



## MONARCH INSTRUMENT

*Instruction Manual*



(Nova-Strobe bbx  
shown / montré /  
mostrado)



**Nova-Strobe bax  
and / et / y**

**Nova-Strobe bbx**

Portable Stroboscopes  
Stroboscopes portables  
Estroboscopios Portátiles

## 8.0 OPTIONS AND ACCESSORIES

<b>CC-7</b>	Latching carrying case for Strobe with provision for accessories
<b>L-1903</b>	Digital Stroboscope replacement lamp
<b>PSC-2U</b>	Universal Recharger, 115/230 Vac with USA, U.K., AUS, Euro Adapter Plugs for battery operated Nova-Strobes
<b>SPC-1</b>	Splash proof Protective Cover for Battery Powered Strobe ONLY
<b>CAL-N.I.S.T.</b>	N.I.S.T. Traceable Certificate of Calibration

## 7.0 SPECIFICATIONS

### Internal Mode:

<b>Flash Range</b>	30 - 10,000 FPM (Flashes Per Minute)
<b>Flash Rate Accuracy</b>	±1 FPM
<b>Flash Rate Resolution</b>	1 FPM
<b>Display Update Rate</b>	Instantaneous
<b>Time Base</b>	Ultra Stable Crystal Oscillator
<b>Display</b>	LCD display with 6 numeric 0.506 inch [12.85 mm] high digits and 5 alphanumeric 0.282 inch [7.17 mm] high digits
<b>Indicators</b>	Battery level
<b>Knob Adjustment</b>	Digital Rotary switch with 36 detents per revolution; velocity sensitive
<b>Memory</b>	Last setting before power down is remembered and restored on next power up
<b>Flash Duration</b>	10-25 microseconds (auto adjust with flash rate)
<b>Flash Tube (Lamp) Life</b>	100 million flashes

This product is designed to be safe for indoor use under the following conditions (per IEC61010-1).

**Operating Temperature** 32-104 °F [0-40 °C] (May be operated for short time periods, slightly beyond stated temperature range)


**NOTE:** Safety thermal feature will set unit into TACH Mode (stops flashing) in the event of internal overheating. Unit must then be power cycled.

**Humidity** Maximum relative humidity 80% for temperature up to 88 °F [31 °C] decreasing linearly to 50% relative humidity at 104 °F [40 °C]

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## 6.1 Low Battery Indication

When the batteries are charged, there will be no battery indication. When the batteries are low, the Low Battery icon will blink in the display. The strobe may still be used for a short time.

Low Battery Icon =  Outline blinking (very little time left)

The strobe has a protection feature that prevents the strobe from operating if the battery voltage is too low. **This condition is indicated by no flash and the display shows “LO BAT”.** At this time the batteries must be recharged. Remember to release the trigger switch.

## 6.2 Charging the Batteries

The unit may be recharged at any time. You do not need to wait until the low battery condition is indicated.

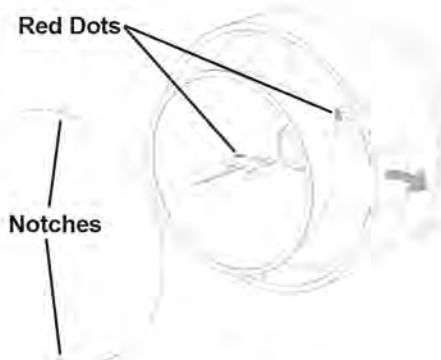
**To charge the battery powered strobe with the recharger:**

1. Release the trigger so the strobe is off.
2. Plug the recharger cable into the recharger socket (located below the display panel behind the handle).
3. Plug the recharger into an AC mains wall outlet (115/230 Vac).

**CAUTION: Use of rechargers other than the one supplied (PSC-2U) will damage the stroboscope and void the warranty.**

When the recharger plug is inserted into the recharger jack, the strobe will go into the Charging Mode. Make sure the trigger switch is not depressed. The strobe will not do anything else when charging (e.g. it will not flash and the buttons have no function).

while pushing it into place (see Figure 4). Make sure the lamp is in straight and centered in the reflector hole.



**Figure 4 Lamp Replacement**








**CAUTION: Do NOT allow the reflector to contact the lamp.**

4. Reinstall the reflector and then position the front lens in place matching up the notches on the lens with the two small tabs on the housing to prevent lens rotation (see Figure 2). Push the tabs on the front rim outward and press the lens into place.

## **5.2 Fuse Replacement**

Under normal operating conditions, the fuse within the stroboscope should never blow. Examples of abnormal operating conditions would be foreign materials entering the strobe, such as water, pulp, ink, etc.

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Stopped Image	1/4 times	1/2 times	1 time	2 times	3 times	4 times
Flash Rate (FPM)	833	1250	2500	5000	7500	10000

**Example: object rotating at 2500 RPM**

If the speed is outside the full scale range of the stroboscope (10,000 FPM), it can be measured using the method of harmonics and multipoint calculation. Start at the highest flash rate and adjust the flash rate down. You will encounter multiple images so be aware of these. Note the flash rate of the first SINGLE image you encounter, call this speed "A". Continue decreasing the flash rate until you encounter a second SINGLE image. Note this speed as "B". Continue decreasing the speed until you reach a third SINGLE image at speed "C".

For a two point calculation the actual speed is given by:

$$RPM = AB/(A-B)$$

For a three point calculation:

$$RPM = 2XY(X+Y)/(X-Y)^2 \text{ where}$$

$$X = (A-B) \text{ and}$$

$$Y = (B-C)$$

In instances when you can shut down the device and install a piece of reflective tape, then an optical tachometer is easier to use for RPM measurement. **Stroboscopes must be used when you can't shut down the device.** The human eye is not easily tricked into seeing a stopped image by a stroboscope when the flash rate is slower than 300 FPM. Therefore, stroboscopes are just about impossible to use below 300 FPM for inspection or to measure RPM.

quickly turn the knob (or use the **x2** or **÷2** buttons) to coarsely change the FPM. Then slowly turn the knob for fine adjustments.

**NOTE:** There are maximum and minimum values in each mode beyond which you cannot adjust. If you are adjusting the rate and you reach a value which on the next increment would exceed the maximum flash rate, the display will not increment. The same is true if you try to adjust the flash rate below the minimum flash rate.

**To multiply or divide the current flash rate by 2:**

In addition to the knob, there are two buttons on the display panel marked **x2** and **÷2**. This enables the user to instantly double or halve the reading on the display to the maximum or minimum values allowed. This feature is useful for checking harmonics in the internal flashing mode.

### **3.1 Power Up Features**

When the strobe is powered up it will remember the last settings.

Press and hold the **x2** button, then turn on the strobe by depressing the trigger switch. This will turn on all the display segments for two seconds or until you release the button. It will then show the software revision, "REV x.x" and then go through a display diagnostic.

Press and hold the **÷2** button, then turn on the strobe by depressing the trigger switch. This will restore the factory programmed presets.



## 1.0 OVERVIEW

All descriptions in this manual apply to both the “basic” battery powered (bbx) and “basic” AC mains powered (bax) digital stroboscopes except where noted.

### 1.1 Display Panel / Definition of Buttons

The display panel consists of a backlit liquid crystal display with six numeric digits on top and five alphanumeric digits on the bottom, which indicate modes, flash rates, etc. (see Figure 1).

Additional information displayed include:

----- Indicates input frequency exceeds the limit of the stroboscope



**(Battery Powered Model Only)** Battery indication, see section 6.0

Below the display are two membrane buttons:



Multiplies flash rate by 2 times  
Hold when powering up to show all segments, then Rev // and display test



Divides flash rate by 2  
Hold when powering up to reset factory defaults



Figure 1 Display Panel



10. This instrument may not be safe for use in certain hazardous environments, and serious personal injury or death could occur as a result of improper use. Please refer to your facility's safety program for proper precautions.
11. The Nova-Strobe bbx contains Nickel Metal Hydride batteries which must be disposed of in accordance with Federal, State, & Local Regulations. Do not incinerate. Batteries should be shipped to a reclamation facility for recovery of the metal and plastic components as the proper method of waste management. Contact distributor for appropriate product return procedures.
12. This instrument is not user serviceable. For technical assistance, contact the sales organization from which you purchased the product or Monarch Instrument directly .



In order to comply with EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE): This product may contain material which could be hazardous to human health and the environment. DO NOT DISPOSE of this product as unsorted municipal waste. This product needs to be RECYCLED in accordance with local regulations, contact your local authorities for more information. This product may be returnable to your distributor for recycling - contact the distributor for details.