

FIBER OPTIC INCREMENTAL ENCODER

MR340-1 DIN Rail Mount Controller

MR340 SERIES

The MR340-1 Din Rail Mount Controller is the active optical and electrical interface for the MR340 Series ZapFREE® Fiber Optic Incremental Encoder System. The system is an innovative all-optical design immune to any electro-magnetic interferences such as magnetic fields, lightning, voltage, and other harsh environment conditions.



U.S. Patent 7,196,320
Inherently Safe Optical Radiation
For EPL Mb/Gb/Gc/Db/Dc

As the incremental code passes through an MR34X Sensor's internal optical pick-up, the phase output of two light beams creates the classical A/B quadrature signals accessible via the controller's electrical interface.

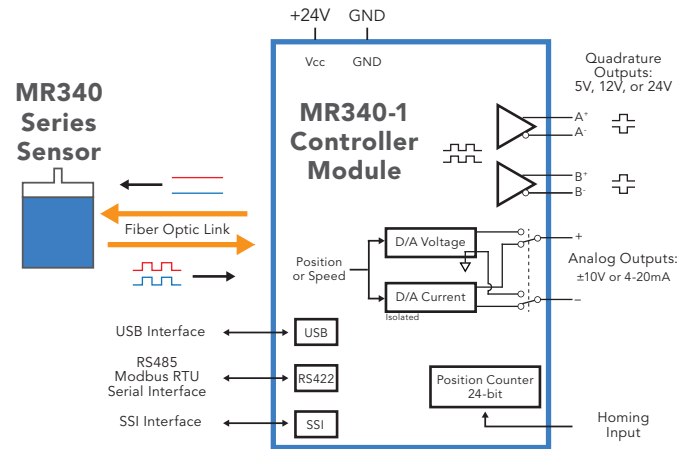
The controller keeps track of position and also calculates the RPM and speed of the connected encoder. Both position and speed can be read via RS485 Modbus RTU serial interface, USB, SSI or analog output. The analog output can be configured for either $\pm 10V$ or 4-20mA output.

Features

- Supports all MR340 series rotary and linear sensors
- Mounts on standard 35mm DIN Rail
- Operates from 24 VDC
- Interference-free transmission up to 2000 meters

Interfaces

- Programmable line driver quadrature outputs: 5V, 12V, or 24V
- Encoder links up to 2000 meters
- Programmable analog output: $\pm 10V$ or 4-20mA
- SSI and USB or RS485/Modbus RTU Interface



System Planning

MR340-1 Controller
Inherently Safe Optical Radiation

MR340 Series Sensors
Simple Mechanical Device

Electrical Connections:
24 VDC Power, A/B Quadrature Output
Analog Output, RS485, SSI, USB

MR343 MR341 MR348 MR342 MR344 MR346 MR345



Duplex LC and ODVA IP-LC
Multimode 62.5/125, Fiber Optic Cabling

MR340-1 Controller

Specifications

| Electrical Interface | |
|--|--|
| NOTE: Electrical connections shall not exceed 3 meters | |
| Connectors | Electrical connections (J1) via Terminal Plug, Phoenix 1803659 (one supplied with Controller) USB (J2) via Type B receptacle SSI/RS485 (J3) via Hirose 3250-10P-C(50) plug (available separately) |
| Quadrature Outputs | A+/A-/B+/B- line driver outputs are user configurable: 5V, 12V, 24V; 100 kHz maximum bandwidth |
| Discrete Digital Signal | HOMING Input (24V) |
| Digital Interfaces | SSI, USB, and RS485/Modbus RTU |
| Analog Output | User selectable: $\pm 10V$ or 4-20mA, Position or Speed Mode Current Range=0-20mA, Max burden resistance=500 Ω (24V supply), Accuracy=0.25% F.S. Voltage Range= $\pm 10V$, Max current=5mA (2k Ω load), Short circuit<5s, Accuracy=0.25% F.S. Position Mode: Full scale range is 1 to 8,388,607 counts (equivalent to >8,192 revolutions of a 1024ppr encoder) based on contents of internal counter. Either Homing Input (+24V) or software command may be used as a Homing command to set absolute position. Speed Mode: Full scale range can be programmed from 10 to 10,000 RPM |
| Power Supply | +24 VDC, 50mA (typical); Operates over 18V to 28V During power-up, external power supply should be capable of 100mA in-rush current |
| Optical Interface | |
| Optical | Dual Wavelength, 850nm/980nm, Class I Eye Safe |
| Fiber | LC Duplex, 62.5/125 μ m Graded Index Fiber, 0.275 NA, Type OM-1 |
| System Loss Budget | 12dB Round Trip |
| Maximum Distance | Up to 2000 meters (6560 ft) with MR340 series Sensor |
| Explosive Atmospheres | |
| Inherently Safe Optical Radiation | |
| EX Classification | Controller shall be installed in non-hazardous location only Power supply shall be current limited to 200mA |
| ATEX | ce [Mb/Gb/Gc/Db/Dc] |
| EAEU/GOST | [Mb/Gb/Gc/Db/Dc] |
| IEC Ex | [Mb/Gb/Gc/Db/Dc] |
| North America | Controller shall be installed in non-hazardous location only |
| Environmental Attributes | |
| Temperature/Humidity | -5°C to +55°C (23°F to +131°F), 0-95% RH, Non-Condensing |
| Ingress Protection | IP30, Keep free from contaminants |
| Physical Attributes | |
| Mounting | 35mm DIN rail or screw mount |
| Dimensions | 114 x 89 x 32 mm (4.5 x 3.5 x 1.25 inches) |
| Weight | 260 g (9 oz) |

Specifications subject to change without notice

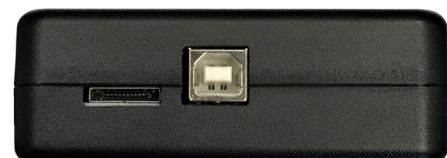
Front View

J1 - Discrete Power/Signal Interface
Duplex LC Optical Interface



Bottom View

J2 - USB Interface
J3 - SSI/RS485 Interface



MR340-1 Controller

J1 - Discrete Power/Signal Interface

| J1 Electrical Interface via Terminal Plug Phoenix 1803659 (one supplied with Controller) | | |
|---|--------------|---|
| Pin | Function | Notes |
| 1 | +24V | +24V Power Supply (typical 50mA) |
| 2 | GND | GND |
| 3 | HOMING INPUT | +24V Digital Input NOTE: Function is determined by user setting of Reset Mode 0x209. Typically used as HOMING Input to set absolute position of encoder. |
| 4 | GND | GND, Connected to Pin 2 |
| 5 | SIG+ | User Selectable Analog Output: $\pm 10V$ or 4-20mA |
| 6 | SIG- | NOTE: Either supplied ZAPPY® software or user software is used to set Electrical Mode, Functional Mode (Position or Speed), Scale and Filter. |
| 7 | A+ | User Selectable Quadrature Output Level: 5V, 12V, 24V NOTE: Supplied ZAPPY® software or user software is used to set A/B output levels. |
| 8 | A- | |
| 9 | B+ | |
| 10 | B- | |

J2 - USB Interface

J3 - SSI/RS485 Interface

| J3 Electrical Interface via Plug Hirose 3240-10P-C(50) Pigtail Assembly available as Micronor MR430-99-01 | | | |
|---|--------------------|----------|-------------------------|
| Pin | RS485 | SSI | MR4430-99-01 Wire Color |
| 1 | +5V | +5V | Brown |
| 2 | RCV- (RS422 Input) | | Red |
| 3 | RCV+ (RS422 Input) | | Orange |
| 4 | TX- (RS422 Input) | | Yellow |
| 5 | TX+ (RS422 Input) | | Green |
| 6 | GND | GND | Blue |
| 7 | | SSI CLK- | Purple |
| 8 | | SSI CLK+ | Grey |
| 9 | | SSI DAT- | White |
| 10 | | SSI DAT+ | Black |

NOTE: +5V can be used to power a RS485-to-RS232 converter module.

Ordering Info

MR340 - 1

DIN Controller

Quick Ship Configurations:

| | |
|--------------------|--|
| MR340-1 | DIN Rail Mount Controller |
| MR430-99-01 | J3 Pigtail Assembly, Length=1m, for SSI and RS485 interface connection |

Compatible Sensors:

| | |
|--------------|---------------------------------------|
| MR341 | Size 11 Mini Rotary Encoder |
| MR342 | Size 58 Standard Rotary Encoder |
| MR343 | MRI Safe, Linear Encoder |
| MR344 | High Resolution, Hollow Shaft Encoder |
| MR345 | High Resolution, Shafted Encoder |
| MR346 | Heavy Duty, IP66 Encoder |
| MR348 | MRI Safe, Rotary Encoder |

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