Reference Manual
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Multipurpose test lamp kit

NET SAFETY MONITORING INC.

EMERSON Process Management

Important Instructions

Net Safety Monitoring, Inc (Net Safety) designs, manufactures and tests products to function within specific conditions. Because these products are sophisticated technical instruments, it is important that the owner and operation personnel must strictly adhere both to the information printed on the product nameplate and to all instructions provided in this manual prior to installation, operation, and maintenance.

⚠WARNING

Installing, operating or maintaining a Net Safety Product improperly could lead to serious injury or death from explosion or exposure to dangerous substances. Comply with all information on the product, in this manual, and in any local and national codes that apply to the product. Do not allow untrained personnel to work with this product. Use Net Safety parts and work procedures specified in this manual.

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Contents

Section 1: Introduction

1.1 Models covered

The multipurpose test lamp is Net Safety's latest design in test lamps and addresses the need to simulate a fire condition when testing any Net Safety flame detector series (UVS, UV/IRS and IR3S Flame Detectors). The multipurpose test lamp allows simulation in classified and hazardous locations. It consists of an electronic module and battery pack mounted inside an ATEX approved and CSA certified enclosure.

The models available are:

- TL-MP-KIT - Multipurpose test lamp kit, CSA approved
- TL-MP-KIT-X - Multipurpose test lamp kit, ATEX approved

1.2 Safety instructions

⚠CAUTION

 The test lamp generates UVC and visible radiation which can be harmful to the eyes. Proper protective eye wear should always be worn when using the multipurpose test lamp. Unprotected eyes are extremely sensitive to direct or indirect (reflected) radiation.

⚠WARNING

Failure to follow these installation guidelines could result in death or serious injury. Ensure that only qualified personnel perform the installation.

Electrical shock could cause death or serious injury. Use extreme caution when making contact with the leads and terminals.

Do not open the test lamp enclosure when in a classified area or when an explosive atmosphere may be present.

1.3 Service support

Technical support for this product can be provided by contacting your local Emerson Process Management/Net Safety representative or by contacting the Net Safety Technical Support department at +1 403 219-0688 or nsm.service@emerson.com.

1.4 Return of material

To expedite the repair and return of this product, proper communication between the customer and the factory is important. Before returning a product for repair, call +1 403 219-0688 or e-mail nsm.service@emerson.com for a Material Return Authorization (MRA) number.

On the return of the equipment, include the following information:

1. MRA number provided to you by Net Safety
2. Company name and contact information
3. Purchase order, from your company, authorizing repairs or request for quote
4. Ship all equipment, prepaid to:
   Net Safety Monitoring
   2721 Hopewell Place NE
   Calgary, Alberta, Canada T1Y 7J7
5. Mark all packages with as **Return for Repair** and include MRA number

Pack items to protect them from damage and use anti-static bags or aluminum-backed cardboard as protection from electrostatic damage.

All equipment must be shipped prepaid. Collect shipments will not be accepted.

1.5 Product recycling/disposal

Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislations/regulations.

Section 2: Installation

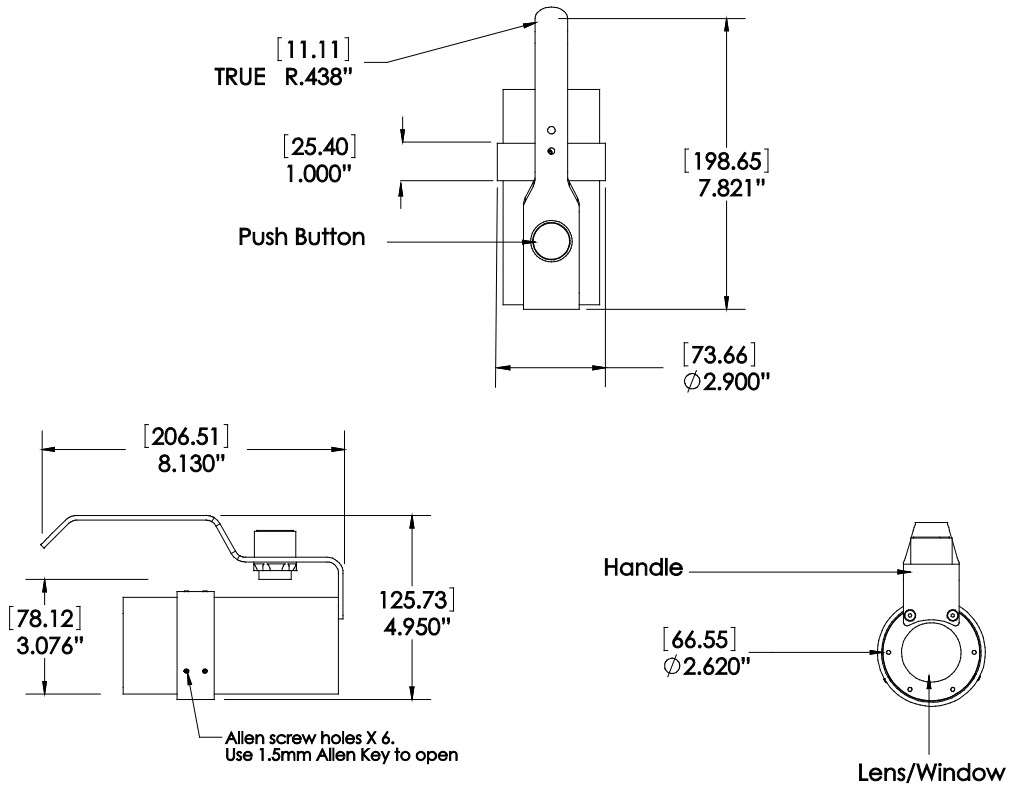
2.1 Unpacking and inspection

Carefully remove all of the components from the packaging and verify them against the enclosed packing list. Inspect all components for any obvious damage such as broken or loose parts. If you find any components missing or damaged, notify your local Net Safety representative or the factory immediately.

2.2 Dimensions

Figure 2-1 outlines the dimensions of the multipurpose test lamp.

Figure 2-1 - Multipurpose test lamp dimensions



Note: ATEX Model (TL-MP-EX-X) test lamp shown

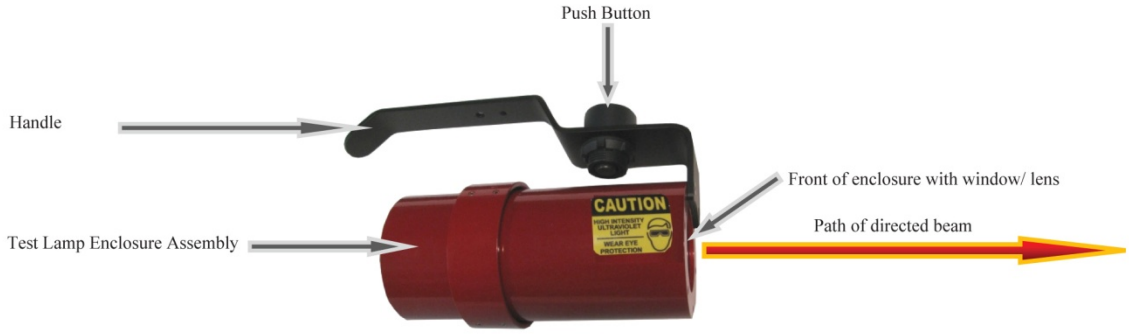
2.3 Kit contents

- Multipurpose test lamp
- Battery charger
- Accessory case
- 7.2 Volt (dc) battery pack
- Window Cleaning Kit (cloth and cleaning solution)

Note: Spare battery pack, window cleaning kit, and test lamp manual are inside accessory case.

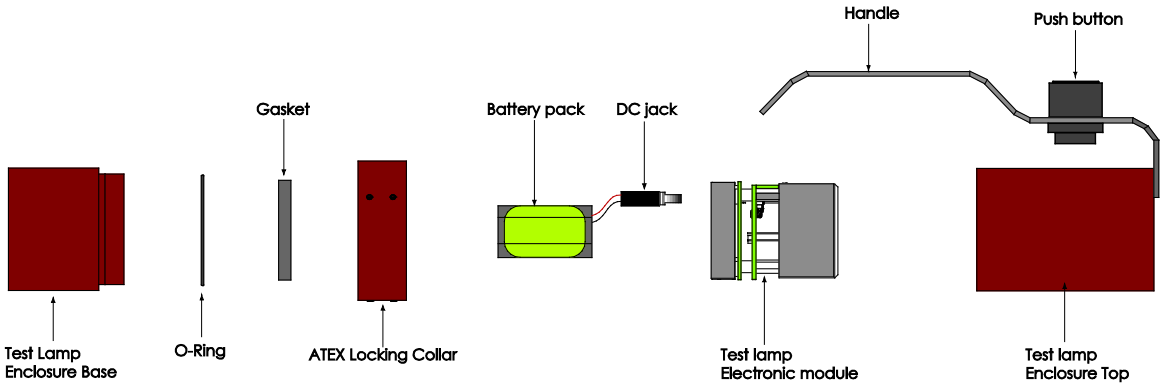
2.3.1 Multipurpose test lamp

Figure 2-2: Test Lamp Enclosure Description



Note: ATEX model (TL-MP-EX-X) test lamp shown. CSA model does not have a locking collar.

Figure 2-3 Test lamp components



2.3.2 Battery charger

⚠WARNING

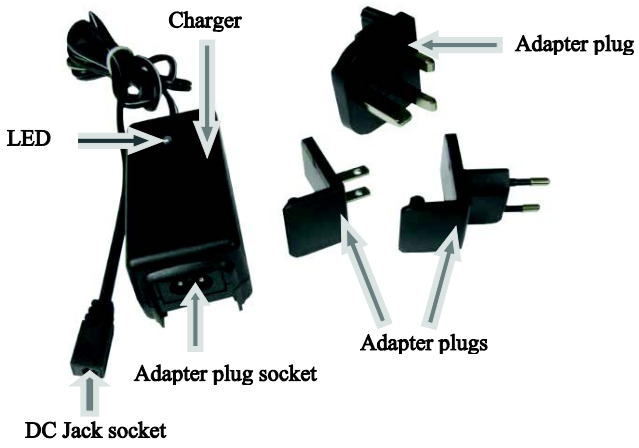
Do not plug the charger into a DC voltage system. Disconnect battery pack from test lamp electronics module prior to charging.

Do not use the charger in a classified area.

The battery charger should always be used indoors and should be kept away from water and dust. To prevent overheating of the charger keep it away from temperatures in excess of 60 degrees Celsius. When the charger is plugged into a 100 to 240Vac outlet, the charger indicator LED will be illuminated orange within 7 seconds to indicate a connection being made to the outlet. The LED will change to red when charging of the battery pack begins. Green with intermittent orange flashes will indicate that charging is almost complete. Green LED indicates charging is complete. If a battery needs replacing or the battery pack voltage is far below normal, the LED will alternate red and green flashes to indicate error mode. When this occurs unplug the charger from the outlet then re-plug to restart charging process. If the results are the same, replace the battery.

The charger is provided with three (3) plug adapters. Install the plug adapter to match your local AC plug standards.

Figure 2-4: Battery Charger



Battery Charger Mode	LED Color	Output
No battery	Orange	16.5 V
Initialization	Orange	30mA
Fast charge	Red	1.0mA
Top- off charge	Green/Orange	130mA
Charge complete	Green	30mA
Error	Red/Green	30mA

2.3.3 Battery pack

CAUTION

Dropping, damaging, or puncturing the battery pack may result in injury to personnel or cause damage to the equipment.

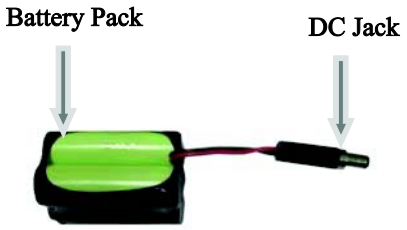
Important

The spare battery pack should be stored in the case to reduce the risk of any potential damage.

The required 7.2Vdc battery pack is located inside the test lamp enclosure. A spare battery pack is also included in the test lamp kit. Battery packs are rechargeable Nickel-Metal hydride (NiMH) types and they may be recharged using the charger included. To maintain the batteries in optimum working condition, the batteries should not be charged until they will no longer power the test lamp properly. The time for recharging battery pack is four (4) hours.

When batteries are no longer useable, they should be properly disposed of. Consult with local safety and environmental personnel on proper methods of disposal.

Figure 2-5 Battery pack



NOTICE

Only use BAT-0009 supplied by Net Safety with the test lamp.

Section 3: Operation

⚠ CAUTION

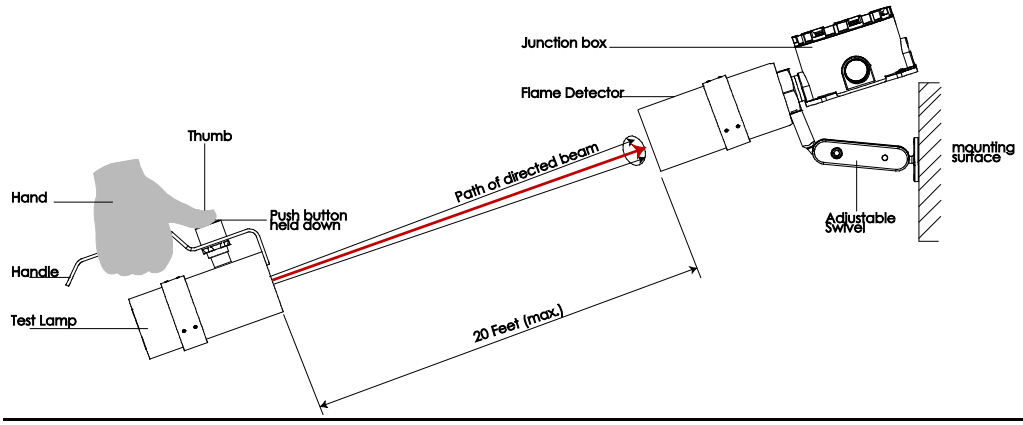
Never point the test lamp at eyes. UV light is invisible and will cause damage with repeated exposure.

When the test lamp push button is held down, ultraviolet and infrared beams will be produced. Beams should be directed at the flame detector window/lens. The location of the infrared component beam will be indicated by a red dot. During fire simulation test, the red dot should be directed at the IR target sensor of the IR3S and UV/IRS Flame Detectors. It is recommended that two persons perform the test procedure; one person should operate the test lamp, while the other observes outputs and responses at controllers and/or fire detector.

NOTICE

External systems should be placed in bypass mode to prevent system alarms and shutdowns while fire simulated tests are being performed.

Figure 3-1: Positioning Test Lamp and Flame Detector



3.1 Response test for IR3S flame detectors

Follow the steps below to ensure accurate testing and fire simulation using the test lamp.

Important

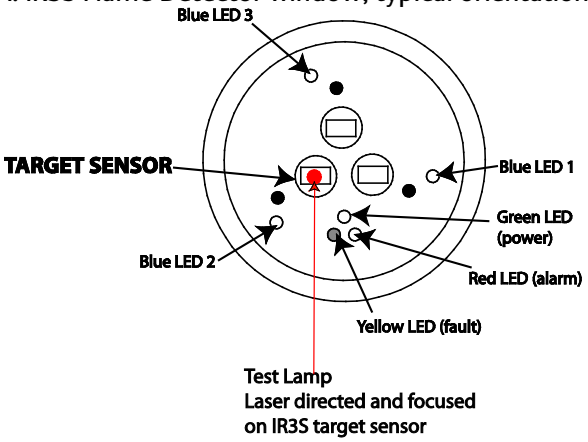
When completing a fire simulation, ensure that the external system is in bypass or erroneous activation of the safety system may occur.

- Point the test lamp at the detector window, no greater than 20 feet (6.06 meters) from the detector, as shown in Figure 3-1, then press and hold the test lamp pushbutton.
- With the pushbutton held down, direct the IR laser (red dot) at the detector's target sensor as shown in Figure 3-2. The location of the target sensor will depend on the mounting orientation of the detector. After the detector time delay has elapsed, the detectors blue LED's will flash after which the red LED will be lit (solid). Refer to the detector manual (MAN-0044 or MAN-0072) for time delay settings.

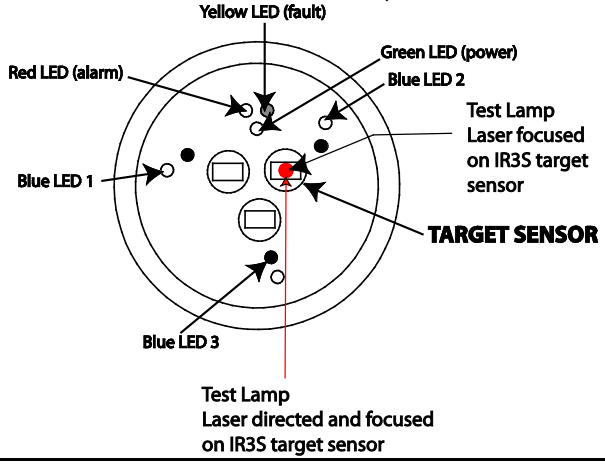
- For analog and analog-HART model detectors, the signal output in alarm (20mA), can be measured using a current measuring device placed in the analog loop or across the meter test jacks inside the junction box.
- For relay model detectors, changes in fire alarm relay status may be monitored at the detector relay terminals or panel.
- For digital model detectors, digital responses may be monitored at a PLC/panel.
- After successful fire simulation, release the test lamp pushbutton and discontinue external system bypass (return external system to normal operating mode).

Figure 3-2: IR3S Flame Detector Orientations and Target Sensor Location

A. IR3S Flame Detector window, typical orientation



B. IR3S Flame Detector window, 180° orientation



3.2 Response test for UV/IRS flame detectors

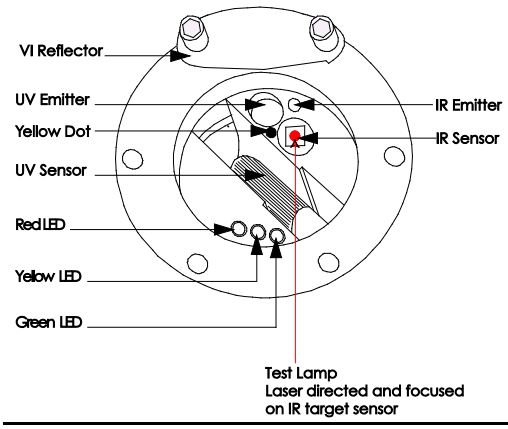
Follow the steps below to ensure accurate testing and fire simulation using the test lamp.

Important

When completing a fire simulation, ensure that the external system is in bypass or erroneous activation of the safety system may occur.

- Point the test lamp at the detector window, no greater than 20 feet (6.06 meters) from the detector, as shown in Figure 3-1, then press and hold the test lamp pushbutton.
- To simulate a fire condition, press and hold the test lamp pushbutton while directing the IR laser (red dot) at the detector's IR sensor as shown in Figure 3-3. After the detector time delay has elapsed, the detectors red LED will flash to indicate a fire condition. Refer to the detector manual (MAN-0015 or MAN-0075) for time delay settings.
- For analog and analog-HART model detectors, the alarm signal output (20mA) can be measured using a current measuring device placed in the analog loop or across the meter test jacks inside the junction box.
- For relay model detectors, changes in fire alarm relay status may be monitored at the detector relay terminals or panel.
- After a successful fire simulation, release the test lamp pushbutton and discontinue external system bypass (return external system to normal operating mode).

Figure 3-3: UV/IRS Flame Detector Window



3.3 Response test for UVS flame detectors

Follow the steps below to ensure accurate testing and fire simulation using the test lamp.

Important

When completing a fire simulation, ensure that the external system is in bypass or erroneous activation of the safety system may occur.

- Point the test lamp at the detector window, no greater than 20 feet (6.06 meters) from the detector, as shown in Figure 3-1, then press and hold the test lamp pushbutton.
- To simulate a fire condition, press and hold test lamp push button beyond the duration of the detector time delay. The detector Red LED will flash after time delay duration is passed, to indicate a fire condition. See detector manual (MAN-0039 or MAN-0086) for time delay settings
- For analog and analog-Hart model detectors, the signal output (20mA) can be measured using a current measuring device placed in the analog loop or across the meter test jacks inside the junction box.
- For relay model detectors, changes in fire alarm relay status may be monitored at the detector relay terminals or panel.
- After a successful fire simulation, release the test lamp pushbutton and discontinue external system bypass (return external system to normal operating mode).

3.4 System Response Test

It is important to verify system response to a fire. System response includes relay, analog and digital output activation. This test is performed with the controller/PLC online, therefore it is important to disable all active external response devices and shut-downs. Utilize the test lamp as described above and verify that the controller outputs become active as programmed. Carefully verify analog, relay and digital output response. Remember to enable external response devices after test.

If test does not produce desired results (20 mA output current, change in the state of the alarm relay or digital output) from detector, there may be a problem with wiring or the battery pack inside the test lamp enclosure may be depleted. Check detector and system wiring, clean all optical surfaces, recharge the battery pack if necessary and repeat the test. Contact the manufacturer immediately, if the flame detector still does not respond.

NOTICE

External systems should be placed in bypass mode to prevent system alarms and shutdowns while fire simulated tests are being performed.

Section 4: Maintenance

4.1 Troubleshooting

If the flame detector does not respond to the test lamp as described in this manual, verify that the test lamp is receiving power by pointing the test lamp at a flat surface, engaging the pushbutton, and noting a red light blinking on the flat surface. If the red light is not present, verify the charge of the battery and replace as necessary.

⚠ CAUTION

Never point the test lamp at eyes. UV light is invisible and will cause damage with repeated exposure.

If the problem remains, check all wiring to the flame detector and refer to the specific flame detector manual for troubleshooting instructions.

If the problem persists please contact our service department to try and resolve the issue over the phone as outlined in 1.3. If the issue cannot be resolved over the phone, the Net Safety representative may advise to proceed to replace either the electronic module or battery pack. For instructions on replacing the electronic module, refer to 4.4.

4.2 Storage

The test lamp and component parts should be stored in a location free from dust and moisture. The device should be stored well within the range: -40°C to +55°C (-40°F to +140°F).

The test lamp uses rechargeable Nickel-Metal hydride (NiMH) batteries. When batteries are no longer used, they should be carefully disposed of. Consult with local safety and environmental personnel on methods of disposal.

4.3 Spare Parts/Accessories

Net Safety Part Number	Description
TL-MP-EX	Multipurpose test lamp - CSA approved
TL-MP-EX-X	Multipurpose test lamp - ATEX approved
TLS-MP-EMOD	TL-MP-EX electronics module
BAT-0009	7.2 V rechargeable NiMH battery pack with DC connector
TLS-MP-CHGR	90-265VAC 4-8 cell, NiCd, NiMH battery charger
WINDOW CLEANER	130ml spray bottle of anti-reflective cleaning solution

4.4 Electronic module replacement

The following procedure outlines the steps required to replace the electronic module, part number TL-MP-EMOD, in the test lamp.

⚠WARNING

Electrical shock could cause death or serious injury. Use extreme caution when making contact with the leads and terminals.

Do not open the test lamp enclosure when in a classified area or when an explosive atmosphere may be present.

Important

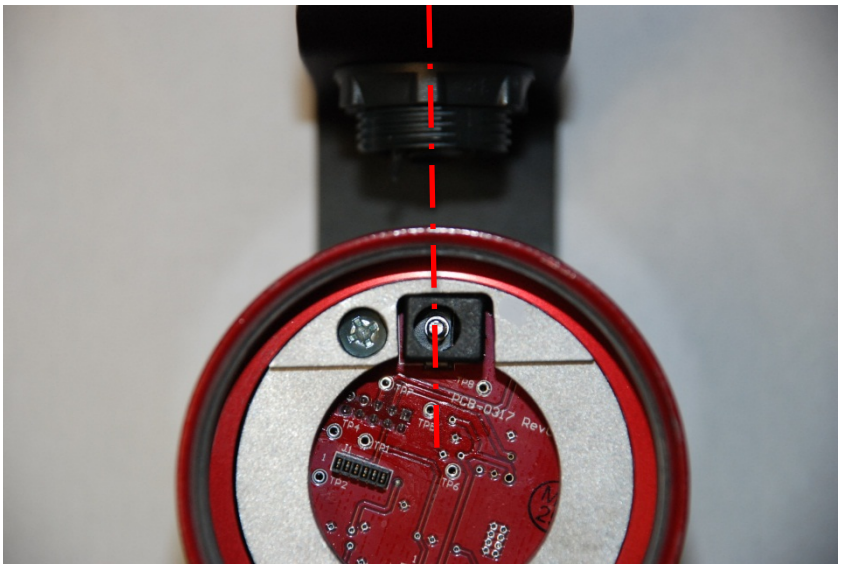
Avoid touching any electronic components, as they may be susceptible to electrostatic discharge (ESD). Refer to Section 5 for further information and proper handling instructions of electronic components.

1. Remove the end cap from the test lamp by a) loosening the set screws on the locking collar (TL-MP-EX-X units only) and b) unscrewing the end cap.
2. Unplug the battery from the electronics module.
3. Using a 1/16” hex wrench, loosen (do not remove) the two (2) setscrews as shown in Figure 4-1.

Figure 4-1 Setscrew locations

4. Remove the old electronics module from housing and insert the new electronics module in the housing.
5. Align the DC power jack on the electronics module with the middle of the handle as shown in Figure 4-2 to ensure proper alignment with the pushbutton.

Figure 4-2 Electronic module alignment



6. Tighten the setscrews on the electronic module shown in Figure 4-1, reconnect the battery to the electronics module, and then replace the end cap ensuring that it is completely tightened.

Section 5 Electrostatic sensitive device

Definition: Electrostatic discharge (ESD) is the transfer, between bodies, of an electrostatic charge caused by direct contact or induced by an electrostatic field.

The most common cause of ESD is physical contact. Touching an object can cause a discharge of electrostatic energy—ESD! If the charge is sufficient and occurs near electronic components, it can damage or destroy those components. In some cases, damage is instantaneous and an immediate malfunction occurs. However, symptoms are not always immediate—performance may be marginal or seemingly normal for an indefinite period of time, followed by a sudden failure.

To eliminate potential ESD damage, review the following guidelines:

- Handle boards by metal shields—taking care not to touch electronic components.
- Wear grounded wrist or foot straps, ESD shoes or heel grounders to dissipate unwanted static energy.
- Prior to handling boards, dispel any charge in your body or equipment.
- Ensure all components are transported and stored in static safe packaging
- When returning boards, carefully package in the original carton and static protective wrapping
- Ensure ALL personnel are educated and trained in ESD Control Procedures

In general, exercise accepted and proven precautions normally observed when handling electrostatic sensitive devices. A warning label is placed on the packaging, identifying product using electrostatic sensitive semiconductor devices.

Section 6: Specifications

6.1 Electrical

6.1.1 Power consumption

200mA @ 8Vdc, 1.6W

6.1.2 Laser optical power & wavelength

Class IIIA, 5mW CW, visible wavelengths (650nm)

6.2 Environmental

6.2.1 UV radiation

UVC (185-260 nm)

6.2.2 Storage temperature

-40°C to +55°C (-40°F to +140°F)

6.2.3 Operating temperature

-40°C to +55°C (-40°F to +140°F)

6.3 Performance

6.3.1 Maximum operating distance

20 feet (6 meters)

6.3.2 Operating time

8 hours constant use at +20°C (68°F)

6.3.3 Battery recharging time

4 hours

6.4 Mechanical

6.4.1 Ingress protection

IP66/67
NEMA 4X

6.4.2 Weight

Kit: 4.4lbs (2Kg)
Test lamp: 2.1lbs (1Kg)

Section 7: Certifications

7.1 North American

Class I, Division 1, Groups B, C, and D T6
Class I, Zone 1, Groups IIB+H_2 T6
IP66/67
-40°C ≤ T_a ≤ +55°C

7.2 ATEX (-X Version)

CE 0575 Ex II 2 G Ex d [op is] IIB+H_2 T6 Gb
-40°C ≤ T_a ≤ +55°C
DNV10 ATEX 69831

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