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

MONARCH INSTRUMENT

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Nova-Pro®
Stroboscope/Tachometer

Patented Technology

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.

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)

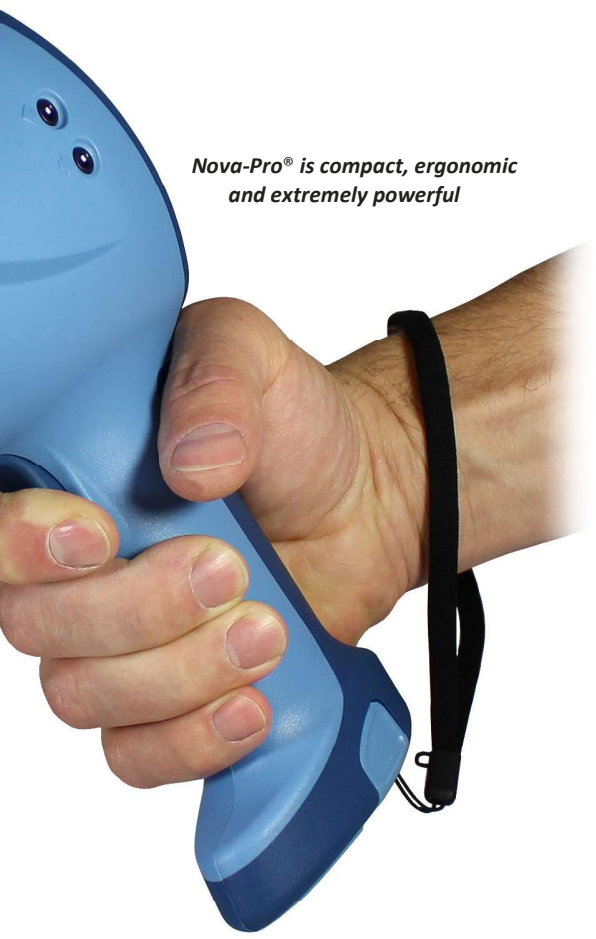
Typical Uses

- 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®
Stroboscope/Tachometer



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 reflective	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.

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)		

Features

- Bright, uniform light pattern
- Diagnostic inspection and RPM checks
- Digital LCD backlit display (DBL, PBL)
- Tripod mounting bushing (¼ -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)

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

PLS
Pocket LED Stroboscope

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.

7 LED Array

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 (¼ -20)
- CE marked, RoHS compliant
- NIST certificate included
- Intuitive one hand operation

Specifications

Display:	LCD display with 6 numeric 0.506 inch (12.85mm) high digits and 5 alphanumeric 0.282inch (7.11mm) high digits
Indicators:	Battery level, On Target, Select, TACH, and EXT icons
Memory:	Last setting before power down is remembered and restored on next power up. 5 user settable memory locations
Flash Duration:	Adjustable 0.5 to 2500 microseconds or 0.1 to 10 degrees of rotation (auto adjusts with flash rate)
Power:	Battery powered: Internal Li-Ion rechargeable batteries 3.6Vdc
Light Source:	7 LED Array
Light Output:	2000 Lux at 6000 FPM 12 (30.48cm) from lens 2° duty cycle Max light output: 8300 Lux
Color Temp:	approx. 6200°K
Run Time:	5-6 hours typical at 6000 FPM, and 2° duty cycle with fully charged batteries
Charge Time:	4-5 hours typical with supplied charger
Weight:	0.6 lbs. (0.27kg) including batteries
Dimensions:	7.75" x 2.75" x 2.3" (197 x 70 x 58 mm)

Internal Mode:	
Flash Range:	30-300,000 FPM (Flashes per minute) 0.5 to 5000Hz
Flash Rate Accuracy:	0.005% of setting or ± last digit
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
External Modes:	
Flash Range:	0-300,000 FPM (Flashes per minute) 0 to 5000Hz
Tachometer Mode:	30 to 300,000 RPM
Accuracy:	±0.005% of reading or ± last digit
Display Update Rate:	0.5 second typical above 120 RPM
Trigger to Flash Delay:	~15 µsec
External Input:	2.5V to 12V peak pulse 500 nanosec min pulse width, positive or negative edge triggered (menu selectable)
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 ±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

Specifications	*DBX Deluxe Battery*	*DAX Deluxe AC*	*BBX Basic Battery*	*BAX Basic AC*
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 µsec (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
- Virtual RPM mode provides slow motion viewing for high speed events
- Store and recall nine memory settings
- 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
- Tracking filter maintains phase lock
- Direct triggering from accelerometers
- 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

PSX
Palm Strobe x

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.

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

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

MVS
Machine Vision Strobes

The ***MVS Machine Vision Stroboscopes*** are designed for fixed installation in any application requiring continuous stroboscopic visual inspection. The **MVS** is available with xenon or LED light source and both have adjustable pulse width for optimized target illumination. Connect your existing trigger signal or the optional Frequency Controller with LCD. Connect multiple units together using the MVS distribution panel for applications requiring wide illumination area. Use the optional Audio Interface Box and Microphone to create stunning audio driven visual effects.

CE

Features

- Continuous cool operation
- Rugged fan cooled aluminum housing
- Tripod mounting bushing
- Dependable and versatile
- 115 or 230Vac input power

Inspection Applications

- Printing
- Textiles
- Paper Processing
- Packaging
- Bottling
- Special effects

Specifications	*Xenon*	*LED*
Range:	1 - 9000 FPM	30 - 500,000 FPM
Flash duration:	10-100 µsecs	1-300 µsecs
Light Source:	Xenon flash tube	12 LED array
Light output:	20 watts	6600 Lux @ 6000 FPM, 12 inches, 50µsec. pulse width. Max Light output: 32,000 Lux
Color Temp:	5000°K	6200°K
Trigger to Flash Delay:	5 µsecs	9 µsecs
Operating Temp:	32° to 104°F (0° to 40°C) max 80% Humidity	
External Trigger input	TTL (5 Vdc Max) Input	
Input Power	115 or 230 Vac 50/60Hz	
Size/Weight:	5.75 L x 4.36 W x 5.0 H / 1.5 lbs.	

MVS Rear Panel

Audio Interface Box

Frequency Controller with LCD

Range (ppm/Hz):	30-20,000 pulses per minute / 0.5-333 Hz
Display:	6 digit numeric and 5 digit alphanumeric LCD with backlight
Accuracy/Resolution:	0.002% of setting or ±1 least significant digit / 0.01 PPM
Input/Output:	Input: TTL (24Vdc max), 1/8 (3.5mm) phone plug connector Output: TTL (3.3Vdc), 1/8 (3.5mm) phone plug connector Output: Threaded DIN connector for direct connection to MVS Strobe. Power for Frequency Controller with LCD provided by MVS when connected. 8 foot cable with connectors included
Tachometer Mode:	5-250,000 - Use with optional remote sensors
Programmable Memory:	Yes
Internal Phase Shift:	Yes
Power Supply:	PSC-2U Universal power supply, 115/230 50/60Hz, supplied with USA, U.K., AUS and Euro adapter plugs.
Size/Weight:	5 x 3.5 x 1.5625 / 0.25 lbs.

Distribution Panel

Microphone

Frequency Controller with LCD

Ordering Information

Item	Description	Part No.
MVS 115	115Vac powered MVS Xenon Stroboscope with 8 foot TTL input cable	6250-020
MVS 230	230Vac powered MVS Xenon Stroboscope with 8 foot TTL input cable	6250-021
MVS LED 115	115Vac powered MVS LED Stroboscope with 8 foot TTL input cable	6250-022
MVS LED 230	230Vac powered MVS LED Stroboscope with 8 foot TTL input cable	6250-023
MVS Frequency Controller with LCD	Controller with universal power supply and 8 foot cable	6280-080
MVS Audio Interface Box	Interface box with interface cables	6280-081
MVS Audio Microphone	Audio Microphone with 8 foot cable and mounting hardware	6280-082
MVS Distribution Panel	Connect up to six (6) MVS strobes in parallel. Includes panel and (2) 8 foot cables	6250-084
MVS Connection Cable	8 foot 3.5mm phone plug to 4 pin DIN connector cable (for connecting MVS to distribution panel)	6280-085

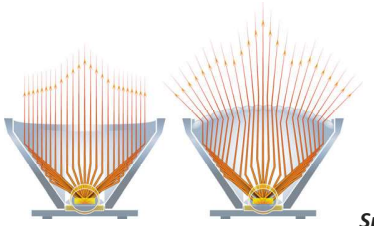
illumiNova®
Fixed Mount LED Stroboscopes

The **illumiNova®** fixed mount LED stroboscopic inspection systems are designed for continuous use in high speed applications requiring crisp, clear, stop motion quality inspection. The extraordinarily bright LED s provide an ultra uniform 6500k white spectrum light and are available in 12 inch aperture openings between 1 to 8 feet in width. There is also a compact 6 iNova model. Three different lens options ensures you will have light coverage for any job. The powerful on board intuitive digital controller allows the user to quickly set flash rates, flash duration, brightness levels and all other advanced features. Flash rates can also be triggered remotely using machine mounted sensors connected directly to illumiNova s digital input or use the optional Remote Controller to extend the operating distance up to 100 feet. Monarch Instrument has been manufacturing the world s most popular portable stroboscopes for over 30 years. We know a thing or two about stop motion analysis. Let us customize an illumiNova® fixed mount strobe system to meet your application specific requirements.

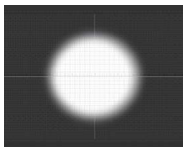
Brightness

The illumiNova® gets its brilliance from the delicate balance of forward current or full on power to the chip, and the ratio of duty -cycle/peak-current capabilities of the premium LED s we use. When combined with user visually-tuned preferences of sharpness & illumination settings, you will have optimal control for creating that perfect slow-motion or freeze-frame illusion for your inspection.

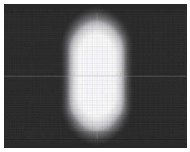
Full brightness is not always best with highly reflective and transparent materials or for multi-strobe, cross-lighting applications, so we have provided three brightness levels at the twist of a knob. This simple adjustment is also useful to compensate for high ambient lighting conditions and to improve on visual acuity in high contrast environments. In some applications the ability to synchronize multiple strobes yet independently control their light output makes the illumiNova perfect for these situations.



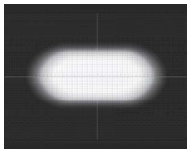
Spot



Flood



Wide



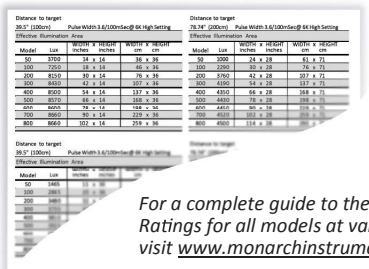
Spot, Flood and Wide lens
Engineered Lighting and Lens Options

Monarch Instrument uses high-intensity white LEDs in clusters of three and then pairs them with your choice of three lenses for the desired effect. We use optical grade polycarbonate acrylic materials to collimate the hundreds of light angles into a controlled illuminating beam that is perfect for your target area. For the tightest beam focus use Spot lenses, and for smoother diffused lighting that covers a wider illumination area, use our Flood or Wide directional lenses. UV and IR units use integral domed or flat LED s with no lens options.

Our LED light clusters have been placed in the optimum position to provide an extremely uniform swath of light, free from hot spots or drop-offs, whether you choose a Spot, Flood, or Wide lens array. Every array is designed and engineered for long-term reliability in demanding industrial environments.

illumiNova®	SPOT LUX	FLOOD LUX	WIDE LUX
Model 50	3700	1465	1627
Model 100	7250	2865	3100
Model 200	8150	3480	5690
Model 300	8430	3735	6890
Model 400	8500	3810	7380
Model 500	8570	3925	7550
Model 600	8600	3960	7640
Model 700	8660	3980	7690
Model 800	8660	4000	7690

Distance to target 39.5" (100cm), Pulse Width 3.6/100mSec @ 6K High Setting



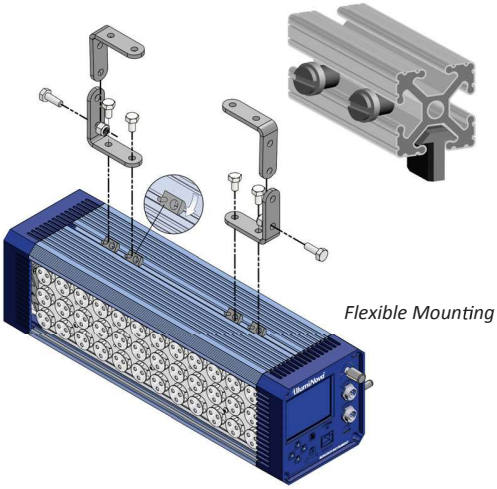
For a complete guide to the illumiNova Lux Ratings for all models at varying distances visit www.monarchinstrument.com or call us!

Controls are designed in

Based on our incredibly popular Nova-Pro® series of portable inspection stroboscopes, illumiNova s on board controller makes setup & use simple and intuitive. The easy to read inverse LCD display is viewable even in high ambient light areas. Flash rates can be quickly entered using the rotary dial, touch screen keypad, or Remote Controller.

Remote Controller

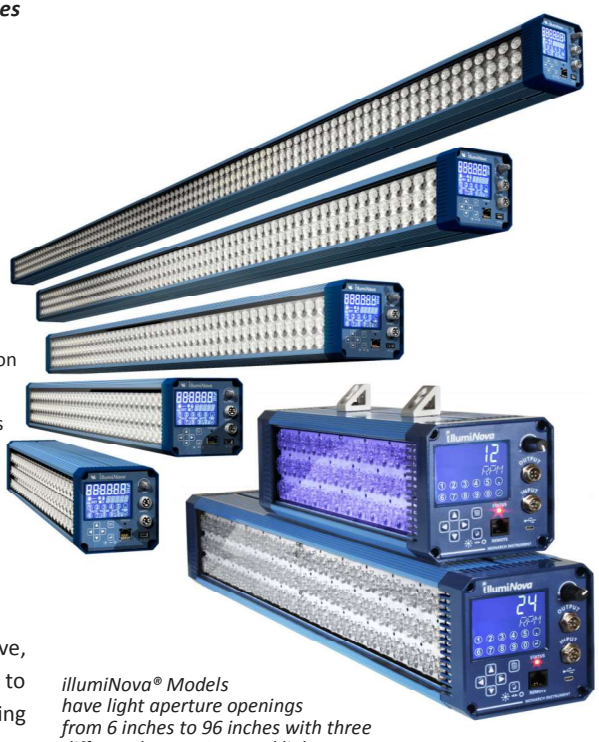
The optional Remote Controller allows you to be up to 100 feet away in a safe location while an overhead or mid-stream strobe is working in position. The same autonomous remote controller can be used on any illumiNova® throughout your production facility.



Flexible Mounting

We specialize in unique strobe technologies

- High speed Material Handling
- Machine Vision lighting & synchronization
- Non-contact speed and motion analysis
- High-speed measurement systems
- Laminated film Inspections
- Metallized coatings and finishing
- Textiles and non-woven manufacturing
- Life Sciences and luminescence
- Pharmaceutical Process Manufacturing
- Pulp & Paper production
- PET and Polypropylene container inspection
- Flexography web and print inspections
- Flexible packaging inspection technologies
- Fluorescent tags and security printing
- Slitting / Rewinding / Converters



illumiNova® Models have light aperture openings from 6 inches to 96 inches with three different lens options and light sources.

Designed for the applications we serve, from flexographic Narrow Web & Labels, to rotor gravure textiles, to metal finishing inspections, the illumiNova® models have a 4.4 x 4.4 square enclosure, and range from 9.5 inches (24cm) to eight feet (250cm) in width. Our versatile and very popular iNova, with its 6 light aperture opening, connects to an array of motion sensor and flash signal inputs.

Leveraging new wavelength technologies in LED illumination, we can now provide our Security Printing, Research Development, and the Life Science early adopters with Brilliant White, Ultraviolet, and Infrared strobes for their high-speed applications.

iNOVA 6 STROBOSCOPE with fully featured controller and input/output connectivity. Order with your choice of motion sensors.

Flexible Mounting Options (80-20® compatible)

The illumiNova® housing has an integral 80-20® compatible T-slot framing system built into three sides of its frame. Use the included mounting brackets or select from a wide range of 80/20® industrial mounting hardware that is readily available. This is practical for our narrow width models by setting up quick-mount utility frames allowing them to perform double-duty at multiple inspection points along the production line.

Ordering Information

Model Number	Description
illumiNova 50	iNOVA 6 LED stroboscope with 54 LED s 115 or 230Vac power 50/60Hz.
illumiNova 100	12 LED stroboscope with 108 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 200	24" LED stroboscope with 216 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 300	36" LED stroboscope with 324 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 400	48" LED stroboscope with 432 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 500	60" LED stroboscope with 540 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 600	72" LED stroboscope with 648 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 700	84" LED stroboscope with 756 LED's, 115 or 230Vac Power 50/60Hz.
illumiNova 800	96" LED stroboscope with 864 LED's, 115 or 230Vac Power 50/60Hz.

Model # + Lens Style + Programming Cable = Order #

Spot Lens = 1 | Flood Lens = 2 | Wide Lens = 3

Programming USB = 1 | Bluetooth = 2

\+ ☐ + ☐ =

Visit our monarchinstrument.com website for more illumiNova accessories

All models include intelligent controller, mounting hardware, NIST Certification and operation manual.

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.

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)

View Display and Target

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	10cm Contact Wheel	12 inch Contact Wheel
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: ±0.01% of reading Contact: ±0.05% of reading	
Resolution:	0.001 to 10 RPM (range dependent)	
Operating Distance:	2 to 25 (5cm to 7.62m), ±70° 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)	

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

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), ± 45° 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

The ***ACT Series Panel Tachometers*** consists of two models - one tachometer and one tachometer/rate meter/totalizer. Both feature inputs for two and three wire sensors providing signals of 0-5V TTL or 0-1.1 Vac to 0-50 Vac. Both models operate with all Monarch sensors (see Pages 15-18) and display in fixed or floating decimal point format. The **ACT-3X** dual channel input provides the best feature set of any panel or bench top instrument available today.

Features

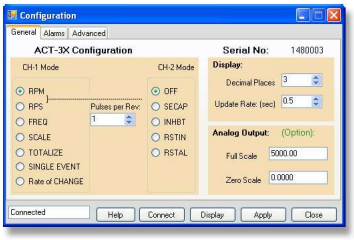
ACT-1B

- 5-99,999 RPM
- Economically priced
- Output options: 4-20mA, 0-5Vdc or TTL pulse

ACT-3X

- 5-999,990 RPM
- NIST Traceable Calibration Certificate
- Standard TTL pulse repeater output
- Optional 4-20mA, 0-5Vdc, and 2 alarm outputs
- Single event capture from start and stop pulses, in units such as mph, cm/sec, etc. Using two sensors - for linear rate of travel on second input channel

PM-Remote Software



Both the **ACT-1B** and the **ACT-3X** can be used with our free downloadable Windows based PM Remote Software to further enhance their capabilities. Use your PC to customize the configuration of the **ACT-1B** and **ACT-3X** or view real-time data over the communications interface. PM Remote Software requires the optional USB Programming Cable for the **ACT-1B** and the **ACT-3X** (with standard serial option). Standard serial, USB A-B and Ethernet patch cables can be used with the ACT-3X when ordered with RS232C serial, USB or Ethernet communication options. (*See page 16 for full details.*)

Specifications	*ACT-1B*	*ACT-3X*
Speed Range:	5-99,999 RPM	5-999,990 RPM (Speeds below 5 RPM Possible with multiple pulses per revolution)
Accuracy:	±1 RPM or 0.005% of reading	±0.001% of reading or ±1 of displayed value (standard gate) ±0.006% of reading or ±1 of displayed value (fast gate)
Resolution:	1 RPM	Up to 0.001 RPM, 10 RPM (100,000 to 999,990 RPM)
Totalizer/Counter:	N/A	Display Range: 0.001 to 99,999
Alarm Capability:	N/A	Two alarm set points: set as High or Low, latching or non-latching Hysteresis and low limit lockout are programmable
Alarm Output:	N/A	Two Form C relay contacts rated 1Amp at 230 Vac, can be set as failsafe
Communications:	3.5mm phone plug	Standard (3.5mm phone plug), Optional: RS232C, USB type B or Ethernet
Scale Factor:	N/A	0.0001-9999.9
Totalize/Count:	N/A	1-99,999
Input Configuration:	Universal inputs for all Monarch Sensors or TTL input or 1.5 to 50Vac input	
Analog Output:	Voltage: 0-5Vdc, 5mA max load or Current: 4-20mA, 500Ω max. 1-5Vdc with 250Ω resistor	
Pulse Repeater:	0-5V TTL compatible. One pulse out for each pulse in.	
Display:	5 digits, 0.56 (14mm) high red LED	
Display Update:	2x per second above 120 RPM	
Dimensions:	1/8 DIN by 4.5 (114mm) deep	
Input Power:	Standard: 100-240Vac, 50/60Hz Optional: 12 or 24Vdc ±20%, Isolated, 5 watts	
Sensor Power:	5 Vdc or 12 Vdc or optional 24Vdc to sensor	

Ordering Information

ACT-1B - ☐ ☐ ☐ ☐ ☐

Input Power
1 100-240Vac 50/60Hz
2 Isolated 12Vdc ±20%
3 Isolated 24Vdc ±20%

Pulse Output
0 No
1 Yes

Sensor Power
1 12Vdc
2 5Vdc
3 24Vdc

Analog Output
0 None
1xxxxx 0-5Vdc Non-iso.
2xxxxx 4-20mA Non-iso.
3xxxxx 0-5Vdc isolated
4xxxxx 4-20mA isolated

xxxxx = must specify full scale RPM

Input Pulses Per Revolution
xxx = Specify (001 to 999)

ACT-3X - ☐ ☐ ☐ ☐ ☐ ☐ ☐

Input Power
1 100-240Vac 50/60Hz
2 Isolated 12Vdc ±20%
3 Isolated 24Vdc ±20%

Sensor Power
1 12Vdc
2 5Vdc
3 24Vdc

Analog Output
0 None
1 0-5Vdc Non-iso.
2 4-20mA Non-iso.
3 0-5Vdc isolated
4 4-20ma isolated

Communications
0 Standard Serial (phone plug)
1 RS232C (9 pin D shell)
2 USB (Type B)
3 Ethernet (RJ45)

Alarm Outputs
0 None
1 2 Form C relays rated 1 amp @ 230Vac

BN Modification
0 None
1 Mod. for use w/ Bentley Nevada or eddy probes

F2A1X
Frequency to Analog Converter/Tachometer

The ***F2A1X Frequency to Analog Converter*** module converts a frequency input signal into a proportional analog voltage (0-5Vdc) or current (4-20mA) output. The output signal is electrically isolated from input signal and input power source effectively eliminating troublesome ground loops. The input signal can be supplied from a Monarch sensor (measuring RPM for example) or any source of digital signal not exceeding 12 volts. The **F2A1X** is factory preprogrammed with the full scale output and input scale factor of your choice. These settings are also user configurable with the optional USB programming cable and free downloadable PM Remote Software. PM Remote Software also displays data in real-time. The **F2A1X** requires 12-24Vdc input power.

CE

Features

- Economically priced
- Rugged, compact and lightweight
- Electrically Isolated input/output
- 5 to 600,000 RPM range (0.1 to 10kHz)
- Compatible with most speed sensors (TTL)
- 12 to 24 Vdc input power
- User configurable*
- View real-time data on PC*
- 4-20mA or 0-5Vdc scalable output
- 5 Vdc or 10 Vdc sensor supply (jumper selectable).

*Requires optional USB programming cable and free downloadable PM Remote Software (see page 16)

Specifications

Input Range:	0.1 to 10,000 Hz (5 to 600,000 RPM)
Accuracy:	0.005%
Resolution:	76 µvolts or 30.5 Nano amps
Power Supply:	12 to 24Vdc ±5% @ 150mA max
Inputs:	TTL input or ±3Vac to ±12Vac, scaling is programmable using PM Remote Software and USB programming cable
Sensor Excitation:	5 Vdc or 10 Vdc @ 75mA (user selectable jumper setting)
Current Output Option:	4-20mA out, 16 bit resolution. Zero and full scale setting as specified when ordered or programmable using PM Remote Software and USB programming cable
Voltage Output Option:	0-5Vdc out, 5mA 16 bit resolution. Zero and full scale setting as specified when ordered or programmable using PM Remote Software and USB programming cable
Dimensions:	L x H x W = 80 x 40 x 28mm (3.2 x 1.6 x 1.2) excluding mounting wings
Environmental:	Indoor use only, installation category II per IEC 664 **Temperature:** -10° to 50°C operating per IEC 61010-1 **Humidity:** 80% max for temps up to 31°C, decreasing linearly to 50% RH at 40°C
Electrical Safety:	Meets EN61010-1:2001, EC low voltage directive 2006/95/EC

Ordering Information

Configure Model # here: **F2A1X -** [ ] [ ] [ ]

Input Mode (select input measurement mode)
1 Frequency (Hz/RPS)
2 RPM (Assumes 1 pulse per revolution)
3 Custom (Contact factory or order optional PM Remote Software and USB programming cable, see accessories below).

Analog Output
1 0 to 5Vdc, Isolated
2 4-20mA, Isolated

Full Scale Output
xxx Specify full scale output of analog signal (1 to 600,000)

Application Example 1: Convert 0 - 5000 RPM signal to a 4-20mA output
Model number = F2A1X-2-2-5000

Application Example 2: Convert a 0 to 8kHz signal to a 0-5Vdc output that is proportional to 0 to 200,000 GPH (Gallons Per Hour)
Model number = F2A1X-1-1-200,000

Recommended Sensors (see pages 17-19)

- Optical - ROS-W
- Infrared - IRS-W
- Laser - ROLS-W

PM Remote Software

More advanced setups such as multiple input pulses per revolution, elevated zeros and custom scale factors can be accomplished using the advanced setup capabilities of our free PM Remote Software and optional USB Programming Cable which can be ordered separately (See page 16 for details).

Item	Description	Part No.
USB Prog. Cable/Sftwr.	3 Ft. USB Programming Cable and Windows compatible PM Remote Software package. Allows user configuration of operation mode, analog output scaling, decimal places, display update rate and pulses per input. View real-time data in digital format and/or through Microsoft® Excel.	6180-031

The ***F2A3X Frequency to Analog converter*** is a DIN rail module that converts a frequency input signal into a proportional analog voltage (0-5Vdc) or current (4-20mA) output. The output signal is electrically isolated from input signal and input power source effectively eliminating troublesome ground loops. The input signal can be supplied from a Monarch sensor (measuring RPM for example) or any source of digital signal not exceeding 12 volts. The **F2A3X** is completely user programmable using the free downloadable PM Remote Software (see full features on page 16).

CE

Features

- Standard DIN rail mounting
- Ethernet communications available
- 5 to 999,990 RPM range (0.083 to 250kHz)
- Compatible with most speed sensors (TTL)
- 12 to 24 Vdc input power
- Alarm set point with optional relay output
- Pulse repeater output
- User configurable
- View real-time data on PC
- 4-20mA or 0-5Vdc scalable output
- 10 Vdc or 5Vdc sensor excitation

Specifications

Input Range:	5-999,990 RPM speeds below 5 RPM possible with multiple pulses per revolution (0.083 Hz to 250 KHz)
Input Configuration and Voltage Range:	1 to 9,999 pulses per revolution or use a scale factor of 0.0001 to 99,999 PC software programmable, TTL input and 1.1V to 25Vdc signals-Internal Jumper for : ±1 to ±25Vac
Analog Output:	Voltage: 0-5Vdc, 5mA max load, Isolated or 4-20mA Isolated, 500Ω max load, Internal 12V compliance voltage. 16 bit resolution. Full scale and offset RPM ranges PC programmable
Accuracy/Resolution:	0.005% of full scale output / 76 µvolts or 30.5 Nano amps
Output Update:	Software selectable up to 244 times/sec-dependent on input frequency
Memory:	Maximum and minimum recall via PC software
Dimensions:	1/8 DIN by 3.94 (100mm) deep
Input Power:	Standard 12-24Vdc 4.5W max or optional 12Vdc to 24Vdc isolated 4.5W max
Sensor Excitation:	10Vdc @ 60mA standard or optional 5Vdc @ 60mA
Pulse Repeater Output:	0-5V TTL compatible, one pulse out for each pulse in. Polarity is software selectable
Communications:	Ethernet RJ45 or USB type B
Alarm Capability:	Optional alarm with relay output - Set points: High or low alarm limit, latching or non-latching. PC Programmable
Alarm Outputs:	1 Form C relay contact, rated 1A at 115Vac or 230Vac
Alarm Reset:	Automatic or manual reset. Front panel push button or remote reset via PM Remote Software
Environmental:	Indoor use only, installation category II per IEC 664 **Temperature:** -10° to 50°C operating per IEC 61010-1 **Humidity:** 80% max for temps up to 31°C, decreasing linearly to 50% RH at 40°C
Electrical Safety:	Meets EN61010-1:2001, EC low voltage directive 2006/95/EC

Ordering Information

Configure Model # here: **F2A3X -** [ ] [ ] [ ] [ ] [ ] [ ]

Input Power
1 12-24 Vdc Non. Isol.
2 12-24 Vdc Isolated

Sensor Power
1 10-12 Vdc
2 5 Vdc

Analog Output
1 0-5 Vdc Isolated
2 4-20mA Isolated

Communications
1 USB Type B
2 Ethernet (RJ45)

Alarm Output
0 None
1 1 Form C Relay

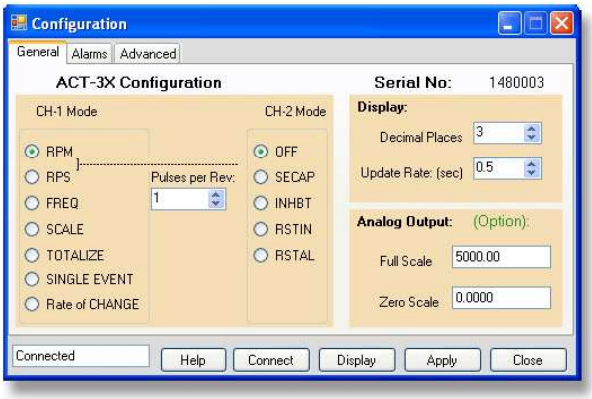
Bentley Nevada Mod
0 None
1 Modification to support use of Bentley Nevada or Eddy style probes

Recommended Sensors (see pages 17-19)

- Optical - ROS-W
- Optical - ROS-HT-W-25
- Optical - ROSM-5W
- Infrared - IRS-W
- Laser - ROLS-W
- Magnetic - MT-190W

PM Remote Software
F2A3X is completely user configurable with free downloadable PM Remote Software (See page 16 for details).

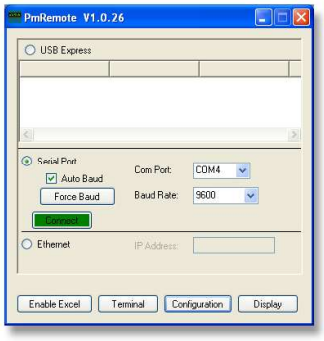
PM Remote Software



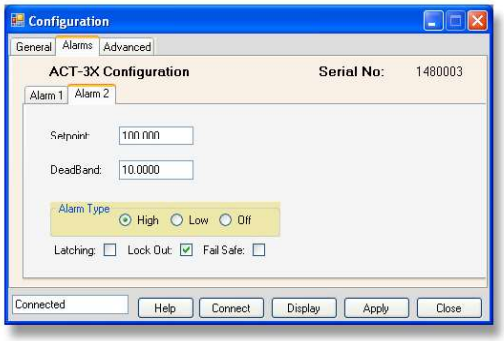
PM Remote Software is a free downloadable Windows based software application that allows users to quickly and easily customize the configuration of the **ACT-1B**, **ACT-3X**, **F2A1X** and **F2A3X**. Set the mode of operation to RPM, RPS or Frequency and select the input scale (pulses per revolution). Real-time data can be displayed directly on the PC along with Min and Max values. Decimal places and display update rate are user configurable.

Features

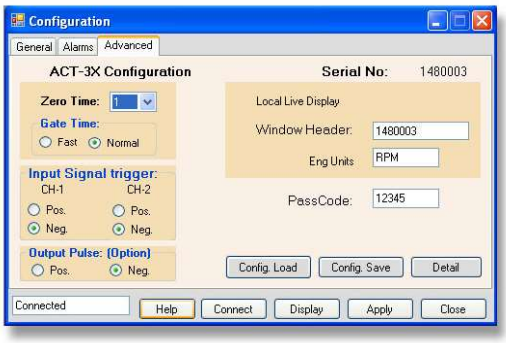
- Allows quick set up of **ACT-1B**, **ACT-3X**, **F2A1X** and **F2A3X**
- Display live data remotely on PC
- Unit configurations can be saved for reloading in the future.



Communications Set-up



Alarm Set-up



Advanced Set-up

Programmable Features	*ACT-1B*	*ACT-3X*	*F2A1X*	*F2A3X*
Mode of operation (RPM, RPS, Hz, etc.):	X	X	X	X
Channel 2 mode:		X		
Input pulses per revolution:	X	X	X	X
Output scale:	X	X	X	X
Pulse output (pos. or neg.):	X	X		
Decimal places:	X	X	X	X
Alarms (set points, type and logic):		X		X
Input signal trigger (pos. or neg.):	X	X	X	X
Real-time PC display:	X	X	X	X

Real-Time PC display

*Communications**	*ACT-1B*	*ACT-3X*	*F2A1X*	*F2A3X*
Serial Programming port**	Standard	Standard	Standard	
USB Type B		Optional		Standard
Ethernet		Optional		Optional
RS232		Optional		

*Only one communications option may be selected per unit.
** USB Programming Cable must be purchased separately.

USB Programming Cable

Ordering Information

The USB Programming Cable is required for communication with the F2A1X frequency converter, the ACT-1B panel tachometer and the ACT-3X panel tachometer with the standard serial communications (option 0).

Item	Description	Part No.
USB Programming Cable	3 Ft. USB Programming Cable for use with free Windows PM Remote Software Download	6180-031

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)

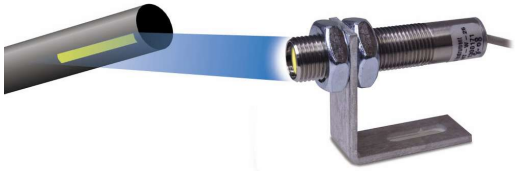
Ordering Information

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)

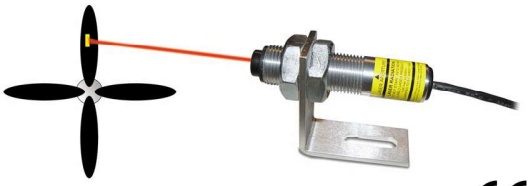
Ordering Information

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.



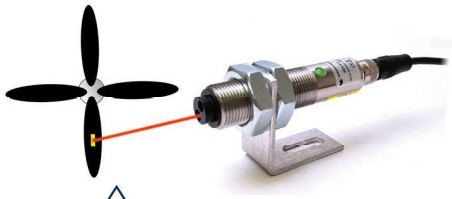
Specifications

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.

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

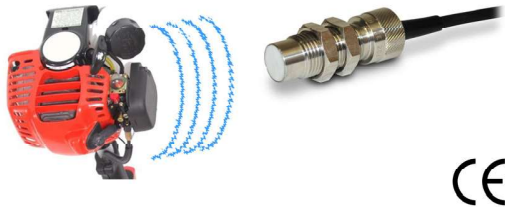
Specifications	*M-190*
Operating Distance:	0.005 (0.127mm) gap w/ 0.1 target (2.5mm) min.
Speed Range:	1-99,999 RPM
Operating Temperature:	-100° to 225°F (-73° to 107°C)
Power Input:	None (self generating)
Output Signal:	190V Peak to Peak
Standard Cable:	8 feet (2.4m)
Dimensions:	2.0 (L) x 0.625 (50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

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)

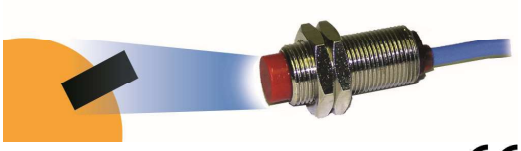
Ordering Information

Item	Description	Part No.
GE-200HP	Electromagnetic inductive spark plug sensor with 15 feet of cable. ***Amplifier module required for proper operation***	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

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.

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

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

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.

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

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

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)

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

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

DataChart 1250
Dual Channel Recording Tachometer

The ***DataChart 1250*** is a feature rich data acquisition system offering 2 universally configurable inputs for measuring DC voltage, DC current, thermocouples and RTD s as well as frequency and pulse inputs. 4 internal alarm set points, 2 alarm relay outputs and 1 digital control input are all standard. A maximum sample storage rate of 100 samples per second can be set for both channels allowing for capture of short duration process signal anomalies. CompactFlash cards up to 2 Gigabytes in size can be used allowing many data points to be stored over long periods of time.

The **DC1250** can be used in conjunction with many of Monarch s speed measurement sensors. Power for sensors is provided from the DC1250 rear terminals. Measure, display and record RPM ranges from 5 to 600,000. Choose the sensor best suited for your application or take your existing signal directly into the DC1250.

ROS-W

MT-190W

IRS-W

Specifications (abbreviated)

Input Power:	
Standard:	9 Vdc ±0.5Vdc @ 5VA (depends on external loads) provided by external AC wall transformer, non-isolated. 100-240Vac 50/60Hz
Option:	Isolated 12-24 Vdc input power available (not compatible with internal battery pack option below)
Option:	Internal battery pack provides uninterrupted operation and controlled shutdown during blackout. 6Vdc, 2400mAH NimH
No. of Channels:	2 universal, user selectable
Isolation:	300V AC/DC channel input to chassis ground
Input Types:	
DC Voltage:	
Ranges:	0-250mV; 0-1.25V; 0-2.5V; 0-5V; 0-12.5V; 0-25V
Accuracy:	0.1% of reading
Resolution:	0.025% of full scale
DC Current:	
Ranges:	0-20mA; 4-20mA; 0-50mA; 10-50mA
Accuracy:	0.1% of reading excluding 250 ohm external shunt (required)
Resolution:	0.025% of full scale
Frequency Input:	
Range:	0-10,000 Hz / 0 - 600,000 RPM
Accuracy:	Freq: ±1 Hz; RPM: ±1 RPM below 9,999: ±10 RPM above 9,999RPM
Input:	Low <1.0Vdc; High >3.0 <12.0Vdc
Pulse Width:	10 microsecond minimum
Input Impedance:	>100K ohms
Measure Rate:	Up to 100 samples/second per channel
Math Functions:	Y = mx + b, average, hi peak, low peak, and totalization
Media:	CompactFlash up to 2GB size max.
Display:	LCD graphics, 160 x 80 pixels, black FSTN with white LED backlight. User controlled backlight level and contrast adjust
User Interface:	5 button keypad (dual function buttons)
Clock:	Auto leap year and daylight savings adjustment. Internal battery back-up
Relay Outputs:	Two alarm outputs: 30V 0.25A Form A relays
Voltage Output:	2 outputs 5Vdc @ 50mA to power external sensors
Control Input:	One input, 5 to 12Vdc activation @ 10mA typical
Audible:	Internal beeper (multiple tones).
Dimensions:	Front panel: 96mm x 96mm (1/4 DIN) x 152mm (3.78 x 3.78 x 6 inches)

Temperature Inputs

Thermocouple:	Range °C	Range °F
J	-100 to 760°C ±2°	-148 to 1400°F ±3°
K1	-100 to 1000°C ±2°	-148 to 1832 °F ±3°
K2	0 to 1370°C ±2°	32 to 2498 °F ±3°
T	-240 to 400°C ±2°	-400 to 750°F ±3°
E	-80 to 400°C ±2°	-112 to 750°F ±3°

Accuracy: 0.3% of full scale (typical)
Ambient temperature sensor accuracy : ±1.5°C

RTD (2 or 3 wire):	Range °C	Range °F
100 ohm Pt 385	-100 to 750°C	-148 to 1380°F
100 ohm Pt 392	-100 to 750°C	-148 to 1380°F

Accuracy: 0.3% of full scale (typical) Resolution 0.1°C
Internal current source: 1mA

Ordering Information

DC1250 - ☐ ☐ ☐

Configure Model # here:

1. Choose Input Power

U	Universal	AC Adapter 100-240Vac wall adapter with interchangeable plug set
D	DC Input Power	12-24Vdc isolated input power

2. Choose backup

0	None	
1	Battery Backup*	Rechargeable NiMH battery pack will operate recorder up to 6 hours in the event of power loss

*Not available with Option D DC input power

3. Choose Communications

0	None	
1	USB Comms.	Mini-USB port for downloading data directly to PC. Front access.
2	Ethernet	10/100 BaseT Rear access RJ45 connector. Allows network access to recorder.

Item	Description	Part No.
Navigator	Windows compatible Software for graphic analysis, printing, transfer and exporting	5380-260
CFCR	CompactFlash card reader , USB 2.0 compatible	5380-102
MAS250R	250 ohm precision resistor for current inputs. 0.1%, 0.5 watt	5380-151
THP-W	Temperature Humidity Probe with 8 foot cable	5380-505
MC1024MBCF	1 Gigabyte CompactFlash card	4380-165
MC2048MBCF	2 Gigabyte CompactFlash card	4380-166
NIST	Calibration available - contact factory	

Portable USB Temperature/Humidity Probe/Data Logger

Android device not included

The Portable USB Temperature and Humidity Probe combines high accuracy temperature and humidity sensors into a rugged stainless steel probe with built in USB interface. The probe can be used with Windows based PC s or Android devices that support On-The-Go communications. To use with an Android device simply download the free App from Google Play, plug the probe into your device with the supplied interface cables and start the application. The probe receives its power from the host USB device. Real time data is displayed and can be stored for review on the PC using a spreadsheet or review data graphically using our free *Track-It* data logger software. Available in 12 or 18 (300mm or 450mm) lengths. The probe comes standard with a free flow Delrin cap. Optional sintered stainless steel filter caps are available for measuring dry bulk material or for use in dusty/dirty environments.

Features

- Rugged stainless steel construction
- 6.5 (2 meter) USB cable included
- Android On-The-Go cable included
- High accuracy and repeatability
- Dew point calculation

Typical Uses

- HVAC spot checking
- Dry bulk material measurement
- Environmental chambers
- Laboratories
- Storage facilities

Android is a trademark of Google LLC

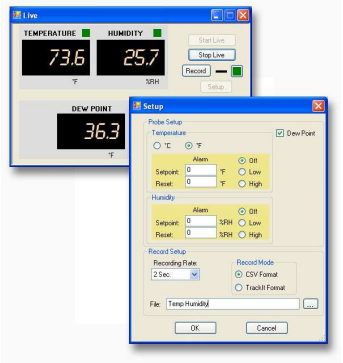
App and Software

The Portable Temperature Humidity Probe includes a suite of free software products that enhance your ability to measure, record, analyze, trend and print historic data. Begin by installing and using either the TH- Probe Android App or the TH Probe PC Software. View and record real time digital temperature, humidity and dew point data and then use our free *Track-It* data logger software to view historic data in graphic format.

Scan code or Download free Android App here:
https://play.google.com/store/apps/details?id=com.trackit.thProbe&hl=en

Android App

THProbe PC Software



Download the free PC software here:
www.monarchinstrument.com/Software/THProbe_Software.zip

Download Track-It Software here:
http://monarchinstrument.com/Software/Track-It_Software.zip

Track-It Software

Specifications

Temperature

Parameter	Conditions		Units
Range:		-40 to 85*	°C
		-40 to 185*	°F
Accuracy:	0 to 100	±0.2	°C
		±0.4	°F
Output:	Serial USB		

**Range applies to sensor end of probe only*

Relative Humidity

Parameter	Conditions		Units
Range:		0-100	%RH
Accuracy (@25°C):	10 to 90	±1.2	%RH
Repeatability:		±0.1	%RH
Response:	Tau at 63%*	10	Sec

**With standard slotted cap*

Optional Stainless Steel Filter Caps

Ordering Information

Part No.	Description
6184-010	12 Temperature/Humidity probe with 2 meter USB interface cable and Android On-The-Go cable
6184-010-CAL	12 Probe above with N.I.S.T. Calibration Certificate
6184-011	18 Temperature/Humidity probe with grip, 2 meter USB interface cable and Android On-The-Go cable
6184-011-CAL	18 Probe above with N.I.S.T. Calibration Certificate
6184-901	Sintered filter cap (30-45 micron)
6184-902	Sintered filter cap (60-90 micron)
6184-910	Protective carry case for USB Temp/Humidity probe

Examiner 1000
Vibration Meter

The ***Examiner 1000*** overall vibration meter and electronic stethoscope is the ideal tool for cost effective predictive maintenance. This meter is simple to operate with only one button and volume adjustment. Troubleshoot bearings and lubrication with the digital LCD and stethoscope features to enhance machinery reliability. Compare your vibration results by using the ISO 10816 Severity Chart right on the meter. **NIST traceable calibration is available.**

Features

- Electronic stethoscope - troubleshoot while listening to the bearing
- Measure vibration in:
  - **Acceleration** - perfect for high speed applications
  - **Velocity** - in English or Metric per ISO 10816
  - **Acceleration Envelope** - high pass filter method

Facilities that establish a predictive maintenance program are able to:

- Improve machinery reliability and reduce unplanned failures
- Reduce maintenance costs
- Optimize machinery performance to increase productivity
- Lower energy consumption-less vibration usually means less friction
- Extend bearing service life

Why Measure Vibration?

Vibration is considered the best operating parameter to judge dynamic conditions such as balance (overall vibration), bearing defects (enveloping) and stress applied to components. Many machinery problems show themselves as excessive vibration. Rotor imbalance, misalignment, mechanical looseness, structural resonance, soft foundation, and gear mesh defects are some of the defects that can be measured by vibration. Measuring the overall vibration of a machine, a rotor in relation to a machine or the structure of a machine, and comparing the measurement to its normal value (norm) indicates the current health of the machine.

Specifications

Amplitude Ranges:		
	Acceleration:	0.01 to 19.99g (RMS)
	Velocity:	0.01 to 19.99 in/sec (RMS)
		0.1 to 199.9 mm/sec (RMS)
	Envelope:	0.01 to 19.99 ge (PEAK)
Frequency Ranges:		Overall: 10 Hz to 10 kHz Envelope: 0.5 kHz to 10 kHz
Display Indications:		LCD 3.5 digit with Measurement, Hold and Low Battery
Vibration Sensor:		Piezoelectric Accelerometer 100 mV/g
Output:		Audio: (3.5 mm) mini plug Sensor Power: 12 Vdc
Power:		(2) AA cell batteries
Operating Time:		20 hours continuous without phones
Environmental:		-14 to 122°F (-10 to 50°C)
Dimensions:		6.3 x 3.3 x 1.25 (1.52 x 83 x 32 mm)
Weight:		2.85 lbs. (1.30 kg)

Vibration Severity Per ISO 10816-1

Machine			Class I Small Machines	Class II Medium Machines	Class III Large rigid foundation	Class IV Large soft foundation
	In/s	mm/s				
Vibration Velocity Vrms	0.01	0.28				
	0.02	0.45				
	0.03	0.71		Good		
	0.04	1.12				
	0.07	1.80				
	0.11	2.80		Satisfactory		
	0.18	4.50				
	0.28	7.10		Unsatisfactory		
	0.44	11.2				
	0.71	18.0				
	1.10	28.0		Unacceptable		
	1.77	45.0				

Ordering Information

Item	Description	Part No.
Examiner 1000	Overall vibration meter and electronic stethoscope. Includes: Vibration meter, batteries, accelerometer and integrated cable, magnetic base, stinger probe, stereo headphones, field carrying case, owners manual and machinery data worksheet.	6400-011
Examiner 1000 NIST	Same as above with NIST Calibration Certificate	6400-011-Cal

Corporate History
Innovation in Instrumentation

Monarch International, Inc. was founded in 1977 as a sales and service organization for a diverse range of instrumentation. In 1982, the Monarch Instrument Division was established to manufacture and market the first microprocessor based portable tachometers.

Monarch International s 30,000 square-foot facility in Amherst, New Hampshire, USA

With the addition of new models of tachometers and the introduction of the Nova-Strobe Series of portable stroboscopes in 1990, Monarch rapidly became the worlds largest supplier of rotational speed measuring instrumentation and stroboscopic inspection equipment.

In 1992, Monarch introduced the DataChart Paperless Recorder. Today, we offer a wide range of technical capabilities and competitive pricing throughout the DataChart product line to include color touch-screens and multi-channel recorders.

The Track-It Data Logger line was introduced in 2010. New and innovative models are being added continuously.

Monarch Instrument remains committed to innovations and quality in sales, customer service and manufacturing. ***Innovation in Instrumentation*** is the Monarch design philosophy and in recent years we have introduced state-of-the-art products:

- **illumiNova® Fixed Mount Stroboscopes**
- **Nova-Pro® Stroboscope/Tachometer**
- **PLS Pocket LED Stroboscope**
- ***Track-It*** **Indicating Pressure/Temp Logger**
- ***DataChart*** **6000 Paperless Recorder**

Monarch Instrument holds multiple Patented Technologies and Registered Trademarks including Nova-Pro® and illumiNova®. In addition the following trademarks and service marks are also property of Monarch Instrument: Track-It , PalmStrobe , DataChart , The Professional s Choice .

Our full service sales force and world-wide distribution network stands ready to answer purchase and product application questions. Please feel free to contact us via our toll free number, website, e-mail or fax. We offer a comprehensive line of precision products and calibration services, all with the convenience of the Internet. Monarch Instrument is a ISO9001:2015 certified facility.

Please visit our website to locate a distributor in your area.

Visit our website to see our complete range of products:

Track-It Pressure Loggers

Portable Tachometers

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DataChart Paperless Recorders

Speed Sensors

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