

**MR 340-1** DIN Rail Mount Controller



**ZAP FREE<sup>®</sup>**

**Features**

- ➔ Supports all MR340 series rotary and linear sensors
- ➔ Immune to EMI, RFI, high voltage and lightning
- ➔ Operates from 24 VDC
- ➔ Sensor can be installed in any manner of hazardous location or explosive atmosphere - gas, dust, or mines
- ➔ Interference-free transmission up to 2000 meters

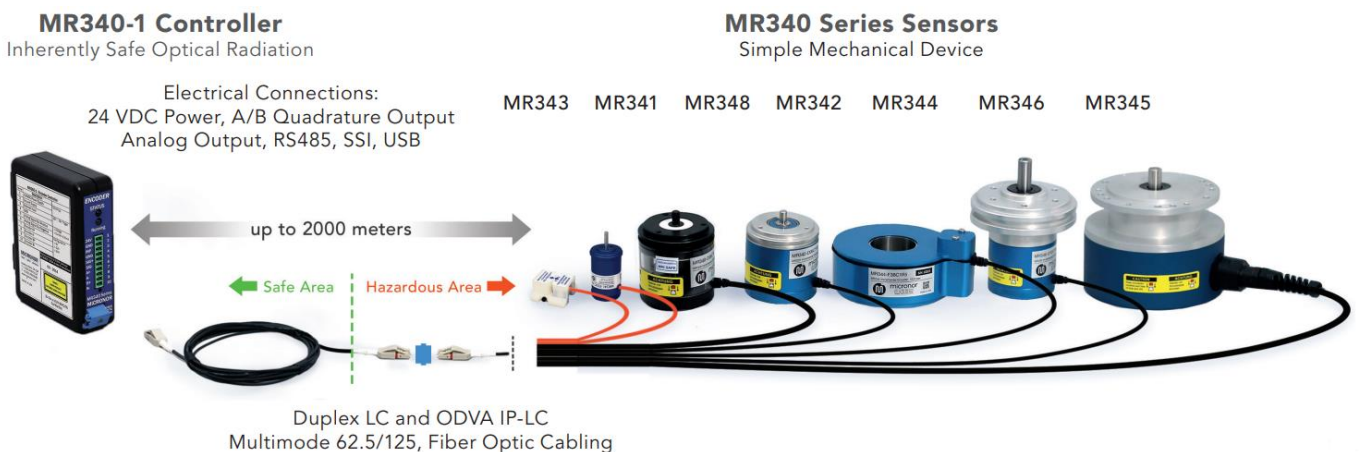
**Product description**

The MR340-1 Din Rail Mount Controller is the active optical and electrical interface for the MR340 Series Fiber Optic Incremental Encoder System. The system is an innovative all-optical design immune to any electromagnetic interferences such as magnetic fields, lightning, voltage, and other harsh environment conditions. 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 ±10V or 4-20mA output.

**Application**

- Medical and MRI
- Transportation
- Oil, gas and mines
- Robotic systems
- Process industries and instrumentation

**System Planning**



1. Verify cabling and junction boxes compatible with the operating environment.
2. Verify that the optical link loss is within Controller's Maximum Loss Budget.
3. Consult Application Note AN118 for more information, examples, and guidance on loss budget.

*Subject to errors and changes Date: 21.04.2023*

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**Electrical and Optical Connections**

**Front View**

J1: Discrete Power/Signal Interface  
Duplex LC Optical Interface



**Bottom View**

J2: USB Interface  
J3: SSI/RS485 Interface

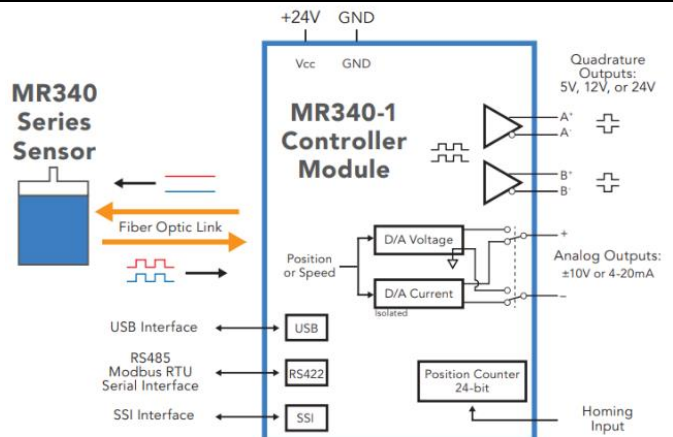


J1 Electrical Interface via Terminal Plug - Phoenix 1803659 (one supplied with Controller)		
Pin	Function	Notes
1	+24V	+24V Power Supply (typical 50mA)
2	GND	GND
3	HOMING INPUT	+24V Digital Input NOTE: Function is determined by user setting of Reset Mode 0x209. Typically used as HOMING Input to set absolute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

J3 Electrical Interface via Plug - Hirose 3240-10P-C (50) - Pigtail Assembly available as Micronor MR430-99-01			
Pin	RS485	SSI	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

**Interfaces**

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



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**Specifications**


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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 $\Omega$ (24V supply), Accuracy=0.25% F.S.	
	Voltage Range= $\pm 10V$ , Max current=5mA (2k $\Omega$ 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 $\mu$ 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	
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)	

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**Order Code**

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9700.01.100      MR340-1 Controller for Fiber Optic Incremental Encoder Series MR340

**Related Products**

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MR341	Small Size Rotary Encoder Ø 25mm
MR342	Rotary Encoder Ø 58mm
MR343	Linear Encoder
MR344	Hollow Shaft Encoder
MR345	High Resolution Rotary Encoder
MR346	Heavy Duty Rotary Encoder
MR348	MRI Safe Rotary Encoder Ø 58mm Metalfree
972XX.XX.XXX	Fiberoptic Extension Cable
973XX.XX.XXX	Fiberoptic Extension Cable