

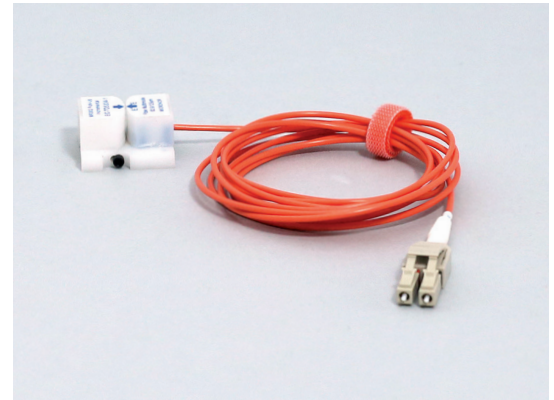
FIBER OPTIC INCREMENTAL ENCODER

MR343 Linear Position Sensor

The MR343 Series Fiber Optic Linear Position Sensor is an innovative all-optical, non-metallic encoder – ideal for MRI applications due to its immunity and invisibility to magnetic fields. The MR343 Linear Position Sensor is optically connected to an MR340 Controller via a duplex multimode fiber optic link.

An incremental film strip passes through the optical pick-up and the phase offset of two light beams create the classical A/B quadrature signals accessible via the controller interface.

As an incremental system, the absolute position must be set every time the system is powered up. To automate this process, Micronor has developed a special “homing” zone left or right of the film’s active area. In operation, the mechanical system starts up in the “homing” zone and moves towards the first line in the active area. This corresponds to the reference or index position on a conventional encoder. As the sensor moves into the active area, the counter can correctly track the absolute position.



U.S. Patent 7,196,320
Inherently Safe, Simple Mechanical Device
EPL Mb/Gb/Gc/Db/Dc

MR340-1 Controller

Inherently Safe Optical Radiation



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

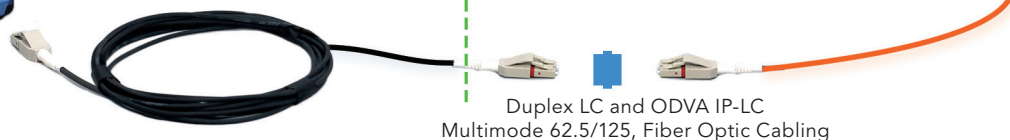
MR343 Sensor

Simple Mechanical Device



up to 1600 meters

← Safe Area | Hazardous Area →



Features

- 100% passive optical sensor
- 0.1 mm positional resolution
- Immune to EMI, RFI, lightning and ground loops
- Immune and invisible to magnetic fields - does not leave artifacts in MRI Scans
- EX Classified “Inherently Safe, Simple Mechanical Device”
- Fiber optic link can extend up to 1600 meters
- DIN rail mount and OEM controller available

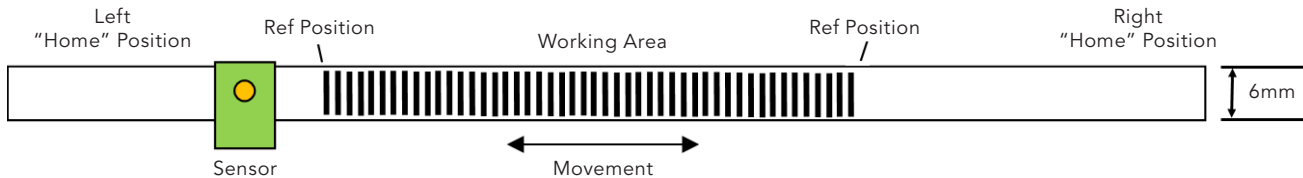
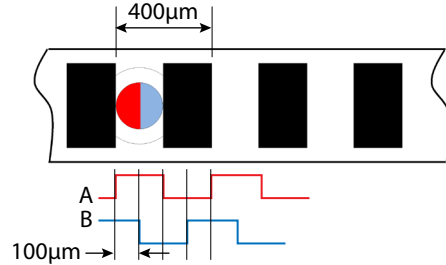
Applications

- Medical
- MRI
- Robotics
- Industrial

MR343 Incremental Film Strip Requirements

The MR343 Linear Encoder System utilizes an Incremental Film Strip for position monitoring. Although several standard film strip configurations are available, most application have unique requirements in terms of length of travel and resolution. Designers should contact Micronor to determine the right Film Strip solution. The standard sensor system provides 400µm line-to-line (pulse to pulse) resolution as shown below. Using 4-edge triggering, 100µm resolution can be achieved.

As an incremental system, the absolute position must be set every time the system is powered up. To automate this process, Micronor has developed a special "homing" zone left or right of the film's active area. In operation, the mechanical system starts up in the "homing" zone and moves towards the first line in the active area. This corresponds to the reference or index position on a conventional encoder. As the sensor moves into the active area, the counter will correctly track the absolute position.



Specifications

Measurement Parameters	
Resolution	100 µm
Maximum Speed	40m/s (based on 100kHz controller bandwidth)
Optical Interface	
Connector	LC Duplex
Fiber Type	Duplex 62.5/125µm, Graded Index Fiber, 0.27NA, Type OM-1
Maximum Distance	Up to 1600 meters (5250 ft) with MR340 series controller
MR Attributes	
MRI Usage Zones	MR343 sensor is designed for safe use in all MR Zones I-IV
Materials Used	Acetal, ceramic, glass (No ferromagnetic metal or conductive materials are used) NOTE: The LC Duplex optical connector has some small metal parts. The pigtail length shall assure that the connector end is safely secured outside the MRI bore
Explosive Atmospheres	
EX Classification	Inherently Safe, Simple Mechanical Device when used with a MR340 Controller
ATEX	EPL Mb/Gb/Gc/Db/Dc
IEC Ex	EPL Mb/Gb/Gc/Db/Dc
Environmental Attributes	
Temperature	Operating: -10°C to +60°C (14°F to +140°F), 0-95% RH, Non-Condensing Storage: -25°C to +70°C (-13°F to +158°F), 0-95% RH, Non-Condensing
Ingress Protection	IP30, Keep free from contaminants
Physical Attributes	
Dimensions	30 x 28 x 15 mm (1.18 x 1.10 x 0.59 inches)
Weight (without cable)	10 g (0.3 oz), Cable weight ~10g/m

Specifications subject to change without notice

Ordering Info MR343 Sensor

M R 3 4 3 - B 4 0 0 C 1 R 5

Material

B Non-metallic, MRI safe

Resolution

400 Code Distance=400µm

Termination Option

1R5 Duplex LC Pigtail, 1.5m

C03 Duplex LC Pigtail, 3m

C05 Duplex LC Pigtail, 5m

C10 Duplex LC Pigtail, 10m

NOTE: The LC Duplex optical connector has some small metal parts. The pigtail length shall assure that the connector end is safely secured outside the MRI bore.

Quick Ship Configurations

MR343-B400C1R5 Pigtail Length=1.5m

Ordering Info Incremental Film

EC-TD5334-033

Length=762.00mm; Code Start=203.20mm; Code End=558.80mm

EC-TD5334-111

Length=508.00mm; Code Start=177.80mm; Code End=330.20mm

EC-TD5334-121

Length=314.10mm; Code Start=84.10mm; Code End=330.20mm

EC-TD5334-122

Length=95.30mm; Code Start=32.30mm; Code End=88.30mm

EC-TD5334-123

Length=130.00mm; Code Start=20.00mm; Code End=99.00mm

EC-TD5414

Length=1200.00mm; Code Start=100.00mm; Code End=1100.00mm

Ordering Info Controller

MR340-0

OEM PCB Controller, Consult MR340-0 Controller data sheet

MR340-1

DIN Rail Mount Controller, Consult MR340-1 Controller data sheet

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