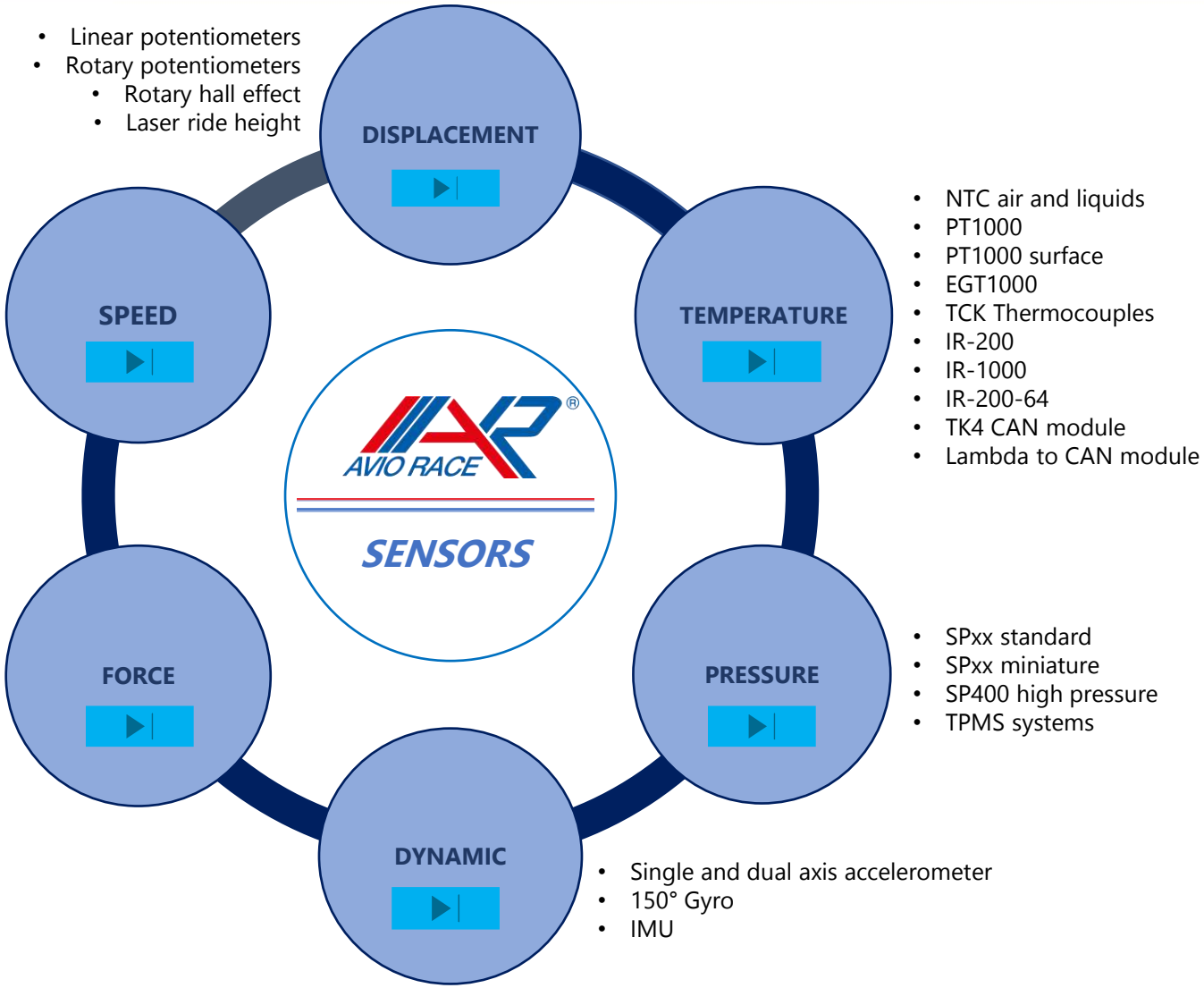
AVIO RACE

AVIORACE SENSORS

AVIO RACE USA

SENSORS CATALOGUE



AVIO RACE

DISPLACEMENT

AVIO RACE USA

LINEAR DISPLACEMENT

Linear potentiometers

Series of linear pots compact and easy to install. These high-performance potentiometers are based on conductive plastic technology that assures light-weight and resistance to oxidation. 2 versions available: external diameter 9,5mm or 13mm, several standard models available at stock. Full customization on request.

APPLICATIONS

- Suspensions
- Motorcycle forks
- Shock Absorbers

TECHNICAL SPECIFICATIONS

- Maximum Supply Voltage: 40 Vdc;
- Resolution: Infinite;
- Temperature Range: -30 to 155°C (limit 175°C);
- Linearity: ≤ ±0.5%;
- Case Material: Aluminum; Stem: stainless steel
- Weight: 26 ÷ 46 gr.

CUSTOM OPTIONS*

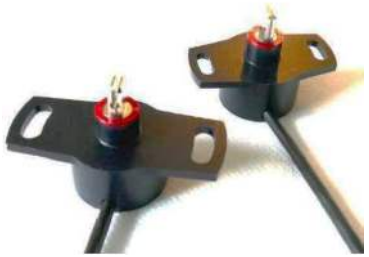
- Shaft thickness
- Fixing systems (uniball, pop-joint, mix..)
- Out cables direction and wires end (motorsport or plastic connector)
- Data acquisition stroke (from 12,5mm up to 200mm)
- Customer Logo

*subject to extra costs or MOQ

ANGULAR DISPLACEMENT

Resistive rotary sensors SRR series

Using conductive plastic technology, these sensors ensure excellent accuracy and reliability, even in demanding environments. With an operating temperature range up to 175°C, the SRR series offers durable performance, making it ideal for use in extreme conditions.



TECHNICAL SPECIFICATIONS

- Electrical angle: 45° - 125° - 125° dual - 350°
- Maximum supply: 40V DC
- Shaft Material: Stainless Steel;
- Weight: 15g (without cable);
- Sealing: IP67.

CUSTOM OPTIONS*

- Wires end (free wires, motorsport or plastic connector)
- Fixing slots and shaft shape
- Electrical angle ch1 and ch2
- Ratiometric output
- Customer logo

*subject to extra costs or MOQ

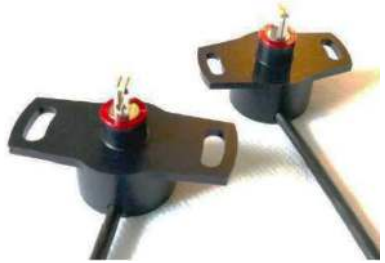
APPLICATIONS

- Detection of angular position of mechanical organs: throttle, pedals, etc.

ANGULAR DISPLACEMENT

Non-contact rotary potentiometers SRH series

Series of ‘non-contact” rotary potentiometers designed to withstand the harsh environmental conditions of motorsports.
Using proven “Hall Effect” technology, the SRH series sensors
offer high performance and reliability at operational temperatures
up to +150°C. These small and lightweight sensors are available
with a large range of options.



CUSTOM OPTIONS*

- Wires end (free wires, motorsport or plastic connector)
- Fixing slots and shaft shape
- Electrical angle ch1 and ch2
- Ratiometric output
- Customer logo

*subject to extra costs or MOQ

TECHNICAL SPECIFICATIONS

- Electrical angle: 30° - 100° - 360° STD;
- Channel Option: Single & Dual channel (redundant);
- Supply Voltage: 5V DC (ratiometric output (10/90% Vin)): 6-30V DC (absolute output 0.5-4.5V);
- Shaft Material: Stainless Steel;
- Weight: 15g (without cable);
- Sealing: IP67.

APPLICATIONS

- Detection of angular position of mechanical organs: throttle, pedals, etc.

LASER RIDE HEIGHT

RHL-350v1

The RHL-350v1 high performance sensor ensures fast and accurate data detection.
The black anodized aluminum case resists to high vibrations and high temperature.

APPLICATIONS

- 4X installed on car floor to detect accurate ride height of the vehicle in dynamics tests
- Movable aerodynamic components position detection

TECHNICAL SPECIFICATIONS

- Range: 300mm (50-350mm);
- Linearity: +/-0.15% of Full Scale;
- Supply voltage: 12-28 V (100mA);
- Temperature range: Operating:-10 to +50 °C;
- Storage: -10° C to +80 °C;
- Free wires – 1mt cable

CUSTOM OPTIONS*

- Motorsport or plastic connector

*subject to extra costs or MOQ

AVIO RACE®

TEMPERATURE

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LIQUID TEMPERATURE

ST250

NTC technology based temperature sensors are designed for liquids or gas measurement. The stainless steel body preserves mechanical characteristics and allows the sensor to provide a quick response to temperature changes.

TECHNICAL SPECIFICATIONS

- Material: Stainless Steel;
- Measurement range: -40÷200°C;
- Accuracy: ±1°C in range 0÷175°C;
- Thread: M6x1;
- Weight: ≈ 13 g.

CUSTOM OPTIONS*

- Specific body materials: Inconel, Titanium…
- Specific fixing threads: M8x1, 3/8UNF…
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.

*subject to extra costs or MOQ

APPLICATIONS

- Liquids measurements like H2O circuits, oil circuits...

AIR TEMPERATURE

ST_AIR

NTC technology based temperature sensors are designed for gas measurement. The stainless steel body preserves mechanical characteristics and allows the sensor to provide a quick response to temperature changes.

TECHNICAL SPECIFICATIONS

- Material: Stainless Steel;
- Measurement range: -40÷125°C
- Accuracy: ±0.1°C tra 0÷70°C
- Thread: M8x1
- Weight: ≈ 13 g.

CUSTOM OPTIONS*

- Specific body materials: Inconel, Titanium…
- Specific fixing threads: M8x1, 3/8UNF…
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.

*subject to extra costs or MOQ

APPLICATIONS

- Gas measurements like air intake manifolds...

LIQUID, AIR TEMPERATURE

PT1000

PT1000 temperature sensor, suitable for measuring liquids or gases, with linear characteristic and high response speed.The sensor is made of STAINLESS steel or TITANIUM to maintain excellent mechanical characteristics combined with good thermal conductivity for better response to temperature variations.

APPLICATIONS

- Liquids or gas measurements like H2O circuits, oil circuits, air intake manifolds, etc.

TECHNICAL SPECIFICATIONS

- Material: Stainless Steel;
- Measurement range: -40÷200°C;
- Accuracy: ±1°C in range 0÷175°C;
- Thread: M6x1;
- Weight: ≈ 13 g.

CUSTOM OPTIONS*

- Specific body materials: Inconel, Titanium…
- Specific fixing threads: M8x1, 3/8UNF…
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.
- Specific tests & certifications

*subject to extra costs or MOQ

SURFACE TEMPERATURE

PT1000 surface

Miniaturised PT1000 temperature sensor - A class - suitable for surface temperature, with linear characteristic and high response speed in liquid or gas measurement. The aluminium housing is very small, allowing it to be used it in very confined spaces.

APPLICATIONS

- Surface temperature measurements, generic.

TECHNICAL SPECIFICATIONS

- Material: Aluminum;
- Measurement Range: -30 ÷ +200°C;
- Accuracy: A Class, according to standard IEC60751;
- Protection: IP67;
- Weight: ≈ 6gr.

CUSTOM OPTIONS*

- Specific fixing shapes
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.
- Specific tests & certifications

*subject to extra costs or MOQ

EXHAUST GAS TEMPERATURE MEASUREMENT

EGT1000

The EGT1000 sensor is composed by a platinum body that ensures resistance to high temperatures.

APPLICATIONS

- Exhaust Gas Temperature measurement.

TECHNICAL SPECIFICATIONS

- Operating Range: -40°C ÷ 1000°C;
- Sensor Accuracy: ±0,9% to 900°C;
- Weight: 50g ± 3g;
- Operation Current: 2.7mA - 4.2mA.

CUSTOM OPTIONS*

- Fixing thread
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.
- Specific tests & certifications

*subject to extra costs or MOQ

THERMOCOUPLE

TCK

The TCK thermocouple ensures elevate noise resistance thanks to its insulated junction.
The good heating transmission between Inconel coating and junction allows the sensor to rapidly responds.
Thanks to its mechanical characteristics the TCK can be used in restricted areas.

APPLICATIONS

- Liquid or gas temperature measurement.
- Temperature measurement – generic

TECHNICAL SPECIFICATIONS

- Thermocouple type: K , 1st class;
- Coating material: Inconel 600;
- Measurement range: -40 ÷ 1000 °C;
- Tollerance: 1,5°C till 375 °C 0,004 x [T] over 375°C:
- Weight: ≈ 50 g.

CUSTOM OPTIONS

- Configuration of dedicated kits in combination with TK4 CAN modules

TK4 CAN MODULE

TK4

The TK4 is a small module that converts 4 k-type thermocouples signal in CAN – BUS.
The CAN bus is configurable by using a free application software. It is possible to set the CAN speed, message frequency, message ID and many other settings.

TECHNICAL SPECIFICATIONS

- Power supply: 5,5 – 16 Vdc;
- Supply current 15mA;
- Transmission: CAN line 2.0A or 2.0B;
- Input low pass filter: 160 Hz;
- Resolution: 0,4 °C;
- Accuracy: ± 1°%

APPLICATIONS

- Exhaust temperature measurement;
- Brakes temperature management.

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.

INFRARED SINGLE SPOT TEMPERATURE SENSOR

IR 200 - Single spot infrared sensor

The infrared sensor measures temperature at a calibrated distance range without touching the target.
The Output voltage is proportional to the detected temperature.

The external case is made of premium aluminum

TECHNICAL SPECIFICATIONS

- Supply voltage Single spot sensor: 5÷16 Vdc;
- Output voltage Single spot sensor: 0÷5 Vdc;
- Current consumption Single spot: 10 mA MAX;
- Full scale: 150°C or 200°C;
- Measurement distance Single spot: 50÷150 mm;
- Protection IP64
- Weight: ≈ 20 g.

APPLICATIONS

- Tyre temperature measurement.
- Single spot non-contact thermal management

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.

INFRARED MULTI SPOT TEMPERATURE SENSOR

IR 200 – 64 Multi spot infrared sensor

The Infrared sensor measures temperature at a distance without touching the target. It detects thermal radiations emitted by objects on 64 points (4 rows x 16 columns). The data are transmitted via CAN bus. Typical application is tire temperature measurement. The sensor is available in three versions with three different fields of view: 40°, 60°, 120°.

TECHNICAL SPECIFICATIONS

- Supply voltage Multi spot sensor: 7÷24 Vdc
- Output voltage Multi spot sensor: CAN line;
- Current consumption Multi spot: 7 mA;
- Full scale: 150°C or 200°C;
- Measurement distance Multi spot: 20÷400 mm;
- Protection: IP64
- Weight: ≈ 20 g.

APPLICATIONS

- Tyre temperature measurement
- Any contactless application for test labs or industrial environments

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths.

INFRARED SINGLE SPOT TEMPERATURE SENSOR

IR 1000 - Single spot infrared sensor

Infrared sensor, specifically designed for brake discs temperature measurement. The output voltage is proportional to the detected temperature and the accuracy of the signal is very high. The sensor has three different elements built-in, to actively compensate the output signals. Mechanical: aluminum body red anodized, fully sealed

APPLICATIONS

- Brake discs temperature measurement
- Any contactless application for test labs or industrial environments

TECHNICAL SPECIFICATIONS

- Supply voltage: 7÷24 Vdc;
- Output voltage: 0÷5 Vdc;
- Current consumption: 23mA;
- Measurement distance: 30 ÷ 100 mm;
- Protection: IP64;
- Weight: ≈ 14 g.

CUSTOM OPTIONS

- Configuration of specific kits in combination with CAN modules

LAMBDA TO CAN

Lambda to CAN

LCU4 controls and reads up to 4 Bosch LSU 4.9 lambda sensors.
The CAN bus output is fully compatible with MoTeC M1 ECU or Dashboard protocol.

LCU

*LCU4**

APPLICATIONS

- CAN bus acquisition of Lambda signals

TECHNICAL SPECIFICATIONS

- Power Supply: 8÷16 Vdc;
- Max Current Absorption: 6 A (during sensors heating)Transmission: CAN line 2.0A or 2.0B;
- Protection: IP66;
- Weight with wires: ≈ 121 g;
- Connection: Plastic JAE Connector.

CUSTOM OPTIONS*

- JAE counterpart connector for Lambda wiring
- Complete wiring harness for connecting 4 Bosch LSU 4.9 lambda sensors to the LCU4 module

*subject to extra costs or MOQ

AVIO RACE®

PRESSURE

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PIEZORESISTIVE PRESSURE SENSORS

Piezoresistive pressure sensors M10x1

Active pressure transducer, linear, ideal for any application. The body and diaphragm are stainless steel made AISI 316L, fully resistant to chemical attacks by standard motorsport fluids.
It integrates a Packard connector

TECHNICAL SPECIFICATIONS

- Power Supply: 5,0 VDC ± 0,5 V;
- Output voltage: 0,5 V...4,5V ratiometric;
- Accuracy (Comp. Temp.- Range): ± 1 %FS (0...50 °C)
  ± 1,5 %FS (-10...80 °C)
  ± 2,5 %FS (-40...125 °C)
- Protection: IP67;
- Weight: ≈ 50 g.

APPLICATIONS

- Chassis (brakes, lifters..);
- Engine application (H2O, oil, etc..)

CUSTOM OPTIONS*

- Fixing threads
- Specific calibrations
- Absolute P and/or T compensated
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

*subject to extra costs or MOQ

PIEZORESISTIVE PRESSURE SENSORS - MINIATURE

Piezoresistive pressure mini transducer SPxx-M8x1 or 3/8 UNF

Piezoresistive pressure mini transducer, linear analogue output, amplified, designed to resist to vibrations, temperature shocks and fluids typical of motorsports applications.
Body structure is in stainless steel; protection cap in Ergal; wires and tubes motorsport graded.

TECHNICAL SPECIFICATIONS

- Power Supply: 8÷28 V;
- Output voltage: 0,5 V...4,5V NOT ratiometric;
- **SPxx-M8x1 – Operating temperature: -20...120 °C**
- **3/8 UNF - Operating temperature: -20...100 °C**
- Current consumption: 3,5mA;
- Sealing: IP67;
- Weight: ≈ 34 g.

CUSTOM OPTIONS*

- Ergal junction for fitting on banjo screw;
- Viton version for hermetic applications;
- Custom calibration.
- Absolute P and/or T compensated
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

APPLICATIONS

- Chassis applications like brakes pumps,
- Engine/gearbox applications
- Cooling systems

*subject to extra costs or MOQ

PIEZORESISTIVE PRESSURE SENSORS – MINIATURE HIGH PRESSURE

PIEZORESISTIVE PRESSURE MINI TRANSDUCER SP400-M8X1 or 3/8 UNF

Piezoresistive pressure mini transducer, linear analogue output, amplified, designed to resist to vibrations, temperature shocks and fluids typical of motorsports applications.
Body structure is in stainless steel; protection cap in ergal; wires and tubes are motorsport graded.
Suitable for measurement on high pressure applications (e.g. Fuel Rail)

TECHNICAL SPECIFICATIONS

- Power Supply: 8÷28 V;
- Output voltage: 0,5 V...4,5V NOT ratiometric;
- **Operating temperature: -20...120 °C**
- Linearization: 0,5 V = 0 _____4,5 V = FS;
- Sealing: IP67;
- Weight: ≈ 40 g.;
- Accuracy (Comp. Temp-Range):
  ± 0,5 % FS max (-10...120 °C)

APPLICATIONS

- Engine
- Any high pressure measurements.

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

PIEZORESISTIVE PRESSURE SENSORS - MINIATURE - HIGH TEMPERATURE

PIEZORESISTIVE PRESSURE MINI TRANSDUCER SPA10HT - M8X1, SP35HT - M8x1 or PSA3/8 116 HT – 2400HT

Miniature piezoresistive pressure transducer with linear analogue output, amplified, designed for motorsport applications in extreme conditions like engine bays and brake ducts.
Suitable for measuring pressure in brake, oil, water, or fuel systems, it features a durable stainless steel body (AISI 316 L). An optional Ergal connection allows mounting on a hollow screw. The body and diaphragm are resistant to motorsport fluids. Custom calibration is available from 8 to 400 bar for precise high-pressure performance.

TECHNICAL SPECIFICATIONS

- Power Supply: 8÷28 V;
- Output voltage: 0,5 V...4,5V NOT ratiometric;
- Operating temperature: **-10...150 °C**
- Linearization: 0,5 V = 0 _____4,5 V = FS;
- Sealing: IP67;
- Weight: ≈ 34 g. (including 600mm cable and tube)
- Accuracy (Comp. Temp-Range):
  ± 2,0 % FS (-10...120 °C)
  ± 3,0 % FS (120...150 °C)

APPLICATIONS

- Engine oil, water, fuel, brakes, steering pumps...

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

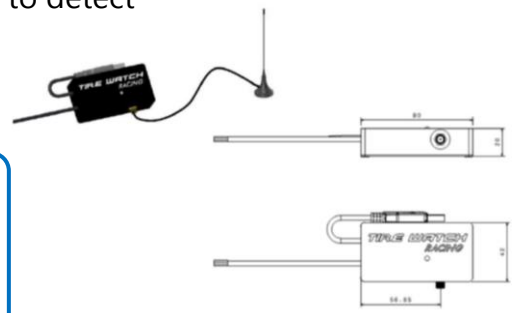
TPMS SYSTEMS

TPMS systems

The TPMS systems are used for tires pressure and temperature real time detecting and to store and monitor data.
It requires 1 or max 2 antenna to detect the sensors: easy installation!

Specific versions available:

- **LMS racing** – high performance sensors + RCU double antenna connected to vehicle ECU.
- **GT Type** – longer life sensors + RCU double antenna connected to vehicle ECU
- **Sport Series** – Long life sensors + mini display receiver to detect live pressure and temperature



APPLICATIONS

- Detecting tires pressure and temperature.

TECHNICAL SPECIFICATIONS

RECEPTION CONTROL UNIT (RCU):

- Power Supply: 9 – 16 Vdc;
- Current Supply: 60 mA at 12V (max 100 mA in logging);
- Trasmission: CAN line 2.0A, 1MBps.

WHEEL SENSORS (WUS):

- Sensor life: > 1 race season;
- Measuring pressure range: 0 – 3,5 bar;
- Pressure accuracy: ± 20 mbar;
- Monitored temperature range: -40 / 125 °C;
- Temperature accuracy: ± 2 °C;
- Weight: 47 g.

AVIO RACE

DYNAMIC

AVIO RACE USA

DYNAMIC SENSORS: GYROSCOPE

GYRO150

The gyroscope GYRO150 is used in many different kind of vehicles, from motorcycles to boats. The anodized aluminum case ensures chemical resistance to motorsport fluids.

TECHNICAL SPECIFICATIONS

- Power supply: 5Vdc or 12 Vdc ± 0,25 V;
- Output voltage: 0,25 V ÷ 4,75V ratiometric;
- Sensitivity: 12.5mV/°/sec ;
- Weight: ≈ 27 gr.

APPLICATIONS

- Vehicles dynamics data acquisition

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

DYNAMIC SENSORS: IMU

IMU: Inertial Measurement Unit

Inertial measurement unit able to output acceleration and angular acceleration on 3 axis.
The can bus output parameters can be configurated in different ranges with specific can message/tools.

TECHNICAL SPECIFICATIONS

- Power Supply: 8÷16 Vdc;
- Working Temperature Range:0÷80 °C (internal compensation on all axis);
- Material: Anodized aluminum;
- Protection:IP64,
- Weight with wires:≈ 58 g

APPLICATIONS

- Vehicles dynamics data acquisition and analysis.

CUSTOM OPTIONS

- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

AVIO RACE

FORCE

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FORCE SENSORS: AR006

AR006 – Load cell

The load cell AR006 is designed for being applicated on gear shafts.
The output voltage is proportional to applied compression or extension force.

TECHNICAL SPECIFICATIONS

- Supply: 5÷24 Vdc;
- Output range: 0÷5V;
- Material: Stainless Steel 17-4;
- Case material: Aluminum;
- Weight: ≈ 35 g.

APPLICATIONS

- Compression and extension force measurements.

CUSTOM OPTIONS

- Available in M8X1,25 or M6X1.
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

STRAIN GAUGE APPLICATION

Strain gauge application

Strain gauges installation service on mechanical components. The integrated electronics amplifies the signal: output voltage and characteristics of the signal are compliant to most of the Motorsport data loggers.

APPLICATIONS

- Tie rods
- Shafts
- Suspension arms
- Forks, dampers

CUSTOM OPTIONS

- Output calibration
- Wires length and application of connectors (autosport or plastic)

AVIO RACE®

SPEED

AVIO RACE USA

SPEED SENSORS: SV8

SV8

The speed sensor SV8 is based on inductive technology NPN – NO. M8x1 aluminium body with 2 nuts for correctadjustment even in the case of difficult installations.The unit is equipped with a reading signalling LED forsensor reading signal, useful for adjustment duringinstallation.
Ideal for speed measurement on bolts and phonic wheels.

APPLICATIONS

- crank shafts measurement
- gear speed
- positions

TECHNICAL SPECIFICATIONS

- Supply: 12 ÷ 24 Vdc;
- MAX Current consumption: 10mA;
- MAX Working distance: 2 mm;
- Typ. Working distance: 0.5 - 1.6mm;
- Weight: ≈ 60 g.

CUSTOM OPTIONS

- Fixing thread
- Body materials
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths

SPEED SENSORS: SVH

SVH

The SVH is a differential hall effect sensor, ideal for speed measurement on bolts and phonic wheels. The output is subjected by changing on magnetic fields. The sensor is composed by fully machined and blue anodized aluminum body. Available with 90 degree or straight output

APPLICATIONS

- Speed measurement

TECHNICAL SPECIFICATIONS

- Supply Voltage: 5 ÷ 18 Vdc;
- Working distance: up to 4 mm depending on targets material (magnets ensure highest gaps);
- Max frequency: up to 5 KHz;
- Weight: ≈ 26 g;
- Protection: IP67.

CUSTOM OPTIONS

- 90° cable exit and straight versions (SVH-S) available.
- Plug & play versions with Motorsport or Aftermarket connectors and custom wires lengths
- Specific fixing / custom body

AVIO RACE®

TECHNICAL & COMMERCIAL PARTNERS GENERAL OVERVIEW

AVIO RACE USA

PARTNERS

Group partners and main partners

Distributors

Technical and commercial partners

Europe, middle East, Africa distributed by Aviorace s.r.l.

North America – distributed by Aviorace USA

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