



DIGITAL MODEL OUTPUT

Info Notes¹

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Fizoptika FOGs are open loop fiber optic gyroscopes. They naturally provide analog output (voltage). Some models are equipped with ADC circuit and provide digital rate signal via RS232 or RS422 transmitter. Output operating mode (RS type, baud rate, data rate) depends on the model and is indicated in the respective datasheet. However, the data content presentation is identical for all digital models.

1. Electrical Interface

| Definition | Contacts | Comments |
|----------------|---|---|
| Power supply | Power supply (+5 V) Power ground (GND) | +5 VDC (0.2 A max) regulated, 4.90V - 5.25V Ripple (0...1MHz) < 10 mV |
| Digital output | Tx of RS232 (TA, TB of RS422) Digital ground (DGND) | Asynchronous, 8 data bits, 1 stop bit, no parity control. Digital ground connected to power ground (GND). |

2. Digital Data Content

Angular Rate Data (RATE) - a binary complementary 24-bit word representing output voltage of the gyro analog core.

Xdata – temperature, supply voltage, SLD current and diagnostics signal. These data (10-bits each) are transmitted completely in series of 16 sendings by 2 bytes (16 bits) each.

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

Data content

| DATA | INDICATION | NUMBER OF BITS | ANALOG SIGNAL | RANGE | LSB |
|-------------------|------------|----------------|------------------------------------|------------------|-------------------|
| VG OUTPUT VOLTAGE | UΩ | 24 | $U(\Omega) \cdot (2.5/2^{23})$ [V] | +2.5V...-2.5V | $2.5/2^{23}$ [V] |
| TEMPERATURE | T | 16 | $T \cdot (250/2^{15}) - 50$ [°C] | +200...-300 °C | $250/2^{15}$ [°C] |
| SUPPLY VOLTAGE | U | 16 | $U \cdot (10/2^{15})$ [V] | +10V...-10 V | $10/2^{15}$ [V] |
| SLD CURRENT | I | 16 | $I \cdot (0.25/2^{15})$ [A] | +0.25A...-0.25 A | $0.25/2^{15}$ [A] |
| DIAGNOSTIC SIGNAL | KS | 16 | $KS \cdot (2.5/2^{15})$ [V] | +2.5V...-2.5V | $2.5/2^{15}$ [V] |
| RESERVED | R1 | 16 | - | - | - |
| RESERVED | R2 | 16 | - | - | - |
| RESERVED | R3 | 16 | - | - | - |
| RESERVED | R4 | 16 | - | - | - |

Data content of a single sending

| BYTE NUMBER | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------|-----------------------------|--|-------|---------|-----------------|----------------------------|------------------------------|-------|
| DATA | SYNCHRONIZATION BYTE (0xdd) | VG OUTPUT VOLTAGE - U(Ω) BYTES: LOW HIGH MIDDLE | | | SENDING COUNTER | HIGH OR LOW BYTE OF X-DATA | CHECK SUM BYTES: HIGH LOW | |
| BYTE SYMBOL | Sinx | UΩ(L) | UΩ(H) | UΩ(MDL) | Count | T, U, I, KS, R1...R4 (H/L) | CS(H) | CS(L) |

CHECK SUM IS THE **SUM** OF BYTES 1...5. SYNCHRONIZATION BYTE IS **0xdd**. VALUE OF **Count** IS +1 FOR ANY SEQUENT SENDING.

Complete Cycle of 16 8-byte Sendings

when U(Ω) data are updated 16 times per cycle and T, U, ...R4 data are updated once per cycle

| SENDING NUMBER | BYTES | | | | | | | |
|----------------|-------|--------|--------|----------|-------|------------------------|-------|-------|
| | Sinx | UΩ (L) | UΩ (H) | UΩ (MDL) | Count | T,U,I,KS,R1...R4 (H/L) | CS(H) | CS(L) |
| 0 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x00 | T(H) | CS(H) | CS(L) |
| 1 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x01 | T(L) | CS(H) | CS(L) |
| 2 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x02 | U(H) | CS(H) | CS(L) |
| 3 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x03 | U(L) | CS(H) | CS(L) |
| 4 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x04 | I(H) | CS(H) | CS(L) |
| 5 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x05 | I(L) | CS(H) | CS(L) |
| 6 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x06 | KS(H) | CS(H) | CS(L) |
| 7 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x07 | KS(L) | CS(H) | CS(L) |
| | | | | | | | | |
| 14 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x0E | R4(H) | CS(H) | CS(L) |
| 15 | 0xdd | UΩ (L) | UΩ (H) | UΩ (MDL) | 0x0F | R4(L) | CS(H) | CS(L) |

3. Data Acquisition Software

The data acquisition program Gyro Monitor displays real time FOGs data and store the data in an output file. The file contains gyro output voltage (mV), SLD current (A), supply voltage (V) and internal temperature (°C). Averaging periods for the display and for the data file are independently selectable. For more information regarding the program, refer to [Gyro Monitor and USB Adapter Info Notes](#).