



**Fizoptika  
Malta**

**3-AXIS**

**FIBER OPTIC GYROSCOPE**

**G181**

*Information Guide*

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## 1. Introduction

### 1.1. Scope<sup>1</sup>

This guide describes Fizoptika Malta 3-axis fiber optic gyroscope's main features. Suggestions on product use, handling and installation are given.

### 1.2. Product Description

The 3-axis unit G181 is based on three VG221-like fiber optic gyroscopes mounted on a solid frame. It also includes a fully integrated three-channel ADC board with RS422 interface.

The fiber optic gyro G181 offers a combination of precision and low power consumption in a cylinder-shaped unit.

See product main parameters in **Annex 1**, pins assignment and axes definition in **Annex 2**, Allan Variance Plot in **Annex 4**.

Special polarization tuning provides the gyroscope with [Minimum Magnetic Sensitivity](#) of about 3°/h/Gauss (unshielded). The housing of G181M variant is fabricated from  $\mu$ -metal to gain ultimate magnetic immunity (<0.1°/h/Gauss).

### 1.3. Essential

The G181 housing is silicone sealed. Keep the product dry during its whole lifetime.

Do not drop. Excessive shock can damage the unit.

Use standard ESD practices when handling the unit.

## 2. Electrical Characteristics

### 2.1. Powering

The gyro requires a clean and stable 5Vdc ( $\pm 5\%$ ) power supply. Voltages greater than 5.5V (or reversing polarity) can cause some components to heat and eventually fail. Smooth voltage transient at power-on is recommended.

## 2.2. Digital Output

Digital signal (RS422, 921.6 kBd, 4.8 kHz rate) contains angular rates raw data and set of gyro parameters.

Angular Rate Data (RATE X, Y, Z) - binary complementary 24-bit words.

Xdata – temperature (ADC board), supply voltage, consumption currents and temperatures of gyros (X, Y, Z). These data (12 bits each) are transmitted completely in series of 32 sendings according to the status of COUNTER.

Read more in [Fiber Optic Gyroscope Digital Output](#).

## 3. Mounting Guidelines

There is a variety of simple methods how to attach the gyro not deforming its housing. Clamping is most recommended as it does not cause any stress to the gyro and is quite reliable. Using plastic tighteners, ties, adhesive tapes, etc. is proved to be practical. Please see examples in **Annex 3**.

**Note:** Resonances of the mating frame with gyro mounted should exceed vibration frequencies. Otherwise, extra noise at the output is possible.

<sup>1</sup> The information presented in this document is believed to be correct. Fizoptika Malta accepts no liability for any errors it might contain and reserves the right to alter specifications without prior notice.

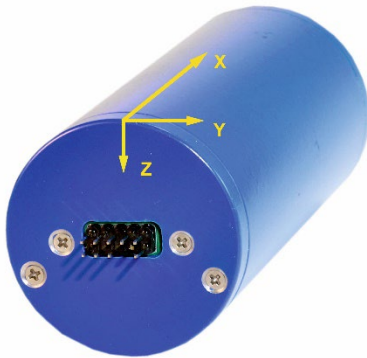
All pictures shown are for illustration purpose only. The actual product may vary due to the ongoing product enhancement. All dimensions given are for info only.

## Annex 1. Product Main Parameters

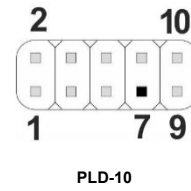
<b>PERFORMANCE</b>	<b>G181</b>	<b>G181M</b>
Input range (°/s)	300	300
Bias stability / Bias repeatability (RMS, °/h)	1	1
Angle random walk (°/√h)	0.015	0.015
Bandwidth (kHz)	0.7	0.7
Magnetic response (°/h/Gauss)	3	0.1
<b>ELECTRICAL INTERFACE</b>		
Initialization (s)	1	1
Powering (W)	2	2
Data rate (kHz)	4.8	4.8
Baud rate (kBd)	921.6	921.6
<b>PHYSICAL PARAMETERS</b>		
Dimensions (mm)	Ø46x111	Ø46x111
Weight (gram)	160	250
Volume (cl)	18.4	18.4
Frame resonance	2	2
Housing material	Al alloy	μ-metal
<b>ENVIRONMENT</b>		
Operating temperature (°C)	-40...+70	-40...+70
Endurance temperature (>2 h, °C)	-55...+85	-55...+85
Vibration (RMS, 0.02 - 2 kHz, g)	12	12
Shocks (g, 1 ms)	750	350
<b>RELIABILITY</b>		
MTBF (hr) *	25 000	25 000
Lifetime (yrs)*	15	15

\* Humidity conditions applied

## Annex 2. Pins Assignment, Axes Definition

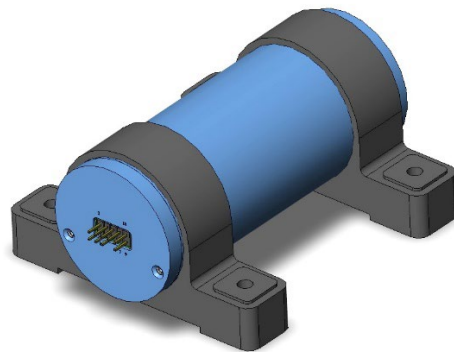
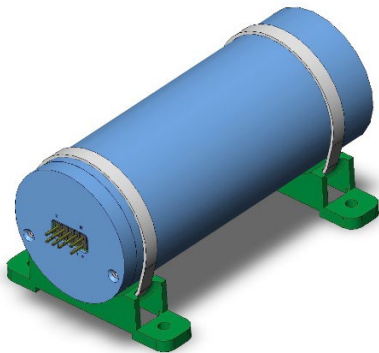


1	+5V
2-5	NC
6	GND
7	KEY
8	GND
9	RS422 TA
10	RS422 TB



X, Y, Z sensing axes misalignment – < 0.5° (typical)

## Annex 3. Mounting Examples



## Annex 4. Allan Variance Plot



Allan Variance Plot