MONARCH INSTRUMENT

*Instruction Manual*

# ROLS / ROLS24

## Remote Optical Laser Sensor




CE

15 Columbia Drive
Amherst, NH 03031 USA
Phone: (603) 883-3390 • Fax: (603) 886-3300
E-mail: support@monarchinstrument.com
Website: www.monarchinstrument.com

# LASER SAFETY – SAFEGUARDS AND PRECAUTIONS

## Laser Classification and Specifications:



**CLASS 2 LASER PRODUCT**
**Classification Standard:** IEC 60825-1:2014 (Ed. 3.0)

**FDA Certification Statement:** *Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019.*

**Max. Output Power ($P_{max}$):** < 1 milliwatt (< 1 mW)
**Wavelength (λ):** 650 nanometers (Visible Red Light)
**Beam Divergence Angle:** < 18 milliradians
**Output / Emission Duration:** Continuous Wave (CW)

## Laser Hazards and Safe Use:

Do not stare into the laser beam or direct the beam toward the eyes. Avoid direct exposure to the laser beam and avoid viewing specular reflections from reflective surfaces.

Class 2 lasers rely on the natural blink reflex for protection during accidental exposure; however, intentional viewing of the beam should be avoided.

The visible laser beam may cause temporary visual distraction. Never direct the beam toward any person, aircraft, or moving vehicle.

This sensor is intended for professional industrial use and is not a toy.

## Manufacturer Contact Info:

Monarch Instrument
15 Columbia Drive
Amherst, NH 03031 USA

www.monarchinstrument.com

Country of Origin: USA

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**CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**

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**Product Labeling:**

The sensor is marked with laser safety, classification, certification, and traceability labels. These labels identify the laser classification, operating specifications, regulatory compliance information, serial number, and manufacturing date. Labels shall remain legible and shall not be removed or obscured.

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.

There are no user-serviceable parts inside this instrument. For technical assistance, contact the sales organization from which you purchased the product.

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## Recycling and Environmental Information



The crossed-out wheeled bin symbol displayed on the product indicates that this product is subject to the requirements of the Waste Electrical and Electronic Equipment (WEEE) Directive and must not be disposed of with household waste. At the end of its service life, the product should be collected separately and recycled in accordance with applicable national, regional, and local environmental regulations.

This product may contain materials that could be harmful to the environment if improperly disposed of. Proper collection and recycling help conserve natural resources and protect human health and the environment.

For information on collection, recycling, or product return programs, contact your local authorities, waste disposal service, distributor, or the manufacturer.

## Packaging Information (EU)

At the end of use, packaging materials should be separated and disposed of or recycled in accordance with applicable local waste management and recycling requirements. Where practical, reusable packaging components should be retained for future storage, transportation, service, or reuse.

Additional packaging and environmental compliance information is provided in the **Environmental & EU Regulatory Compliance** section of this manual.

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Monarch Instrument's Limited Warranty applies.
See www.monarchinstrument.com for details.

Warranty Registration and Extended Warranty Coverage information is available online at www.monarchinstrument.com.

## 1.0 DESCRIPTION

The Remote Optical Laser Sensor has a visible red laser light source and green LED On-Target Indicator. The Class 2 laser source acts as the aiming device during setup and can accurately measure speeds from 1-250,000 RPM from a distance of up to 25 feet with a maximum offset angle of 60 degrees from the rotating object. The sensor is housed in a threaded 303 stainless steel tube and supplied with a 90-degree mounting bracket and jam nuts. The sensor is available in the following configurations:

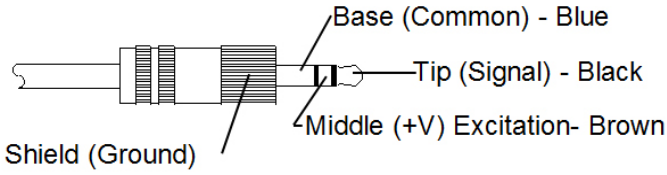
| Model | Power Requirement | Cable Length | Cable Termination |
|---|---|---|---|
| ROLS-P | 3.3 - 15 Vdc | 8 feet | 1/8 in. [3.5 mm] male stereo plug |
| ROLS-W | 3.3 - 15 Vdc | 8 feet | tinned wires |
| ROLS-P-25 | 3.3 - 15 Vdc | 25 feet | 1/8 in. [3.5 mm] male stereo plug |
| ROLS24-W | 24 Vdc ±10% | 8 feet | tinned wires |
| ROLS24-W-25 | 24 Vdc ±10% | 25 feet | tinned wires |

## 2.0 MODELS WITH STEREO PLUG

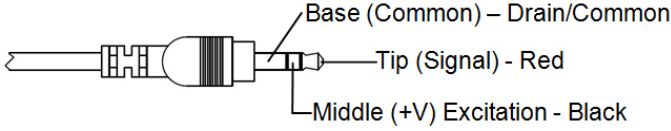


The ROLS-P and ROLS-P-25 models have an 8-foot or 25-foot length cable ending with a 3.5 mm [1/8 in] stereo plug connection. These models will work directly with all Monarch handheld stroboscopes that accept pulse input through an input jack (e.g. PLS; Nova-Strobe dax, dbx, DBL, pbx, and PBL; Nova-Pro® 300 and Nova-Pro® 500). A sensor power supply (SPSR-IM) with BNC output and connecting cable (CA-4044-6) are available for those applications that require a separate power source for the sensor (i.e. Monarch's PLT200). An optional 25 ft. [7.6 m] extension cable (EC-25P) is available with a female socket for the plug on one end and a 3.5 mm [1/8 in] male stereo plug on the other.

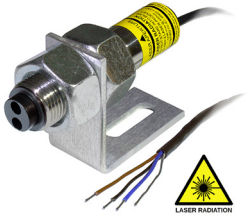
### 2.1 Connection Detail for Metal Plug




### 2.2 Connection Detail for Molded Plug




### 3.0 MODELS WITH TINNED WIRES




The ROLS-W, ROLS24-W and ROLS24-W-25 models have an 8-foot or 25-foot length cable ending with tinned wires. These models will work with most Monarch Instrument panel instruments that accept pulse inputs (e.g. ACT Series, Frequency to Analog Converters, DataChart™ 1250) and vibration data collectors. Pay close attention to power requirements for each ROLS model. Additional cables or sensor power supply may be required. ACT models need the appropriate Sensor Power option selected during product configuration.

### 3.1 Connection Detail for ROLS-W

| Wire Color | Function | Unit |
|---|---|---|
| Brown | Positive Power Supply | 3.3 - 15 Vdc |
| Blue | Common | Com |
| Black | Signal (+ V to 0 Vdc pulse) | Sig |
| Shield | Housing Ground | Gnd |

### 3.2 Connection Detail for ROLS24-W and ROLS24-W-25

| Wire Color | Function | Unit |
|---|---|---|
| Brown | Positive Power Supply | 24 Vdc ±10% |
| Blue | Common | Com |
| Black | Signal (+ V to 0 Vdc pulse) | Sig |
| Shield | Housing Ground | Gnd |

## 4.0 OPERATING INSTRUCTIONS

The ROLS Remote Optical Laser Sensor is capable of detecting a reflected pulse from a target consisting of T-5 Reflective Tape or high-contrast color differences (such as black and white) at distances up to 25 feet [7.6 m] from the rotating object and angles up to 60 degrees. For most applications, a ½" [12 mm] square piece of reflective tape (T-5) should be applied to a clean area on the rotating object. At slow speeds (<500 RPM), best results will be obtained by aiming the laser perpendicular (90°) to the target using a narrow piece of reflective tape – typically 0.2 inch [5 mm] wide.



The senor should be mounted (using the supplied jam nuts and aluminum mounting bracket) and optically aligned to illuminate the on-target indicator once per revolution. It is recommended that the optical sensor be placed at a slight angle (15 degrees) from perpendicular, so that the sensor will receive only pulses from the reflective marker. Triggering from contrasting colors should be done perpendicular to the target. The ROLS should be at least 1 inch from the reflective target to avoid false triggering. The green LED On-Target Indicator will blink at the input frequency rate when the ROLS is properly aimed.

**NOTE**: The green LED On-Target Indicator will blink on and off at slow speeds and remain on steady at high speeds.

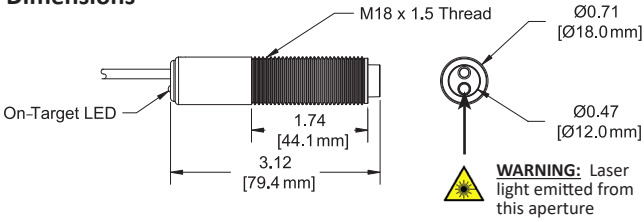
## 5.0 SPECIFICATIONS

| Specifications* | ROLS | ROLS24 |
|---|---|---|
| **Speed Range** | 1-250,000 RPM | |
| **Illumination** | Visible Red Laser, Class 2 | |
| **Laser Specifications:** | | |
| **Classification** | Class 2 (per IEC 60825-1:2014) This product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019. | |
| **Max Laser Output** | 1 mW max | |
| **Pulse Duration** | Continuous | |
| **Laser Wavelength** | 650 nm (visible red) | |
| **Beam Divergence** | < 18 mrad | |
| **Beam Diameter** | 4 x 7 mm typical at 2 m | |
| **Laser Diode Life** | 8,000 operating hours MTBF (1-year warranty) | |
| **On-Target Indicator** | Green LED on wire end cap | |

| Specifications* | ROLS | ROLS24 |
|---|---|---|
| **Operating Range** | Up to 25 feet [7.6 m] and 60° offset from target | |
| **Power Requirement** | 3.3 - 15 Vdc, 0.4 W max | 24 Vdc ±10%, 0.4 W max |
| **Output - Standard** | Open collector with internal pull up resistor to supply voltage; positive pulse when target present - Output Voltage = Supply Voltage | Open collector with internal pull up resistor (5600 ohm) to supply voltage minus ~5 V; positive pulse when target present |
| **Output - Optional** (contact factory) | TTL pulse, negative pulse, open collector with internal pull up resistor (4700 ohm) to 3.3 V – 25 mA max load | |
| **Operating Temperature** | 14 °F to 158 °F (-10 °C to 70 °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) | |
| **Connection** | 1/8 in. [3.5 mm] male stereo plug or tinned wires | Tinned wires |
| **Cable Length** | 8 ft. [2.4 m] or 25 ft. [7.6 m] | |
| **Material** | 303 stainless steel supplied with two M18 jam nuts and mounting bracket | |
| **Lens** | Acrylic plastic | |
| **Dimensions** | Threaded tube 3.12 in. x 0.71 in. diameter [M18 x 1.5 x 79.4 mm] | |

***Specifications are subject to change without notice.**

## 5.1 Dimensions




## 5.2 Compliance

### 5.2.1 CE and RoHS Compliance

The ROLS and ROLS24 sensors conform to applicable European Union requirements, including Directive 2011/65/EU (RoHS), as amended, and bear the CE marking. The EU Declaration of Conformity for these products is available at: www.monarchinstrument.com.

### 5.2.2 Environmental & EU Regulatory Compliance

This information is provided to support compliance with applicable environmental and packaging requirements, including the European Union Packaging and Packaging Waste Regulation (EU) 2025/40, where applicable.

All ROLS (Remote Optical Laser Sensor) product configurations utilize a common packaging system designed to protect the product during storage, handling, and transport. The packaging may include a corrugated paperboard carton, packaging tape, polyethylene bags, and thermally printed labels. For larger orders or mixed-product shipments, smaller products and/or accessories may be consolidated within a larger polyethylene bag to prevent loss or damage during transport.

Where practical, packaging components should be retained and reused to help reduce packaging waste and support circular economy principles.

At the end of their useful life, packaging components should be separated and disposed of or recycled in accordance with applicable local regulations.

**Packaging materials may include:**

- Corrugated Paperboard Carton
- Packaging Tape
- Low-Density Polyethylene (LDPE) Film Bags
- Reclosable Polyethylene Bags
- Thermal Labels

Material composition may vary by product configuration, manufacturing revision, supplier, or regional requirements.

**Recommended end-of-life handling:**

- **Corrugated Carton:** Recycle in accordance with local requirements for paper and cardboard recycling. Attached labels and packaging tape may generally remain in place unless local recycling requirements specify otherwise.
- **Polyethylene Film Bags:** Recycle in accordance with local requirements for polyethylene film materials where collection and recycling facilities are available.
- **Thermal Labels:** Small identification and shipping labels may generally remain attached to packaging during recycling unless local recycling guidance specifies otherwise.

## 6.0 ACCESSORIES

For a complete list, see Accessories webpage.

| Model | Part No. | Description |
|---|---|---|
| **SPSR-IM**<br>**Self-Powered Sensor Interface Module** | 6150-021 | Self-contained, rechargeable battery-powered Interface Module with SPSR-U 115/230 Vac power supply/recharger |
| **EC-25P**<br>**25 Ft. Extension Cable** | 6180-028 | 25 ft. extension cable with male/female 1/8" phone plug connectors |

# Measure • Monitor • Maintain

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



*Portable Tachometers*



*Track-It™ Data Loggers*




*Panel Tachometers*



*Fixed Mounted Strobes*



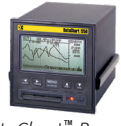
*Portable Strobes*




*Frequency Converters*



*Speed Sensors*



*DataChart™ Paperless Recorders*

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15 Columbia Drive, Amherst NH 03031 USA
Tel.: (603) 883-3390 // (800) 999-3390
Email: support@monarchinstrument.com
Website: www.monarchinstrument.com

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