

FIBER OPTIC INCREMENTAL ENCODER

MR303 Linear Position Sensor

MR30X SERIES

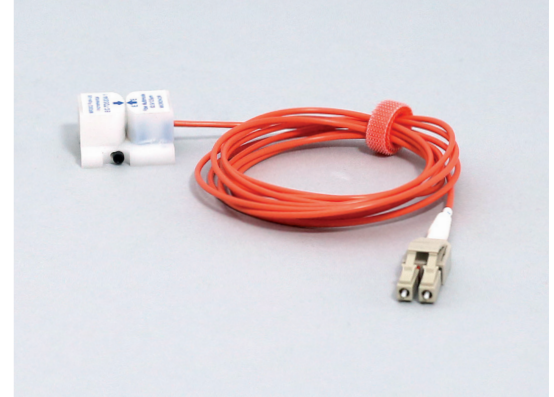
The MR303 series fiber optic linear position sensor is an innovative all-optical, passive design which is immune to any electro-magnetic interferences such as magnetic fields, lightning and high voltages. Its non-metallic construction makes the sensor entirely MRI safe, being both immune and invisible to magnetic fields.

In operation, the MR303 Linear Position Sensor is optically connected to an MR302 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.

Applications

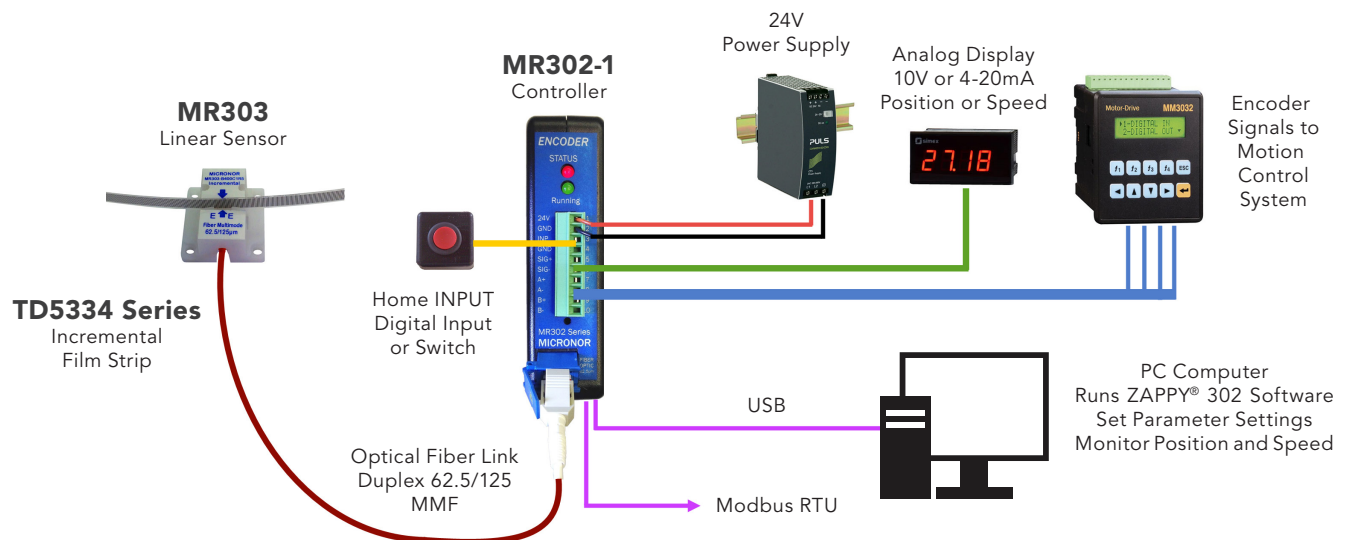
- Medical
- Robotics
- MRI
- Industrial



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

Features

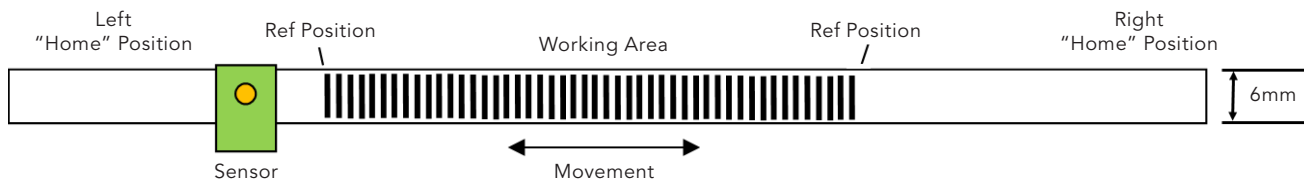
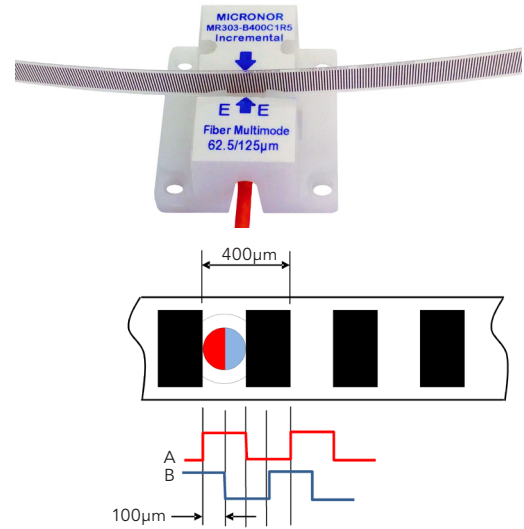
- 100% passive optical sensor
- 0.1 mm positional resolution
- MRI safe design
- Immune to EMI, RFI, lightning and ground loops
- Immune and invisible to magnetic fields
- EX Classified "Inherently Safe, Simple Mechanical Device"
- Fiber optic link can extend up to 2000 meters
- DIN rail mount and OEM controller available



MR303 Incremental Film Strip Requirements

The MR303 Linear Encoder System utilizes an Incremental Film Strip for position monitoring. Although several standard film strip configurations are available, most applications 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 2000 meters with MR302 series encoder
MR Attributes	
MRI Usage Zones	Reference: ACR Guidance Document for Safe MR Practices 2007 MR303 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 MR382 Controller
ATEX	EPL Mb/Gb/Gc/Db/Dc
IEC Ex	EPL Mb/Gb/Gc/Db/Dc
NEC	Exempt
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 MR303 Sensor

MR303 - B 400 C 1R5

Material
B Non-metallic, MRI safe

Resolution
400 Code Distance=400µm

Optical Connector
C LC Duplex

Pigtail length
1R5 1.5m
03 3m
05 5m
10 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

MR303-B400C1R5 Pigtail Length=1.5m

Ordering Info Incremental Film

EC-TD5334 - 111

Film Number
111 Length of Travel=508mm
382 lines with Homing position on both sides
Request drawing 78-5334-111A

Contact Micronor for other incremental film configurations

Quick Ship Configurations

ECTD4334-111 Film Strip, Type 111

Ordering Info Controller

MR302-1 DIN Rail Mount Controller, Consult MR302-1 Controller data sheet
MR302-2 OEM PCB Controller, Consult MR302-2 Controller data sheet

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