

MR312-MR310

ZapFree™ FIBER OPTIC ROTARY ENCODER SYSTEM

MICRONOR

automation components

Products

The MR312 ZapFree™ Rotary Encoder is an entirely passive, fiber optic incremental rotary encoder. There are no integral electronics within the encoder housing and the all-optical design requires just a one 62.5/125 MM optical fiber connection – the utmost in simplicity, reliability and ease of installation. Downstream, the powerful MR310 Remote Encoder Interface (REI) module converts the optical signals to an array of standard outputs as well as a serial interface for ease of connection to any conventional counter, PLC or computer interface board. The MR312 encoder is available in a standard Size 58 (58mm OD) encoder package for ease of integration into existing systems; the MR310 REI is a DIN-rail mountable module using readily available 12-32 VDC/60mA power for operation. It doesn't get any simpler to design into your system.



Features

- 100% passive sensing design
- Intrinsically safe and inert for use in hazardous and explosive atmospheres
- Insensitive to EMI and RFI for use in and around medical equipment and “noisy” industrial environments
- Immune to lightning and atmospheric static that “zaps” conventional encoders
- Outdistances copper, link lengths to 1000m
- 100 or 256 ppr models available
- Standard model operates -40 °C to +80 °C; Extended option covers -60 °C to +150 °C
- MR310 REI module offers multiple formats for interfacing to wide range of control systems – direct A/B open collector and A/A'/B/B' line driver outputs, programmable divider with separate OC and line driver outputs, two fully-programmable analog outputs (mA and V), and RS485/RS422 serial interface (optional RS232 adapter available)
- MICRONOR can supply complete system and support entire installation

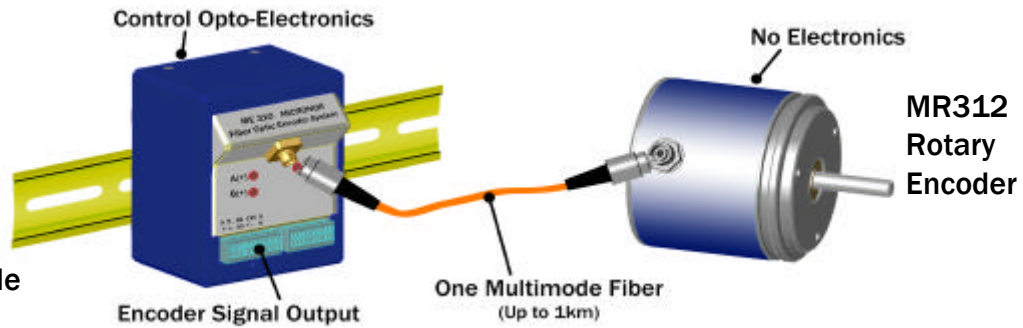
Applications

- Aerial Tramways, Gondolas, Ski-Lifts – immune against lightning
- Petrochemical processing plants – inherently safe in hazardous and explosive atmospheres
- Medical imaging systems – immune to high magnetic fields
- Anti-Lock Break Systems (ABS) - rugged, passive design withstands high temperatures
- Long distance sensing and routing simpler with only one fiber to connect



Installation

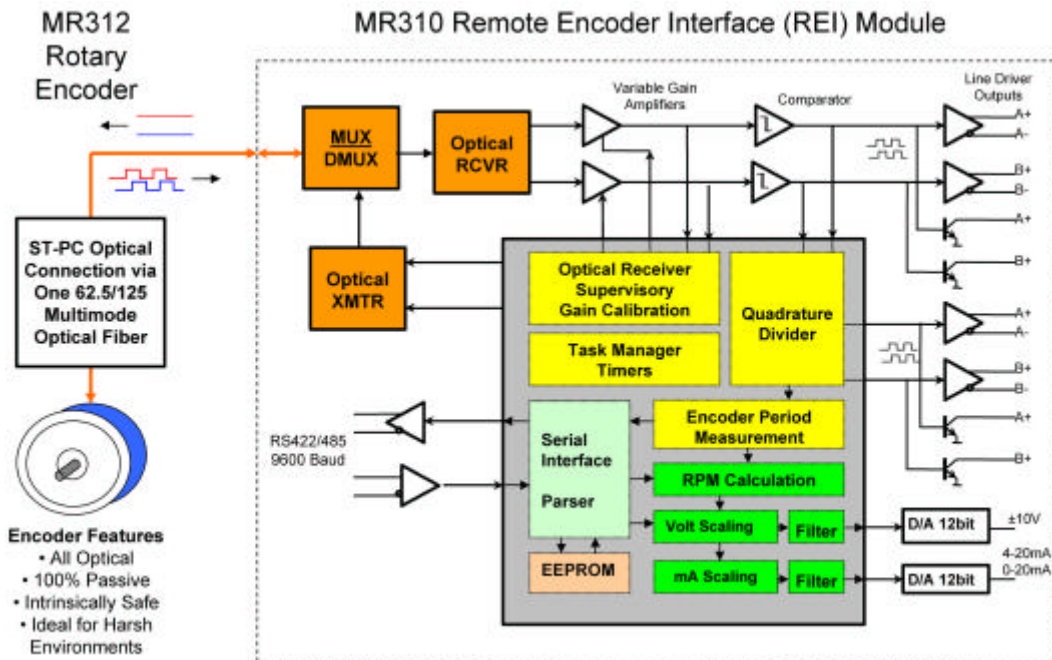
MR310 Remote Encoder Interface (REI) Module



Integrating the ZapFREE™ into your motion control system couldn't be simpler:

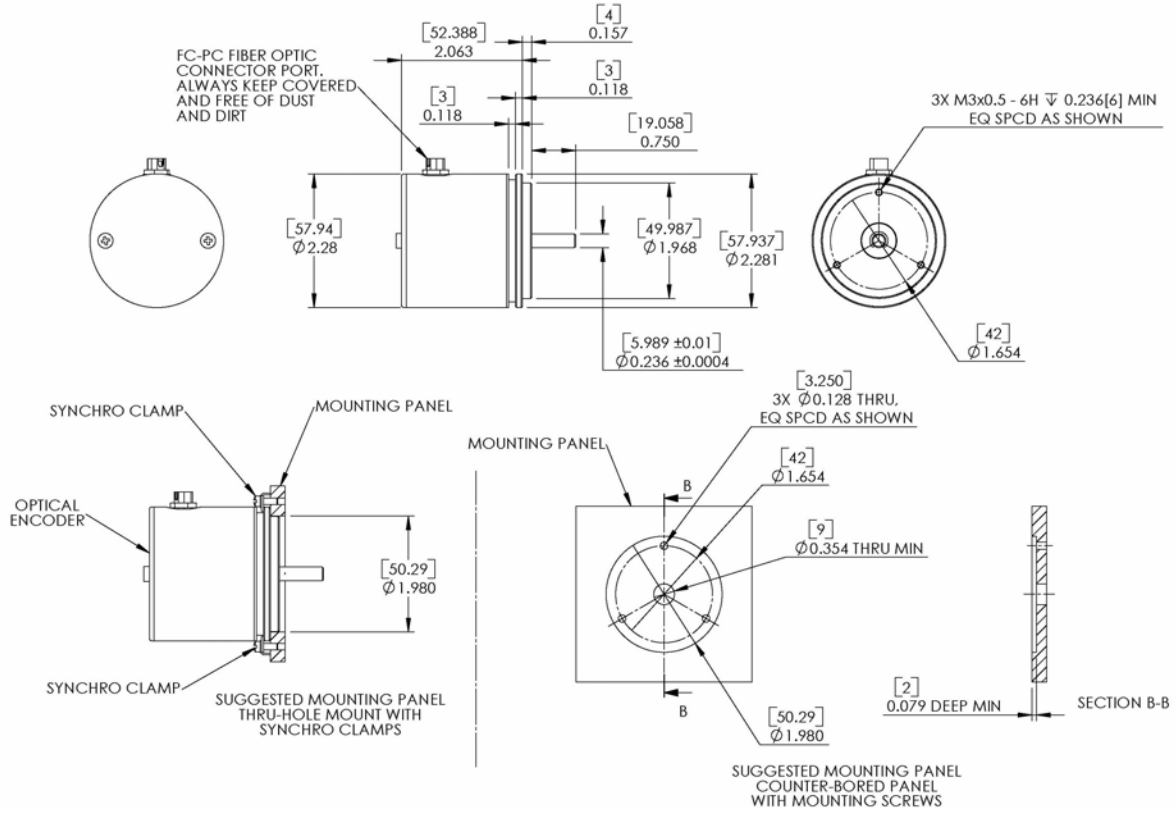
1. Mount MR312 rotary encoder to the external equipment. Conventional mounting techniques via standard synchro clamps (also available as Micronor P/N 609920651) or direct panel mounting are shown on the following page. Always use a flexible coupling to connect the encoder's shaft to the equipment's shaft.
2. Locate MR310 REI Module along with other control system's electronics via 35mm DIN rail mount.
3. Make electrical connections (power, ground, quadrature signals, serial interface, etc.) to J1/J2/J3 via the three WAGO Quick-Connect plugs (supplied with the MR310).
4. Connect MR312 Encoder to MR310 REI Module via an ST-PC to ST-PC optical cable assembly.
5. The ZapFREE™ Fiber Optic Encoder System is now ready to operate!

How It Works

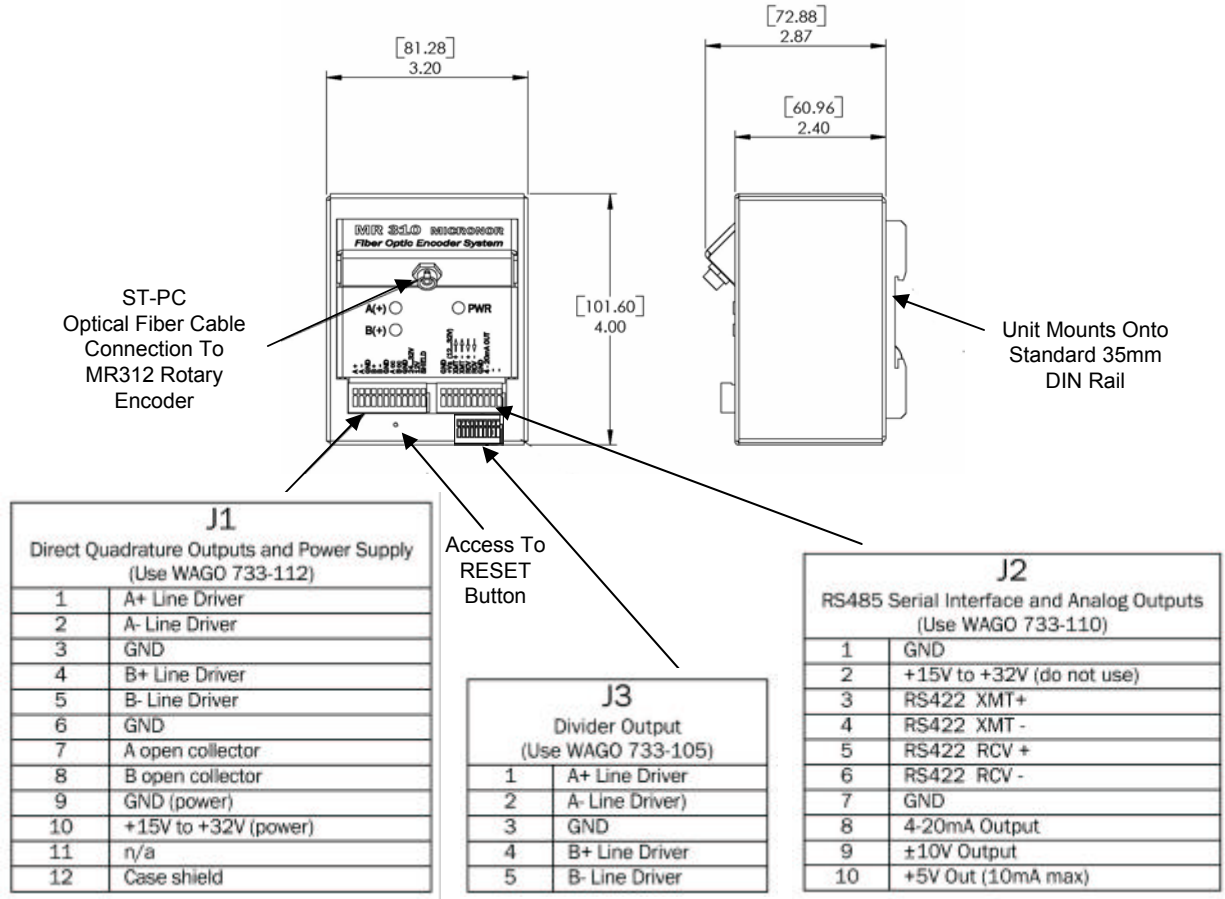


Conventional encoders incorporate internal electronics and copper wire connections which are susceptible to electromagnetic interference and can be easily “zapped” by lightning and atmospheric static. Potential shorts and arcing are also concerns, especially in flammable or explosive environments. To solve these problems, the MR312 ZapFREE™ Fiber Optic Rotary Encoder uses light instead of electrical signals. Two-color light enters the encoder, passing through a rotating slotted disk and a pair of filters. The light then reflects off a mirror, returning through the same filters and disk back into the fiber where it originated. The remote MR310 REI Module contains the opto-electronics and brain power – counting pulses and measuring phase differences between the two wavelengths to determine shaft angle, direction and speed. Remotely “relocating” the electronics in this way allows incorporation of valued-added features; including multiple output formats allowing connection to diverse control systems, PC-friendly serial interface control and powerful programmable features (divider and two fully-programmable analog outputs. And while copper wire usually limits connections to 50-100 feet, optical fiber allows extended links up to 3280 feet (1000 meters).

MR312 Encoder



MR310 Module



Specifications

MR312 Rotary Encoder

| | |
|----------------------------------------|---------------------------------------|
| Resolution | 100 or 256ppr models |
| Max Speed | 8000+ rpm |
| Optical Interface | ST-PC |
| Fiber Type | MM 62.5/125µm, Graded Index, 0.275NA |
| Fiber Length (between MR310 and MR312) | Up to 1000m (3280 ft) |
| Temperature Range | |
| STANDARD Option | -40 °C to +80 °C |
| EXTENDED Option | -60 °C to +150 °C |
| Humidity | 0% to 95% RH (non-condensing) |
| Seal Rating | IP64 (splash proof) |
| Shaft | Ø 6mm x 17mm L |
| Housing/Weight | Ø 58mm x 58mm (length); 210g (7.25oz) |

MR310 Remote Encoder Interface (REI) Module

| | |
|----------------------------------------|--------------------------------------------------------------------------------------------------|
| Max Speed | 8000 rpm (direct quadrature outputs) 6000 rpm (divider quadrature outputs and analog outputs) |
| Optical Interface | ST-PC |
| Fiber Type | MM 62.5/125µm, Graded Index, 0.275NA |
| Fiber Length (between MR310 and MR312) | Up to 1km (3280 feet) |
| Electrical Connections | J1 (12-pin WAGO 733-112) J2 (10-pin WAGO 733-110) J3 (5-pin WAGO 733-105) |
| Quadrature Output Signals | (Two Sets) |
| Direct Outputs | A/B Open Collector and A/A'/B/B' Line Driver |
| Programmable Divider Outputs | A/B Open Collector and A/A'/B/B' Line Driver |
| Analog Outputs | (SPEED Output) |
| Current (4-20mA) | Programmable over 0-24mA; max 500? burden resistance at 24 VDC |
| Voltage (0-10V) | Programmable over ±12VDC; 5mA maximum current (2000 ? load) |
| Serial Interface | Built-in RS422/RS485 (requires optional MR310-1 for RS232 operation) |
| Power Supply Input | +15VDC to +32VDC, 60mA maximum |
| Power Supply Output (+5VDC) | +5VDC, 10mA maximum load (for powering MR232-1 RS232 Adapter) |
| Temperature Range | -5 °C to +55 °C |
| Humidity | 0% to 85% RH (non-condensing) |
| Seal Rating | IP40 (non-protected) |
| Mounting | 35mm DIN rail |
| Housing/Weight | 79mm W x 99mm H x 80mm D; 300g (10.5 oz) |

Ordering Info

MR312 - X X X Y Encoder

Pulses Per Revolution
100
256

Operating Range
(Blank) Standard
E Extended

MR310 REI Module

MR232-1 RS232 Cable Adapter

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