



*Instruction Manual*

# Nova-Pro<sup>®</sup> IR 850

## Infrared Stroboscope/Tachometer



PATENTED  
TECHNOLOGY



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## SAFEGUARDS AND PRECAUTIONS



1. Read and follow all instructions in this manual carefully, and retain this manual for future reference.
2. Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.



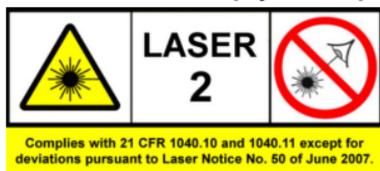
**3. CAUTION: Infrared Radiation emitted from this product. Eye or skin irritation may result from exposure. Use appropriate shielding.**

4. **DO NOT STARE AT THE LIGHT SOURCE.**
5. Certain strobe frequencies can trigger epileptic seizures in those prone to that type of attack.
6. Objects viewed with this product may appear to be stationary when in fact they are moving at high speeds. Always keep a safe distance from moving machinery and do not touch the target.
7. There are no user serviceable parts in this instrument. Refer service to a qualified technician.
8. 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.
9. Do not clean this instrument with alcohol or other cleaning solvents as these may damage the LEDs.
10. Nova-Pro Battery Packs contain Lithium Ion 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 product return procedures.



**In order to comply with EU Directive 2012/19/EU 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.

## LASER MODULE (optional)



### Diode Laser

Max. Output Power: <1 milliwatt  
Wavelength: **650 nanometers (visible light)**  
Beam Divergence: <18 milliradian  
Output: **Continuous (CW)**  
Laser Hazard Classification: **Class 2**

### Laser Hazards:

Eye injury from beam - Do not look into the direct or reflected beam; can cause eye injury up to 25 ft [7.5 m] away.

Visual interference (glare) with pilots and drivers - Interferes with vision up to 525 ft [160 m] away. Can be a distraction up to 1 mile (1.6 km) away. NEVER point any laser towards aircraft or vehicles; it is unsafe and illegal.

### Safe Use Guidance:

Class 2 lasers are considered safe for accidental eye exposure. Do not look or stare into beam. Do not aim at aircraft. *This is not a toy.* Always supervise children.

### Manufacturer:

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Country of Origin: USA  
Contact info: [www.monarchinstrument.com](http://www.monarchinstrument.com)

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Monarch Instrument's Limited Warranty applies.

See [www.monarchinstrument.com](http://www.monarchinstrument.com) for details.

Warranty Registration and Extended Warranty Coverage information is available online at [www.monarchinstrument.com](http://www.monarchinstrument.com).

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This product is protected by United States Patent No. 10,080,268.

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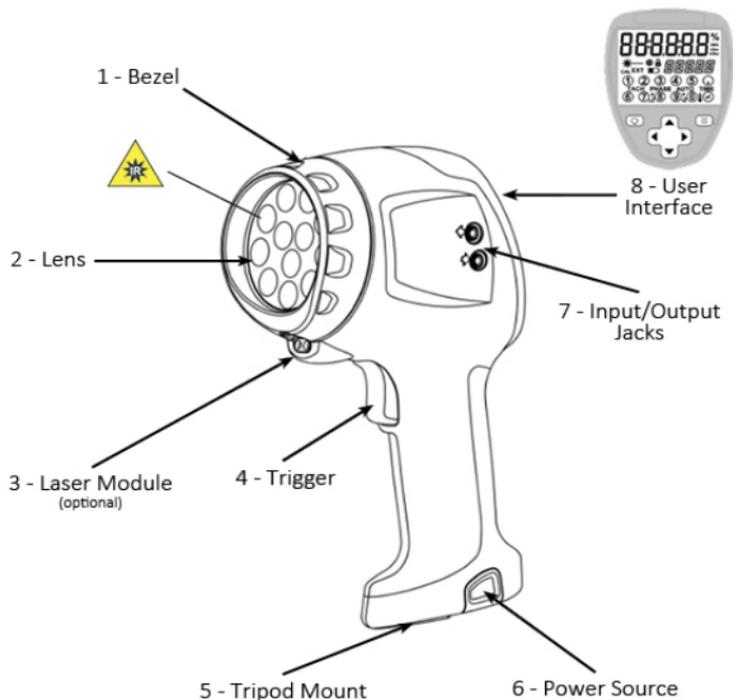
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## 1.0 INTRODUCTION

The Nova-Pro IR 850 is a portable handheld infrared (IR) LED Stroboscope/Lamp use for inspection and to stop motion of moving objects. It emits IR light at 850 nm. This strobe comes standard as battery powered and has delay functions which enable the user to delay the flash by degrees or time and do virtual slow motion inspection of rotating and reciprocating objects. An optional dedicated Laser Module can be used to synchronize the strobe flash to a remote target or be used as a laser tachometer to determine the speed of rotating objects (Tach Mode).

The features of the Nova-Pro IR 850 are highlighted in Figure 1 and Table 1.



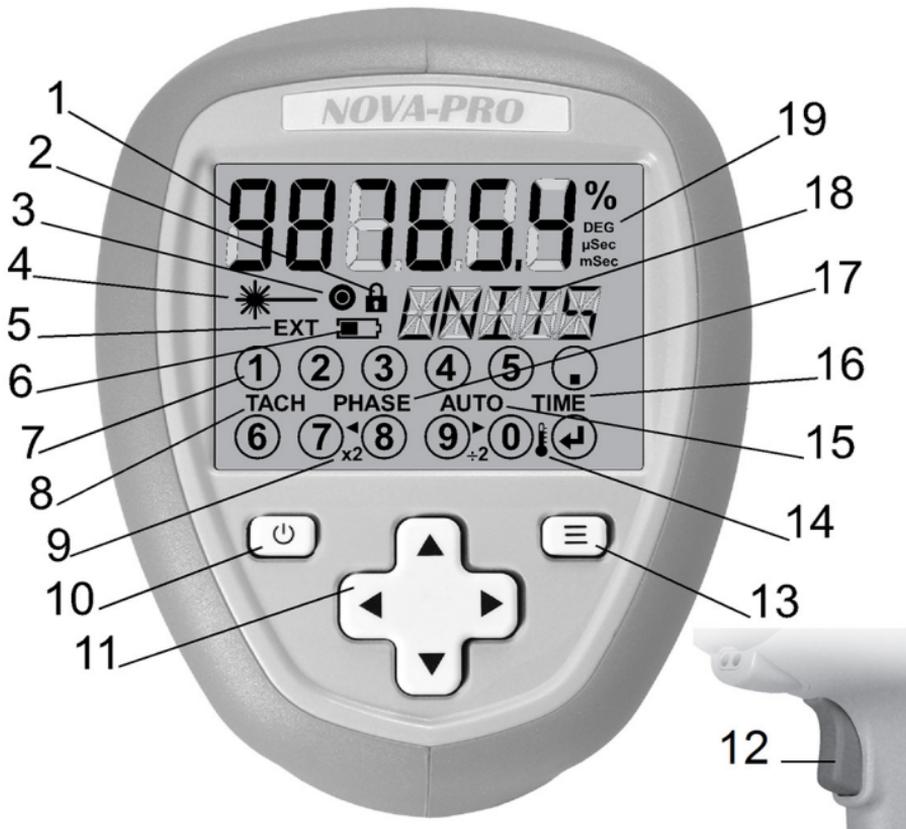
**Figure 1 Nova-Pro IR 850 Features**

## Table 1 Nova-Pro IR 850 Features

1	Bezel	Bezel is removable to add/remove the optional Laser Module; Infrared Radiation emitted from LEDs
2	Lens	
3	Laser Module <i>(optional accessory)</i>	Internal laser used to sync the flash to an external marker on the object under inspection; can also be used in Tachometer Mode (patented technology)
4	Trigger	Used to activate the unit (when power is on)
5	Tripod Mount	1/4-20 tripod mount for hands-free operation
6	Power Source	Removable battery pack — recharged in the external battery charger base or AC Power — plug-in for continuous power
7	Input/Output Jacks	Input jack for external trigger devices Output jack for pulse sync for other strobes or data systems
8	User Interface	<ul style="list-style-type: none"><li>• Dedicated keypad with “joystick” button for adjusting flash rate</li><li>• Backlit LCD (Liquid Crystal Display)</li><li>• Touchscreen keypad for precise flash rate value entry</li></ul>

## 2.0 USER INTERFACE

The Nova-Pro IR 850 user interface consists of a large backlit display with touch keypad, dedicated keys on the user interface panel, and a trigger to activate the unit when the power is on. The user interface is described in Figure 2 and Table 2.



*Figure 2 Nova-Pro IR 850 User Interface*

**Table 2: Nova-Pro IR 850 User Interface**

1	6-digit display used to display flash rate and other numeric values
2	Lock icon — active when the device is locked
3	On-Target indicator — active when the input/laser is locked on to a target; also used to indicate current selection in the menus
4	Laser icon — indicates that the laser is armed (flashing) or on (solid)
5	EXT icon — active when an external source is plugged into the unit
6	Battery icon — active when the battery is low
7	Touch Keypad — numeric; used to directly enter precise flash rates
8	TACH icon — active when Tachometer Mode is selected
9	x2, ÷2 and arrows — used to double or halve the flash rate
10	POWER button — turns the unit on/off; also used as escape/back button in menus and locks the strobe on when pushed with the trigger engaged
11	Joystick — adjusts flash rate and is also used for menu navigation
12	Trigger — used to activate the unit when the power is on
13	MENU button — allows access to the menus and is used to confirm selections
14	Temperature icon — active when the system is overheated
15	AUTO icon — active when unit is in virtual slow motion AUTO VRPM mode
16	TIME icon — active when a TIME DELAY is selected
17	PHASE icon — active when a PHASE DELAY is selected
18	5-digit alphanumeric display used to show units and other statuses
19	Engineering units used in menu for brightness and delay parameters

## 3.0 GETTING STARTED

### 3.1 Power

The Nova-Pro IR 850 comes standard with a removable Battery Pack that should be charged before use (see section [7.0 Battery Pack](#)). The Battery Pack is keyed to ensure correct insertion into the Nova-Pro and Battery Charging Station. **Make sure to remove the tape protecting the battery terminals and charge the battery before use.**



An optional AC Power Adapter is available to allow the Nova-Pro to be plugged in for continuous use. The AC Power Adapter must be plugged into an AC outlet (115 V ac or 230 V ac) using the appropriate connector. Interchangeable plugs allow for operation in most countries (see section [9.0 Wall Power Supplies](#)).



Insert the power source (battery or AC) into the Nova-Pro until the clips lock into place. Turn the unit on by pressing and holding the POWER button until the display illuminates, then release the button. To operate the unit, pull the trigger. The unit will remember the last mode used

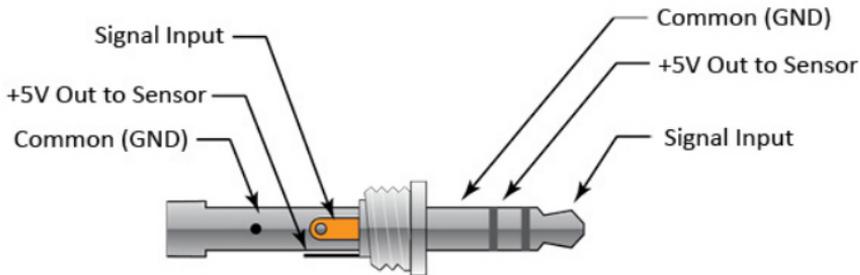
#### 3.1.1 Continuous Operation

The unit can be locked in continuous operation by pressing the POWER button while squeezing the trigger. Keep holding the POWER button as you release the trigger and the  Lock icon will show on the display. To remove the lock simply pull the trigger.

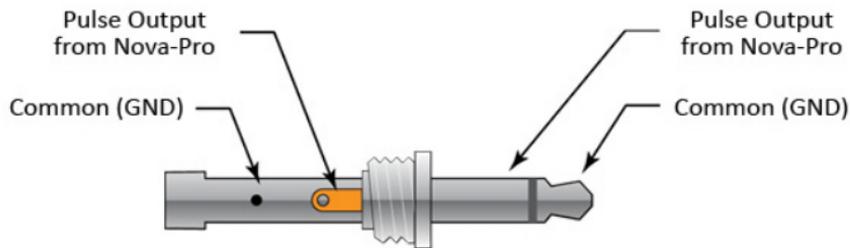
MENU button  POWER button  On-Target Indicator  Joystick Arrows 

## 3.2 Input/Output Connections

The Nova-Pro IR 850 has input and output jacks on the side that can be used for external triggering or synchronization (daisy-chaining two or more strobes). These jacks accept 1/8" [3.5 mm] phone plugs (input-stereo, output-mono). The input jack provides a source of power (5 V dc @ 75 mA) to power an external sensor and will accept a signal from 3 to 12 volts. The output is TTL compatible (3 V) and provides a pulse synchronized to the internal generator (flash rate) or external input signal. Connection details are shown in Figures 3 and 4 below.



**Figure 3 Input Connector Detail (Stereo plug)**



**Figure 4 Output Connector Detail (Mono plug)**

## 4.0 MODES OF OPERATION

The Nova-Pro IR 850 has four modes of operation: **STROBE**, **LAMP**, **LASER** and **TACH** (Tachometer). The mode can be changed in the Mode Menu (see section [5.2 MODE Menu](#)). Each are described in the sections below:

### 4.1 Strobe Mode

In this mode the strobe generates the flash rate from an internal generator set by the user. The strobe will not flash until the trigger is depressed. The strobe will output a pulse from the output jack at the rate of the internal setting whether the trigger is pressed or not. The user can set the flash rate using several methods.

#### 4.1.1 Joystick

Pressing any button on the joystick will cause a digit on the display to start blinking — this is the digit that will be edited. There is a rollover effect when the digit is changed — if incrementing the units digit 99 will roll over to 100. If the user does not increment or decrement a digit within 5 seconds the edit mode will be canceled.



Press ◀ or ▶ to change the digit that blinks



Press ▲ or ▼ to increase or decrease the value of the blinking digit. Hold for auto increment or decrement.



MENU button



POWER button



On-Target Indicator



Joystick Arrows

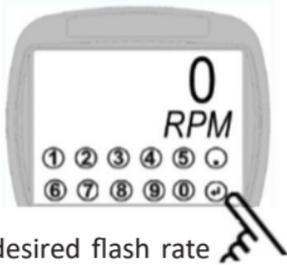


### 4.1.2 Touch Keypad Entry

Press the MENU button to display the numeric keypad. The flash rate will default to 0 and show the units you are entering. Note that this is a capacitive touch sensitive keypad and will not respond if the user is wearing gloves.



Press the MENU button.



Enter the desired flash rate and press the enter key ←.

### 4.1.3 Doubling or Halving the Flash Rate

Press the MENU button twice to display the times 2 (x2) and divide by 2 ( $\div 2$ ) icons. Press the POWER button to exit this mode.



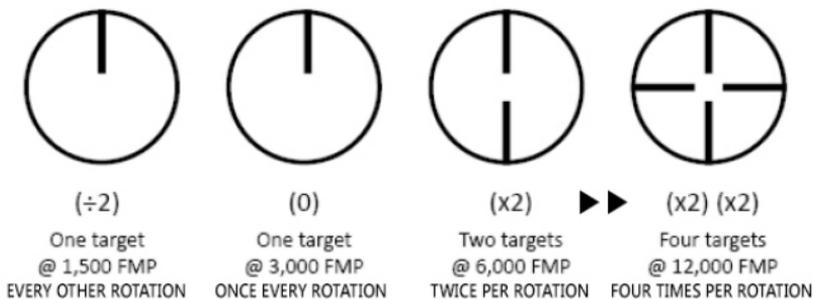
Press the MENU button twice.



Use the joystick or touch icons on display to x2 or  $\div 2$ .

To confirm that the strobe is flashing at the same rate as the target is moving and that the RPM/RPS reading is accurate, use the x2 button until you see a double or multiple image, then use the  $\div 2$  button until you see a single image. This will now be the correct speeds. (See Figure 5 on the next page.)

MENU button  POWER button  On-Target Indicator  Joystick Arrows 



**Figure 5 Object Rotating at 3,000 RPM**

**Note:** If doubling or halving the flash rate causes the strobe to exceed its range, the display flash rate will remain at the current flash value.

#### 4.1.4 External Input

Whenever an external source (sensor, signal generator or another strobe) is plugged into the input jack (➡ pointing towards jack) and the unit is in Strobe Mode, the signal from the external source becomes the source of trigger for the flash. The user cannot make any flash rate adjustments and the display will show the rate of the external input.

**EXT** External icon will show in display when there is an external sensor plugged into the strobe.

Activating the trigger with a valid external input will cause the strobe to flash. If the external input is an optical sensor, activating the trigger will power the sensor. Aim the sensor at the target. Once the strobe has detected the target via the sensor on the rotating or reciprocating machine, the strobe will flash each time a signal is received allowing the user to virtually “stop motion”. The speed read by the external sensor will be displayed in the selected units. The strobe can be configured to trigger on the positive or negative edge of the incoming pulse (MENU-MISC).

MENU button  POWER button  On-Target Indicator  Joystick Arrows 

- On-Target icon will show in display when a valid external signal is detected.

*Monarch offers various types of external sensors that are compatible with the Nova-Pro including optical, laser, magnetic, and inductive. (Shown: ROS-P)*



**Figure 6 Strobe with External Sensor**

## 4.2 Lamp Mode

For full time activation of the Infrared light source, the Nova-Pro IR 850 has a Lamp Mode that creates a bright, constant light for inspection. Be aware that this mode uses considerably more battery power and that you should never look directly into the light source. The Nova-Pro IR has a temperature monitor for the LED lights, and will dim the lights if they become overheated during extended use. A thermometer will appear on the display when this happens, and the Nova-Pro may go into shut-down mode if the LEDs get too hot.



## 4.4 Tachometer (TACH) Mode

The TACH (Tachometer) Mode requires the Laser Module to be installed OR an external input (sensor) be plugged in. This mode uses the Laser or External signal to measure rotational speed.

**TACH** Tachometer icon will show in display when the Nova-Pro is in TACH Mode.

**Note:** Unit will NOT FLASH in Tachometer Mode.



Laser icon will blink when Laser Mode is enabled and be on solid when trigger is pulled and laser is on.

**EXT** External icon will show in display when there is an external sensor plugged into the Nova-Pro.

Pull the trigger and aim the laser (or external sensor) at a reflective target. The speed will be displayed in the selected units.



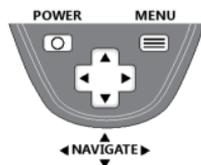
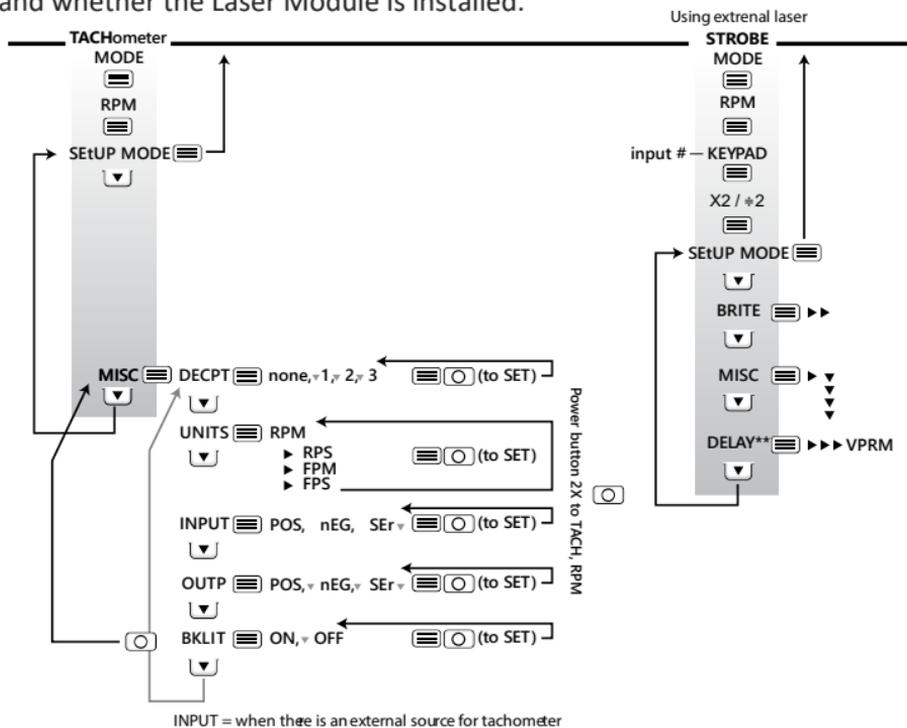
On-Target icon will show in display when target is detected.

The TACH can be configured to trigger on the positive or negative edge of the incoming pulse from the external input (MENU-MISC).

**Note:** Refer to Figure 7 - Using the Laser Module and the associated warnings.

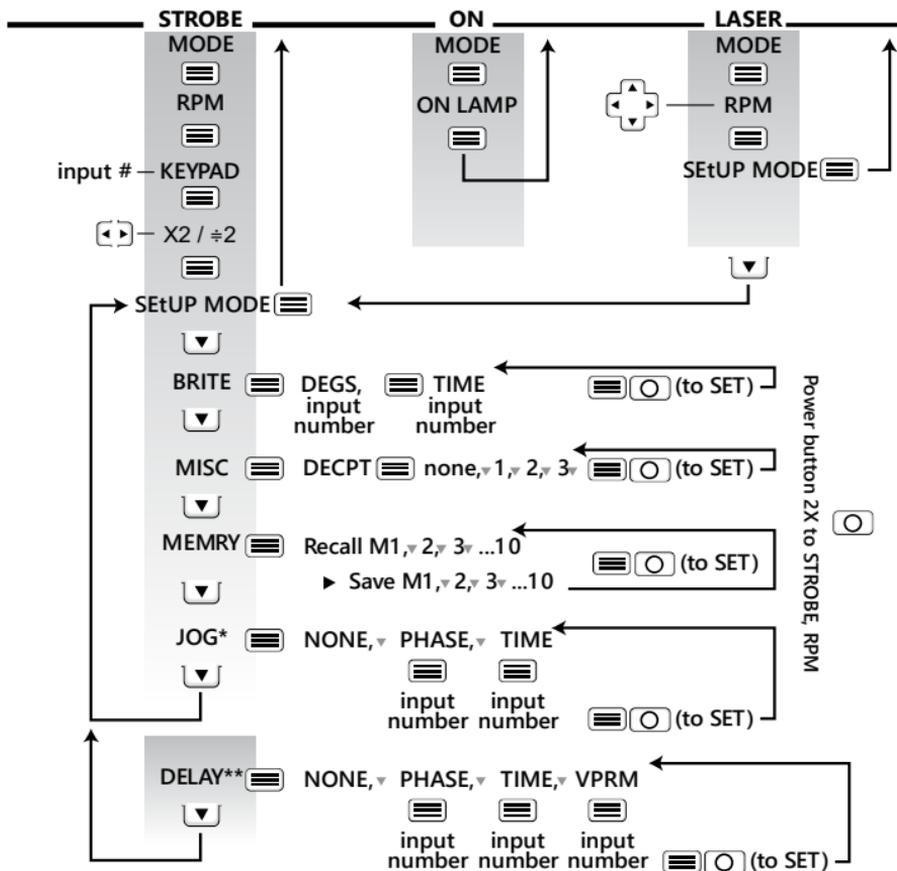
## 5.0 MENUS

The menu that displays is dependent on the unit's current operating mode and whether the Laser Module is installed.



- UP ARROW (▲) will be reverse direction through menu
- MENU button at any menu item will enter that item submenu
- POWER button will exit the current menu item

MENU button  POWER button  On-Target Indicator  Joystick Arrows 



MENU button  POWER button  On-Target Indicator  Joystick Arrows 

## 5.1 MENU Overview

To enter the menus, press the MENU button once or three times depending on the current mode (see overview) until the word SETUP appears on the top line of the display. To select the current item shown on the lower line press the MENU button again. Not all items will be available in the menu; it depends on the operating mode.

Once in the Setup menu:

Use the ▲ and ▼ arrows on the joystick to scroll through the different available menu options.

Press the MENU button to enter menu options and make selections.

Press the POWER button to escape or back out of the menus.  
On-Target icon will show which menu option is selected.

The following sections describe the individual submenus.

## 5.2 MODE Menu

MODE choices are: **Strobe**, **On** (Lamp), **tACH** (Tachometer), or **LASer** (if Laser Module installed).

Press the MENU button to enter the MODE menu. The top line will show the mode and the On-Target Indicator will be on for the currently selected mode.

Use the ▲ and ▼ arrows on the joystick to select the desired mode.

Press the MENU button to select the desired mode. This will change the mode and exit the menu.

Press the POWER button to escape without changing the mode.

MENU button



POWER button



On-Target Indicator



Joystick Arrows



## 5.3 Brightness (BRITE) Menu

Refer to section 6 for details on Brightness and Flash Duration before using this feature.

The Brightness (BRITE) menu option sets the flash duration which affects the brightness. Flash duration can be adjusted in degrees of rotation (proportional flash duration — changes with flash rate) or time in milliseconds (msec — fixed flash duration). The flash duration will be set by the last flash duration value adjusted. If you adjusted degrees, the strobe will have a flash duration in degrees proportional to the flash rate. If the adjustment was in time, the strobe will have a fixed duration irrespective of the flash rate.

This is a live adjustment — if the trigger is depressed, the effect of changing the brightness can be seen immediately.

### 5.3.1 Degrees

Press the MENU button to enter the BRITE menu. The current flash duration will be shown in degrees.

Use the arrows on the joystick to adjust the flash duration in degrees (refer to section [4.1.1 Joystick](#)). Degrees can be set from 0.1° to 14°.

Press the MENU button followed by the Power button to save the degree setting.

### 5.3.2 Time

To set the flash duration in time instead of degrees, press the MENU button again (skip the DEG menu).

Use the arrows on the joystick to adjust to the time value. Time can be set from 0.001 mSec to 2.000 mSec.

Press the MENU button followed by the Power button to save the time setting.

## 5.4 Miscellaneous (MISC) Menu

This menu item contains seldom used options. The miscellaneous items are: DECPT (Decimal Point), UNITS, INPUT, OUP (Output) and BKLIT (Backlight).

Press the MENU button to enter the MISC menu.

Use the ▲ and ▼ arrows on the joystick to scroll through the miscellaneous options.

Press the MENU button to select the desired option.

Press the POWER button to exit/escape.

### 5.4.1 Decimal Point (DECPT) Menu

The Decimal Point menu adjusts the resolution of the Flash/Tach rate displayed. Up to three places after the decimal point can be shown. The number of decimal places is limited by the 6-digits available and the unit will auto range to show the maximum number of digits after the decimal point selected by the user. The choices are NONE, 1, 2, 3. A value of 600 will be displayed as 600, 600.0, 600.00, 600.000 depending on the setting.

Press the MENU button to enter the DECPT menu. The current value is shown on the top line with DECPT on the lower line. The On-Target indicator will be on for the currently selected value.

Use the arrows on the joystick to select the desired value.

Press the MENU button followed by the Power button to save the decimal point setting.

To exit without setting the decimal point, press the Power button.

MENU button  POWER button  On-Target Indicator  Joystick Arrows 

### 5.4.2 UNITS Menu

This menu option selects the engineering units used to display the flash rate or speed. The choices are:

**FPM** - Flashes per Minute (not available in TACH Mode)

**FPS** - Flashes per Second (same as Hz, not available in TACH Mode)

**RPM** - Revolutions per Minute

**RPS** - Revolutions per Second (same as Hz)

Press the MENU button to enter the UNITS menu. Unit is shown on the top line with the current engineering unit on the lower line. The On-Target indicator will be on for the currently selected value.

Use the arrows on the joystick to select the desired value.

Press the MENU button followed by the Power button to save the value.

To exit without setting the units, press the Power button.

### 5.4.3 INPUT Menu

This menu sets the pulse polarity of the external signal that will trigger the strobe. The options are nEG for negative edge or POS for positive edge.

Press the MENU button to enter the INPUT menu. The current edge setting is shown on the top line with INPUT on the lower line. The On-Target Indicator will be on for the currently selected value.

Use the arrows on the joystick to select the desired value.

Press the MENU button followed by the Power button to save the value.

To exit without changing the polarity, press the Power button.

MENU button  POWER button  On-Target Indicator  Joystick Arrows 

#### 5.4.4 Output (OUTP) Menu

This menu sets the pulse polarity of the output signal that will trigger a device connected to the output jack. The options are **nEG** for negative pulse or **POS** for positive pulse.

Press the MENU button to enter the OUTP menu. The current edge setting is shown on the top line with OUTP on the lower line. The On-Target Indicator will be on for the currently selected value.

Use the arrows on the joystick to select the desired value.

Press the MENU button followed by the Power button to save the value.

To exit without changing the polarity press the Power button.

#### 5.4.5 Backlight (BKLIT) Menu

This menu option turns the backlight of the display ON or OFF.

Press the MENU button to enter the BKLIT menu.

Use the arrows on the joystick to select the desired value. The backlight will change in real-time.

Press the MENU button followed by the Power button to save the value.

To exit without changing press the Power button.

### 5.5 Memory (MEMRY) MENU

The Memory (MEMRY) menu is used to store (save) or recall up to 10 different strobe settings. The settings that are saved and recalled are the flash rate and the brightness. All other settings on the unit remain the same.

MENU button  POWER button  On-Target Indicator  Joystick Arrows 

Press the MENU button to enter the MEMRY menu.

Use the right arrow ► on the joystick to toggle between SM (Save Memory) or RM (Recall Memory).

### 5.5.1 Save Memory

#### To STORE the current strobe setting into a memory location:

Once in the Memory (MEMRY) menu, press the ► arrow on the joystick to enter the Save Mode indicated by SM on the display. Use the ▲ and ▼ arrows on the joystick to select one of the memory locations in which to save the settings — SM1, SM2...SM10.

Press the MENU button followed by the Power button to save the current strobe setting into the displayed location. The current flash rate will then be shown in that location.

To exit without saving a value press the POWER button.

### 5.5.2 Recall Memory

#### To RECALL a saved strobe setting:

Once in the Memory (MEMRY) menu, make sure the you are in the Recall Mode as indicated by RM on the display. Use the ▲ and ▼ arrows on the joystick to select one of the memory locations from which to load the settings — RM1, RM2...RM10.

Press the MENU button followed by the Power button to recall the setting from the selected location.

To exit without recalling a memory location, press the Power button.

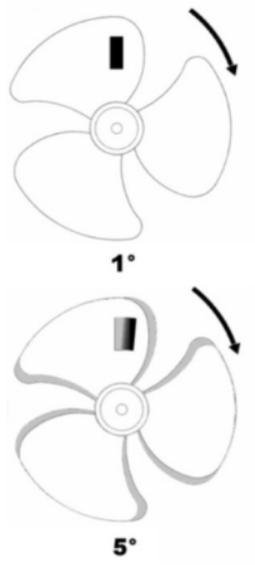
## 6.0 STROBE BRIGHTNESS

The strobe's brightness depends on how wide the strobe's flash pulse is; the wider the pulse, the brighter the flash from the LEDs appears to be. There is however, a downside to the wider pulses. All strobes work by giving short bursts of light (the pulse width) at a rapid repetition rate (the flash rate). Strobes rely on the persistence of the human eye (the ability to remember and image) and its response to bright light to give an apparent stop motion image. Imagine a shaft rotating at 6000 RPM or one rotation every 1/100 of a second (10 msec). If the strobe flashes once every 10 msec for a brief moment, the user sees the flash at the same spot in the rotation of the shaft and the persistence of the eye remembers this until the next flash making the shaft appeared to be stopped. As the target is rotating there is some movement evident during the strobe flash. The longer the flash duration, the more obvious the rotation is and this increases the blur. The Lamp ON Mode does not have a brightness setting.

### 6.1 Calculating Blur

Blur can be calculated— if the shaft is turning at 6000 RPM, it takes 10 msec to complete one revolution. If the strobe flash duration is 100  $\mu$ sec (1/100 of a millisecond), the shaft will turn:  $(\text{flash duration}/\text{time per rotation}) \times 360^\circ$ , which is  $(.0001/.01) \times 360 = 3.6^\circ$ . So you will see the shaft appear to move  $3.6^\circ$ .

As the flash pulse widens you will see greater degrees of rotation which results in more blur and a brighter perceived illumination (the LEDs are on longer so the average light the eyes see is greater). The trade off is blur versus brightness. The further away the rotating point is from the center axis the faster the tangential velocity and the worse the blur appears to be.



When setting the pulse duration in degrees, what you set is what you get. Refer to the image on the right for the difference between a 1° and 5° (of rotation) flash duration.

There are two methods of adjusting the flash pulse width and hence the brightness and consequently the blur. *To set Brightness, see section [5.3 Brightness \(BRITE\) Menu](#).*

## 6.2 Brightness in Degrees of Rotation

Brightness can be set from 0.2 to 14 degrees out of 360. The higher the setting the brighter the strobe appears to be but the more blurred the target is. Optimal setting to stop motion is 1.8 to 3.6°. The number of degrees is a proportional amount and remains constant as the flash rate increases or decreases. The strobe automatically calculates how wide the pulse width should be at different flash rates to keep the blur constant\*— the faster the flash rate the narrower the pulse width. The pulse width equals: (setting in degrees/360) x (1/flash rate in Hz).

## 6.3 Brightness in Pulse Duration

Brightness can also be set to a fixed duration pulse in microseconds. The flash rate remains constant\* irrespective of the flash rate, thus as the flash rate increases, the image will get brighter and more blurred.

**\*Note:** There are two limits maintained by the strobe – the flash pulse width can never be greater than 2.0 msec (milliseconds) nor can it exceed 14° of rotation.

The strobe automatically adjusts the pulse width and rotation values as the flash rate is increased or decreased to maintain the limits at all times. For example — a flash rate of 600 flashes per minute (10 Hz), 14° of rotation represents a flash pulse width of 3.8 msec. The strobe will limit this value to 2.0 msec or 7.3° of rotation (blur).

## 7.0 BATTERY PACK

The Nova-Pro IR 850 comes standard with one rechargeable Lithium-Ion battery pack, external charging station, and power supply. The Battery Pack is shipped in a mostly discharged state and has tape over the terminals.



### **CAUTION:**

- Do not store battery in hot locations
- Do not expose to fire
- Do not disassemble
- Do not apply mechanical force

**REMOVE Battery Pack from unit before storing for long periods.**

**DO NOT DISPOSE** of the Lithium-ion batteries as unsorted municipal waste. The batteries need to be **RECYCLED** in accordance with local regulations. The batteries should be sent to a recycling center or returned to the factory using appropriate shipping methods.

The Nova-Pro Battery Pack is specifically keyed to fit in the Nova-Pro and Battery Charging Station one way only. The Battery Pack can also be screwed into the Nova-Pro using the attached captive screw.

### **7.1 Low Battery Functionality**

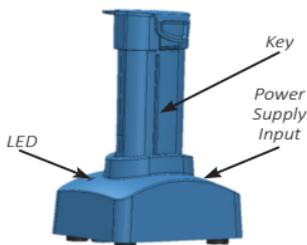
-  Low battery icon will blink when battery pack needs to be recharged. The unit may still be used for a short time.

The Nova-Pro will display “LOBAT” and shut down when the battery pack is exhausted and must be recharged.

## 7.2 Charging the Battery

The Nova-Pro Battery Pack must be removed from the Nova-Pro to be charged using the Nova-Pro Charging Station and power supply provided.

**! CAUTION:** Never attempt to charge the Battery Pack with anything other than the Charging Station and power supply provided with the Nova-Pro.



The Nova-Pro Charging Station has an light emitting diode (LED) that indicates the state of the battery/station. The LED indicates the following:

- Green On/No Battery or Battery Charged
- Red Charging
- Flashing Red Error/Replace Battery

Battery charge time will be up to 6 hours depending on Battery Pack and residual charge. Once the battery is charged the charger will switch to trickle charge mode — the battery should be removed once the charge LED turns green.

## 8.0 AC POWER OPTION

The AC Power Option can also be ordered as a separate option for the Nova-Pro. Simply insert the AC Power Option into the Nova-Pro (matching the keyed slot) until it clicks into place. Then plug the wall power supply into an outlet (115 V ac to 230 V ac) using the appropriate interchangeable plug.



## 9.0 WALL POWER SUPPLIES

The wall power supplies provided with the Nova-Pro IR 850 have interchangeable plugs allowing them to be used with AC outlets in different countries.

To change the plugs, depress the button on the installed plug and slide the plug up and out of the power supply. Select the correct plug and slide it back into the power supply until the plug seats firmly. Make sure the plug cannot slide out.



### CAUTION: RISK OF ELECTRIC SHOCK

- Do not insert the plugs into an AC outlet without the power supply attached
- Avoid touching the plug blades when inserting or removing the power supply from the AC outlet
- Indoor use only



## 10.0 SPECIFICATIONS

Specification*	Nova-Pro IR 850 Infrared Stroboscope
Flash Range (FPM/RPM)	30 to 999,999
Display	6-digit numeric and 5-digit alphanumeric LCD with touch keypad; high-contrast blue background/white characters with backlight
Accuracy/Resolution	0.001% of setting or $\pm 1$ LSD/6 digits to 0.001
Light Source	IR 850nm 12 LED array (60° lens, 850nm $\pm 2$ nm)
Light Output	Typical radiant intensity (mW/SR) 1150
Flash Duration	Adjustable from 0.1 to 14°/2.000 msec max
External Triggers (in/out)	TTL (12 V dc max) input; provides 3.3 V dc TTL output
Tachometer Mode (optional)	0-999,999 RPM with integral laser or external input
Programmable Memory	Yes (10 setpoints)

Specification*	Nova-Pro IR 850 Infrared Stroboscope
<b>Operating Time</b>	Battery pack: 9.5 hours typical (6000 FPM, 2° duty cycle)
<b>Power Supply</b> (battery)	Removable/rechargeable UN38.3 compliant Li-ion battery pack; battery: 7.4 V 2.8Ah (21 W)
<b>Power Supply</b> (AC)	115/230 Vac 50/60Hz AC adapter with 6 ft. [2 m] cable and interchangeable outlet adapters (optional)
<b>Weight</b>	1.4 lbs. (635 grams) with battery
<b>Size</b> (H x W x D)	9.5 x 3.75 x 5.5 in. [241 x 95 x 140 mm]
<b>Housing Material / Rating</b>	ABS/splash-proof — IP54

\*Specifications are subject to change without notice.

## 10.1 Operating Environment

This equipment is NOT intended for permanent installation. This equipment is for use in a controlled environment; Environmental situation A, Pollution Degree 2.

**Altitude:** up to 2000 m

**Temperature:** 5 °C to 40 °C

**Humidity:** Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C.

**Category:** 2

## 10.2 Compliance

### 10.2.1 Batteries

The Lithium-ion battery packs used in this product meet the requirements of UN DOT 38.3.

Tested by Shenzhen SEM. Test Technology Co. Ltd.  
(Reports STR16079052S/54S)

### **10.2.2 EU Declaration of Conformity**

Please visit our website [www.monarchinstrument.com](http://www.monarchinstrument.com) to download our EU Declaration of Conformity for this product.

### **10.2.3 Energy Efficiency**

 This product complies with the U.S. Department of Energy's energy conservation standards specified in the Code of Federal Regulations 10 CFR 430.32(z) and is registered in the DoE CCMS database.

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## 11.0 ACCESSORIES AND SENSORS

There are many accessories available to enhance the functionality and keep your Nova-Pro up and running. See Monarch's website for info:

[Accessories webpage](#).

AC Power Adapter      PN: 6281-015



Charging Station      PN: 6281-012



Battery Pack      PN: 6281-010



Input/Output Cable      PN: 6280-038



## **Sensors:**

See Monarch's [Sensors webpage](#) for details.

### **ROLS-P**

Remote Optical Laser Sensor w/ 8 ft. [2.5 m] cable



### **RLS-P**

Rugged Laser Sensor w/ removable 9.8 ft. [3 m] cable with watertight M12 connector



### **ROS-P**

Remote Optical Sensor w/ 8 ft. [2.5 m] cable

### **ROS-P-25**

Remote Optical Sensor w/ 25 ft. [7.6 m] cable



### **IRS-P**

Infrared Sensor w/ 8 ft. [2.5 m] cable for use triggering strobe use w/out reflective target at 0.5 in. [2 mm] gap



### **MT-190P**

Magnetic Trigger Sensor/Amplifier w/ 8 ft. [2.5 m] cable



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## The Professional's Choice

Monarch Instrument is committed to excellence and quality in manufacturing, sales, and service.



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