

*Your solution source for pro-active maintenance and monitoring instruments since 1977*



- Tachometers
- Totalizers
- Timers
- Stroboscopes
- Vibration Meters
- Speed Sensors
- Fiberscopes
- Ultrasonic Leak Detectors
- Recording Tachometers



**MONARCH INSTRUMENT**



#### Example Applications:

- Centrifuges
- Saw blades
- Grinders
- Elevators/escalators
- Engines
- Motors
- Conveyor belts
- Fans
- Propellers
- Vibration Studies

Pocket Laser Tach 200



#### "Safety First"

Safe and Accurate Non-Contact Measurements-View Target & Display Simultaneously, a Monarch Exclusive.

#### Two Tachs in One ... the only portable laser tachometer available with both Remote Contact and Remote Sensors.

Optional plug-in Remote Sensors with 8 foot cable. (25 foot cables available). See page 9 for details.



Remote Optical Sensor (ROS-P) Gap 36 inches



Remote Magnetic Sensor (MT-190-P) Gap 0.25 inches



Remote Infrared Sensor (IRS-P) Gap 0.50 inches

Remote Contact Assembly (RCA) with 6 foot (1.82m) cable, Contact Tips and 10 cm Linear Contact Wheel (Shows optional 12 inch circumference Linear Contact Wheel)



Optional RCA



TTL pulse Input/output cable with BNC connector



Protective Carry Pouch with belt loop (optional)



PLT200 shown with optical sensor and TTL output cable



PLT200 and PT99 have a 1/4 20 threaded bushing for tripod mounting

The rugged and versatile Pocket Laser Tach is ideally suited for non-contact, contact and linear speed measurements.

**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.

#### Multi-Function For Pro-Active Maintenance

PLT200 is a 32 function Tachometer/Ratemeter, Totalizer/Counter and Timer (stopwatch), which is programmable in both Imperial and Metric rates. Includes two phono 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.

Pocket Laser Tach 200 Kit includes: Tachometer, RCA, Contact Tips, 10cm Linear Contact Wheel, 5 feet of Reflective Tape and a Latching Carrying Case.



PLT200 Kit

#### Specifications PLT200

- Display: 5 Digits, 5 Alphanumeric LCD
- Range(s): \*Optical: 5 to 200,000 RPM  
\*\*Contact: 0.5 to 20,000 RPM

Rates	10cm Contact Wheel	12 inch circumference Contact Wheel
Inch/min	1.969 to 78,740 IPM	6.000 to 144,000 IPM
Feet/min	0.164 to 6,561.7 FT/M	0.500 to 12,000 FT/M
Yard/min	0.055 to 2,187.2 YPM	0.167 to 4,000.0 YPM
Cm/min	5.000 to 200,000 cm/M	15.240 to 365,760 cm/M
M/min	0.050 to 2,000.0 M/M	0.153 to 3,657.6 M/M

- 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 (rpm)
- Resolution: 0.001 to 10 RPM (range dependent)
- Operating Distance: 2" to 25' (5cm to 7.62m),  $\pm 70^\circ$  from perpendicular
- Memory: Maximum, Minimum and Last
- Power: (2) "AA" 1.5 VDC batteries (30 hours)  
5° to 40°C (40° to 105°F)
- Environmental: 80% RH up to 31°C (88°F)
- Dimensions: 6.92 "H x 2.4" W x 1.6" D  
(17.58 x 6.10 x 4.06cm)
- Weight: 7 oz. (210 g)

\* performance subject to intensity of ambient light irradiation.  
\*\* also reads units per second and per hour.



#### Ordering Information

Pocket Laser Tach 200 Tachometer, N.I.S.T. traceable certificate of calibration, 12 inches of Reflective Tape.  
 Pocket Laser Tach 200 Kit Tachometer with Latching Carrying Case, RCA, Tips and Linear Speed Wheel, Battery, 5 foot roll Reflective Tape, N.I.S.T. traceable certificate of calibration.  
 ROS-P Remote Optical Sensor with Mounting Bracket and 8 foot cable for Pocket Laser Tach 200 only.  
 ROS-P-25 Same as above with 25 foot cable.  
 T-5 Reflective Tape, 5 foot roll, 1/2" wide.  
 TTL pulse output cable  
 Latching Carrying Case

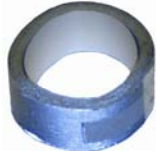
## Pocket-Tach PT99



**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. Pocket Tach 99 is the value-leader of the world-class Pocket Tach Series from Monarch.



Protective Carry Pouch with belt loop (optional)



T-5 Reflective Tape 5' x 1/2" wide roll



PLT200 and PT99 have a 1/4" 20 threaded bushing for tripod mounting



Pocket Tach 99

- Example Applications:**
- Grinders
  - Abrasives
  - Motors
  - Engines
  - Pumps

### Specifications PT99

• Display:	5 Digits, 5 Alphanumeric LCD
• Range:	5 to 99,999 RPM
• Accuracy:	±0.01% or ±1 Digit
• Resolution	Autoranging: 0.001 to 1.0 RPM
	Fixed: 1 Digit RPM
• Operating Range:	2 inches to 36 inches, ±45°
• Memory:	Maximum, Minimum and Last
• Power:	(2) "AA" 1.5 VDC batteries (60 hours)
• Environmental:	5° to 40°C (40° to 105°F)
	80% RH up to 31°C (88°F)
• Dimensions:	6.92 "H x 2.4"W x 1.6"D (17.58 x 6.10 x .06cm)
• Weight:	7 oz. (210 g)

### Ordering Information

Pocket-Tach 99 Tachometer, Battery & 6 inches Reflective Tape.  
Carry Pouch  
T-5 Reflective Tape, 5 foot roll, 1/2" wide.

# PORTABLE TACHOMETERS (Non-Contact with Pistol Grip)

## Phasar-Laser Tach Series



**Phasar-Laser** combines the accuracy and safety of a non-contact optical tachometer with the convenience and ease of operation of a pistol grip instrument, housed in a rugged steel enclosure. The tachometer provides a convenient visible red laser for easy targeting along with a latching trigger for hand held operation and a mounting bushing for tripod mounted use.

**Phasar-Laser-R** provides for an optional remote sensor for difficult to reach locations in addition to the standard internal measurement optics.

### Features

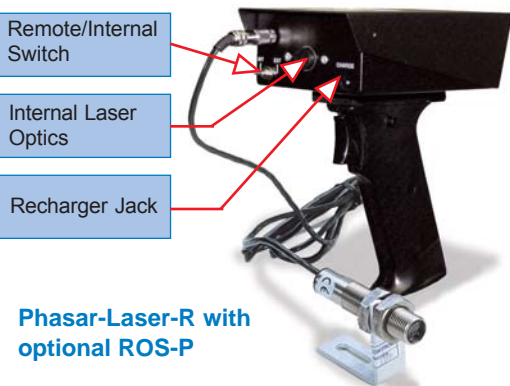
- Convenient pistol grip design
- Rugged steel enclosure
- Safe non-contact operation to 10 feet (3 m) and 45 degrees from reflective tape
- On-target and low battery indicators
- Last measurement memory



Phasar-Laser

### Example Applications:

- Engines
- Dynamometers
- Pumps
- Fan blades
- Centrifuges
- Motors



Phasar-Laser-R with optional ROS-P

Specifications	Phasar-Laser and Laser-R
Range	5-100,000 RPM
Accuracy	±1 RPM or 0.01% of reading
Resolution	1 RPM
Display	6 digit, 0.5" high Liquid Crystal Display
Power On	Pistol grip trigger with latching "on" Switch
Operating Range	10 feet (3m) and 45° from reflective tape
Power	(4) "AA" (LR6) Alkaline batteries or *optional NiCad batteries and AC recharger

### Ordering Information

Phasar-Laser Tachometer, 12" of Tape, and Alkaline Batteries  
Phasar-Laser Kit Tachometer, Recharger, 5 foot roll of Tape, NiCad Batteries in Latching Case  
Phasar-Laser-R Kit Tachometer, Recharger, Remote Optical Sensor, 5 foot roll of Tape, NiCad Batteries in Latching Carrying Case



Nova-Strobe dbx

## Common Applications:

- Non-contact RPM
- Diagnostic Inspection
- Bent blades/shafts
- Slipping/worm belts
- Printing Press
- Stop-action Inspection
- Textiles

**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  $\div 2$  capability for distinguishing actual RPM from harmonic frequencies. In addition, 9 user presettable memory flash rates for repetitive measurements and storage of the last flash rate measured are included.

**Features** All Nova-Strobes, Deluxe and Basic:

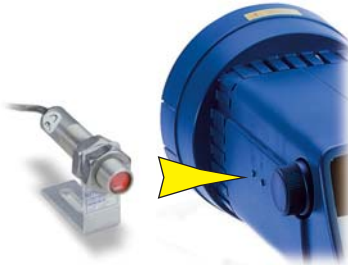
- Internal rechargeable batteries or AC powered models
- Weighs less than 2.0 Lbs. for easy handling
- More than 20% brighter Xenon light than competitors
- Electronic switching provides continuous cool operation
- Tripod mounting bushing in handle
- Low battery indicator (for battery powered models)

In addition, Nova-Strobe **dbx** and **dax** Plus models have:

- N.I.S.T. Traceable Certificate of Calibration included
- Internal phase shifting for easy reference target viewing
- Tachometer mode, speed measurement up to 250,000 RPM
- Power for optional sensors

Nova-Strobe dbx  
Deluxe

Select optional sensors for  
tachometer mode (see page 9)

TTL compatible input/output  
1/8" (3.5mm) phone plugs

Nova-Strobe bbx/bax Basic  
Digital LCD Display



Nova-Strobe dbx Kit

## Ordering Information

Nova-Strobe bax 115 Stroboscope, AC powered  
 Nova-Strobe bax 230 Stroboscope, AC powered  
 Nova-Strobe dax 115 Stroboscope, AC powered  
 Nova-Strobe dax 230 Stroboscope, AC powered  
 Nova-Strobe bbx 115/230 Stroboscope, battery  
 Powered, universal PSC-2U (115/230 VAC)  
 recharger (USA, UK, AUS, EURO plug)  
 Nova-Strobe dbx 115/230 Stroboscope, battery  
 powered, universal PSC-2U (115/230 VAC) recharger  
 (USA, UK, AUS, EURO plugs)  
 Also available in Kit form including: Stroboscope  
 Recharger, spare lamp and carrying case.

Specifications	Nova-Strobe dbx, Deluxe Battery Powered	Nova-Strobe dax, Deluxe AC Powered	Nova-Strobe bbx, Basic Battery Powered	Nova-Strobe bax, Basic AC Powered
Range Flashes/Minute	30-20,000 FPM (Flashes Per Minute)		30-10,000 FPM (Flashes Per Minute)	
Display	6 Digit Numeric and 5 digit Alphanumeric LCD			
Accuracy/Resolution	0.002% of setting or +/- 1 lsd /0.01 FPM			
Flash Energy/Duration	230 mJoule up to 3450 FPM / 8-20 $\mu$ sec			
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 Jacks	TTL (24Vdc Max) Input. Provides 3.3 Vdc 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, 50-400 Hz or 230 Vac, 50-400 Hz	Internal NiMH rechargeable batteries	115 Vac, 50-400 Hz or 230 Vac, 50-400 Hz
Weight	1.9 Lbs. (.86 kg)	1.5 Lbs. (.68 kg)	1.9 Lbs. (.86 kg)	1.5 Lbs. (.68 kg)
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) diameter; Handle: 4.25" (108 mm) long			

## Phaser-Strobe pbx

RoHS NIST CE

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:**

- N.I.S.T. Traceable Certificate of Calibration included
- Phase Shift adjustable as phase angle or time with resolution to 0.01° and 0.01 msec
- Virtual RPM mode provides slow motion viewing for high speed events
- Backlit alphanumeric LCD shows flash rate, degrees, time
- Store and recall nine memory settings
- TTL compatible input/output jacks, power for optional sensors
- Tachometer mode from Remote Sensors (see page 9)

Specifications	Phaser-Strobe pbx
<b>Flash Range</b>	30-50,000 FPM (Flashes/Minute) 0.5-830 FPS (Flashes/Sec) (Hz)
<b>Accuracy</b>	±0.002% of Setting +/- least significant digit
<b>Digital Adjustment Knob</b>	36 detents per revolution and blinking decade selection
<b>Flash Rate Resolution (Internal Triggering)</b>	0.01 to 1.0 FPM (Menu Selectable)
<b>Operating Time</b>	2 hours typical @ 1800 FPM or continuous AC power
<b>Phase Delay - Degrees</b>	0.1 to 359.9 degrees
<b>Time Delay - Seconds</b>	0.01 to 1000 msec.
<b>Virtual RPM (Slow Motion)</b>	0-200 VRPM
<b>Flash Energy (Typical)</b>	230mJoule up to 3450 FPM
<b>Flash Duration (Typical)</b>	8-20 usec
<b>Average Power - Watts</b>	11W @ 3000 FPM; >13W @ 3450 FPM
<b>Tachometer Mode</b>	5-250,000 RPM from external trigger
<b>External Input</b>	Input Pulse - 0.5 usec min, TTL to 24V max (1/8" phone plug)
<b>Trigger Output/Remote Sync</b>	3.3V TTL Compatible 40 usec pulse-Positive/Negative
<b>Power</b>	Internal rechargeable batteries with AC power supply/recharger
<b>Weight</b>	1.9 Lbs. (0.85 kg) including batteries



Phaser-Strobe pbx

- Common Applications:**
- Calibration of Tachometers
  - Diagnostic Inspection
  - Engine R&D
  - Textiles
  - Centrifuges
  - Shaker Tables



Compatible with Remote Sensors (see page 9).

**Ordering Information**  
 Phaser-Strobe pbx 115/230 - Stroboscope with PSC-pbxU (115/230 Vac) Power Supply/Recharger  
 Phaser-Strobe pbx Kit 115/230 - Same as above with Spare Lamp and Latching Carrying Case

# PORTABLE STROBOSCOPES (for use with Vibration Data Collectors)

## Vibration-Strobe vbx

RoHS NIST CE

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.

**Kit includes:** Strobe, interface cable, universal p.s./recharger, spare lamp in carry case.

Specifications	Vibration-Strobe vbx
<b>Flash Range</b>	30-50,000 FPM (Flashes/Minute) 0.5-830 FPS (Flashes/Sec) (Hz)
<b>Accuracy</b>	±0.002% of Setting +/- least significant digit
<b>Digital Adjustment Knob</b>	36 detents per revolution and blinking decade selection
<b>Flash Rate Resolution (Internal Triggering)</b>	0.01 to 1.0 FPM (Menu Selectable)
<b>Indicators</b>	Battery Level, On Target, Time, Auto, Alt, Tach, Lock, and EXT icons
<b>Operating Time</b>	2 hours typical @ 1800 FPM or continuous AC power
<b>Phase Delay - Degrees</b>	0.1 to 359.9 degrees
<b>Tracking Filter</b>	Selectable Wide and Narrow Bandwidths. Filter may not lock below 100 fpm
<b>Time Delay - Seconds</b>	0.01 to 1000 msec.
<b>Virtual RPM (Slow Motion)</b>	0-200 VRPM
<b>Flash Energy (Typical)</b>	230mJoule up to 3450 FPM
<b>Flash Duration (Typical)</b>	8-20 usec
<b>Average Power - Watts</b>	11W @ 3000 FPM; >13W @ 3450 FPM
<b>Tachometer Mode</b>	5-250,000 RPM from external trigger
<b>External Input</b>	Input Pulse - 0.5 usec min, TTL to 24V max (1/8" phone plug)
<b>Trigger Output/Remote Sync</b>	3.3V TTL Compatible 40 usec pulse-Positive/Negative
<b>Power</b>	Internal rechargeable batteries with AC power supply/recharger
<b>Weight</b>	1.9 Lbs. (0.85 kg) including batteries



Vibration Strobe vbx



**Ordering Information**  
 Contact Factory for available Models.



Palm Strobe x

**Common Applications:**

- Data Collectors
- Fans
- Printing Presses
- R&D
- Utilities
- Felt Belts/Conveyor
- Vibration Studies
- Textiles

**PALM STROBE x** Offers excellent brightness, exceptional features 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 input, tachometer display and x2 ÷2 functions. Eight memory positions provide rapid recall of user defined frequencies.

**Features:**

- Removable Plug-in Battery Pack
- Easy One Hand Operation
- Light weight, Pocket Size
- Flash Rates to 12,500 FPM
- Tachometer Mode from Remote Sensors
- TTL Compatible Input/Output



**Unlimited Power**  
World's First Stroboscope with removable, rechargeable battery pack (patented).



Palm Strobe x Deluxe Kit



**Remote Trigger**

Supports optional SPSR(self-powered sensor) trigger. See page 10.



**Universal Power 115/230Vac**

Universal Power Supply allows you to recharge anywhere in the world.



**Portable Inspection Light**

Unique Field Holster gives you true mobility.



**TTL Pulse Input/Output Cable**

Input/Output cable with BNC connector.

**Ordering Information**

- Palm Strobe x 115/230 - Stroboscope with PSC-2U (115/230Vac) recharger \*
- Palm Strobe x Pak 115/230 - Same as above with spare battery and holster
- Palm Strobe x Kit 115/230 - Stroboscope with PSC-2U (115/230 Vac) recharger \*, Spare Lamps and Latching Carrying Case
- Palm Strobe x Deluxe Kit - Stroboscope and Battery with PSC-2U (115/230 Vac) recharger \*, Spare Lamps & Battery, Holster and Latching Carrying Case

\* Includes USA, Australian, UK and Euro plug adapters.

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



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. **N.I.S.T. 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



Examiner 1000

- Example Applications:**
- Bearings
  - Gearboxes
  - Lubrication
  - Pumps
  - Motors
  - Fans

SPECIFICATIONS		EXAMINER 1000
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 @ 2 mA
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" (152 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	45.9					

Overall Vibration Severity Chart, located on the front panel of the Examiner 1000, provides instant status of measured machinery.



Examiner 1000 Kit with OnTime Trending Software

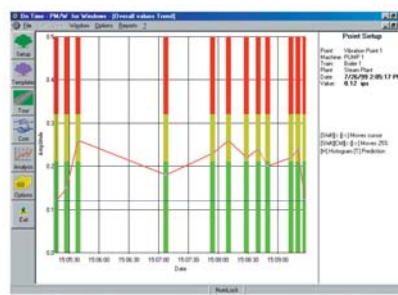
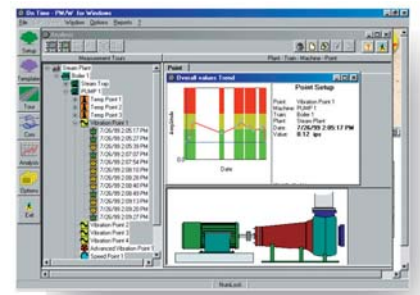
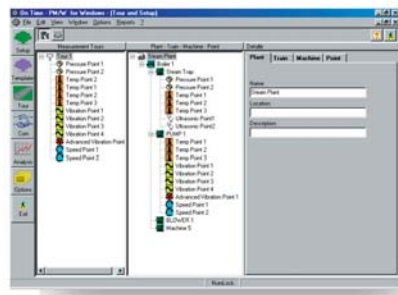
**OnTime Trending Software** is a simple-to-use, graphical program designed for condition-based maintenance through the routine trending of vibration and process information. Trending is the best method to judge the dynamic operating conditions of your machinery. **OnTime** helps you to manage all key machinery operating conditions.

**Trend:**

- overall vibration readings
- temperature
- speed
- process measurements of any type

**OnTime** is easy to set-up. Building the user-defined database of collection points is simple and intuitive. Construct entire Plants with complex machines and data collection points in minutes. Cut, paste, copy and edit-all the familiar windows features are here.

**OnTime** graphically displays automatically built trends of the data entered. User defined alarms are set and if violated, an immediate visual alarm is displayed in the software. This allows for instant identification of machines which require corrective action. Compare any type of data.



OnTime software does not work with Windows 2000 OS.

**Ordering Information**  
 Examiner 1000 System Vibration Meter, Sensor Pak, Headphones, Carrying Case, OnTime GP Software  
 Examiner 1000 Kit Vibration Meter, Sensor Pak, Headphones, Carrying Case and OnTime GPLite Software  
 Examiner 1000 Vibration Meter with Sensor Pak, Headphones, Carrying Case, No OnTime Software included  
 OnTime GP Software for Windows 95/98, XP and NT 4.0



ACT-3X Panel Tachometer/Ratemeter/Totalizer

The ACT Series consists of two models - one tachometer and one tachometer/ratemeter/totalizer. Both feature universal 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 from all Monarch sensors (see Page 9) 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: 4-20 mA, 0-5 Vdc or TTL pulse

**ACT-3X (5-999,990 RPM)**

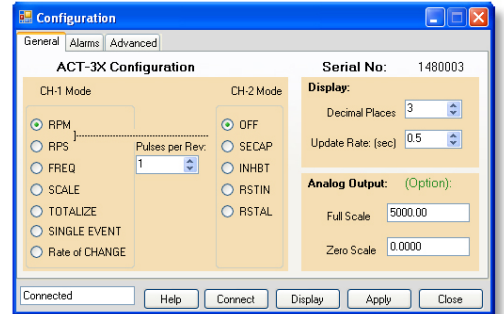
- N.I.S.T. Traceable Certificate of Calibration included
- Standard pulse repeater output
- Optional 4-20mA, 0-5Vdc, and 2 alarm outputs
- Optional Serial, USB or Ethernet communications
- Single event speed capture from start and stop pulses, in units such as MPH, cm/sec, etc. Using two sensors - for linear rate of travel on second input channel.



**PM Remote Software**

Both the ACT-1B and the ACT-3X can be used with the optional Windows based PM Remote Software to further enhance their capabilities. Use your desktop PC to customize the configuration of the ACT-1B and ACT-3X or view real-time data over the communications interface. Live data can also be streamed directly into Microsoft Excel™. PM Remote Software can be ordered with the USB Programming Cable for the ACT-1B and the ACT-3X (with standard serial option) or ordered alone for use with the ACT-3X with RS232C serial, USB or Ethernet communication options.

**PC Configurable**



**Ordering Information**

PM Remote Software and USB Programming Cable:  
for use with ACT-1B and ACT-3X (with standard serial option).  
PM Remote Software:  
for use with ACT-3X (with RS232C, USB or Ethernet communication options).

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

**Ordering Information**

ACT-1B - [ ] - [ ] - [ ] - [ ] - [ ]

ACT-3X - [ ] - [ ] - [ ] - [ ] - [ ]

**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**  
0xxxxx None  
1xxxxx 0-5Vdc Non-iso.  
2xxxxx 4-2mA Non-iso.  
3xxxxx 0-5Vdc isolated  
4xxxxx 4-20mA isolated  
  
xxxxx = must specify full scale

**Input Pulses Per Rev.**  
xxx = Specify (001 to 999)

**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 4-2mA Non-iso.  
3 0-5Vdc isolated  
4 4-20mA isolated

**Communications**  
0 Standard Serial (phono plug)  
1 RS232C (9 pin D shell)  
2 USB (USB type B)  
3 Ethernet (RJ45)

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

for Tachometers & Stroboscopes or stand alone use


Sensor Types

**Optical LED (1-250,000 RPM) Most popular.**



CE

**Optical Laser (1-250,000 RPM) Distances to 25 feet.**



CE

**Proximity (1-60,000 RPM) Rugged industrial sensor.**



CE

**Magnetic (1-99,999 RPM) Self-powered gear sensor.**



CE

**Magnetic with Amplifier Module (1-99,999 RPM) Enhances performance of M-190 magnetic sensor.**



CE

**Inductive (200-20,000 RPM) Gasoline Engine RPM.**



**Infrared (1-999,990 RPM) High speed sensor.**



CE

Description

**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. Modulated and High Temperature versions available (to 257°F). **Common usage:** Wide range of general purpose applications in relatively clean environments.

**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

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

**M-190W or M-190P:** Most popular sensor for use with 60 tooth 20 pitch gears. Sensor mounts within 0.005 inches (0.127 mm) of a minimum 0.1 inch (2.5 mm) target. Requires no power from the display module and self-generates an AC signal. **Common usage:** Ferrous metals, primarily gear teeth.

**MT-190W or MT-190P:** Amplifier extends operating gap to 0.25 inches (6.35 mm) from the target. Frequently used on gears as the M-190, but can also sense bolt heads or shaft keys and provides a 0-5V TTL output signal. **Common usage:** Ferrous metals including bolt heads or shaft keys in addition to gear teeth.

**GE-200:** Ideal sensor for gasoline engine RPM, working 0.5 to 4.0 inches (12 to 100 mm) from ignition coil or magneto.

**Common usage:** 2-cycle and 4-cycle gasoline engines.

**IRS-W or IRS-P:** Ideal sensor for working 0.5 to 1.0 inch (12 to 25 mm) from high speed equipment or other applications providing only contrasting light and dark surfaces or beam interruption by solid objects.

**Common usage:** Dentist and other high speed drills, slots or gear teeth. Does not require reflective tape.

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 Required	3.3 to 15 Vdc @ 45 mA
Output Signal	TTL Same as Source
Standard Cable	8 Feet (2.4 m)
Dimensions	2.9" (L) x 0.625" diameter (73 x 16mm)

Operating Distance	Up to 25 feet (7.62 m) and 60° offset from target
Speed Range	1-250,000 RPM
Operating Temperature	-40° to 180° F (-40° to 80° C)
Power Required	3.3-15 Vdc @ 35mA
Output Signal	TTL Same as Source
Standard Cable	8 Feet (2.4 m)
Dimensions	3.12" (L) x 0.71" (M16 x 18 x 79.4mm)

Operating Distance	0.2" (5mm) from 0.5" (12mm) metallic target
Speed Range	1-60,000 RPM
Operating Temperature	-4° to 140° F (-20° to 60° C)
Power Required	7.7 to 9 Vdc, 3mA
Output Signal	Namur (DIN 19 234)
Standard Cable	6 Feet (1.8 m)
Dimensions	1.3" (L) x 0.43" (32 x 11 mm)

Operating Distance	0.005" (0.127 mm) 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 Required	None (Self Generating)
Output Signal	190V P-P
Standard Cable	8 Feet (2.4 m)
Dimensions	2.0" (L) x 0.625" (50 x 16mm)

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 80° C)
Power Required	3.3 to 24 Vdc, 4mA
Output Signal	TTL Same as Source
Standard Cable	8 Feet (2.4m)
Dimensions	2.0" (L) x 0.625" (50 x 16mm)

Operating Distance	Up to 4 inches (100mm)
Speed Range	200-20,000 RPM
Operating Temperature	0° to 175°F (-18° to 80°C)
Power Required	3.3 to 24 Vdc, 4mA
Output Signal	TTL Same as Source
Standard Cable	15 Feet (4.5 m)
Dimensions	2.16" (L) x 0.82" (55 x 21 mm)

Operating Distance	0.5 to 1.0" (12 to 25 mm)
Speed Range	1-999,990 RPM
Operating Temperature	-10° to 212°F (-23° to 100°C)
Power Required	3.3 to 15 Vdc
Output Signal	TTL Same as Source
Standard Cable	8 Feet (2.4 m)
Dimensions	2.9" (L) x 0.625" diameter (73 x 16mm)

NOTE: W = tinned wire leads, P = 1/8" (3.5mm) phone plug connector. ROS is available with 8 or 25 foot cable.

NOTE: Additional cable length for all sensors (up to 500 feet) can be purchased and added in the field.



SPSR-115/230

- Common Applications:**
- Vibration Studies
  - Fans/Blades
  - Engines/Motors
  - Balancers
  - Tach Input
  - Data Acquisition

The unique SPSR Series of Self-Powered Sensors provide a TTL compatible pulse output from any of four input sensors (see page 9 for details):

- A laser light source (ROLS-P)
- A visible optical red LED light source (ROS-P)
- An infrared light source (IRS-P)
- An amplified magnetic sensor (MT-190P)

See Page 9 for detailed sensor specifications

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 115Vac, 230Vac or 9-15Vdc.

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.

Remote Optical Laser Sensor (ROSL-P)



Remote Optical Sensor (ROS-P)



Magnetic Trigger Sensor (MT-190P)



Infrared Sensor (IRS-P)



1 SPSR-IM with PSC-2U



How to Select your custom SPSR and sensor

- 1 Begin with the SPSR-IM Interface Module and PSC-2U
- 2 Select the sensor(s) best suited for your application

Ordering Information

SPSR-115/230 includes: SPSR-IM, PSC-2U, ROS-P and 12 inches of reflective tape  
 SPSR-IM includes: PSC-2U, 115/230 Vac power supply/re-charger (USA, AUS, UK and EURO plugs).  
 CA-DCSPSR: Cigarette Lighter DC Power adapter with 6 foot cable



Cigarette Lighter DC Power adapter with 6 foot cable (optional)

Specifications	SPSR Series
Range (RPM)	Same as sensor
Output Signal	TTL compatible pulse, 0-5V or 5-0V
Pulse Width	Determined by size of target and rotational speed
Output Connector	BNC
Power	Built in rechargeable battery pack (NiMH), 4.8Vdc



Smart Laser Sensor 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.

- "Smart" auto gain provides best performance in picking up target reflections.
- "On Target" indicator
- 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 or recharger port
- Tripod mounting bushing (1/4 - 20 UNC)
- Optional RS232, DB9 Pin connector with tinned wire leads



\* performance subject to intensity of ambient light irradiation.

Specifications	Smart Laser Sensor
Optical:	Class 3R (per IEC 60825-1) visible laser 650nm @ 3 mW peak power
Operating Range:	up to 65 feet (19.8 m) from T-5 reflective tape
Speed Range:	1-500,000 RPM
Output Signal:	TTL 5-0 VDC (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 5.43cm)
Mounting:	1/4 - 20 UNC bushing for tripod



Ordering Information  
 SLS-115/230  
 Smart Laser Sensor with 115/230 VAC PR Universal recharger, SLS-CA-BNC cable and 12 inches of Reflective Tape.

## Recording Tachometer



The DC1250 is a feature rich data acquisition system offering 2 universally configurable isolated inputs for measuring DC voltage, DC current, thermocouples and RTD's as well as frequency and pulse inputs. 4 internal alarm setpoints, 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 Gigabyte 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 - 600,000. Choose the sensor best suited for your application or take your existing signal directly into the DC1250.



Data Chart 1250



### Temperature Inputs

**Thermocouple:** Accuracy: 0.3% of full scale (typical). Ambient Temperature Sensor Accuracy: ±1.5°C

Type	Range
J	-100 to 760°C ±2°C (-148 to 1400°F ±3°)
K <sup>1</sup>	-100 to 1000°C ±2°C (-148 to 1832°F ±3°)
K <sup>2</sup>	0 to 1370°C ±2°C (32 to 2498°F ±3°)
T	-240 to 400°C ±2°C (-400 to 750°F ±3°)
E	-80 to 400°C ±2°C (-112 to 750°F ±3°)

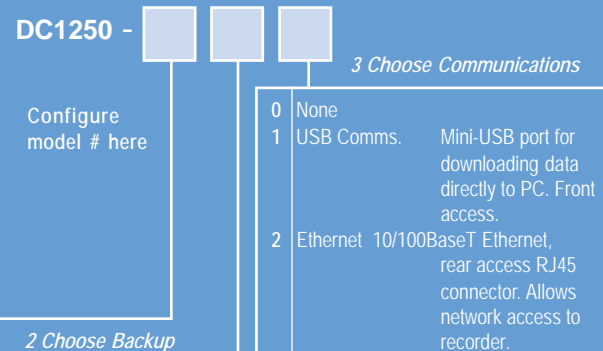
**RTD:** Accuracy: 0.3% of full scale (typical). Resolution: 0.1°C

**Internal current source: 1mA**

Type	Range
100 Ohm Pt 385	-100 to 750°C (-148 to 1380°F)
100 Ohm Pt 392	-100 to 750°C (-148 to 1380°F)

2 or 3 wire.

### Ordering Information



### 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

### DataChart DC1250 Specifications (abbreviated)

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

### 1 Choose Input Power

U	Universal AC Adapter	100-240Vac wall adapter with interchangeable Plug Set
D	DC Input Power	12-24Vdc input power Isolated

### Accessories

Model No.	Description	Model No.	Description
Navigator	Windows Compatible Software for graphic analysis, printing transfer and exporting CompactFlash™ Card Reader USB 2.0 compatible	MAS250R	250 ohm Precision Resistor for current inputs. 0.1% 0.5 watt
CFCR	CompactFlash™ Card Reader USB 2.0 compatible	NIST-1250	N.I.S.T. Calibration with data

### CompactFlash™ Memory Cards

MC256MBCF	256 Megabyte
MC512MBCF	512 Megabyte
MC1024MBCF	1 Gigabyte
MC2048MBCF	2 Gigabyte

Model No.	Description
THS-W	Temperature/Humidity Probe with 8 foot cable.

*UltraPro AG500 Ultrasonic Meter and Stethoscope*

The **UltraPro AG500** is a powerful ultrasonic leak detector and electronic stethoscope for use in construction, maintenance and manufacturing wherever precision gaseous leak detection or diagnostics are required.

Ultrasound is composed of high-frequency sound waves above the range of human hearing. **UltraPro** uses this technology to sense frequencies ranging from 18 to 42 kilohertz, which are electronically translated down into the audible range. Predictive Maintenance uses airborne/structure-borne ultrasound technology to locate leaks in any gaseous systems and to troubleshoot bearings, injectors, solenoid or valve operations. **UltraPro** features a unique Automatic Gain Control which automatically filters the signal to provide the best signal-to-noise ratio, suppressing background noise and pinpointing leaks. The AG circuit simplifies operation, removing complicated adjustment knobs and filter switches. **UltraPro** offers superior electronics with rugged industrial packaging and a protective rubberized case in a simple-to-use ultrasonic meter.

**Features:**

- Automatic Gain Control
- Simple Operation
- 10 Element LED Bargraph Display
- Industrial Rubber Holster
- Air and Contact Probes
- Audio Out with volume Control

**Common Applications:**

- Steam Traps
- Vacuum/Air Leaks
- Bearings/Valves
- Pressure Leaks
- Water Leaks



UltraPro AG500 Ultrasonic Leak Detector



UltraPro AG500 System includes:  
Detector, Headset, Air and Contact  
Probes, Tone Generator, Batteries and  
Latching Carrying Case.

**Ordering Information**

UltraPro AG500 System Detector, Air and Contact  
Probes, Headset, Tone Generator, 9v Batteries and  
Latching Carrying Case.

UltraPro AG500 Kit Same as above but without  
Tone Generator.

Tone Generator Generator and Battery



Monarch Ultrasonic Tone  
Generator is a battery-powered  
continuous tone source of 40  
kHz. It effectively allows you to  
"pressurize with noise". It is  
capable of 155 dB and transmits  
up to 40 feet. Ideal for enclosed  
vessels, tanks and buildings.

**Locate Pin-Hole Leaks**

Using the air probe you can locate pin-hole leaks up to 10 feet away. Find pressurized or vacuum leaks on all types of gases such as air, freon, nitrogen, propane, etc.

**Listen to Bearings, Gear Boxes and Steam Traps**

Use the contact probe to listen to bearings, gearboxes, valves, steam traps etc. Easily compare noise levels between like objects.

**Water/Air Leaks in Vehicles and Vessels**

Place the tone generator inside a vehicle, closed vessel, container or building and search for leaking seals and gaskets around doors and windows.

## FSI and FSX Series Flexible Fiberscopes

Monarch Flexible Fiberscopes are perfect for inspecting interior areas which are difficult to view. Optical inspection can save thousands of dollars in preventing unnecessary disassembly of complex machines. With the **FSI** or **FSX Fiberscopes**, visual inspection can confirm your diagnosis, ensure proper assembly and welded joints or even locate a dropped component.

**FSI and FSX Features:**

- Superior Resolution 7400 Pixels
- Water/Chemical Resistant
- 40° Field of View
- 10mm and 6mm Diameters Available
- Bending Radius down to 3 inches

- Common Applications:**
- Automotive/Marine
  - Security
  - Manufacturing
  - Construction
  - Maintenance
  - HVAC
  - Electrical
  - Engines
  - Gear Boxes



FSI Flexible Fiberscope



Monarch FSI Series Flexible Fiberscopes are self-illuminating with either LED or Halogen lamps. Both 10mm and 6mm diameters are available in lengths of 24, 36 and 48 inches.

Monarch FSX Series Flexible Fiberscopes require an optional external light source. (Order the Scorpion Xenon flashlight). Only 6mm diameters are available in lengths of 24, 36, 48, 60, 72, 84 and 96 inches.

**Ordering Information**  
 FSI-24-6-H Self-illuminating, 24" length, 6mm diameter, Halogen lamp.  
 FSI-36-6-H Same as above in 36" length.  
 FSI-36-6-L Same as above with LED lamp.  
 FSI-24-10-L Self-illuminating, 24" length, 10mm diameter, LED lamp.  
 FSI-36-10-L Same as above in 36" length.  
 FSI-48-10-L Same as above in 48" length.  
 FSX-24-6 External illumination, 24" length and 6mm diameter.  
 FSX-36-6 Same as above in 36" length.  
 FSX-48-6 Same as above in 48" length.  
 FSX-60-6 Same as above in 60" length.  
 FSX-72-6 Same as above in 72" length.  
 FSX-84-6 Same as above in 84" length.  
 FSX-96-6 same as above in 96" length.  
 Scorpion Halogen Flashlight for FSX series fiberscopes



Monarch FSI and FSX flexible fiberscopes include padded latching carry case with operation manual (optional clip on mirror shown).



Monarch FSI 10mm Series Flexible Fiberscope shown with powerful bright white LED illumination and optional clip on 45 degree mirror attachment. An optional clip on retrieval magnet is also available.

**Plumbing and Construction**



Inspect drains for blockages and lost items. Inspect behind walls for water or insect damage. Watertight tips eliminate worry of damage.

**Electrical and HVAC**



Inspect electrical wire routing and condition or HVAC ducts for leaks and dust buildup.

**Gas and Diesel Engines**



Inspect pistons, cylinder walls and T-belts. Look inside A/C ducts for mold and mildew buildup. Find oil and water leaks in hidden areas.

# 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, U.S.A.

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 world's 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 touchscreens and multi-channel recorders.



ISO9001:2000 Certified

Monarch Instrument also manufactures a full line of paperless recorders and compact data loggers please visit [www.monarchinstrument.com](http://www.monarchinstrument.com) for more information.



Proudly distributed by:

“*Innovation in Instrumentation*” is the Monarch design philosophy and in recent years we have introduced state-of-the-art products:

- ▶ **Pocket Laser Tachometer**
- ▶ **PALM STROBE x**
- ▶ **Nova-Strobe dbx Stroboscope**
- ▶ **Examiner 1000 Vibration Meter**
- ▶ **DataChart™ 1250 Paperless Recorder**

Monarch Instrument remains committed to innovations and quality in sales, customer service and manufacturing.



Thank you from all of us at Team Monarch

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

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