MONARCH INSTRUMENT

Instruction Manual

IRS
Infrared Optical Sensor
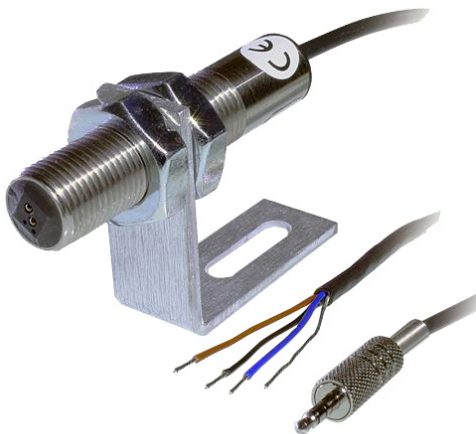
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SAFEGUARDS AND PRECAUTIONS

Read and follow all instructions in this manual carefully, and retain this manual for future reference.

Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.

This instrument is not user serviceable. For technical assistance, contact the sales organization from which you purchased the product.

TABLE OF CONTENTS:

1.0 DESCRIPTION

The IRS Infrared Optical Sensor has an invisible infrared light source that is ideal for working up to 0.5 inch [12 mm] from high-speed equipment or other applications providing only contrasting light and dark surfaces or beam interruption by solid objects as small as 0.039 inch [1 mm]. The sensor is housed in a threaded 303 stainless steel tube and supplied with a 90-degree angle aluminum-mounting bracket and two M16 jam nuts. The IRS comes with an 8 ft. [2.4 m] cable terminated with:

Model	Cable Termination
IRS-P	1/8 in. [3.5 mm] male stereo plug
IRS-W	Tinned wires

2.0 IRS-P: MODEL WITH STEREO PLUG

The IRS-P model will work directly with all Monarch handheld tachometers and stroboscopes that accept pulse input through an input jack (e.g. PLT200, PLS Pocket LED Strobe, Nova-Strobe dax, Nova-Strobe dbx, Nova-Strobe DBL, Nova-Strobe pbx, Phaser Strobe PBL, Nova-Pro® 300, Nova-Pro® 500).

A sensor power supply (SPSR-IM) with BNC output is available for those applications that require a separate power source for the sensor.

An optional 25 ft. [7.6 mm] extension cable (EC-25P) is available with a female socket for the plug on one end and a 1/8 inch [3.5 mm] male stereo plug on the other.

2.1 Connection Detail for Metal Plug

Base (Common) - Blue

Tip (Signal) - Black

Shield (Ground)

Middle (+V) Excitation - Brown
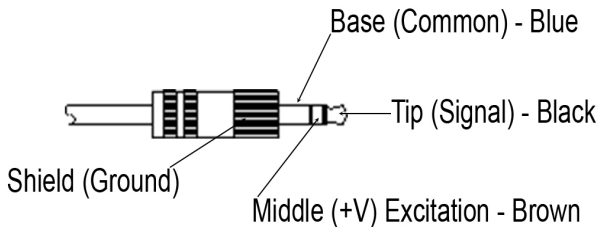
2.2 Connection Detail for Molded Plug

Base (Common) – Drain/Common

Tip (Signal) - Red

Middle (+V) Excitation - Black
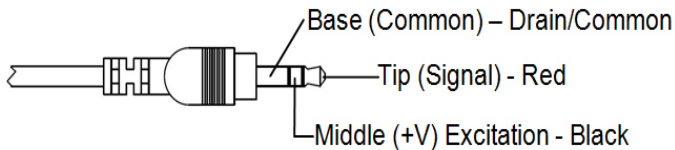
3.0 IRS-W: MODEL WITH TINNED WIRES

The IRS-W model will work directly with all Monarch panel instruments that accept pulse inputs (e.g. ACT Series, Frequency to Analog Converters, DataChart™ 1250, DataChart™ 6000).

3.1 Connection Detail for IRS-W

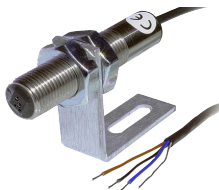| Wire Color	Function	Connect To
Brown	Positive Power Excitation	+V
Blue	Common	Gnd
Black	Signal (+V to 0 V dc Pulse)	Sig
Shield	Housing Ground	Gnd

4.0 PREPARATION FOR USE

In order for the sensor to work, you are required to have a contrasting color target on the rotating part. **NOTE: Standard Monarch reflective tape will not work.** The target can be any white surface that will reflect the infrared. A solution that works well on small high-speed shafts is wax crayon. Use black or white paint/ink to coat the shaft, 2/3 black and 1/3 white, so that as the shaft rotates the colors alternate in front of the sensor. White paper labels also work when wrapped fully around the shaft and then part of the label is blackened out with a marker. The sensor can also target off gear teeth, objects 0.039 inch [1 mm] diameter, slots, bolt heads and keys.

⚠️ **CAUTION:** Centrifugal force at high speeds can be dangerous. Ensure all targets are adequately secured to shafts and always have operators protected by a plexiglass sheet at least 0.5 inch [12 mm] thick.

NOTE: In order for the IRS to be fully CE compliant, the supplied ferrite must be attached around the plug/wire end of the cable.

5.0 OPERATING INSTRUCTIONS

The user must mount the IRS to obtain an accurate measurement. The ideal focal point of the sensor is 0.5 inch [12 mm], but this is dependent on the size and speed of the target. The sensor has a red/green LED On-Target Indicator that shows when it is picking up a valid signal. The LED will be solid green when the unit is powered and will turn amber when on target. Use this to properly place the sensor, as you cannot see the infrared emissions.

NOTE: The sensor is sensitive to lighting, such as fluorescent lamps or sunlight. If the system appears to read a speed when the shaft is stationary, it may be necessary to shield it from ambient lighting.

6.0 SPECIFICATIONS

Specifications*	IRS-P / IRS-W
Speed Range	1-1,000,000 RPM
Illumination	Infrared LED (not visible)
On-Target Indicator	Red/green LED on wire end cap
Target	Contrasting colors or beam interrupt
Operating Range	Up to 0.5 inch [12 mm] from target
Power Requirement	3.3 - 15 V dc @ 40mA
Output Signal	Negative pulse input voltage (+V) to 0
Operating Temperature	-40° to 185° F [-40° to 85° C]
Humidity	Maximum relative humidity 80% for temperature up to 88 °F [31 °C] decreasing linearly to 50% relative humidity at 104 °F [40 °C], humidity must be non-condensing
Connection	1/8 in. [3.5 mm] male stereo plug (IRS-P); Tinned wires (IRS-W)
Cable Length	8 ft. [2.4 m]
Material	303 stainless steel tube supplied with mounting bracket and two M16 jam nuts
Dimensions	Threaded tube: 2.90 in. x 0.625 in. diameter [M16 x 1.5 x 74 mm] long

*Specifications are subject to change without notice.

M16 x 1.5

On-Target LED

2.90" [74.0 mm]

0.62" [15.9 mm]
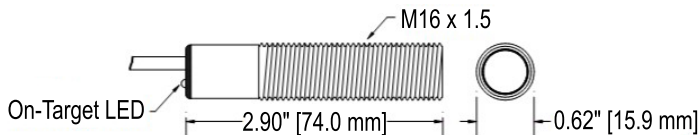
6.1 Dimensions of Mounting Bracket (inches)
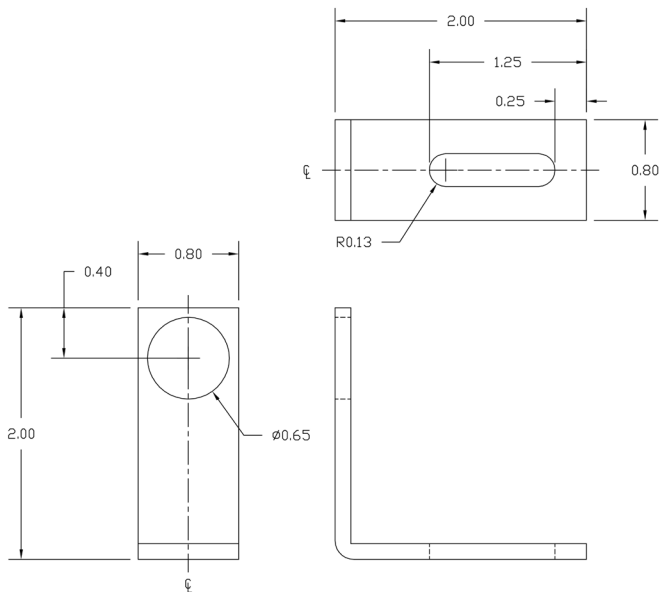
6.2 Compliance
- **CE Compliant (with supplied ferrite)**
- Low Voltage Directive (LVD) 2014/35/EU
- Electromagnetic Compatibility Directive (EMC) 2014/30/EU
- Restriction of Hazardous Substances (RoHS 3) Directive 2015/863/EU

This product is not waterproof.

7.0 ACCESSORIES
See Accessories webpage for details.

SPSR Self-Powered Sensor - Interface Module
    PN: 6150-021

EC-25P 25-Ft. Extension Cable
    PN: 6180-028

Mounting Hardware
    "L" bracket and mounting nuts
    PN: 4180-287

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The Professional's Choice

Monarch Instrument is committed to excellence and quality in manufacturing, sales, and service.

Portable Tachometers

Track-It™ Data Loggers

Panel Tachometers

Fixed Mounted Strobes

Portable Strobes

Frequency Converters

Speed Sensors

DataChart™ Paperless Recorders

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