

- *Tachometers*
- *Stroboscopes*
- *Speed Sensors*
- *Frequency Converters*
- *Vibration Meters*
- *Temperature Humidity Sensors*
- *Data Acquisition*

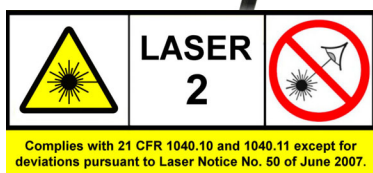


MONARCH INSTRUMENT

Nova-Pro® Stroboscope/Tachometer



Patented Technology



Features

- Stroboscope and tachometer in one tool
- Super bright LED's
- Integral/removable laser module
- Water and dust resistant IP54 enclosure
- 1/4" x 20 tripod mount
- Ergonomic one handed operation
- Removable rechargeable Li-ion battery
- Continuous AC operation available
- TTL compatible input/output (300, 500)
- NIST certificate included (300, 500)

The **Nova-Pro®** is a series of powerful portable visual inspection and speed measurement tools. We have combined all the features of our hand held LED stroboscopes together with a full function laser tachometer to create a compact, ergonomic and extremely powerful two in one predictive maintenance tool. The stroboscope light source is made up of twelve LED's which are extraordinarily bright yet extremely efficient allowing cool continuous operation and extremely long battery life on a single charge. Continuous operation is also possible with the optional AC adapter.

Nova-Pro® 100: Designed for simple stroboscopic stop motion inspection and RPM measurement applications. The integral laser module is an optional item that can be added to make the 100 a full featured non-contact tachometer.

Nova-Pro® 300: Has all the features of the 100 and adds an additional integral laser module for tachometer mode or strobe trigger mode, and adds a high contrast inverse blue LCD display with backlight and touch sensitive number pad (for setting flash rates quickly), ultra high intensity LED's for even more light output, memory for up to 10 preset flash rates, input and output jacks for external sensors or pulse repeater output, and NIST calibration certificate.

Nova-Pro® 500: Has all the features of the 300 and adds an additional standard battery pack, remote laser docking station, phase delay, time delay and virtual slow motion.

Nova-Pro® UV365 and UV385 Ultraviolet: Is a fully featured Nova-Pro 500, but comes in two different ultraviolet wavelengths for Security Printing, Pharmaceutical Process Manufacturing, and specular inspection of highly reflective textures and transparent poly-films.

Typical Uses

- Visual running inspections of: Fan blades, motors, shafts, gears, rollers, webs, belts, sheaves, chains, sprockets and much more without having to shut down your process
- Diagnose alignment issues
- Determine speed of rotating equipment using strobe or built in laser tachometer
- Troubleshoot high speed automation processes by placing them in virtual slow motion
- Print quality inspection
- Textile processing inspection
- Phase reference for balancing
- Fluid Analysis
- Food & Fruit Inspection



Ordering Information

Item	Description	Part No.
Nova-Pro 100	100 Strobe, standard battery, recharging station with interchangeable wall plugs and manual	6241-010
Nova-Pro 100 Kit	Same as above with plastic latching carry case	6241-011
Nova-Pro 300	300 Strobe, laser module, standard battery, recharging station with interchangeable wall plugs, NIST cert and manual	6243-010
Nova-Pro 300 Kit	Same as above with plastic latching carry case	6243-011
Nova-Pro 500	500 Strobe, laser module with remote laser dock, (2) standard batteries, recharging station with interchangeable wall plugs, NIST cert and manual	6245-010
Nova-Pro 500 Kit	Same as above with deluxe die cut foam lined water tight plastic carry case	6245-011
Nova-Pro 100 AC	100 Strobe, 115/230 Vac adapter with interchangeable wall plugs and manual	6241-020
Nova-Pro 100 AC Kit	Same as above with plastic latching carry case	6241-021
Nova-Pro 300 AC	300 Strobe, laser module, 115/230 Vac adapter with interchangeable wall plugs, NIST cert and manual	6243-020
Nova-Pro 300 AC Kit	Same as above with plastic latching carry case	6243-021
Nova-Pro UV365	UV365 Strobe, laser module with remote laser dock, standard battery, recharging station with interchangeable wall plugs, and manual	6248-010
Nova-Pro UV365 Kit	Includes a second battery and deluxe water tight case	6248-011
Nova-Pro UV385	UV385 Strobe, laser module with remote laser dock, standard battery, recharging station with interchangeable wall plugs, and manual	6249-010
Nova-Pro UV385 Kit	Includes a second battery and deluxe water tight case	6249-011



"Nova-Pro® is compact, ergonomic and extremely powerful"

Specifications



	100	300	500
Flash Range (FPM/RPM):	30 to 999,999		
Display:	6 digit numeric and 5 digit alphanumeric LCD	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 ±1 lsd/6 digits to 0.001		
Light Source:	12 LED Array	12 High Output LED Array	
Flash Duration:	Adjustable to 14 degrees/2.000msec max		
Light output:	3400 Lux @ 6000 FPM, 12 inches (30.48cm), 2° duty cycle, Max light output: 24,000 Lux	5500 Lux @ 6000 FPM, 12 inches (30.48 cm), 2° duty cycle, Max light output: 30,000 Lux	
Color Temperature:	approx. 6200°K		
External Triggers in/out:	N/A	TTL (12Vdc Max) Input. Provides 3.3 Vdc TTL output	
Tachometer Mode:	0-999,999 RPM with integral laser (Optional)	0-999,999 RPM with integral laser or external input	
Programmable Memory:	N/A	Yes (10 set points)	
Internal Phase Shift:	N/A	Yes	
Phase Delay - degrees:	N/A	-360.0 to 345.0 degrees	
Time Delay - milliseconds:	N/A	-50.000 to 50.000 msec	
Virtual RPM (Slow Motion):	N/A	-60.0 to 60.0 VRPM	
Operating Time:	Standard battery pack: 9.5 hours typical (6000 FPM, 2° duty cycle)		
Power Supply (Battery):	Removable/rechargeable UN38.3 compliant Standard Li-Ion battery pack with 115/230 50/60Hz recharging station	Removable/rechargeable Standard Li-Ion battery packs (Qty. 2) with 115/230 50/60Hz recharging station	
Power Supply (AC):	115/230 Vac 50/60Hz AC adapter with 6 foot (2M) cable and interchangeable outlet adapters (Optional)		
Weight:	1.4 Lbs. (635 grams) with Standard battery		
Size (H x W x D):	9.5 x 3.75 x 5.5 in. (241 x 95 x 140mm)		
Housing material/rating:	ABS/IP54		

Remote Laser Dock - Remove the laser module from the Nova-Pro and insert it into the remote laser dock with 1/4 x 20 tripod mount. Plug the cable into the external input jack (300, 500 models) and make measurements in hard to reach or unsafe areas. (tripod sold separately)



AC Power Adapter - The 115/230 AC power adapter allows for continuous operation. Included with certain models or may be ordered separately.



Battery Recharging Station

Accessories

Item	Part No.
1. Standard Li-ion battery pack	6281-010
2. Battery charging station 115/230 Vac, 50/60 Hz	6281-012
3. Laser module	6281-020
4. Remote laser dock and blanking panel	6281-021
5. AC power adapter 115/230, 50/60Hz	6281-015
6. Deluxe water tight carry case	6281-031
7. T-5 reflective tape	6180-070
8. Miniature tripod with 1/4" x 20 stud	6180-040

Nova-Strobe LED Stroboscopes



The **Nova-Strobe LED** family of rugged industrial stroboscopes provide an extremely bright, uniform light output for performing stop motion diagnostic inspection and RPM measurements. The twelve LED light source is extremely efficient which means long battery life and continuous cool operation. A wide operating range of 30-500,000 flashes per minute covers all applications. The Basic **BBL** is designed for simple stop motion inspection and RPM measurement applications. The Deluxe **DBL** adds internal phase shifting, memory for up to 5 preset flash rates, NIST calibration certificate and tachometer mode for speed measurements up to 500,000 RPM using optional remote sensors or TTL pulse input/output. The top of the line Phaser **PBL** has all the features of the **DBL** and adds external phase delay, time delay and virtual RPM mode. The **PBL** will also run continuously, 24/7 with the power supply/recharger. Each unit is available stand alone or as a kit.



Features

- Bright, uniform light pattern
- Diagnostic inspection and RPM checks
- Digital LCD backlit display (DBL, PBL)
- Tripod mounting bushing (1/4"-20) in handle
- NIST certificate included with DBL and PBL
- Lightweight industrial design
- 12 button keypad makes entering flash rates extremely quick (DBL, PBL models)
- Continuous, 24/7 operation (PBL)



Specifications	BBL Basic	DBL Deluxe	PBL Phaser
Flash Range (FPM/RPM):	30-500,000		
Display:	6 Digit Numeric and 5 Digit Alphanumeric LCD		
Accuracy/Resolution:	0.01%....	0.004% of setting or ±1 least significant digit/0.01 FPM	
Light output:	4200 Lux @ 6000 FPM, 12 inches (30.48cm), 2° duty cycle Max light output: 27,000 Lux		
Flash Duration:	Adjustable to 14 degrees /3000µsecs max		
Light Source:	12 LED Array		
Color Temperature:	Approx. 6200°K		
External Triggers in/out:	N/A	TTL (24Vdc Max) Input. Provides 3.3 Vdc TTL output	
Tachometer Mode:	N/A	0-500,000 RPM (Use with optional remote sensor)	
Programmable Memory:	N/A	Yes	
Internal Phase Shift:	N/A	Yes	
Phase Delay - Degrees:	N/A	0.1 to 359.9 degrees	
Time Delay - milliseconds:	N/A	0.01 to 1000 msec.	
Virtual RPM (Slow Motion):	N/A	0-200 VRPM	
Operating Time:	8-10 hours typical @ 1800 FPM		8-10 hours typical @ 1800 FPM with batteries or continuous using power supply
Power Supply:	Internal NiMH rechargeable batteries with 115/230 50/60Hz recharger		Internal NiMH rechargeable batteries or continuous using 115/230 50/60 Hz Vac power supply/recharger
Weight:	1.9 Lbs. (860g)		
Size (L x W x H):	Body: 9" x 3.66" x 3.56" (229 x 93 x 90 mm); Reflector Housing: 4.8" (122 mm) dia.; Handle: 4.254" (108 mm long)		

Ordering Information

Item	Description	Part No.
Nova-Strobe BBL	BBL Strobe, universal 115/230 recharger with interchangeable wall plugs and manual	6230-010
Nova-Strobe BBL Kit	Same as above with plastic latching carry case	6230-011
Nova-Strobe DBL	DBL Strobe, universal 115/230 recharger with interchangeable wall plugs, manual and NIST Calibration	6231-010
Nova-Strobe DBL Kit	Same as above with plastic latching carry case	6231-011
Nova-Strobe PBL	PBL Strobe, universal 115/230 power supply/recharger with USA and Euro cables, manual and NIST Calibration	6232-010
Nova-Strobe PBL Kit	Same as above with Deluxe water tight plastic carry case	6232-011

Accessories (compatible with all Nova-Strobes)

Item	Part No.
1. Remote Optical Laser Sensor	6180-029
2. Splash Proof Cover	6280-041
3. Protective Rubber Cover	6280-048
4. Reflective Tape, 5' roll x 1/2"	6180-070
5. Pulse input/output cable (BNC)	6280-037
6. Standard Latching Carry Case	6280-040
7. Deluxe Water Tight Carry Case	6280-049



The **PLS Pocket LED Stroboscope** is a compact, rugged, light weight device that provides a super bright, uniform light output for performing visual diagnostic inspection and RPM measurements. The silent cool running LED's are extremely energy efficient providing up to 5 hours of operation on a single charge. The **PLS** has a wide operating range of 30-300,000 flashes per minute which covers most industrial applications. Additional features include external input for remote triggering or tachometer mode, pulse output, memory for up to 5 preset flash rates, NIST calibration certificate, tachometer mode for speed measurements up to 300,000 RPM using optional remote sensors and TTL pulse output.

Features

- Energy efficient with long battery life
- Extremely bright, uniform light
- Quiet/Cool operation
- No lamp replacements
- Diagnostic inspection and RPM checks
- Compact size
- Lightweight
- Digital LCD backlit display
- Tripod mounting bushing (1/4"-20)
- CE marked, RoHS compliant
- NIST certificate included
- Intuitive one hand operation



7 LED Array



Specifications

Display:	LCD display with 6 numeric 0.506 inch (12.85mm) high digits and 5 alphanumeric 0.282inch (7.11mm) high digits	Internal Mode:	
Indicators:	Battery level, On Target, Select, TACH, and EXT icons	Flash Range:	30-300,000 FPM (Flashes per minute) 0.5 to 5000Hz
Memory:	Last setting before power down is remembered and restored on next power up. 5 user settable memory locations	Flash Rate Accuracy:	0.005% of setting or ± last digit
Flash Duration:	Adjustable 0.5 to 2500 microseconds or 0.1 to 10 degrees of rotation (auto adjusts with flash rate)	Flash Rate Resolution:	0.01 to 1 FPM (menu selectable), 0.1 FPM resolution above 9,999.99 FPM, 1 FPM resolution above 99,999.9
Power:	Battery powered: Internal Li-Ion rechargeable batteries 3.6Vdc	External Modes:	
Light Source:	7 LED Array	Flash Range:	0-300,000 FPM (Flashes per minute) 0 to 5000Hz
Light Output:	2000 Lux at 6000 FPM 12" (30.48cm) from lens 2° duty cycle Max light output: 8300 Lux	Tachometer Mode:	30 to 300,000 RPM
Color Temp:	approx. 6200°K	Accuracy:	±0.005% of reading or ± last digit
Run Time:	5-6 hours typical at 6000 FPM, and 2° duty cycle with fully charged batteries	Display Update Rate:	0.5 second typical above 120 RPM
Charge Time:	4-5 hours typical with supplied charger	Trigger to Flash Delay:	~15 µsec
Weight:	0.6 lbs. (0.27kg) including batteries	External Input:	2.5V to 12V peak pulse 500 nanosec min pulse width, positive or negative edge triggered (menu selectable)
Dimensions:	7.75" x 2.75" x 2.3" (197 x 70 x 58 mm)	Pulse In to Out Delay	<0.2µsec
		Output Pulse:	3V pulse. One pulse per flash in internal mode. Mimics input pulse in external mode



Ordering Information

Item	Description	Part No.
PLS	Pocket LED Stroboscope, universal 115/230 VAC recharger with interchangeable wall plugs, manual and NIST calibration certificate	6235-010
PLS Kit	Same as above with die cut foam lined latching carry case	6235-011
PLS Kit Plus	Same as PLS Kit above. Also includes ROLS-P Remote Optical Sensor for triggering flash or for use as a laser tachometer	6235-012

Accessories

Pouch	Protective carry pouch with belt hook	6280-073
LBC-U	Lithium Battery Charger 115/230 VAC recharger with interchangeable wall plugs	6280-027
BAT-PLS	Replacement Li-Ion battery pack	6280-074
ROS-P	Remote Optical Sensor with 1/8" phone plug connector, 8 foot cable and 12 inches of reflective tape	6180-057
ROLS-P	Remote Optical Laser Sensor with 1/8" phone plug connector, 8 foot cable and 12 inches of reflective tape	6180-029
T-5	T-5 reflective tape, 5 foot roll x 1/2" wide	6180-070
CC-13	Latching carry case for PLS	6280-072
Tripod	Miniature tripod with 1/4" x 20 stud	6180-040

Nova-Strobe Xenon Stroboscopes



Nova-Strobe x - The standard for high intensity multi-function portable stroboscopes. Models are available with digital displays, battery or AC power, and a useful range of features which provide unmatched performance and value. Four models range from the Nova-Strobe **DBX** Deluxe, the most versatile battery powered digital stroboscope with internal phase shifting, down to the Nova-Strobe **BAX** Basic, the most cost effective AC powered digital stroboscope.

Both the battery powered Nova-Strobe **DBX** and AC powered Nova-Strobe **DAX** provide a range of 30 to 20,000 flashes per minute and an accuracy of $\pm 0.002\%$ of setting. Flash rates are easily adjusted to fractional RPM by a coarse/fine control knob. Individual TTL compatible input and output jacks are provided for 'daisy chaining' of multiple strobes, triggering from an external source, or providing a trigger signal to external equipment.

Both **DBX** and **DAX** provide internal phase shifting to keep the target precisely in view. Both provide x2 and ± 2 capability for distinguishing actual RPM from harmonic frequencies. In addition, 9 user programmable memory flash rates for repetitive measurements and storage of the last flash rate measured are included.



Features (all models)

- Internal rechargeable batteries or AC powered models
- Lightweight (Less than 2.0 pounds) for easy handling
- Continuous cool operation
- Tripod mountable

Nova Strobe DAX and DBX also add:

- NIST Traceable Calibration Certificate
- Internal phase shifting for easy reference target viewing
- Tach mode, speed measurement up to 250,000 RPM
- Power for optional sensors
- Pulse repeater output



	DBX Deluxe Battery	DAX Deluxe AC	BBX Basic Battery	BAX Basic AC
Specifications				
Range Flashes/Minute:	30-20,000 FPM		30-10,000 FPM	
Display:	6 Digit Numeric and 5 Digit Alphanumeric LCD			
Accuracy/Resolution:	0.004% of setting or ± 1 least significant digit / 0.01 FPM			
Flash Energy/Duration:	230 mJoule up to 3450 FPM / 10-25 μ sec (auto adjust)			
Average Power-Watts:	>13W above 3450 FPM			
Flash Tube & Life:	High Power Xenon, 100 million flashes typical			
External Triggers - in/out: (1/8" (3.5mm) phone jack)	TTL (24Vdc Max) Input. Provides 3.3Vdc TTL output		N/A	
Tachometer Mode:	5-250,000 RPM -Use with optional remote sensor		N/A	
Programmable Memory:	Yes	Yes	N/A	
Internal Phase Shift:	Yes	Yes	N/A	
Operating Time:	2 hours typical @ 1800 FPM	Continuous	2 hours typical @ 1800 FPM	Continuous
Power Supply:	Internal NiMH rechargeable batteries	115 Vac, 50-400Hz or 230 Vac, 50-400Hz	Internal NiMH rechargeable batteries	115 Vac, 50-400Hz or 230 Vac, 50-400Hz
Weight:	1.9 lbs. (0.86 kg)	1.5 lbs. (0.68 kg)	1.9 lbs. (0.86 kg)	1.5 lbs. (0.68 kg)
Size (L x W x H):	Body: 9" x 3.66" x 3.56" (229 x 93 x 90mm); Reflector Housing: 4.8" (122mm) diameter; Handle: 4.25" (108mm) long			

Ordering Information

Item	Description	Part No.
BAX 115	Basic 115Vac powered xenon Strobe	6206-010
BAX 115 Kit	Same as BAX 115 plus latching carry case and spare lamp	6206-011
BAX 230	Basic 230Vac powered xenon Strobe	6206-012
BAX 230 Kit	Same as BAX 230 plus latching carry case and spare lamp	6206-013
BBX 115/230	Basic xenon Strobe, battery powered, with 115/230 Vac recharger with interchangeable plugs	6207-012
BBX 115/230 Kit	Same as BBX 115/230 plus latching carry case and spare lamp	6207-013
DAX 115	Deluxe 115Vac powered Strobe with NIST certificate	6203-010
DAX 115 Kit	Same as DAX 115 plus latching carry case and spare lamp	6203-011
DAX 230	Deluxe 230Vac powered Strobe with NIST certificate	6203-012
DAX 230 Kit	Same as DAX 230 plus latching carry case and spare lamp	6203-013
DBX 115/230	Deluxe Strobe, battery powered, with 115/230Vac recharger with interchangeable plugs and NIST certificate	6204-012
DBX 115/230 Kit	Same as DBX 115/230 plus latching carry case and spare lamp	6204-013

Accessories: See page 4 for compatible Nova-Strobe accessories

PBX Phaser Strobe

The **Phaser-Strobe PBX** incorporates the unique design features of the Nova-Strobe DBX with an increased operating range of 30 to 50,000 flashes per minute, as well as external phase shifting. The unique digital adjustment knob can select the decade for adjustments so coarse and fine adjustments of flash rates are made quickly and with significantly better resolution than competitive units. The memory feature of the **Phaser-Strobe pbx** allows nine flash rates to be stored - displayed in flashes per minute or flashes per second. **Phaser-Strobe PBX** operates with internal rechargeable batteries or continuously from AC line power with the power supply/recharger.

Features:

- Phase Shift adjustable as phase angle or time
- Store and recall nine memory settings
- Virtual RPM mode provides slow motion viewing for high speed events
- TTL compatible input/output jacks
- NIST traceable certificate included

Specifications

Flash Range:	30-50,000 FPM (flashes/minute) 0.5-830 FPS (flashes/sec.) (Hz)
Accuracy:	±0.004% of setting ± least significant digit
Digital Adjustment Knob:	36 detents per revolution and blinking decade selection
Flash Rate Resolution:	0.01 to 1.0 FPM (menu selectable)
Operating Time:	2 hours typical @ 1800 FPM or continuous AC power
Phase Delay:	0.1 to 359.9 degrees
Time Delay:	0.01 to 1000 msec.
Virtual RPM (Slow motion):	0-200 VRPM
Flash Energy (Typical):	230 mJoule up to 3450 FPM
Flash Duration (Typical):	10-25 µsec (auto adjust)
Average Power:	11W @ 3000 FPM; > 13W @3450 FPM
Tachometer Mode:	5-250,000 RPM from external trigger
External Input:	Input pulse - 0.5 µsec min, TTL to 24V max (1/8" phone plug)
Trigger Output/Remote Sync:	3.3V TTL compatible 40 µsec pulse positive/negative
Power:	Internal rechargeable NiMH batteries with AC power supply/recharger
Weight:	1.9 lbs. (0.85 kg) including batteries



Ordering Information

Item	Description	Part No.
PBX 115/230	Strobe with PSC-pbxU 115/230 power supply/recharger, manual and NIST certificate.	6210-020
PBX 115/230 Kit	Same as above with deluxe water tight foam lined carry case.	6210-021

VBX Vibration Strobe

The **VBX Vibration Strobe** is uniquely designed to provide precise, instantaneous synchronization to a number of data collectors and FFT analyzers triggered by an accelerometer. Built for portable applications, the **VBX** is the perfect lightweight phase analysis tool. **VBX** allows for the measurement of phase without stopping the machinery to install reflective tape. Phase analysis is quick and accurate using the filter bandwidth selector and the relative phase adjustment. Unique "Tracking Filter" maintains phase lock to input pulse. **VBX** can power and be triggered by accelerometers with or without data collectors.

Features:

- Compatible with CSI and SKF analyzers
- Direct triggering from accelerometers
- Tracking filter maintains phase lock
- NIST traceable certificate included

Specifications

Flash Range:	30-50,000 FPM (flashes/minute) 0.5-830 FPS (flashes/sec.) (Hz)
Accuracy:	±0.004% of setting ± least significant digit
Digital Adjustment Knob:	36 detents per revolution and blinking decade selection
Flash Rate Resolution:	0.01 to 1.0 FPM (menu selectable)
Operating Time:	2 hours typical @ 1800 FPM or continuous AC power
Phase Delay:	0.1 to 359.9 degrees
Tracking Filter:	Selectable Wide and Narrow Bandwidths. Filter may not lock below 100 FPM
Time Delay:	0.01 to 1000 msec.
Virtual RPM (Slow motion):	0-200 VRPM
Flash Energy (Typical):	230 mJoule up to 3450 FPM
Flash Duration (Typical):	10-25 µsec (auto adjust)
Average Power:	11W @ 3000 FPM; > 13W @3450 FPM
Tachometer Mode:	5-250,000 RPM from external trigger
External Input:	Input pulse - 0.5 µsec min, TTL to 24V max (1/8" phone plug)
Trigger Output/Remote Sync:	3.3V TTL compatible 40 µsec pulse positive/negative
Power:	Internal rechargeable NiMH batteries with AC power supply/recharger
Weight:	1.9 lbs. (0.85 kg) including batteries



Ordering Information

Please visit www.monarchinstrument.com or contact us directly for complete part number and pricing information.

PSX Palm Strobe x



Patented Design

Features

- Patented Plug in Battery Pack
- Easy one hand operation
- Lightweight
- Flash rates to 12,500 FPM
- Tachometer mode from Self Powered Sensors
- TTL compatible input/output (3.5mm phone plug)
- NIST Certificate included

Palm Strobe x offers excellent brightness, exceptional features, rugged construction and extra long battery life. Unique one-touch joystick-type button allows single hand operation for fast fractional RPM tuning. Select mode of operation for internal tuning, external TTL pulse input, tachometer display and x2 ÷2 functions. Eight memory positions provide rapid recall of user defined frequencies. The **Palm strobe x** can be ordered in various configurations to fit the demand of your application.

Optional Accessories



Protective Rubber Cover



Holster



Quick Change Battery Pack



Palm Strobe x Deluxe Kit

Specifications

Internal Mode Range:	100 to 12,500 FPM (Flashes per minute)
Light Power:	7.9 watts @ 6000 FPM, 150 mJoules up to 3100 FPM
Flash Lamp Life:	100 million flashes typical
Flash Duration:	10 - 30 µsec typical
Display:	6 digit alphanumeric backlit LCD display
Flash Rate Resolution:	0.1 FPM
Flash Rate Accuracy:	Greater of ±0.01% of reading or ±0.5 FPM
Tachometer Mode:	5 to 250,000 RPM
External Input:	0 to 5 Vdc (12 Vdc max.) TTL compatible, positive edge triggered
Output Pulse:	0 to 5 Vdc typical - 350µsec positive pulse (2.5mm) 1/8" phone plug
Run Time:	2 hours typical @1800 FPM >1 Hour typical @ 6000 FPM
Memory:	8 programmable flash rates and last flash rate at power down
Adjustment:	Four quadrant tuner button with blinking decade select for flash rate up and down, multiply by 2 and divide by 2
Modes:	Internal, External, Tachometer, Preset, x or ÷ by 2, locked on
Battery Power:	Removable 6Vdc rechargeable NiMH battery pack
Recharger:	100-240 Vac, 50/60Hz, includes 4 interchangeable adapters
Weight:	1.2 lbs. (0.55 kg) including battery
Strobe Dimensions:	3.04 x 9.34" (77 x 237mm)

Ordering Information

Item	Description	Part No.
Palm Strobe x	Palm Strobe x, battery pack, PSC-2U 115/230 Vac recharger, NIST certificate and manual	6205-050
Palm Strobe x Pak	Palm Strobe x, 2 battery packs, PSC-2U 115/230 Vac recharger, NIST certificate, manual and holster	6205-051
Palm Strobe x Kit	Palm Strobe x, battery pack, PSC-2U 115/230 Vac recharger, NIST certificate, spare lamp, manual and latching carry case	6205-052
Palm Strobe x Deluxe Kit	Palm Strobe x, 2 battery packs, PSC-2U 115/230 Vac recharger, NIST certificate, spare lamp, manual and latching carry case	6205-053

Accessories

PS Input Cable	TTL pulse input cable, 6 feet (1.82m) -1/8" stereo plug to BNC male connector	6280-032
PS Output Cable	TTL pulse output cable, 6 feet (1.82m) -1/8" stereo plug to BNC male connector (CA-4044-6)	6280-037
PS Holster	Holster with belt loop and pouch	6280-043
Rubber Cover	Protective rubber cover for Palm Strobe x	6280-044

PLT200

Pocket Laser Tachometer



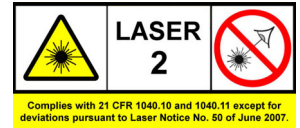
The **Pocket Laser Tach 200 (PLT200)** is a digital, battery-powered portable optical tachometer, which operates up to 25 feet (8 meters) from a reflective target using a class 2 laser light source. The ergonomic design allows safe, direct line-of-sight viewing of both the target and the display at the same time, while providing a non-slip rubber surface for single hand operation.

Multifunction Tool

The **PLT200** is a 32 function Tachometer/Rate meter, Totalizer/Counter and Timer (stopwatch), which is programmable in both Imperial and Metric rates. It includes two phone plug connectors for our optional Remote Contact Assembly (RCA) or remote sensors. The **PLT200** also has a TTL compatible pulse output to trigger devices like vibration data collectors or stroboscopes. The KIT is supplied complete with a Remote Contact Assembly including concave and convex tips and a 10 cm linear speed wheel all in a latching carrying case. Sensors and input/output cable are optional.



View Display and Target



Features

- Contact or Non-Contact modes
- View display and target simultaneously
- Lightweight
- Operates up to 25 feet from target
- Use remote sensors
- TTL input/output (3.5mm phone plug)

Ordering Information

Item	Description	Part No.
PLT200	Tachometer, NIST Cert., batteries, 12 inches of T-5 tape	6125-010
PLT200 Kit	Tachometer, NIST Cert., batteries, latching carry case, RCA with tips, linear speed wheel, 5 foot roll of T-5 tape	6125-011

Accessories

ROS-P	Remote Optical Sensor (LED) with 8' cable, 1/8" (3.5mm) phone plug and 12 inches of T-5 tape	6180-057
T-5 tape	Reflective tape 5' roll, 0.5" wide	6180-070
12" Wheel	Linear contact wheel with 12" circumference for use with RCA (Remote Contact Assembly)	6580-011

Specifications

Display:	5 Digits, 5 Alphanumeric LCD	
Range (Optical):	5 to 200,000 RPM (subject to ambient light intensity)	
Range (Contact):	0.5 to 20,000 RPM (also reads RPS and RPH)	
Rates	<u>10cm Contact Wheel</u>	<u>12 inch Contact Wheel</u>
Inch/min	1.969 to 78,740	6.000 to 144,000
Feet/min	0.164 to 6,561.7	0.500 to 12,000
Yard/min	0.055 to 2,187.2	0.167 to 4,000
Cm/min	5.000 to 200,000	15.240 to 365,760
Meter/min	0.050 to 2,000.0	0.153 to 3,657.6
Totalizer:	1-999,990 (events or length)	
Timer:	99:59.9 Min, sec, tenths	
Accuracy:	Optical: $\pm 0.01\%$ of reading Contact: $\pm 0.05\%$ of reading	
Resolution:	0.001 to 10 RPM (range dependent)	
Operating Distance:	2" to 25' (5cm to 7.62m), $\pm 70^\circ$ from perpendicular	
Memory:	Max, Min and Last	
Power:	(2) "AA" 1.5Vdc batteries (30 hours)	
Environmental:	5° to 40° C (40° to 105° F), 80% RH up to 31° C (88° F)	
Dimensions:	6.92 x 2.4 x 1.6in (17.58 x 6.10 x 4.06cm)	
Weight:	7 ounces (210 grams)	

PT-99

Pocket Tachometer



The **Pocket Tach 99 (PT99)** is a digital, battery-powered portable non-contact optical tachometer, which operates up to 36 inches from a reflective target using a bright red LED light source. The ergonomic design allows safe, direct line-of-sight viewing of both the rotating target and the display at the same time, while providing a non-slip rubber surface for single hand operation. The **PT99** is the value-leader of the world-class Pocket Tach Series from Monarch.

Features

- 36 inch operating distance
- One hand operation
- LED light source
- Simple operation

Specifications

Display:	5 Digits, 5 Alphanumeric LCD
Range:	5 to 99,999 RPM
Accuracy:	0.01% or ± 1 Digit
Resolution:	Auto ranging: 0.001 to 1 RPM Fixed: 1 Digit
Operating Range:	2" to 36" (5cm to 91.44cm), $\pm 45^\circ$ from perpendicular
Memory:	Max, Min and Last
Power:	(2) "AA" 1.5Vdc batteries (60 hours)
Environmental:	5° to 40° C (40° to 105° F), 80% RH up to 31° C (88° F)
Dimensions:	6.92 x 2.4 x 1.6in (17.58 x 6.10 x 4.06cm)
Weight:	7 ounces (210 grams)

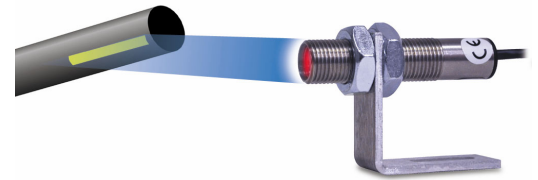
Ordering Information

Item	Description	Part No.
PT99	Tachometer with 12 inches of T-5 tape, batteries	6109-010

ROS Remote Optical Sensor

ROS (Remote Optical Sensor): Threaded stainless steel remote optical sensors have a visible red LED light source and green LED 'On Target' indicator. Performs over a wide speed range and operating envelope.

Common usage: Wide range of general purpose applications in relatively clean environments.



Specifications

Operating Distance:	3 feet (1 m) and 45° from reflective tape
Speed Range:	1-250,000 RPM
Operating Temperature:	-14° to 158°F (-10 to 70°C)
Power Input:	3.3 to 15Vdc @ 45mA
Output Signal:	TTL same as source
Standard Cable:	8 feet (2.4m)
Dimensions:	2.9" (L) x 0.625" diameter (73 x 16mm)

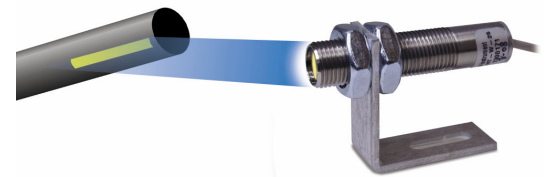
Ordering Information

Item	Description	Part No.
ROS-W	Sensor with 8 ft. cable with tinned leads, mounting bracket and 12" of T-5 tape	6180-056
ROS-P	Sensor with 8 ft. cable, 1/8" phone plug, mounting bracket and 12" of T-5 tape	6180-057
ROS-P-25	Sensor with 25 ft. cable, 1/8" phone plug, mounting bracket and 12" of T-5 tape	6180-057-25

ROS-HT Remote Optical Sensor - High Temp

ROS-HT (Remote Optical Sensor, High Temp): Threaded stainless steel remote optical sensor with visible incandescent white light source. Ideal for automotive and truck cooling system testing up to 257°F (125°C).

Common usage: Automotive and heavy truck cooling fan speeds.



Specifications

Operating Distance:	2 feet (61cm) and 45° offset from target
Speed Range:	1-50,000 RPM
Operating Temperature:	-13° to 257° F (-25° to 125°C)
Power Input:	6-24Vdc, 40mA
Output Signal:	TTL same as source
Standard Cable:	25 feet (7.6m)
Dimensions:	2.9" (L) x 0.625" diameter (73 x 16mm)

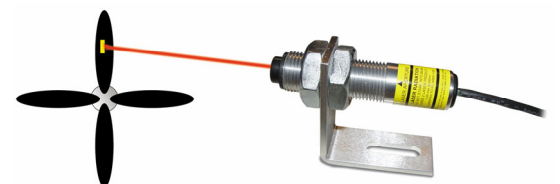
Ordering Information

Item	Description	Part No.
ROS-HT-W-25	Sensor with 25 ft. cable with tinned leads, mounting bracket and 12" of T-5 tape	6180-058-25

ROLS Remote Optical Laser Sensor

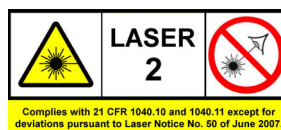
ROLS (Remote Optical Laser Sensor): Threaded stainless steel remote optical laser sensors have a visible red laser light source and green LED 'On Target' indicator. Performs over a wide speed range and operating envelope.

Common usage: Wide range of applications where distance to target is large.



Specifications

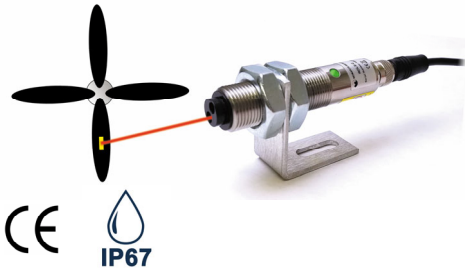
Operating Distance:	Up to 25 feet (7.62m) and 70° offset from target
Speed Range:	1-250,000 RPM
Operating Temperature:	14° to 158°F (-10° to 70°C)
Power Input:	3.3 to 15Vdc, 35mA
Output Signal:	TTL same as source
Standard Cable:	8 feet (2.4m)
Dimensions:	3.12" (L) x 0.71" (M16 x 18 x 79.4mm)



Ordering Information

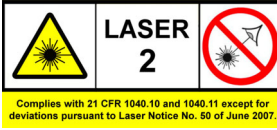
Item	Description	Part No.
ROLS-W	Sensor with 8 ft. cable with tinned leads, mounting bracket and 12" of T-5 tape	6180-030
ROLS24-W	Same as above with 24Vdc input power	6180-035
ROLS-P	Sensor with 8 ft. cable, 1/8" phone plug, mounting bracket and 12" of T-5 tape	6180-029
ROLS-P-25	Same as ROLS-P, with 25 ft. cable	6180-029-25

RLS Rugged Laser Sensor



RLS (Rugged Laser Sensor): Threaded 316L stainless steel remote optical laser sensor with a visible red laser light source and green LED 'On Target' indicator. Performs over a wide speed range and operating envelope. The Rugged Laser Sensor is **IP67 rated** and includes a removable cable with water tight M12 connector for easy removal and cleaning.

Common usage: Wide range of applications where distance to target is large or accidental exposure to water, oil, dust and other contaminants is possible.



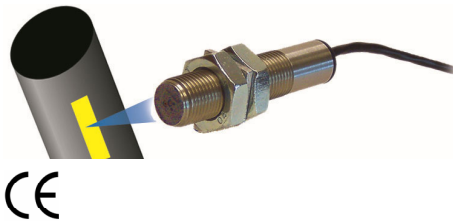
Specifications

Operating Distance:	Up to 25 feet (7.62m) and 70° offset from target
Speed Range:	1-250,000 RPM
Operating Temperature:	14° to 158°F (-10° to 70°C)
Power Input:	3.3 to 15Vdc, 35mA or 24Vdc ± 10%
Output Signal:	TTL same as source
Standard Cable:	8 feet (2.4m)
Dimensions:	3.12" (L) x 0.71" (M16 x 18 x 79.4mm)

Ordering Information

Item	Description	Part No.
RLS-P	Rugged Laser Sensor with 3m cable, 1/8" phone plug and mounting bracket	6180-081
RLS-W	Rugged Laser Sensor with 8 ft. cable, and tinned leads and mounting bracket	6180-080
RLS24-P	24 Vdc powered Rugged Laser Sensor with phone plug cable and bracket	6180-083
RLS24-W	24 Vdc powered Rugged Laser Sensor with tinned leads cable and bracket	6180-082

IRS Infrared Sensor



IRS (Infrared Sensor): Ideal sensor for working up to 0.5" (12mm) from high speed equipment or other applications providing only contrasting light and dark surfaces or beam interruption by solid objects as small as 0.30" (1mm).

Common usage: Dentist and other high speed drills, slots or gear teeth. Does not require reflective tape. Use black/white contrasting colors.

Specifications

Operating Distance:	0.5" (12mm)
Speed Range:	1-999,990 RPM
Operating Temperature:	-40° to 185°F (-40° to 85°C)
Power Input:	3.3 to 15Vdc, 40mA
Output Signal:	TTL same as source
Standard Cable:	8 feet (2.4m)
Dimensions:	2.9" (L) x 0.625" diameter (73 x 16mm)

Ordering Information

Item	Description	Part No.
IRS-P	Sensor with 8 ft. cable with 1/8" phone plug connector and mounting bracket	6180-020
IRS-W	Sensor with 8 ft. cable with tinned lead and mounting bracket	6180-021

M-190 and MT-190 Magnetic Sensor/Amplifier



M-190 (Magnetic Sensor): Most popular sensor for use with 60 tooth 20 pitch gears. Sensor mounts within 0.005 inches (0.127mm) of a minimum 0.1 inch (2.5mm) target. Requires no power from the display module and self-generates an AC signal.

MT-190 (Magnetic Sensor with Amplifier): Extends operating gap to 0.25 inches (6.35mm) from the target. Frequently used on gears as the M-190, but can also sense bolt heads or shaft keys and provides a TTL output signal that is equal to the source voltage.

Common usage: Ferrous metal targets including gear teeth bolt heads or shaft keys for on-line systems.

Specifications M-190

Operating Distance:	0.005" (0.127mm) gap w/ 0.1" target (2.5mm) min.
Speed Range:	1-99,999 RPM
Operating Temperature:	-100° to 225°F (-73° to 107°C)
Power Input:	None (self generating)
Output Signal:	190V Peak to Peak
Standard Cable:	8 feet (2.4m)
Dimensions:	2.0" (L) x 0.625" (50 x 16mm)

Specifications MT-190

Operating Distance:	0.25" (6.35mm) gap with 0.1" target (2.5mm) min.
Speed Range:	1-99,999 RPM
Operating Temperature:	-100° to 225°F (-73° to 107°C)
Power Input:	3.3 to 12Vdc, 15mA
Output Signal:	TTL same as source
Standard Cable:	8 feet (2.4m)
Dimensions:	2.0" (L) x 0.625 diameter (50 x 16mm)

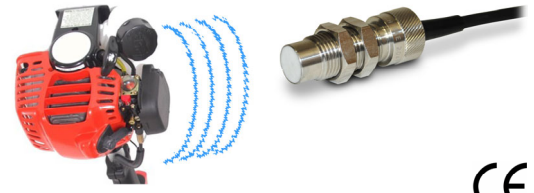
Ordering Information

Item	Description	Part No.
M-190-W	Sensor with 8 ft. cable with tinned leads	6180-012
MT-190W	Sensor with 8 ft. cable with tinned leads Includes amplifier with tinned leads	6180-037
MT-190P	Sensor with 8 ft. cable with tinned leads Includes amplifier with phone plug connector	6180-036

GE-200HP Inductive Gasoline Engine Sensor

GE-200HP: Ideal sensor for detecting gasoline engine RPM. Up to 12 inch (304mm) working distance from ignition coil or magneto.

Common usage: 2-cycle and 4-cycle gasoline/petrol engines.



Specifications

Operating Distance:	Up to 12 inches (304mm)
Speed Range:	200-30,000 RPM
Operating Temperature:	0° to 175°F (-18° to 80°C)
Power Input:	3.3 to 24Vdc, 4mA
Output Signal:	TTL same as source
Standard Cable:	15 feet (4.5m)
Dimensions:	2.16" (L) x 0.82" diameter (55 x 21mm)

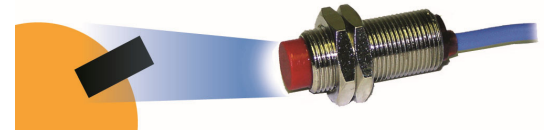
Ordering Information

Item	Description	Part No.
GE-200HP	Electromagnetic inductive spark plug sensor with 15 feet of cable. <i>Amplifier module required for proper operation</i>	6180-014
Mag Amp	Amplifier for GE200 HP Sensor. 3 ft. cable with 1/8" phone plug	4180-405
Mag Amp	Amplifier for GE200 HP Sensor. 3 ft. cable with tinned leads	4180-406

P5-11 Proximity Sensor

P5-11: A two wire probe style inductive sensor for use up to 0.2 inches (5mm) from 0.5 inch (12mm) metallic target such as bolt head or shaft locking key.

Common usage: Permanent installation in harsh industrial environments.



Specifications

Operating Distance:	0.2" (5mm) from 0.5" (12mm) metal target
Speed Range:	1-60,000 RPM
Operating Temperature:	-4° to 140°F (-20° to 60°C)
Power Input:	5.0 to 24Vdc, 3mA
Output Signal:	Namur (DIN 19 234)
Standard Cable:	6 feet (1.8m)
Dimensions:	1.3" (L) x 0.54" diameter (33 x 13.7mm)

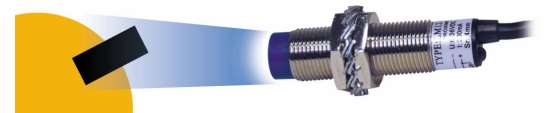
Ordering Information

Item	Description	Part No.
PS-11	Proximity sensor with 6 ft. cable	6180-013

PS-12 Proximity Sensor

PS-12: A three wire threaded IP67 metal sensor outputs an open collector PNP pulse. Operates at a 0.15 inch (4mm) gap with a .45 inch (12mm) target. Includes red LED on target indicator.

Common usage: Permanent installation in harsh industrial environment. Online vibration data collectors.



Specifications

Operating Distance:	0.15" (4mm) from 0.5" (12mm) metal target
Speed Range:	1-24,000 RPM
Operating Temperature:	-13° to 167°F (-25° to 75°C)
Power Input:	6 to 36Vdc, 15mA
Output Signal:	PNP Open Collector
Standard Cable:	6 feet (1.8m)
Dimensions:	2.0" (L) x 0.48" diameter (50 x 12mm)

Ordering Information

Item	Description	Part No.
PS-12	Proximity sensor with 6 ft. cable	6180-032

SPSR Self Powered Sensor



Specifications

Range (RPM):	Same as sensor
Output Signal:	TTL 0-5V or 5-0V (user selectable polarity)
Pulse Width:	Determined by size of target and rotational speed
Output Connector:	BNC connector
Power:	Rechargeable NiMH batteries, 40 hours or continuous with 115/230 Vac supply/recharger with interchangeable wall plugs

The unique **Self-Powered Sensor (SPSR)** provides a square wave pulse output from any of four input sensors: ROLS-P, ROS-P, IRS-P or MT-190P (See pages 17-18 for details). The TTL compatible pulse output is switch selectable as either positive going 0-5V pulses or negative going 5-0V pulses provided on a BNC connector. Internal rechargeable batteries provide 40 hours of operation between charges. For continuous operation, all SPSR configurations can be powered by the included 115/230Vac universal recharger/power supply with interchangeable wall plugs. Self-powered sensors are a critical element for providing one TTL pulse per revolution for vibration analyzers, spectrum analyzers, stroboscopes, data acquisition equipment, tachometers, balancers, waveform analyzers and magnetic tape recorders.

Ordering Information

Item	Description	Part No.
SPSR-115/230	SPSR interface module, power supply/recharger, ROS-P and 12 inches of T-5 tape	6150-020
SPSR-IM	SPSR interface module, power supply/recharger	6150-021

CSLS Compact Smart Laser Sensor



Specifications

Optical:	Class 3R (per IEC 60825-1) visible laser 650nm @ 3mW peak power
Operating Range:	Up to 65 feet (19.8m) from T-5 reflective tape
Speed Range:	1-500,000 RPM
Output Signal:	TTL 0-3.0V typical (positive going pulse)
Operating Temp:	32° to 104°F (0° to 40°C)
Dimensions:	3.5(L) x 2.4(W) x 2.2(H) (8.9 x 6.0 x 5.5mm)
Power:	5Vdc ±5% @ 30mA max

The **Compact Smart Laser Sensor (CSLS)** is a self-contained optical sensor intended to be used to make non-contact speed measurements from rotating targets at distances up to 65 feet (19.8 m). The sensor has both digital pulse and analog outputs to provide non-contact reference points to balancing equipment or signals to a vibration analyzer. The sensor will track surface irregularities on rotating shafts and provide pulse outputs from reflective tape, contrasting colors and keyways. The sensor is IP64 rated and is suitable for use in dusty damp environments. Includes ¼-20 tripod mounting bushing.



Ordering Information

Item	Description	Part No.
CSLS	Compact Smart Laser Sensor, 6 foot power/output cable and 12 inches of T-5 tape	6180-038

SLS Smart Laser Sensor



Specifications

Optical:	Class 3R (per IEC 60825-1) visible laser 650nm @ 3mW peak power
Operating Range:	Up to 65 feet (19.8m) from T-5 reflective tape
Speed Range:	1-500,000 RPM
Output Signal:	TTL 0-5 or 5-0V (user selectable polarity), RS232
Operating Temp:	32° to 104°F (0° to 40°C)
Dimensions:	5.41(L) x 2.35(W) x 2.14(H) (13.74 x 6.43 x 5.43mm)
Mounting:	¼-20 UNC bushing for tripod

The **Smart Laser Sensor (SLS)** is an internal battery-powered optical speed sensor utilizing a visible Class 3R Laser for a TTL pulse output. Operating range up to 65 feet (19.8 m) with reflective tape and up to 3 feet (1 m) from contrasting color targets, keyways, bolt heads or blades.

Features

- "Smart" auto gain provides best performance in picking up target reflections
- TTL pulse output signal inverter switch
- Manual sensitivity knob provides dynamic fine tuning of sensor response
- Signal/Pulse/RS232 Output DIN connector port
- External DC power/recharger port for continuous operation (24/7)



Ordering Information

Item	Description	Part No.
SLS 115/230	Smart Laser Sensor with 115/230 VAC universal power supply/ Recharger, BNC cable, 12 inches of T-5 tape and NIST certificate	6180-022