BEAMHIT®

110 SYSTEM MANUAL

AFG Training Technology, LLC

VERSION 20160303-00

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System Description

The **110 System** is a portable, electronic marksmanship trainer that utilizes the Beamhit **TR700** target, **LS101** Laser Transmitter and Multi-Caliber Rods for effective training with your own firearm indoors or outdoors.

The target provides the shooter with instant visual and audible feedback of laser target hits with the LED hit counter and buzzer. The system includes 3 scaled target masks to vary the difficulty of engagement and a timer that allows you to set a time limit during which the target will detect and count the hits on the target.

The target is powered by four AA batteries or an AC power adapter, and the laser transmitter uses three LR44 batteries.

A variety of laser transmitter rods are available as accessories to support training with most popular size firearm barrels for rifles, pistols, and shotguns. Scaled accessory masks are available to provide realistic training, as well as a remote cable to activate the timer and clear the hit counter at a distance, and daisy chain cables to link multiple targets.

SPECIFICATIONS - TR700TARGET	
Actual target diameter	3.86 in (98mm)
Maximum recommended shooting distance	80 ft. (25 meters)
Dimensions (L x W x H)	7.8 x 2.0 x 6.4 in (197x50x162mm)
Weight	1.07 lb (485 gr)
Power Supply	6 VDC (4x AA size Alkaline batteries - included) or 9 VDC via external AC adaptor 110 V or 220 V (sold separately)
Timer	1-35 sec. (with enable/ disable setting by operator)
Buzzer	Sounds for each hit, when starting or stopping (with disable button)
Display	Score counter, two digits Hit LED Timer mode session START and STOP LED
Recommended Operational Environment	Indoor (limited outdoor)
Temperature - Operation	0°C to +40°C (+32°F to +104°F)
Temperature - Storage	-20°C to +50°C (-14°F to +122°F)

SPECIFICATIONS - LS101 LASER TRANSMITTER	
Beam shape	Elliptical (7:4 major exit)
Wavelength	655 nm @ 25 °C (visible Red)
Class	IIIA
Power supply	Battery 3X L1154 1.5V
Maximum recommended shooting distance	80 ft (25 meters)
Dimensions (Length, Diameter)	2.6 inches 0.6 inches
Weight	~0.12 lb with batteries
Eye safety	Complies with eye-safety standards: 21 CFR chapter 1, subchapter J
Operational time with new batteries	>5 hours if it is left in constant ON mode, >15000 continues shots in training mode
Training Mode Activation	Vibration (~300g)
Recommended Operational Environment	Indoor (limited outdoor)
Recommended Operational Temperature	0°C to +40°C (+32°F to +104°F)
Recommended Storage Temperature	-20°C to +50°C (-4°F to +122°F)

WARNINGS AND PRECAUTIONS

Please ensure you carefully read and follow all warnings, safety precautions, and operating instructions listed within this system manual before using this laser and/or system.

LIABILITY LIMITATIONS: AFG Training Technology, LLC, it's suppliers, vendors and agents shall not be liable for damages, regardless of their nature, caused by user's negligence or failure to comply with recognized firearms safety procedures.

FIREARMS SAFETY: Verify that your firearm is UNLOADED before using the system. Double check that no live rounds are in the chamber, magazine, or cylinder of your firearm. Remove all ammunition from your training area. Always point your firearm in a safe direction and make sure no one is in the line of fire. Remember FIREARMS SAFETY IS YOUR RESPONSIBILITY.

LASER LABELS AND SAFETY: The LS101 Laser meets all Class III A Laser requirements and complies with FDA requirements, 21 CFR chapter 1, subchapter j. AVOID DIRECT EYE EXPOSURE

PROPER USE: The 110 System is designed mainly for indoor usage. It can be used outdoors with limitations such as no direct sunlight on the target. The system can not be exposed to rain, snow or moisture. Do not leave the laser and target on for long periods of time as this may create corrosion across the battery contacts. Do not use tools or excessive force while installing the laser/rod into the firearm. Ensure that the rod is installed and removed in a straight direction to avoid contact with the crown of the barrel.

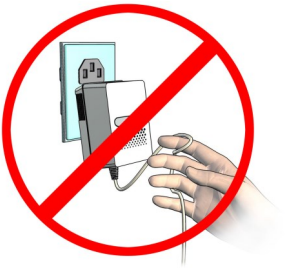
Sold separately

The electronic target is powered by four batteries (included) or an AC power adaptor (not included). When using with the AC power adaptor, *check* that the voltage specified on the electronic target power supply matches the power outlet:

U.S.A. - 110V

Euro plug - 220V-240V

Never touch the cord or plug of the power supply with wet hands.

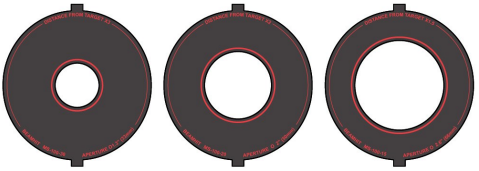


Always pull the power supply cord out by the plug - not by the cord.

Do not expose the electronic target and the laser to rain or moisture.

TR700 TARGET

QTY: 1ea



MASK SET (Regular)

QTY: 1ea

SYSTEM MANUAL

QTY: 1ea

Available for download from website www.beamhit.net

MCR-SM-L

(.22 to .32 Caliber Rifle)

QTY: 1ea

MCR-SM

(.22 to .32 Caliber)

QTY: 1ea

MCR-ML

(.357 to .45 Caliber)

QTY: 1ea

Laser: LS-101

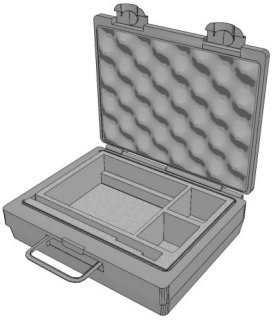
QTY: 1ea

ALLEN WRENCH - 1.5mm

QTY: 1ea

CARRYING CASE

For carrying a complete 110 System, including accessories.



BATTERY:LR44

QTY: 3 per laser

BATTERY: AA

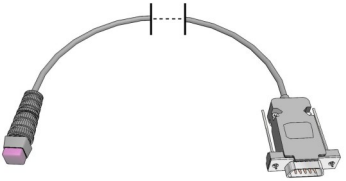
QTY: 4 per TR700 Target

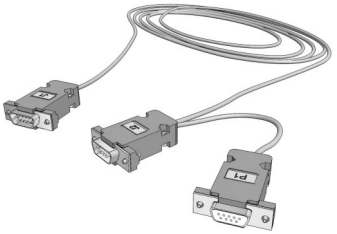
CARRYING CASE - Multi-Target

For storing and transporting 10 targets and accessories.

TR-700 Remote Reset Cable

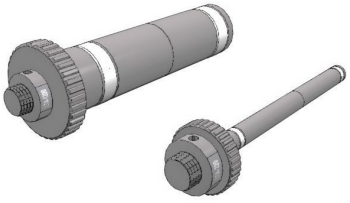
For remotely resetting and re-starting the TR700 hit counter





Daisy Chain Cable

For linking targets (works with Remote Reset Cable)



Laser Transmitter Rods

Rod: 10/12 Gauge

Rod: .177 caliber

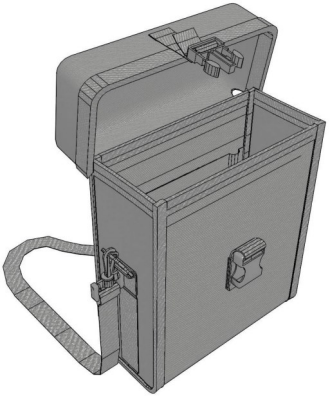
Please call for applications specific Rods

SWITCHING POWER SUPPLY

(For TR700 TARGET)

Reflective Target - Mini 2S

(For zeroing and shooter diagnostics)

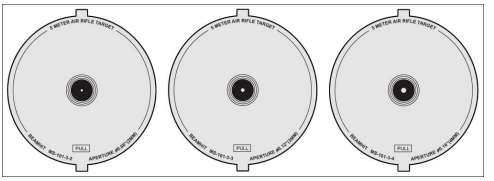


CARRYING CASE WARRIOR (SOFT)

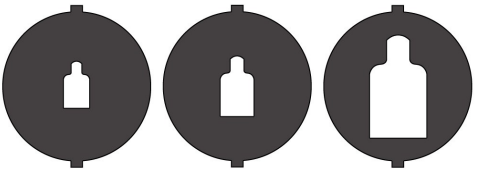
And more.....

Mask Sets

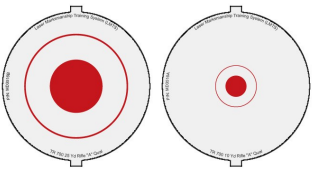
Mask Set: Precise Aiming



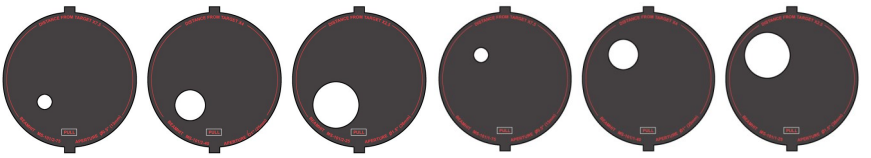
Mask Set: Military



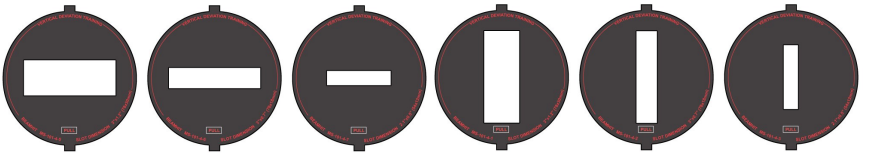
Mask Set: Navy



Mask Set: Off Center Group /Off Center Group(SW)



Mask Set: Horizontal / Vertical Slot



Mask Set: Red Fox

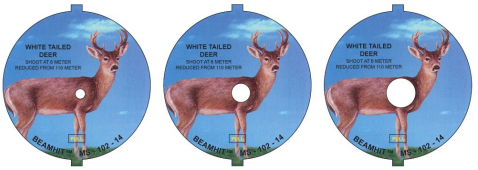
Mask Sets

Mask Set: White Tail Rabbit

Mask Set: Mouflon

Mask Set: Moose

Mask Set: White Tailed Deer

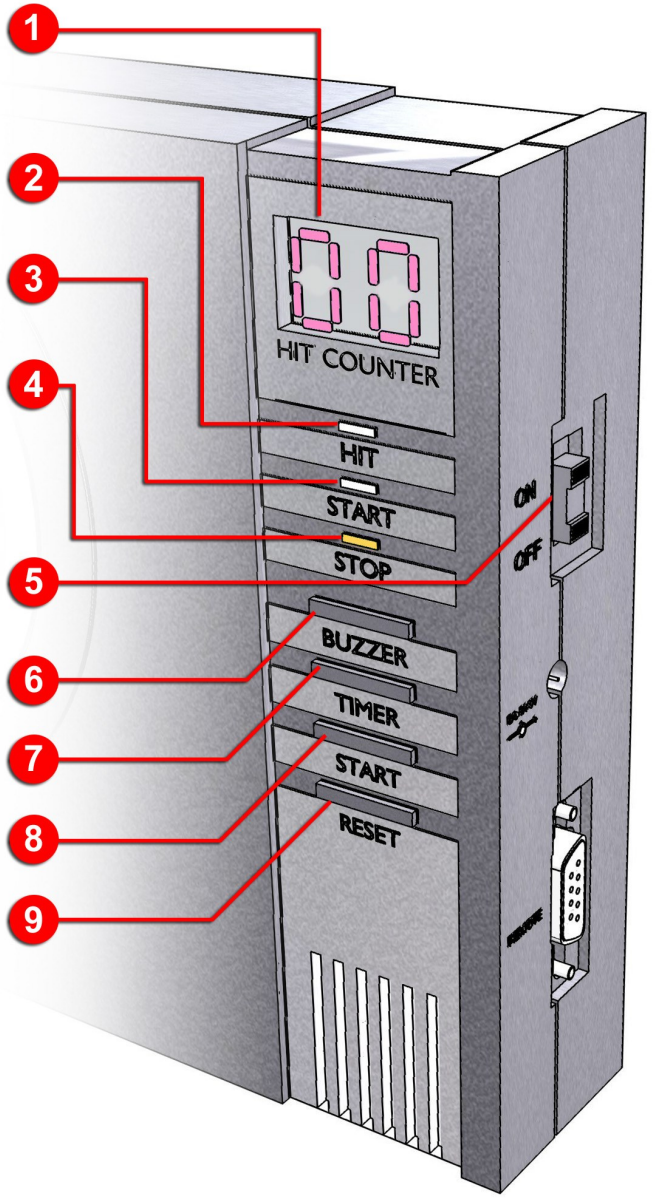


Mask Set: Rock Dove

Mask Set: Ring Necked Pheasant

Mask Set: Clay Pigeon

Location of Controls - Front/Side



Location of Controls - Front/Side

1. DIGITAL HIT COUNTER - Two digits display the number of hits on target during the shooting session. (up to 99 hits)

2. HIT INDICATOR LAMP (YELLOW) - Lights up each time a hit is detected by the electronic target.

3. START INDICATOR LAMP (GREEN) - Lights up when the target is ready for timed mode.

4. STOP INDICATOR LAMP (RED) - Lights up when the preset shooting time has elapsed.

5. POWER ON/OFF SWITCH - Turns the target ON and OFF.

6. BUZZER SWITCH - Turns the HIT sound indication buzzer ON and OFF.

7. TIMER SWITCH - Turns the timer ON and OFF. The timer defines a time period to perform rapid shooting sessions.

8. START SWITCH - Used to start or change the timer.

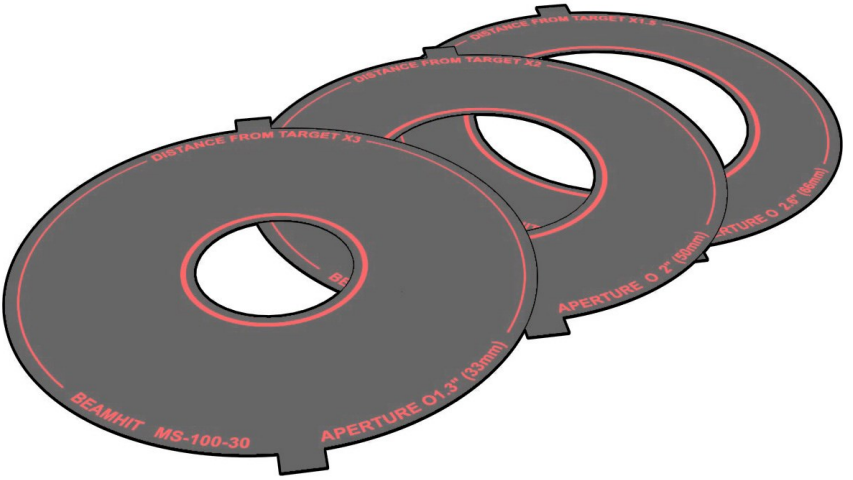
9. RESET SWITCH - Resets HIT COUNTER (1).

NOTE: There is a ¼" - 20 UNC threaded hole on the bottom of the target for attaching the target to a tripod or similar device.

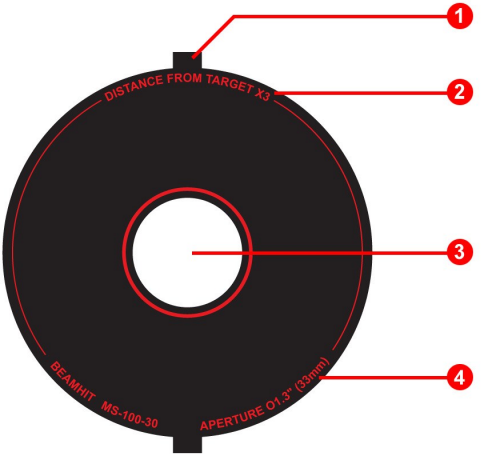
Location of Controls - Back/Side

1. **MANUFACTURER LABEL -** Includes serial number
2. **POWER ON/OFF SWITCH**
3. **AC POWER ADAPTOR CONNECTOR**
4. **BATTERY COVER** - Encloses the battery compartment.
5. **REMOTE CONTROL CONNECTOR**

Mask Set



Your system includes a basic set of masks which are used to increase degree of difficulty and scale for longer engagement distances from the target. Optional mask sets are available for different purposes, such as animals, vertical and horizontal control, etc. (see accessories).



1. MASK TAB - Used to hold the mask on the target.

2. MULTIPLICATION FACTOR

3. MASK APERTURE

4. APERTURE DIAMETER

The target masks serve two functions:

1. Reduced target area to simulate different distances.

Examples:

- The circular mask marked x3 will make the target look as if it was 3 times farther away, therefore a distance of 20 ft. (6 m) between the target and the shooter will make the target look as if it was 60 ft. (18.3 m) away from the shooter.
- The standard military mask set is designed to simulate engagement of a standard E-type silhouette at 300M when the target is engaged at 25M (large), 15M (medium), and 10M (small). Similarly, the medium mask engaged at 25M simulates a 450M engagement and the small mask engaged at 25M simulates a 600M engagement.

2. Reduced target area to improve shot grouping. The shooter will improve basic marksmanship skills by grouping over a smaller target area.

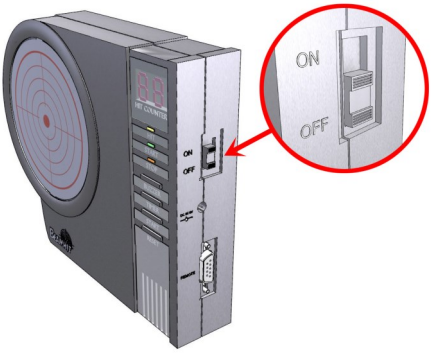
To install the target masks:

1. Insert the bottom tab of the mask into the tab slot at the bottom of the target face.

2. Insert the upper tab into the target's upper slot by gently bending the mask.

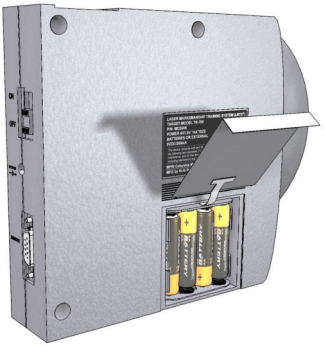
Installing the Batteries

1. Check that the target power button is **OFF**.



2. Open the battery lid and insert four fresh 1.5V alkaline AA batteries according to the polarity (+ and -) as indicated inside battery compartment.

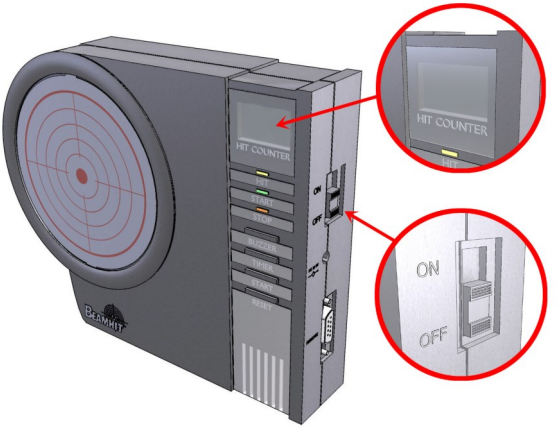
3. Close the lid. Slide the lid up until the tabs fit in their respective slots then push shut.



CAUTION: Do not mix different types of batteries. Do not charge, short circuit, disassemble, or heat. Dispose only in recycling receptacles for used batteries. Change all batteries at the same time Do not leave the batteries in the target when not used for long periods.

Connecting the AC Power Adapter

1. Check that the target power switch is **OFF**.



2. Connect the AC power adaptor to the target and plug into the power outlet. Please refer to accessories for the power adaptor. It is not included with the basic 110 System.

Preparing and Operating the System

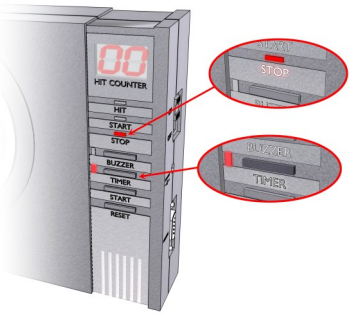
1. Press target power switch to **ON**. Ensure that hit counter shows 00. The system allows you to display up to 99 hits. After 99 hits, additional hits will not be displayed, but the **HIT** indicator lamp and the sound buzzer will still work. Press **RESET** if needed. Pressing the **RESET** button on the target at any stage resets the hit counter to 00 and enables you to start the shooting session over again. Attach the remote cable if used.

NOTE: The hit indicator (yellow lamp) lights up momentarily (150 msec) after each hit.

2. Press BUZZER button **ON** to enable a beep with each hit, or **OFF** to disable as desired.

3. The timer allows you to set a time limit during which the target will detect and count the hits on the target. To disable, press the **TIMER** button until the **STOP** indication lamp is off.

- To enable, press the **TIMER** button until the **STOP** indication lamp is on.

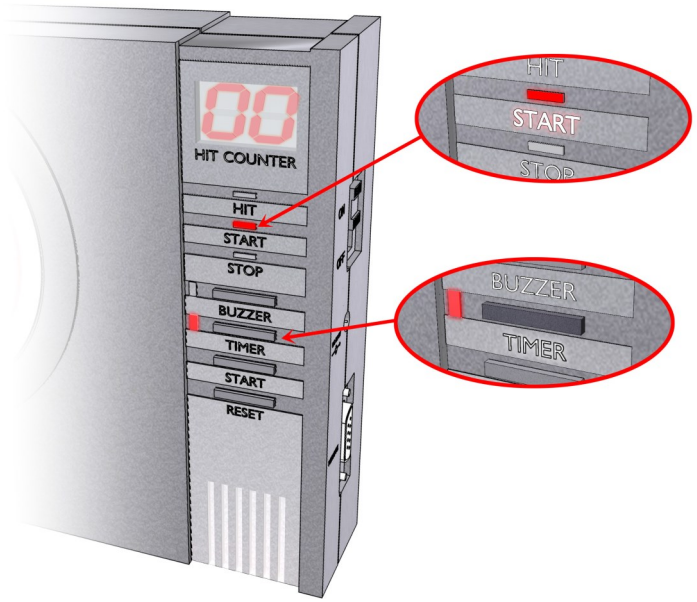


- To set the duration of the shooting session, hold the **START** button for more than 2 seconds to turn the score display into a **TIMER** display.
- Then adjust the time as desired (system default is 35 seconds). The actual time allotted will be displayed for 2 seconds.

- If you continue to hold the **START** button down, the timer will start counting down.
- Releasing the **START** button sets the new time-out period and then changes back to hit display.

NOTE: The last preset allotted time period will be saved in the target's memory until **POWER** button is turned OFF. Turning the target ON automatically resets the 35 second factory default.

- To start, push the **START** button (or remote cable button) for LESS than 2 seconds. You then have 10 seconds until the system starts working. Once the buzzer sounds and the green **START** indicator lamp lights up, the countdown starts.



- After the set time expires, the red **STOP** lamp lights and the buzzer sounds for 2 seconds. Further shots will not be stored. Pressing the **START** button (or remote cable button) again restarts the shooting session.

STANDBY MODE

When the target is not hit for more than 15 minutes, it switches to a standby mode to save energy. To resume operation, simply shoot the laser at the target. The hit counter will count your hits in the normal manner (added to the previous hits before the system entered the standby mode).

SAFETY PRECAUTIONS

Your system includes a Laser Transmitter compliant with FDA Safety Standards for Laser Products under 21 CFR chapter 1, subchapter j.

Before using this system, please read these operating instructions carefully. Follow all safety precautions and warnings.

Never use the Laser Marksmanship Training System (LMTS) with live ammunition!

Clear your firearm before using the LMTS. Always store ammunition separately.

Never look directly at the laser beam.

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

Laser Controls

1- Battery Access

2- Mode Selection Toggle Switch

3- Mode Display LED

4- Zeroing Adjustment (2 axis, 4 screws—UP/DOWN/LEFT/RIGHT)

5- Laser Output

6- Label

7– Transmitter Rod Attachment

Appendix A - LS101 Laser Transmitter

Basic Functional Description

- Compatible with all BEAMHIT LMTS targets.
- External Laser with zeroing adjustment - Emits visible Red Laser for zeroing the laser to the firearm sights easier.
- Adaptable to most common pistols and rifles with proper Laser Transmitter Rods included with the system.
- The LS101 laser is activated by sensing the vibration caused by the trigger fall of the firearm. The laser will emit a pulse at each subsequent pull of the trigger allowing a real-time simulation of a bullet being fired.
- The LS101 Laser is for indoor training or limited outdoor training.

NOTE: Minimal use of the "**zero**" or constant on mode will maximize battery life.

Mode of Operations

The mode of operation of the LS101 laser can be selected by using the mode selection toggle switch. The laser toggles between modes; OFF -> Train -> Zero -> Back to OFF and so on.

OFF: Mode selection display LED is OFF. No laser output. This is not a storage mode. it is recommended to take the batteries out before storage.

Train: Mode selection display LED is Red (may not be easily visible under high environment light, such as outdoors). The LS101 emits a single laser pulse per vibration generated by the firearm trigger fall. This is the training mode.

Zero: Mode selection display LED is Green (may not be easily visible under high environment light). The LS101 emits constant laser output for zeroing the laser to the firearm sights using zeroing adjustment screws.

Do not look directly into the laser light or aim at anyone in the zeroing mode.

Preparing the Laser for Use

1. Three (3) type LR-44 or equivalent batteries are used to power the LS101.

BATTERY PRECAUTIONS

- *Batteries must be inserted with correct polarity.*
- *Do not mix different types of batteries.*
- *Do not charge, short circuit, disassemble, heat or dispose of batteries in fire.*
- *Always replace all three batteries at the same time.*
- *Always remove batteries prior to storage to eliminate the possibility of corrosion due to damage from leaking batteries.*

2. Remove the battery cap by turning it Counter clockwise.

3. Check the battery springs on the cap and inside the laser for possible deformation from previous usage.

4. Insert the batteries (3) with the correct polarity as it is shown (negative goes in, positive on the cap).

5. Close the battery cap by turning it clockwise. The cap should turn smoothly. Hand tighten, ensuring not to cross-thread. Do not use a tool to tighten the battery cap.

6. Function test the Laser

- Toggle the mode selection switch and ensure the laser transmitter emits a constant beam when in the **Zero** mode.
- Toggle the mode selection switch to the **Train** mode and gently tap on the back of the laser. Ensure the laser emits a pulse when tapped.
- If you have any functional problems, try replacing the batteries and check for any deformation on internal battery springs. Visit our website www.beamhit.net for further assistance.

7. Select the proper caliber rod for the firearm you will be attaching the laser.

Note: MCR-ML will be used as an example in this user manual to describe the firearm attachment process.

MCR-SM-L (.22 to .32 Caliber Rifle)

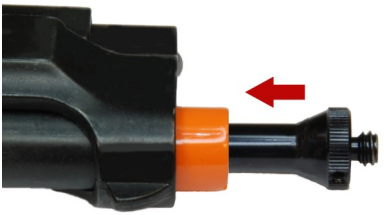
MCR-SM (.22 to .32 Caliber)

MCR-ML (.357 to .45 Caliber)

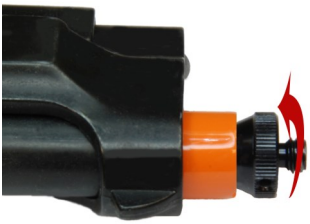
8. Expand the selected multi-caliber rod slightly larger than the firearm barrel diameter by turning the back piece clockwise.

Please use your fingers. Do not try to use tools.

NOTE: BEAMHIT Multi-Caliber rods are designed from soft aluminum and plastic to prevent any damage to the firearm barrel. Do not force, bend or expose the multi-caliber rods to high temperature. This will increase the life of the rod and prevent damage to firearm barrel.

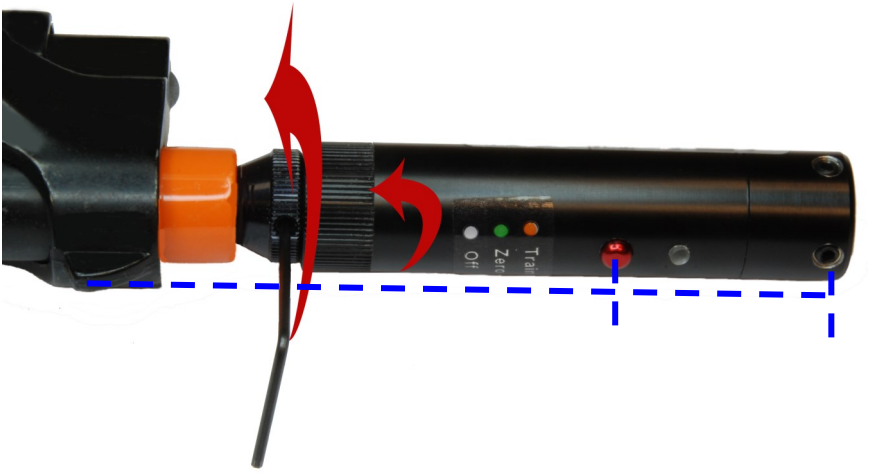


9. Place the rod to the tip of the barrel. While slightly pushing the rod into the barrel turn the rod in counter clockwise direction until the rod starts to move in to the barrel. Then, stop turning the rod but continue pushing.



10. When the rod is completely seated in the barrel, turn the rod in clockwise direction to expand the plastic extension and secure the rod in to the barrel. DO NOT OVER TIGHTEN!

11. Use the Allen wrench included with the system to keep the rod from turning while attaching the laser to the rod by turning in clockwise direction. When the laser is securely attached to the rod, turn the rod in clockwise direction using the Allen wrench until the top of the laser is aligned with the firearm front sight. Do not turn the rod more than 1 turn and overly tighten the rod to the barrel. This will prevent damaging the rod.



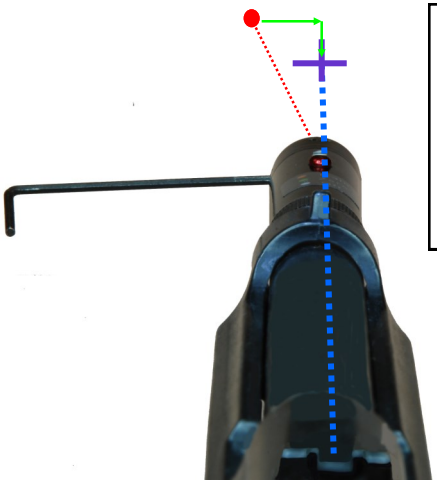
Zeroing the LS101 laser to the firearm sights:

The zeroing process is required for each selected training distance. Because of the parallax, this process must be repeated with an alternate aiming point as the training distance changes.

There are 4 zeroing adjustment screws located at the front of the laser. The adjustment screws are also designed to hold the laser diode locked in place and keep the zero.

To be able to move the laser in any direction, all 4 zeroing adjustment screws need to be loosened using the Allen key included with the system This will allow the internal laser diode to move angularly when any of the 4 adjustment screw is tightened. Be careful not to loosen the set screws excessively to avoid loss should they come out.

NOTE: The above example will be used to describe the zeroing process (The laser is pointing to the left and higher than the aiming point).



NOTE: After initial zeroing, minimal changes, if any will be need for future training sessions.

The goal is to move the laser spot to the aiming point. The picture on the left shows the properly zeroed laser to the sight picture or the aiming point.

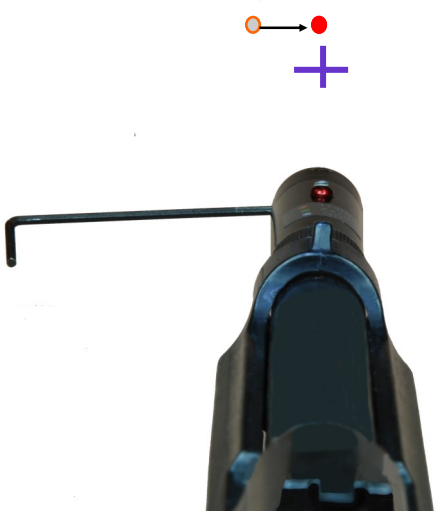
1. Identify your training distance. Set the laser mode to Zeroing then aim the laser to the selected target at training distance (white background is preferable to be able to see the laser spot comfortably).

2. Look through firearm sights and identify which direction you need to move the laser spot. For our example we are assuming it needs to move right and down.

3. Loosen all 4 zeroing adjustment screws by turning them CCW direction for complete one turn.

4. While loosening the right adjustment screw, tighten the left screw until the laser spot roughly zeroed for the horizontal axis.

NOTE: During zeroing process the laser can turn off if the screws are loosened more than needed. Tighten the screw back, turn on the laser and continue.



5. Make sure that left and right screws are not very tight and the laser diode is free to move up and down.

6. While loosening the bottom adjustment screw, tighten the top adjustment screw until the laser spot is roughly zeroed for the vertical axis.

7. Fine adjustment: By loosening and tightening all four adjustment screws finalize the zeroing process. All four screws should be tight, locking the laser diode in place at the end of this process. Do not over tighten, instead firmly seat the locking screws.

8. Confirm your sight picture.

9. Set the laser to Training mode and confirm that the laser is generating a single laser pulse for every trigger pull.

The firearm is ready for Training !

LMTS products are manufactured to provide years of dependable use. If for some reason the product needs to be repaired and is still under warranty, please contact AFG Training Technology, LLC at www.beamhit.net for a return authorization (RMA) number. Remove the batteries and return the product securely packaged. In the event the product is not covered by warranty, you will be notified as to the nature and cost of the necessary repair.

For technical support

www.beamhit.net

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