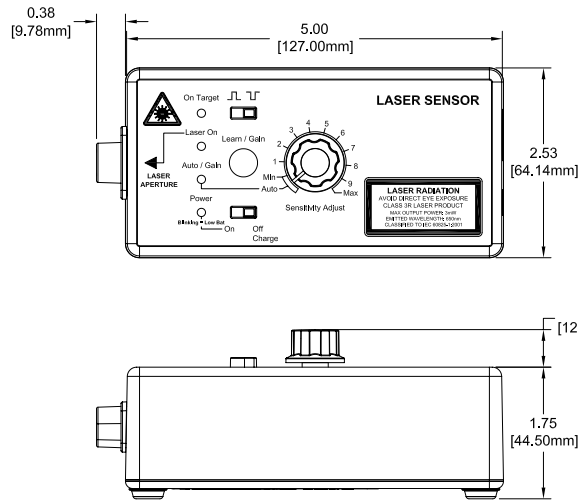
MONARCH INSTRUMENT

Instruction Manual

SLS-115/230
Smart Laser Sensor

Dimensions: 5.38" (13.67cm) L (including snout) x 2.53" (6.42cm) W x 2.25" (5.72cm) H (including knob and feet)



Dimensions in Inches [mm]

Installation Environment:

Installation Category II per IEC 664

Pollution Degree Level II per IEC 61010-1

Temperature: 32 to 104 °F (0 to +40 °C) operating

14 to 158 °F (-10 to +70 °C) storage

Humidity: Maximum relative humidity of 80% for temperatures up to 88 °F (31 °C) decreasing linearly to 50% relative humidity at 104 °F (40 °C)

Specifications subject to change without notice.

TABLE OF CONTENTS

Symbols on the unit and in this manual:


Warning
Laser Beam

⎓ Direct current


Caution
Read Manual

~ Alternating current

Operating Range: Up to 65 feet depending on target reflectivity:

1/2" reflective tape (T-5) @3600 RPM:	up to 65 ft. (19.8 m) or up to 75° from target
White/Black contrast @3600 RPM:	up to 3 ft. (91 cm) or up to 45° from target
Black mark on dental drill:	up to 4 in. (10 cm) at over 260,000 RPM

Max RPM: 500,000 RPM

Min. Trigger Duration: 10 µsec

Indicators: LEDs for On Target, Laser On, Auto/Gain, Power/Charge

Modes: Normal (manual) or Auto, and charging

Normal mode – manual adjustment of sensitivity / gain

Auto mode – auto learn, automatic gain control

Sensitivity Adjust: Single Turn knob on top panel in Normal mode

Voltage Requirements:

Operational: Internal: rechargeable batteries
External: +9 V ⎓ 1VA

Charging: External: +9 V ⎓ 3VA

Batteries: Internal 4 "AA" rechargeable NiCd 700mAh

Run Time: Over 6 hours continuous operation from fully charged batteries @ 70 °F (21 °C)

Charge Time: Typically less than 3 hours @ 70 °F (21 °C)

2. Laser On LED — Blinks when unit is first turned on. Remains lit when the laser beam is on.

3. Auto/Gain LED — On solid whenever the unit is in the Auto mode. It also blinks from 1 to 8 times to indicate the current gain whenever the gain is changed.

4. Power LED — (Dependent on the Power switch location)

On position: GREEN when the batteries are charged.

Blinks AMBER when the batteries are low.

Charge position: Blinks RED when fast charging for very low batteries.

Blinks AMBER when slow charging.

Steady AMBER when the batteries are fully charged.

5. Polarity switch — Selects either a positive or negative output pulse.

6. Learn/Gain button

In Auto Mode: Press and hold until the On Target LED blinks regularly or is on solid.

In Manual Mode: Press to change gain ranges.

7. Sensitivity Adjust knob — Turn fully counterclockwise to select Auto mode or manually adjust sensitivity threshold.

8. Power switch — Turns unit On or Off. When the unit is switched to Off/Charge and a charger is plugged into the unit, the batteries will charge.

To aid in locating the laser dot over a large distance, hold a piece of white cardboard or equivalent in front of the laser. Progressively move the white surface closer to the desired target. Then adjust the aim of the laser as necessary.

In areas of high ambient light (outdoors), performance can be enhanced at long distances by slipping a piece of black tube with a minimum inner diameter of 0.6 inches, over the nose piece to act as an extension nose piece. This tube should not deflect the beam in any way.

8.0 RS232

Baud rate = 9600, 8 bits, 1 stop bit, no parity.

When the unit is turned on, it will send out: “SLS<lf><cr>Vx.x<lf><cr> 0.0<cr>”. Where <lf> is the linefeed character, <cr> is a carriage return character, and x.x is the firmware version number.

The unit will send out the current RPM as a right justified 7-digit ASCII number that will always include a decimal point followed by carriage return. The update rate is a function of the speed of the target and will not exceed twice per second.

Examples:

1234.56<cr>

123456.<cr>

_ _ _ _0.0<cr> (_ = space character)

4.0 CONNECTION DETAIL

The unit has an input power jack for DC power or recharging the batteries. Use only the PR Universal charger supplied.

The unit also has a five-pin DIN output socket for Pulse outputs and RS232. An 8-foot [2.5 m] cable with a DIN plug and BNC connector is supplied. The BNC plug is connected to the SO output. A variety of optional cables are available including: tinned wire termination, 1/8 inch [3.5 mm] mono plug, or DB9 for RS-232.

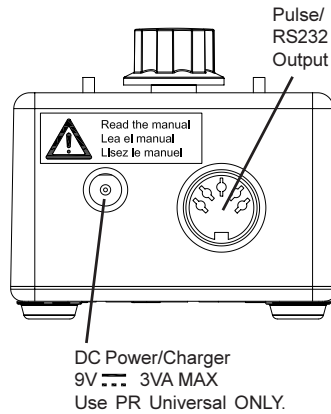


Figure 2 Connection Details

Refer to Table 1 and Figure 3 for the output socket connection detail:

Pin	Description	Wire Color (of cable)
1	RS232 Receive (input to sensor)	Red
2	Common	Orange [BNC –]
3	SO (PNP Output) TTL compatible output	Yellow [BNC +]
4	RS232 Transmit (output from sensor)	White
5	OC (NPN Output)	Black

Table 1 Output Connections

(negative pulse). The user can select either a positive or a negative output pulse using the Polarity switch (5).

The gain of the input amplifier and the sensitivity can be adjusted manually or automatically. This allows the unit to be used with many types of targets at various distances and contrasting color conditions. To select the Auto mode, turn the Sensitivity Adjust knob (7) fully counterclockwise, otherwise you are in the Manual mode. Reflective tape and high contrast color applications should be able to use the Auto mode.

5.1 Auto Mode

Make sure the Sensitivity Adjust knob (7) is fully counterclockwise and the **Auto/Gain** LED (3) is on. Aim the laser at your target. Press and hold the Learn/Gain button (6) until the **On Target** LED (1) blinks regularly or is on solid (depending on the RPM of the target). Release the Learn/Gain button. The **Auto/Gain** LED will blink to show what gain has been selected. Refer to Table 2.

Number of blinks	Gain
1 Strong Signal	X 1
2	X 2
3	X 4
4	X 5
5	X 8
6	X 10
7	X 16
8 Weak Signal - Move Closer	X 32

Table 2 Auto/Gain Blinks

In many applications, this is all that is needed. In cases where the target is marginal, the user may need to manually adjust the sensitivity after trying the Auto mode.

5.2 Manual Mode

Aim the laser at your target. Turn the Sensitivity Adjust knob (7) between **Min** and **Max** until the **On Target** LED (1) starts blinking or comes on solid. If you can't get a good setting, change the gain. Press and release the Learn/Gain button (6) to change the gain of the input amplifier. Each time the button is pressed, the gain is changed. The

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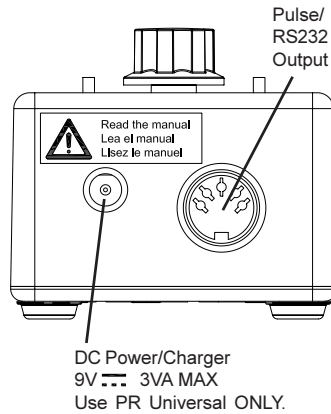

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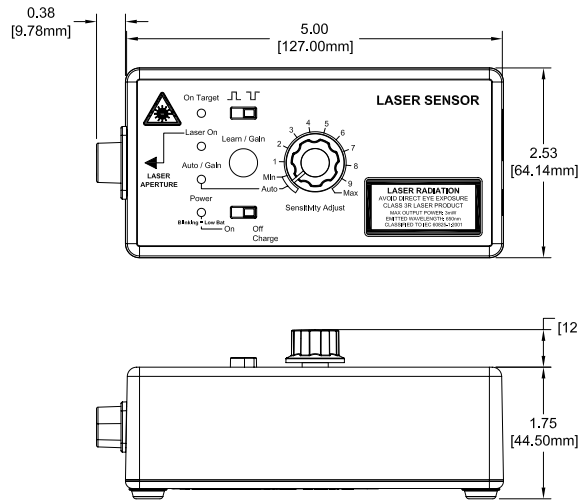

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