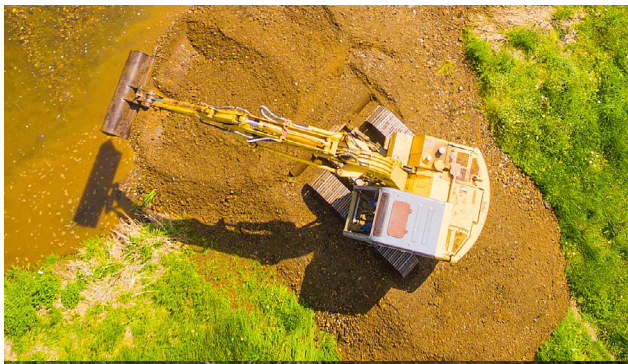
The configurable sensor measuring unit GEMAC Motus® enables 6-axis motion detection on Mobile POWER-Machines, such as **construction machinery, agricultural and forestry machinery, cranes and lifting technology**, as well as **ships**.

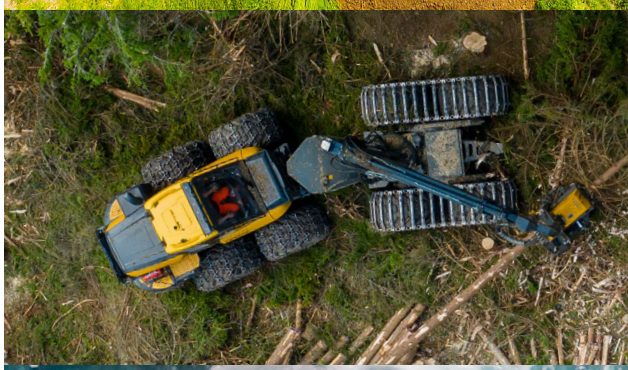
GEMAC Motus® ***BLACKLINE*** also offers cost-effective variants in plastic housing and different accuracy types.

Our in-house developed sensor fusion algorithm with the **„Enhanced Kalman Filter“** specially optimized for motion detection takes over the highly accurate orientation calculation and is even more robust. It enables the correction of nonlinear disturbances and thus even better damping of external accelerations or vibrations.

The accuracy of the inclination measurement includes a compensated cross-sensitivity and is independent of the local gravity field due to the 3D measurement.

- Automatic adaptation of the filter parameters according to the motion state of the sensor
- Improved offset correction of the gyroscope
- Increased user-friendliness through simplification of sensor configuration





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GEMAC Motus® BLACKLINE variants

- Recording of static inclination:
  GEMAC Motus® *BLACKLINE* SB and SC
- Recording of static and dynamic inclination:
  GEMAC Motus® *BLACKLINE* NB and NC
- Recording of inclination (static and dynamic), acceleration and rotation rate:
  GEMAC Motus® *BLACKLINE* XB and XC

Variants	SB	SC	NB	NC
General parameters	Inclination static		Inclination static and dynamic	
Measurement range	±90°/ ±180° (360°) [2]		±90°/ ±180° (360°) [2]	
Resolution	0.01°		0.01°	
Temperature coefficient	±0.01 °/K	±0.0016 °/K	±0.01 °/K	±0.0016 °/K
Static accuracy [1]	±0.3°	±0.1°	±0.3°	±0.1°
Dynamic accuracy [1]	-	-	±0.5°	±0.5°
Interface	CAN, CANopen, SAE J1939, Current 4...20 mA, Voltage 0...10 V			

Variants	XB			XC		
General parameters	Inclination	Accelerometer	Gyroscope	Inclination	Accelerometer	Gyroscope
Measurement range	±90°/ ±180° (360°) [2]	±8 g	±250 °/s	±90°/ ±180° (360°) [2]	±8 g	±250 °/s
Resolution	0.01°	0.244 mg	0.00875 °/s	0.01°	0.244 mg	0.00875 °/s
Temperature coefficient	±0.01 °/K	0.2 mg/K	0.01 °/s/K	±0.0016 °/K	0.02 mg/K	0.01 °/s/K
Static accuracy [1]	±0.3°			±0.1°		
Dynamic accuracy [1]	±0.5°			±0.5°		
In run bias stability			5 °/h			5 °/h
Angle Random Walk (ARW)			0.2 °/√h			0.2 °/√h
Interface	CAN, CANopen, SAE J1939					

[1] incl. compensated cross sensitivity [2] up to 2 measuring axes with configurable orientation

Range of functions:

- Automatic adaptation of the filter parameters according to the motion state of the sensor
- Improved offset correction of the gyroscope
- More user-friendliness through simplification of sensor configuration
- Automatic configuration of the mounting position
- Flexible zero point adjustment
- Expert mode with advanced setting options
- Individual configuration of the sensor fusion

Available interfaces:

- CAN 2.0 A and B (11- and 29-Bit-ID) according ISO 11898-2
- CANopen according CiA DS-301, profile according CiA DSP-410
- SAE J1939, configurable process data
- Analog: Current (4...20 mA), Voltage (0...10 V)

- Starter kit (including programming adapter, cables and PC software)

Mechanical parameters:

Connector: 1 or 2 sensor connectors M12 5-pole, A-coded
Degree of protection: IP6K7/IP6K9K,
Operating temperature: -40 °C to +85 °C
Dimensions and weight: 121 mm x 66 mm x 30 mm, approx. 200 g
Housing material: plastic (PA)

Electrical parameters:

Supply Voltage: 10 V to 36 V (in some cases from 7.5 V)
Current consumption at 24 V: approx. 12 mA (digital), max. 70 mA (analog)

GEMAC Chemnitz GmbH | +49 (0)371 3377-0 | info@gemac-chemnitz.de | www.gemac-chemnitz.com

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