



Introduction

Get the most out of your purchase of the Ext ch 461880 Vibration Meter. The Com n ton L s r T chom t r. Th 461880 Vibration functions have frequency sensitivity that is IS -2954, non-linear Acceleration, Velocity Displacement. A 1000 point filter allows correction of data for overload to protect the software. The T chom t r functions provide contact PM n L n r Surf c Sp , s will s non-contact PM m sur m nts. Th 461880 ships fully tested and calibrated, with proper instructions, will provide you with a full service.

Features

Vibration Function Features:

- Measure Acceleration from 0.5 to 199.9 m/s², 0.05 to 20.39 G or 2 to 656 ft/s²
- Measure Velocity from 0.5 to 199.9 mm/s, 0.05 to 19.99 cm/s or 0.02 to 7.87 in/s
- Measure Displacement from 0.005 to 1.999 mm or 0.002 to 0.078 inches
- MS measuremnts for Acceleration Velocity
- Peak to Peak measuremnts for Displacement
- Peak function for Acceleration Velocity
- Max Hold function for Acceleration (Peak), Velocity (Peak) and Displacement (Peak to Peak)
- Frequency range from 10 Hz to 1 kHz is IS 2954 standards
- Zero function
- 1000 point filter with just a small bit
- Hold function for zero measurement display
- MAX/MIN function to record maximum minimum measurement values
- Auto Power-off conserves battery power
- Separate vibrations sensor with magnetic mount included

Tachometer Function Features:

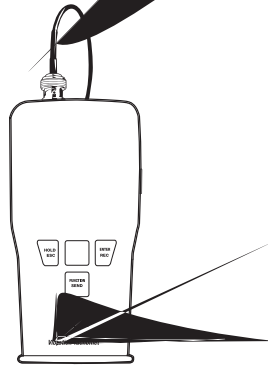
- Photo non Contact Tachometer functions
- Laser light source with long life span, up to 1.5 meters (4.9 feet)
- Measurements from 0.5 to 100,000 RPM
- 0.1 RPM resolution, <1000 RPM, 1 RPM resolution ≥1000 RPM
- Memory function with recall save MAX, MIN and LAST measurement values
- Microprocessor with crystal time base provides 0.05% accuracy

General Features

- Large LCD display
- Low Battery indicator
- High Performance microprocessor circuitry
- Compact Heavy Duty Construction
- High Accuracy

Meter Description

1. Meter Top (see Meter Top Callout below)
2. LCD display
3. Temperature Function push button
4. HOLD/ESCAPE push button
5. Power push button
6. ENTER / ESCAPE push button
7. BATTERY / SELF TEST push button
8. BATTERY / SELF TEST push button
9. Contact Temperature Surface Switch
10. Contact Temperature Probe
11. Velocity Sensor Gnomonic Mount
12. Contact Temperature Protective Cover
13. Access Switch for Protective Cover



Meter Terminals

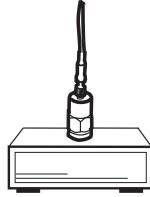
1. BNC Connector
2. Input Temperature probe (fiber not supported)
3. RS-232 Output Terminal
4. Photo Temperature Laser Detector
5. Photo Temperature Laser Light Source

Meter LCD Display

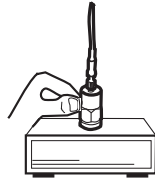
Vibration Meter Operation

Connecting Probe

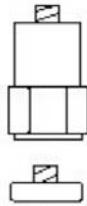
1. Note that this meter accepts only the supplied vibration probe.
2. Plug the BNC connector of the probe cable onto the BNC connector at the top of the meter.
3. The probe can then be connected to the test mechanism in three ways:
 - a. Attach the mounting of the probe to the front meter panel on the equipment unit directly.



- b. Manually hold the probe in place against the equipment unit directly.



- c. Unscrew the mounting from the probe and use the threaded mount to connect to the screw, bolt, or stud on the equipment unit directly.



Powering the meter

1. Press the **POWER** key once to power the meter on. The meter will perform a short self-test.
2. Press and hold the **POWER** key to power the unit off. The unit will power up again.

Selecting Units

1. The unit powers on in Accurate mode in the units it stores.
2. Use the **UNIT/LARGE** key to scroll through the other available functions/units.
3. To change display units (Metric or Imperial), press and hold the **UNIT/LOGGER** key for 2 seconds.

RMS, PEAK, PEAK MAX HOLD, MAX HOLD

Press the **FUNCTION/SEND** key to select MS, PEAK, or PEAK MAX HOLD (ACC or EL); or PEAK or PEAK MAX HOLD (DISP).

1. MS - Typical selection for voltage measurements. (PEAK to PEAK for Display mode)
2. PEAK - For measurement of the peak value. Not available in the Display mode.
3. PEAK MAX HOLD - Holds the maximum value. The display will update only when a new maximum is measured. Not available in the Display mode.
4. MAX HOLD - Holds the maximum Peak-to-Peak value. Available in Display mode only.
5. To clear the MAX HOLD or PEAK MAX HOLD values, press the **HOLD/ESCAPE** key for more than 2 seconds. This will zero the display in the MAX HOLD or PEAK MAX HOLD function.

DATA HOLD

To freeze the LCD display, momentarily press the **HOLD/ESC** key. The HOLD function will appear on the top right-hand corner of the LCD. Momentarily press the **HOLD/ESC** key again to return to normal operation (the HOLD function will disappear).

MAX/MIN Record Function

1. Press the **REC** key to enter the MAX/MIN mode. The LCD will appear on the display. Successive presses of the **REC** key will select the Max or Min record mode. Press and hold the **RECORD** key for more than 2 seconds.
2. To exit the MAX/MIN record values, press the **HOLD** button while the MAX/MIN value to record is on the display. The value will record in the MAX or MIN and will disappear. The unit will return to normal operation until the **REC** key is held for more than 2 seconds.

ZERO Adjustment Procedure

The meter may not be zeroed when the power is on. Although this is usually not a problem, this procedure will reset the meter with the following steps:

1. Connect the vibration sensor to the meter.
2. Turn the meter on and the function to ACC on MS.
3. Make sure the vibration sensor is perfectly still (no vibration).
4. Press and hold the **HOLD/ESC** key for > 2 seconds to allow the display to reach the zero value.

Advanced Vibration Functions

The Advanced Functions Menu allows adjustment for the AutoPower function. The following steps will access the Memory status, and the Clear Memory

1. Press and hold the **HOLD/ESC** key while power is on. The display will show the **HOLD/ESC** key will scroll through the following functions:
 - 8 FF – AutoPower
 - SEC – Set the Sample Rate
 - Cnt – Number of Points in Memory
 - CLr – Clear Memory
 - ESC – Exit the Advanced Functions Menu
2. Press the **HOLD** key to select the FF function. Use the **FUNCTION/SEND** key or **UNIT/LOGGER** key to toggle the status between "0" and "1". "0" is the AutoPower function. "1" is the function. Press the **ENTER** key to save the status.
3. Press the **HOLD/ESC** key to select the SEC function. Use the **FUNCTION/SEND** key or **UNIT/LOGGER** key to scroll through the following sample rates: 1, 2, 10, 30, 60, 600, 1800, or 3600 seconds. Press the **ENTER** key to save the status.
4. Press the **HOLD/ESC** key to select the Cnt function. The display will flash the following Memory points in memory.
5. Press the **HOLD/ESC** key to select the CLr function. Use the **FUNCTION/SEND** key or **UNIT/LOGGER** key to toggle the status between "0" and "1". Select "1" to clear the memory. Select "0" to return the memory. Press the **ENTER** key to exit.
6. Press the **HOLD/ESC** key to select the ESC function. Press the **HOLD/ESC** key again to exit the Advanced Functions menu. The meter will power off.

Tachometer Operation

Safety

WARNING: Do not directly view or direct the laser pointer at an eye. Low power visible lasers do not normally present a hazard, but may present some potential for hazardous work directly for certain professions.



Reversible LCD Display

The meter's display can be switched between normal and reverse. The normal display shows the speed in the normal direction. The reverse display shows the speed in the opposite direction.

Selecting Function and Units

Press and hold the Tachometer Function push button on the right side of the 461880. The display will scroll through the following:

- PM – Contact PM measurement.
- M/mn – Surface speed - Metric RPM measurement.
- Ft/mn – Surface Speed - Feet per Minute measurement.
- PM – non-contact PM measurement.

NON-CONTACT PHOTO TACHOMETER MEASUREMENTS

1. Apply the appropriate square or rectangular tip to the surface of the object to be measured.
2. With the meter OFF, point the laser pointer of the meter towards the velocity to be measured.
3. Press and hold the Tachometer Function Push button (located on the right side of the meter). Press the **FUNCTION/SEND** key to select the non-contact PM mode. All the laser pointer measurements will be taken.
4. Verify the ((●)) Monitor Indicator appears on the LCD when the object to be measured is in the laser beam.
5. If the measurement is under 50 PM, apply the square or rectangular tip to the surface. The number shown on the display is the number of pulses per second of the surface speed. To calculate the circumference.
6. When the measurement is over, the display will show the measurement.

NOTE: Be sure to hold the meter firmly with the correct height measurement. The measurement will be inaccurate if the meter is not held correctly.

CAUTION: Do not touch the object being measured. Use extreme care.

CONTACT TACHOMETER RPM MEASUREMENTS

1. Move the Tachometer Protective Cover to the open position by pulling the cap away from the unit.
2. Install one of the PM contact pins (store the Tachometer Protective Cover) on the contact shaft.
3. Press and hold the Tachometer Function Push button (located on the right side of the meter). Press the **FUNCTION/SEND** key to select the contact PM mode.
4. Lightly press the contact pin against the center of the contact shaft.
5. Watch the Green number on the display lights, not the Green number.

CONTACT LINEAR SURFACE SPEED (ft/min or m/min) MEASUREMENTS

1. Move the Tachometer Protective Cover to the open position by pulling the cap away from the unit.
2. Press and hold the Tachometer Function Push button (located on the right side of the meter). Press the **FUNCTION/SEND** key to select one of the Linear Speed modes (M/min or ft/min).
3. Lightly press the Linear Speed wheel on the moving surface to measure.
4. Watch the Green number on the display lights, not the Green number.

RECALLING CONTACT TACHOMETER READINGS

To recall Contact Tachometer readings, press and hold the **ENTER/REC** key. The display shows:

LA - Last Green number display.

UP - Maximum value recorded.

LN - Minimum value recorded.

After 3 seconds, the **ENTER/REC** key will scroll through the 3 modes. The value will flash, return to the mode number value.

Datalogging

The internal memory can hold up to 1000 records. The sample rate is normally, with the button pressed, automatically, the programmed sample rate.

Sample Rate

The sample rate can be set to 0 (manual), 1, 2, 10, 30, 60, 600, 1800 or 3600 samples per second. See the Advanced Functions section for instructions on setting the sample rate.

Auto Data Logging

1. Set the sample rate to '0' (manual).
2. Turn the meter off and on.
3. Press the **REC** button to enter the logging function. The **REC** symbol will appear on the display.
4. Press the **LOGGER** button to set the logging rate. The logging rate will be shown with the selected sample rate.
5. Press the **LOGGER** button to pass the sum of the logging.
6. Press and hold the **REC** button > 2s to store the logging mode.

Manual Data Logging

1. Set the sample rate to '0' (manual).
2. Turn the meter off and on.
3. Press the **REC** button to enter the logging function. The **REC** symbol will appear on the display.
4. Press the **LOGGER** button.
5. Press **LOGGER** button to log on the spot. The logging rate will be shown on the display. Press the stop button to store the sample rate.
6. Press and hold the **REC** button > 2s to store the logging mode.

PC Interface

The meter is equipped with an S-232 serial port (located at the top of the meter next to the power input jack). This interface is used to operate with the optional Extch 407001A software package, which includes two programs in the required meter to PC interface file.

1. **407001A - Extch Data Acquisition Software**: This software allows the user to connect the meter to PC via a serial interface (this software does not download the contents of the meter's memory to the PC)
2. **DL2005 Getloader Download Software**: This software allows the user to download the contents of the meter's memory to the PC

Download Stored Data to PC (requires DL2005 software)

The **SEND** button is used to send the contents of the meter's non-volatile memory to the PC via the optional DL2005 software.

1. Connect the S-232 cable to the PC
2. Install and run the DL2005 Getloader software.
3. Press and hold the **SEND** button for > 2 seconds. "r-232" will flash rapidly on the display.
4. In the DL2005 software, press **START**.
5. Press the **SEND** button on the meter. It will send the meter's S-232 port data onto the connected PC.
6. Press the **ESC** button to return to normal operation.

Specifications

	Display	DuID display Mult-function LCD
	Display Time	Approximately 15 seconds
	Getloader memory	1000 point memory
	Getloader Display Time	0 (manual), 1, 2, 10, 30, 60, 180 and 3600 seconds
8	Green indicator	"L" appears on the LCD
8	power input indicator	"0" appears on the LCD
	Low battery indicator	Battery symbol appears on the LCD
	Power supply	4 x 1.5 AA Batteries
	Power Consumption	operation: approximately 10.5 mA standby: approximately 21 mA
	Auto Power Off	15 minutes
8	Operating Temperature	32 to 122°F (0 to 50°C)
8	Operating Humidity	less than 80% RH
	Storage Temperature	-4 to 140°F (-10 to 60°C)
	Storage Humidity	10 to 80% RH
	Dimensions	Metric: 7.4 x 3.0 x 1.8" (188 x 75.5 x 46.8 mm) Imperial: 1.8 mm metric, 40 mm height
G	Vibration	Metric: 0.87 Gs (397 ms) Imperial: 0.24 Gs (110 ms)
	Compliance with:	FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1 (2001-08) Edition 1.2, IEC 60825-1:1994/A2:2001/A1:2002

Vibration Functions

	Range	Resolution	Accuracy (% of reading)
Acceleration (MS or P k)	0.5 to 199.9m/s ²	0.1m/s ²	±(5% + 2 ts) @160HZ&80HZ
	0.05 to 20.39G	0.01G	
	2 to 656ft/s ²	1ft/s ²	
	C l r t on po nt: 50 m/s ² @ 160Hz		
Velocity (MS or P k)	0.5 to 199.9mm/s	0.1mm/s	±(5% + 2 ts) @160HZ&80HZ
	0.05 to 19.99cm/s	0.01cm/s	
	0.02 to 7.87 n/s	0.01 n/s	
	C l r t on po nt: 50mm/s @ 160Hz		
Displacement (p k to p k)	0.005 to 1.999mm	0.001mm	±(5% + 2 ts) @160HZ&80HZ
	0.002 to 0.078 n	0.001 n	
	C l r t on po nt: 0.14mm @ 160Hz		
Frequency Range	10 Hz to 1 kHz – r8 ts IS 2954		

Tachometer Functions

	Range	Resolution	Accuracy (%rdg)
Photo T chom t r	10 to 99,999 rpm	0.1 rpm (<1000rpm) 1 rpm (≥1000 rpm)	± (0.05% + 1)
Cont ct T chom t r	0.5 to 19,999 rpm	0.1 rpm (<1000rpm) 1 rpm (≥1000 rpm)	
Surf c Sp	0.2 to 6560 ft/m n	0.1 ft/m n (<1000ft/m n) 1 ft/m n (≥1000ft/m n)	± (1% + 1)
Surf c Sp	0.05 to 1999.9 m/m n	0.01 m/m n (<100m/m n) 0.1 m/m n (≥100 m/m n)	
Photo T chom t r G t ct n D st nc	2 to 59" (50 to 1,500mm) typ c l* *sp c fG us n 10mm squ r of G fl ct n t p t 1,800rpm. Th m x n m n G t ct n st nc vll ch n w th nv ronm nt l con tons, G fl ct n t p , or sp s ov 1800rpm.		

Warranty

EXTECH INSTRUMENTS CORPORATION (A FLIR COMPANY) warrants this instrument to be free of defects in parts and workmanship for **one year** from date of shipment (a six month limited warranty applies to sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website www.extech.com for contact information. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Care Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.



Support line (781) 890-7440

Technical Support: Extension 200; E-mail: support@extech.com

Repair & Returns: Extension 210; E-mail: repair@extech.com

Product specifications subject to change without notice

For the latest version of this User Guide, Software updates, and other up-to-the-minute product information, visit our website: www.extech.com
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