

Operation Manual



Warning

- Remove battery pack prior to recharging. Do not use the adapter as an external source for the techstrobe.
- DT-900 handheld stroboscope operates at HIGH VOLTAGE inside the lamp and the electronic compartment. Please disconnect battery prior to lamp replacement.
- Eye damage may result in improper use of the lamp, please use best judgement in using this equipment.
- Damage due to the use of other AC adapter beside the one provided will void the warranty.
- Do not store instrument on the following places
 - Explosive or combustible areas
 - Near water, oil, dust and chemicals.
 - Areas where temperature is above 104°F (40°C)
- Bulb is hot after use; let cool prior to attempting to replace bulb.



The TechStrobe from Shimpo Instruments is the perfect tool for slow motion or stop action stroboscopic inspection. The Shimpo TechStrobe is the only palm size unit to include a phase shift feature. Phase shifting allows the TechStrobe operator to advance or retard the flash timing by degrees of angle, without changing the actual flash rate (FPM) of the TechStrobe. Employing its unique phase shifting feature, the TechStrobe “freezes” rotating or reciprocating machinery for visual inspection of covered gear teeth, shafts, oil/fuel/ink injector patterns, and print media; all without stopping production. The TechStrobe is completely portable and operates up to 2.5 hours at 1600 FPM from its detachable, rechargeable battery. The ergonomically designed battery serves as the padded grip area. The battery is quickly detached and recharged while another battery is snapped into place. Designed for right or left hand operation, all TechStrobe functions are intuitive and easy to use. Quality and maintenance professionals will appreciate the rotary and push button controls for internal flash (FPM/RPM) control, external triggering, tachometer mode and phase shift control. The push buttons rapidly increase (x 2), or decrease ($\div 2$) the flashes per minute (FPM) and change by degrees the flash phase. Compact, impact resistant and rugged, with that balanced feeling for one-handed operation, the TechStrobe will quickly become one of the quality and maintenance professionals’ favorite tools.

SPECIFICATIONS

Flash Rate Range: 40-12,500 Flashes Per Minute (fpm)

Accuracy: Flash Rate: +/- 0.5 fpm or +/- 0.01% of reading, whichever is greater; Tachometer: +/- 0.5 rpm or +/- 0.01% of reading, whichever is greater

Display Resolution: 0.1 fpm for 100 to 9,999 fpm, 1 fpm for 10,000 to 12,500 fpm

Tachometer Range: 40 - 59,000 rpm

Flash Tube: Xenon, 10W, user replaceable; Life: 100 Million Flashes

Flash Duration: 9-15 usec

Light Power: 154 mJoules per flash

Battery: NiMH, rechargeable, removable; Capacity: 2.6 AmpHr; Charge Time: 2-4 hours, using supplied AC adapter

Run Time Per Charge: 2.5 hours at 1600 fpm, 1.25 hours at 3200 fpm

Battery Charger AC Input: 115 VAC, 50/60 Hz / Universal charger optional

Display: 8 character by 2 line LCD, alphanumeric

Timebase: Crystal oscillator, 100 ppm accuracy

Controls: Power, multiply by 2, divide by 2, phase shift, external trigger

External Trigger Input: 0-5V TTL type via stereo phono jack

External Trigger to Flash Delay: 5 usec maximum

Clock Output: 0-5V TTL type signal via stereo phono jack

Housing: Impact & oil resistant polycarbonate

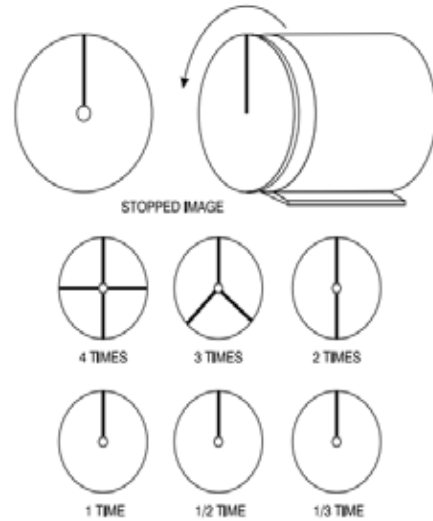
Product Weight: 1.44 lbs (0.65 kg)

Package Weight: 3.4 lbs (1.54 kg)

Dimensions: 9.63" (244 mm) x 3.25" (82.6 mm) x 3.25" (82.6 mm)

Included Accessories: Rechargeable battery (BAT-900), additional flashtube (FT-900), 120 VAC charging adapter (CH-900)

DESCRIPTION OF PARTS



OPERATION

Mounting

To mount the strobe on a tripod (or any other mounting surface), use screw $\frac{1}{4}$ -20 UNC, length 0.3" (8 mm) or shorter for the tripod screw hole on the bottom.



To measure true revolutions per minute (RPM):

1. "Mark" the object to be measured by either visually noting an inherent distinguishing characteristic (such as a label, scratch, etc.) or physically marking the object with a small piece of tape, pencil mark, etc.
2. Turn power switch on.
3. Adjust flash rate from highest Flash per minute (FPM) downward.
4. The true RPM can be noted once the action appears frozen and the first single image of the "mark" appears (see diagram below for further explanation).
5. To verify RPM reading, press " $\div 2$ ". A single image should appear again.

Internal Triggering Mode

To use the DT-900 stroboscope in internal triggering mode:

1. Turn power switch on.
2. Press "MODE" button and the power indicator will light up, the tachometer is default to internal mode. Unless there are sensors connected to the external signal connector, the display will show "EXT.Mode No Signal". Press mode again to select "TachMode", then press mode again for "Internal mode".
3. Aim light beam at object under observation. The optimal distance between the strobe and moving object is approximately 2 feet.
4. Measure RPM by turning the dial to adjust the flashing rate to the rotational speed of the object.

NOTE: To achieve a particular RPM or FPM quickly, use the "x2" or " $\div 2$ " switches and then the dial for fine-tuning.

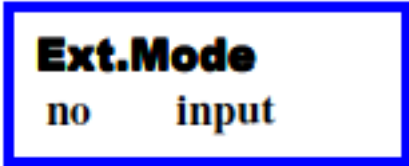
External Triggering Mode

To use the DT-900 stroboscope in external triggering mode:

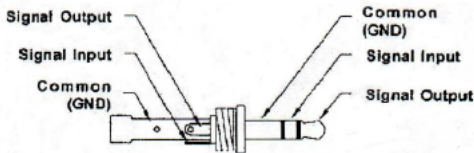
1. Firmly plug in external sensor. This unit accepts TTL Logic, high of +5V and low of 0V.
2. Turn power switch on.
3. Press "MODE" button to select External Mode option. Power indicator will light up and automatically detect the presence of an external source of signal, otherwise the indicator will lit up to red to indicate absence of external source of signal

FPM Flash indicator will flash in correspondence with input signal. The input signal will be displayed as FPM (Flash per Minute). Check Appendix for Additional Information

External Mode, automatically look for an external source of signal. If source is found, LED power indicator will light up green otherwise it will be red, and the message “no input” appears. Maximum 12,500 FPM, Minimum 15 FPM. If max value is exceeded the strobe will stop flashing but the clock source frequency will continue to be displayed.



Phono Style Connector Information



The phono connector is 3.5mm in diameter size. Stereotype tip, it is the signal output from the strobe and ring is the signal input to the strobe (Check Diagram Above). Electrically the signals are TTL logic levels, 0-5 V swing, high impedance.

Phono Connector	Description DT-900
Size	3.5mm
Type	Stereo
Signal Input	Tip
Signal Output	Ring
Ground	Lower end of the Jack

Adjusting Flash Rate

1. After powering on the strobe, you can adjust the flash rate in 2 ways:
 - Use the central dial to spin to the desired rate.
 - Use the “x2” and “÷2” buttons to increase or decrease the rate.
2. Turn the dial counter clockwise to decrease the flash rate. Turn the dial clockwise to increase the flash rate. Flash step is 0.5 flash per turn of the knob.
3. The faster you turn the dial, the faster the rate will change.
4. Press the “x2” button to double the current flash rate. For example, if the strobe is set to 1000 FPM, pressing the “x2” button will change the rate to 2000 FPM.
5. Press the “÷2” button to reduce the flash rate in half. For example, if the strobe is set at 5000 FPM, pressing the “÷2” button will change the rate to 2500 FPM.
6. If the “x2” or “÷2” buttons are pressed and the calculated rate is beyond the range of 40-12,500 FPM, the flash rate will be set to the limit of the strobe. For example, if the strobe is set to 8000 FPM, pressing the x2 button will change the rate to 12,500 FPM.

NOTE: The DT900 is only limited to the following FPM
 Max Flash: 12,500 FPM
 Min Flash: 40 FPM (Internal Triggering Mode)
 Min Flash: 15 FPM (External Triggering Mode)

Phase Shift Function

The Phase Shift function button is used to read the angular delay or advancement in degrees between the trigger signal and the actual speed of the moving object.

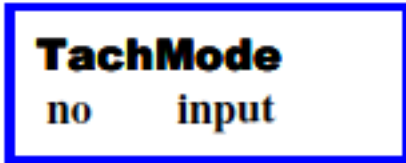
Phase shifting is used to examine the entire circumference of a gear or reciprocating machine while in operation. This important handy feature that allows the operator to examine the object in motion, providing a “real time” view for predictive and preventive maintenance. The operator can rotate the view by changing the phase of the strobe flash.

1. Lock onto the desired speed by adjusting the strobe flash rate until the object appears stationary.
2. Enter the “Phase Mode” by pressing the Phase button. The display will show “Phase: 0 deg”.
3. Rotate the knob counter clockwise to decrease the phase angle. Turn the knob clockwise to increase the phase angle. Angle is change by 5 degrees by each step on the dial. Alternatively, you can spin the phase angle using the “x2” and “÷2” buttons. Hold down the “x2” button to spin positively through the phase angles. Hold down the “÷2” button to spin negatively through the phase angles. Releasing the button will stop and hold the last phase angle.
4. Press “Phase button” again to exit the Phase Shift Mode and return to normal operation.

Tachometer Mode

In Tachometer Mode the strobe will not flash but can be used like a Shimpo handheld tachometer. The DT-900 Techstrobe will display the frequency of the signal source connected to it.

1. To use the tachometer mode, power the strobe "On" and press the "Mode button" until "TachMode" is displayed.
2. Connect a signal source to the external signal connector (See please refer to the description of parts page) using a stereo type phono connector. Review phono connector signal description (See Phono style connector information under External triggering section).
3. If no valid signal source is detected, the strobe will display "TachMode – no input" and the LED will be red.
4. If a valid signal source is detected, the DT-900 Techstrobe LCD will display the signal rate and the LED will be green.
5. For tachometer mode, the maximum signal rate is 59,000 FPM and the minimum signal rate is 40 FPM.
6. To exit tachometer mode and return to normal strobe operation, disconnect the signal source and press the "Mode button" once.

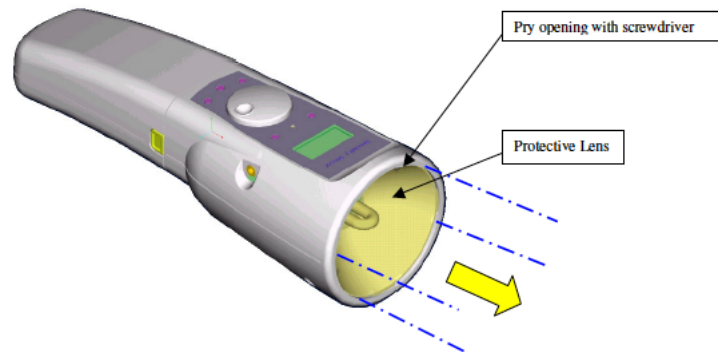


Tachometer Mode, automatically look for an external source of signal. If source is found, LED power indicator will light up green otherwise it will be red, and the message "no input" appears. Maximum 59,000 FPM, and the minimum is 40 FPM.

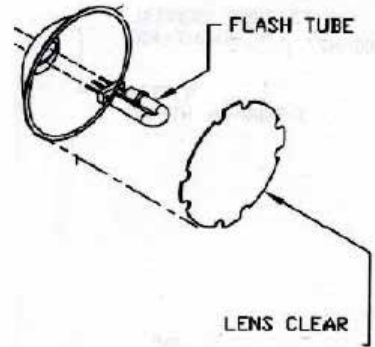
Flashtube Replacement

When FPM reading is displayed but unit is not flashing, flash tube may need to be replaced:

WARNING: The surface of the DT-900 TechStrobe lens especially the bulb can get hot during continued use. Caution should be taken to allow sufficient cooling time before attempting to replace the bulb.



1. Remove the front lens from the strobe by inserting the tip of a pen, screwdriver or similar device into one of the vent holes. Gently pry the lens out (Be careful not to damage the edge of the lens.). Pry each side out, one by one until the lens can be removed.



2. NOTE: The reflector does not need to be removed to replace the bulb. It should remain in place.
3. Protect the bulb from any oil or residue by using a piece of cloth between your fingers and the bulb. Grasp and pull the bulb to remove it
4. Handle the new bulb with a piece of cloth. Insert the new bulb in the connector by pressing it in place. Be sure to orient the red dot on the bulb connector with the red dot on the strobe connector. If the bulb is inserted backwards, it will fail to operate as specified.
5. Ensure the bulb is centered in the reflector.
6. Re-install the protective lens. Line up the four tabs of the lens with the four slots of the strobe. Insert one tab in place, and then press the lens back into the strobe so that the remaining tabs snap into place.

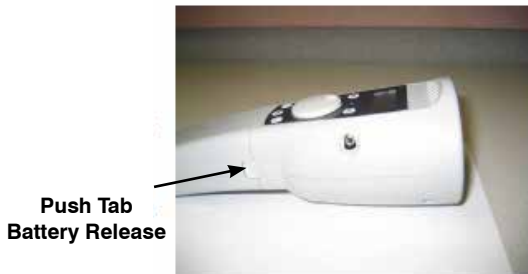
Charging the Battery

If the battery is low, the stroboscope will not turn on completely and the display will eventually disappear. It is recommended to recharge the battery once the message "LOW BATT flash on screen.

Charge battery as follows:

1. Turn power off.

2. Push the two tabs on the sides of the DT-900 Techstrobe to release the battery. Always remove the battery from the DT-900 Techstrobe before charging.

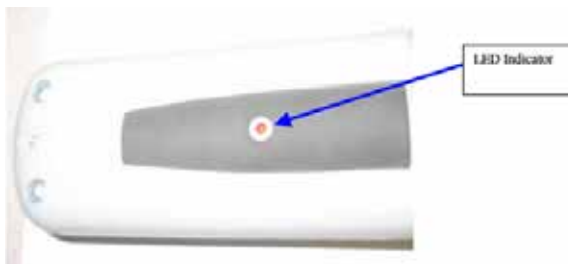


3. Insert AC adapter/charger plug into the strobe receptacle (CAUTION: Charge the unit only with the Shimpo provided AC adapter/charger).



4. The LED indicator on the handle will light up, indicating the battery is charging. Normal charging time is within 2 to 4 hours. It is strongly recommended charging the battery fully before using. Red LED light will turn off after the battery is fully charge.

5. NOTE: The adapter/charger may NOT be used as a power supply to power the strobe continuously.



If the LED is flashing when the charger is plugged into the battery, it means that the battery has been discharged below its safe charging level. The charger will attempt to recover the battery by trickle charging. If it is successful, the charger will continue with the regular charge time, otherwise it will continue flashing. If this happens you may need to replace your battery pack.

Troubleshooting

FPM reading is displayed but unit is not flashing:

- Flash tube may need to be replaced (See Flash tube replacement section)

Stroboscope is in external trigger mode, with no flash:

- Check flash tube
- Check Sensor
- Check wire continuity
- Check phono connector wiring (see phono connector section), possible loose connection

Stroboscope is in internal trigger mode, no flash:

- Check flash tube
- Check battery and recharge if needed.

Stroboscope will not turn on completely

- Check Battery, it may need to be charged.
- The DT-900 Techstrobe may have reached Max Flash Rate, triggering auto shutoff feature. The DT-900 Techstrobe will shutoff after 60 seconds if no buttons are pressed, or the dial knob is not turned. If the Max Flash rate is reached, allow a couple of minutes to make adjustments.
- Allow the unit to cool down if unit turns off due to high flash rate and continuous operation.

Red LED flashing from Battery while charging

- Continue charging, the battery has been drained below its safe charging level
- Observe the LED indicator, it should stop flashing after a couple of minutes if flashing does not stop charger can not recover battery by trickle charging. A replacement is needed.

IMPORTANT: Remove battery pack prior to charging.

IF AFTER PERFORMING THE PROCEDURES ABOVE AND THE DT-900 TECHSTROBE IS STILL NOT WORKING, CONTACT YOUR DEALER FOR SERVICE INFORMATION.

Low Battery Indicator

When display shows "LOW BATT" unit needs recharging. Although the stroboscope will continue to flash it is recommended that you charge the battery when this message appears. Approximately 2.5 hours of continuous usage per charge.

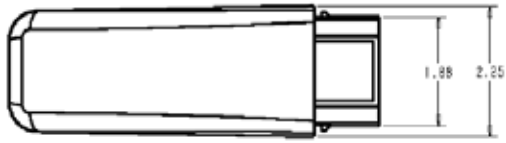
DIMENSIONS

Battery Pack

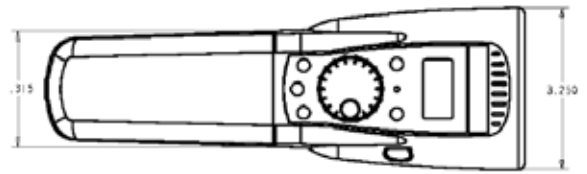
Dimensions are in Inches, unless otherwise specified

DT-900 Dimensions with Battery Pack

Dimensions are in Inches, unless otherwise specified



SCALE 1.00



SCALE 1.000

