



Rock Solid Machines

Unshakeable Service

Mini-SuperGraph II User Guide

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Overview

The Mini-SuperGraph II allows you to monitor ground vibrations and air over-pressure with ease and accuracy. The Mini-SuperGraph II can be used for most vibration and sound monitoring activities including blasting operations, pile driving operations, construction equipment activity, environmental activity, ambient levels, and any other operation where a permanent record is needed. Our improved, updated Mini-SuperGraph II model provides innovation in seismic instrument design that focuses on simplicity, while giving you the powerful, reliable features you've come to expect from Nomis Seismographs.

Features

- Use the HELP button for quick and easy access to info about common features.
- Save setups on a daily basis for a quick set up with each subsequent use. No wait time between events means you will never miss any seismic data.
- Three different modes to fit various monitoring situations: SELF TRIGGER, BAR GRAPH, and COMBO.
- LCD with backlight displays all vibration data on one screen with 3 levels of

- brightness.
- Instrument and all accessories fit neatly into the sturdy plastic, watertight carrying case.
 - Gel cell rechargeable battery powers the unit.

What Comes with the Mini-SuperGraph II?

The following items are included in your Mini-SuperGraph II package:

- Mini-SuperGraph II unit
- Transducer
- USB cable to PC cable
- USB to thumb drive cable
- Ground spikes
- Charger cable
- RS232 cable
- Dust covers for serial and auxiliary ports
- User Guide
- Watertight carrying case
- Microphone
- Microphone holder
- Microphone mast
- Microphone wind screen
- SuperGraphics software CD

Operating Instructions

1. Point the arrow on the transducer toward the vibration source.
2. **IMPORTANT: Connect the transducer and/or microphone cables before turning the instrument on.** The transducer and microphone plugs are color coded to allow for easy connections. The quick lock ring on each connector is designed to prevent the connection from coming out. If it is difficult to make a connection, check the color-coding to make sure the colors match or rotate the connector until the pins mate properly and then lock the connector in place.
3. Install the transducer in a **stable** position where you plan to record an event using one of the recommended methods described on pages 10-13.

The initial sensor check procedure will occur automatically when the instrument is turned on – any movement may produce inaccurate results, therefore it is crucial that the transducer remain stable. The electronics within the sensor must be allowed to stabilize before monitoring can take place.

See the **Transducer Placement Procedure** on pages 10-13 for further instructions on how to make a stable placement.

4. Press the green ON button and **WAIT 60 SECONDS** for the Nomis Main Menu to appear.
5. Use the ↑ and ↓ keys to select the type of monitoring you want to use (See the **Monitor Modes** section for details about each available option):
 - **SELF TRIGGER (Waveform)** – designed for situations where data collection is needed for a short, precise period of time (normally less than 60 seconds). This operation captures the complete digital waveform for analysis. Each event is stored individually in internal memory.
 - **BAR GRAPH** – designed for situations where large data collection is needed for long periods of time (normally over 60 seconds and lasting for hours or days). Seismic and/or air data is collected and recorded in a bar graph (histogram) format and stored in the internal memory for future use.
 - **COMBO** – designed for situations where both bar graph and waveform data are needed. The files for these will be split into each type and stored.

This mode provides both the data collection from a period of time and detailed analysis of events over their trigger level. The Super Graphics program allows you to match these files together for a complete analysis.

6. After you select a mode, the screen will display MONITOR and EDIT.
 - **MONITOR** – The cursor will default to the MONITOR option. Press ENTER to start monitoring. When you start monitoring, another sensor check will be performed (which takes about 15 seconds) to ensure that nothing has changed with the sensors.
 - **EDIT** – If you want to modify the settings, press the ↓ button to select EDIT and press ENTER. With the EDIT option, a different screen will display each time you press ENTER. Press ENTER to keep displayed data or use the ↑ and ↓ keys to change a setting (use the + and - keys to move the cursor from right to left). Standard selections are highlighted on each screen. Continue pressing ENTER to proceed through all of the questions. For numeric options, use the ↑ and ↓ arrow button to change the numbers. See the **Monitor Modes** section for details about each available option.

When the SAVE SETUP screen displays, choose YES to can save the current settings for future use. Enter up to 8 characters for the name of

the saved data (use at least one character for this name). These saved settings will appear on the NOMIS MAIN MENU under option number 4: SAVED SETTINGS. You can save a maximum of 14 settings.

7. Once monitoring is complete, press ESC and then ENTER to stop monitoring.
8. To turn the instrument off, press the red OFF button.
9. When you move a unit/transducer, DO NOT remove the cables/connections until you are in a CLEAN environment. Any soil or other debris could damage the instrument.

Other Operating Information

- Press ESC at any point to leave the current operation or reverse the previous operation. To stop monitoring, always press ESC first and then press ENTER.
- You can use the HELP menu to view or change many features for the Mini-SuperGraph II, such as change the date and time, erase memory, change the language, check event summaries & much more. See the Help Menu section below for details about each option.
- The LCD screen automatically turns off after 2 minutes to conserve power. Press any key to turn the LCD back on. While in the monitor mode, the results of the last vibration event will display on the LCD.
- To view previous events, go to the HELP menu and select EVENTS SUMMARY.
- The LED light on the unit indicates what is taking place:
 - Solid green light indicates unit is powered on and not monitoring.
 - Red light indicates that the battery is charging.
 - Green flashing light indicates that monitoring is in operation.

- Red to green flashing light indicates monitoring while charging.
- Quick flashing of green light during monitoring indicates the unit is writing data. Note that the LCD screen may be slow to update in certain configurations during this time and will return to normal updating speed once the data write is complete.
- Use the USB to thumb drive adaptor to download data so that you do not have to carry a PC to the field. Simply attach the cable to the unit and plug in the thumb drive when the unit is not in monitoring mode. The unit will detect the drive and prompt for data transfer. Remember to unplug the thumb drive when finished to conserve battery power.
- When you use the USB to PC cable, the unit will appear as a mass storage device and you can navigate to the events folder and retrieve data much faster than through serial download.

Transducer Placement Procedure

Placement of the transducer block is critical when taking vibration readings. This block must always make firm contact with the surface to ensure an accurate vibration reading. There are very few incidents where the transducer block can be simply placed on the surface for an accurate vibration measurement. Even when you cannot see movement, it is possible that the transducer can actually vibrate or "walk" on the surface during vibration activity. This creates an inaccurate reading because the instrument will measure the block vibrating against the surface instead of the actual vibration source. The process of leveling the transducer on a surface is a minor part of setting up the instrument correctly. It is very important to make sure that the transducer is secured to the surface.

The following pages list the four generally accepted procedures you can use to mount the transducer in preparation to record vibration activity. They are arranged in order from most effective to least effective.

Placement Method	Instructions
Bury Transducer in Soil	<p>This is the most accepted procedure and will produce the most dependable results. For more information about this procedure, refer to the U.S. Bureau of Mines Bulletin RI 8506 – Measurement of Blast Induced Ground Vibrations and Seismograph Calibration.</p> <ol style="list-style-type: none"> 1. For most blasting operations (vibration readings less than 1.0 ips, 25.4 mm/s), bury the transducer block in the soil with the top of the block level with the surface of the ground. 2. To add further coupling that will make the block more secure, place the spike on the transducer block and spike it in the bottom of the hole in which the transducer is placed. 3. Fill the hole with soil and pack it tightly around the transducer block. 4. Apply slight force to the transducer block to see if it is secure enough – if it moves at all, the soil is not packed tightly enough around it. <p>For larger vibration recordings (in excess of 1.0 ips, 25.4 mm/s), consider burying the transducer block deeper. For best results, place the transducer block in a hole that is at least 6 inches deep and pack the soil on top of the</p>

Placement Method	Instructions
	transducer block. This will provide a solid coupling with the soil so that no slippage can occur.
Bolt Transducer Block	When soil is not available to bury the transducer, you can bolt the transducer block to a rock or concrete surface. Depending on the anchors available in your area, an anchor can be placed in the concrete or rock and a threaded bolt placed through the hole to bolt the transducer block into place. This procedure will assure no slippage and result in accurate readings of the vibration levels.
Spike Transducer in Soil	<p>For most vibration levels less than .25 ips (6 mm/s), it is typically adequate to spike the transducer block in the ground.</p> <p>Make sure the spikes are pushed into soil enough to provide a good coupling. As with the other placement methods, the transducer block should not move when a slight force is applied to it.</p> <p>When you need to monitor vibration in a landscaped area, spiking may be the only way to avoid damaging a lawn. It is not always feasible or acceptable to</p>

Placement Method	Instructions
	dig a hole to bury the transducer block. However, once vibration levels exceed .25 ips (6 mm/s), consider burying the transducer block.
Sand Bag on Top of Transducer Block	As a last resort it may be necessary to sandbag the transducer block to eliminate slippage. Only use this option when burying, bolting, or spiking the transducer block is not permissible or acceptable. The effectiveness of sandbagging will depend on the vibration level and the weight of the sand placed on the transducer block. Note that the higher the vibration level being recorded, the heavier the sand bag should be. For vibration levels less than 1.0 ips (25.4 mm/s) a 15 pound (7 kg) bag of sand should be adequate. Place the sand bag on top of the transducer block so that the sand can form around the block to provide good coupling with the transducer block and prevent horizontal slippage. In an emergency situation, you can fill a plastic trash bag with sand to provide an adequate anchor for the transducer block.

As stated previously, simply placing the transducer on a surface and using leveling feet to level this transducer block is NOT effective. For this reason NOMIS does not provide leveling feet with the transducer block. We do not want operators to falsely assume that leveling is the most important aspect of proper transducer installation. The type of geophone elements used in NOMIS Seismographs only require a leveling of 20 degrees or less against the horizon, according to the geophone manufacturer. This can often be detected by the naked eye.

The most common result of an improperly placed transducer is an abnormally high reading. Therefore, make sure you use the instructions above to properly set up the transducer block. If you have any questions about placement, please contact our technicians at NOMIS Seismographs.

Monitor Modes

Three monitoring modes are available with the Mini-SuperGraph II: SELF TRIGGER, BAR GRAPH, and COMBO.

If you want to modify the settings for a monitoring mode, select that mode, press the ↓ button to select EDIT and press ENTER. With the EDIT option, a different screen will display each time you press ENTER. Press ENTER to keep displayed data or use the ↑ and ↓ keys to change a setting (use the + and - keys to move the cursor from right to left). Standard selections are highlighted on each screen. Continue pressing ENTER to proceed through all of the questions. For numeric options, use the ↑ and ↓ arrow button to change the numbers.

When the SAVE SETUP screen displays at the end, choose YES to can save the current settings for future use. Enter up to 8 characters for the name of the saved data (use at least one character for this name). These saved settings will appear on the NOMIS MAIN MENU under option number 4: SAVED SETTINGS. You can save a maximum of 14 settings.

SELF TRIGGER (Waveform) Mode

This mode is designed for situations where data collection is needed for a short, precise period of time (normally less than 60 seconds). This operation captures the complete digital waveform for analysis. With this mode, you will select pre-determined vibration and/or sound trigger levels to activate the instrument automatically and record the activity for the specified period of time. All activity is stored in internal memory in a numbered event format. Once the recording is complete, the Mini-SuperGraph II returns to a wait mode for the next event that exceeds the trigger levels.

When you select SELF TRIGGER from the main menu and choose EDIT, you will be able to modify the following settings:

- **Sample Rate** – 512, 1024, 2048, 4096, 8192, 16384. Faster sample rates are more accurate at higher frequencies, but will create larger files.
- **Bit accuracy** – 16, 14, 12, 10 bit. Higher bit accuracy results in higher data accuracy, but will create larger files.
- **Recalibrate on temp change** – Adjusts A/D Midpoint after 10 degree change if needed.

- **Company** – User setting for record
- **Seis. Location** – User setting for record
- **Notes** – User setting for record
- **Distance to source** – None, 1-99999 ft (User setting for record)
- **Weight Per Delay** – None, 1-99999 lbs (User setting for record)
- **Operator** – User setting for record
- **Sensitivity** – Low or High. Changes dynamic range. High sensitivity trades range for increased resolution. Numbers depend on sensor type.
- **Seismic Trigger** – Threshold for recording a waveform that is triggered by seismic activity. Range is dynamic depending on sensitivity and sensor type. Step increments are dynamic depending on sensitivity and sensor type.
- **Air Trigger** – Threshold for recording a waveform. Range is dynamic depending on sensitivity and sensor type. Step increments are dynamic depending on sensitivity and sensor type.
- **Record Time** – 1-894 seconds. Length of time the event will record once a trigger level is exceeded. Longer record times create larger files.

- **Save Setup** – Choose YES or NO to save the setup for later use. If you choose to save settings, enter a name to identify the saved settings.

Additional Settings:

- Alarm 1: Able to set as follows: Off, Seismic, Air, both. If you choose Seismic, Air, or Both, set the trigger level for the sensor(s) selected.
- Alarm 1 Time: Range: 0.5-60.0 seconds in 0.5 second increments. This is the amount of time the alarm output will pull to GND reference.
- Alarm 2: Able to set as follows: Off, Seismic, Air, both. If you choose Seismic, Air, or Both, set the trigger level for the sensor(s) selected.
- Alarm 2 Time: Range: 0.5-60.0 seconds in 0.5 second increments. This is the amount of time the alarm output will pull to GND reference.

High Level Steps for SELF TRIGGER Mode:

1. Set to Monitor and record event(s)
2. Allow it to go to sleep
3. Wake it up
4. Exit

BAR GRAPH

This mode is designed for situations where large data collection is needed for long periods of time (normally over 60 seconds and lasting for hours or days). Seismic and/or air data is collected and recorded in a bar graph (histogram) format and stored in the internal memory for future use. The instrument stores the history in an event format and creates a new event at midnight each day. The longest time span for any event will be 24 hours. Each 24-hour recording is given a job number on the record stored in memory for easy reference. No digital waveform is stored in this mode. The current summary bar graph results will display on the LCD in real time. With this mode, you can press the ↓ arrow button to view the current job peak results, which is a summary of peak data since starting the job. You can also press the ↑ arrow button at any time to see impulse readings.

When you select BAR GRAPH from the main menu and choose EDIT, you will be able to modify the following settings:

- **Sample Rate** – 512, 1024, 2048, 4096, 8192. Faster sample rates are more accurate at higher frequencies, but will create larger files.
- **Bit accuracy** – 16, 14, 12, 10 bit. Higher bit accuracy results in higher data accuracy, but will create larger files.
- **Recalibrate on temp change** – Adjusts A/D Midpoint after 10 degree change if needed.
- **Company** – User setting for record
- **Seis. Location** – User setting for record
- **Notes** – User setting for record
- **Distance to source** – None, 1-99999 ft (User setting for record)
- **Operator** – User setting for record
- **Sensitivity** – Low or High. Changes dynamic range. High sensitivity trades range for increased resolution. Numbers depend on sensor type.
- **Monitor Bargraph** – Both, Seismic, Air. Chooses which sensor(s) to monitor.

- **Bar Interval** – 1, 10, 20, 30, 40, 50, 60 seconds. This is the amount of time each bar represents.
- **Summary Interval** – 5 min., 10 min., 30 min., 1 hour, 2 hours, 4 hours, 8 hours, 12 hours. Indicates how often a complete summary is saved in the record.
- **LCD Impulse Time** – 1-15 seconds in 1 second intervals. Amount of time the Impulse screen displays results before being reset back to zeros. After being reset back to zero, the impulse screen will continue to display maximum results for impulse time setting.
- **Save Setup** – Choose YES or NO to save the setup for later use. If you choose to save settings, enter a name to identify the saved settings.

High Level Steps for BAR GRAPH Mode:

1. Set to monitor and record for 10 minutes
2. Allow it to go to sleep
3. Wake it up
4. Exit

COMBO

COMBO mode, a combination of both SELF TRIGGER and BAR GRAPH modes, is designed for situations where both types of data are needed. The files for these will be split into each type and stored. This mode provides both the data collection from a period of time and detailed analysis of events over their trigger level. The Super Graphics program allows you to match these files together for a complete analysis.

When you select COMBO from the main menu and choose EDIT, the settings that will display are the same as those listed above for SELF TRIGGER and BAR GRAPH modes.

High Level Steps for COMBO Mode:

1. Set to monitor
2. Trigger waveform
3. Allow it to go to sleep
4. Wake it up
5. Exit

Help Menu

Press the HELP key on the unit for assistance with the normal features of the Mini-SuperGraph II. You can use the HELP menu at any time before monitoring starts. The HELP function has 2 different menus:

- **1: CONFIG & OPTIONS** - This option shows the features of the Mini-SuperGraph II. Use the ↑ and ↓ keys to scroll through the options on the help menu and press ENTER to select an option. Press ESC to exit a selection at any time. Use the + and - keys to move the cursor right or left. In the English version, these options are in alphabetical order. The features of the HELP 1 menu are listed on the following pages.
- **2: HELP INFORMATION** - This option displays the software version being used and date of that version.

Configurations and Options

Feature	Description
Alarm Output Mode	<p>Use this option to turn the external alarm feature on or off. With this feature you can connect external alarms to the unit to indicate when vibration and/or air limits have been exceeded. Choose DISABLED or ENABLED. If you enable the alarm here, you can then go to the Edit menu for the monitoring mode to select two (2) limits of your choice as a caution and not to exceed limit. Once either of these limits is exceeded, the external alarm will activate.</p>
Auto Calibration	<p>Use this option to generate a calibration record (stored as an event in memory noted by a "P") after a specified time:</p> <ol style="list-style-type: none"><li data-bbox="417 681 748 710">1. AFTER EVERY 24 HR<li data-bbox="417 717 748 746">2. AFTER EVERY 48 HR<li data-bbox="417 754 748 783">3. AFTER EVERY 72 HR<li data-bbox="417 790 917 819">4. NO AUTO CAL – disable this feature. <p>Each self-trigger event recorded <u>ALWAYS</u> has a calibration signal recorded</p>

Feature	Description
	<p>with that record. Bar graph does not store a calibration graph with the event. If a calibration graph is required, enable this option.</p> <p>This feature is intended for use on instruments that are left in place for a number of days at a time. You can use this feature to prove that the instrument was operating each day but may not have been triggered during the selected monitoring time period. The auto calibration record will occur at <u>midnight</u> at the selected time period. In most cases, this selection should remain at the default setting of NO AUTO CAL.</p>
Auto Dial Info	<p>Use this option to see the status of any automatic dial-out activity from the unit. It shows the last downloaded event, the last received event and the last connection. It can also be used for all seismograph connections, including computer and modem connections. Please keep in mind that if the operator only viewed the last event at the time of connection to the seismograph, this will show at this screen. The events before this may not be downloaded.</p>
Auto Monitor	<p>Use this option to set the instrument to automatically go into monitoring</p>

Feature	Description
	<p>mode after 2, 3, or 4 minutes. You can choose “NO AUTO MONITOR” to deactivate this feature. If you select the 2, 3, or 4 minutes option, the Mini-SuperGraph II will automatically go into monitor mode after the selected period of time; the time begins after the last key is pressed. If you have not selected a set up preference, it will default to the set up used for the last operation.</p> <p>This option is intended for instances when an operator may forget to put the Mini-SuperGraph II into monitor mode. If you set this feature to “no auto monitor”, the operator will need to press all keys necessary to begin monitoring with the unit. If the unit is not placed in monitor mode, the event will not be recorded.</p>
Battery	<p>Use this option to check the status of the battery voltage. The real voltage is shown on the screen. A bar indicator shows the battery status. Please note that when the unit is not connected to a charging system, the charging voltage will appear as 0 V. The unit will stop monitoring at 5.4 volts and return to the NOMIS MAIN MENU.</p>

Feature	Description
Baud Rate	<p>Use this option to set the baud rate of the instrument when some type of modem is in use. The default value for this setting is 38400. Other options are 115200, 57600, 19200 and 9600.</p> <p>This is used for serial communication with the PC as well as modem communication. This must be set to match the SuperGraphics program for PC communication via serial or the modem for remote communication. 38400 is typical for modem use.</p>
Calibration Date	<p>Use this option to check for the last factory calibration performed on the unit by an authorized NOMIS facility.</p>
Date/Time	<p>Use this option to change the date and time. When you choose this option, the cursor will start on the hour. All time is listed in military format, with hours represented by numbers ranging from 1 to 23. After 23:59 (11:59 pm), the numbers will change to 00 (midnight). Use the + and – keys to move horizontally through the edit Process. Use the ↑ or ↓ keys to change the settings at the cursor. The time will not begin to count until you press ENTER.</p>

Feature	Description
Erase Memory	<p>Use this option if you want to clear all stored events from the memory. Choose YES to erase the memory. CAUTION: With this feature all previously stored data will be permanently deleted. Make sure you have downloaded all useable data prior to executing the erase procedure. You will be asked twice to verify that you want to erase all data.</p> <p>Because this unit has 1 gigabyte of memory, it may take several minutes to perform this operation.</p> <p>After you answer YES to both verification questions, all data events will be erased from memory, and the question "ZERO EVENT NUMBERS?" will display. Select YES to restart event numbering at 1. Select NO if you want to allow the numbers continue to increase. Choose YES or NO and press ENTER.</p> <p>Then you will be asked if you want to erase saved settings (the settings at option 4 of the NOMIS MAIN MENU). Choose YES to erase all saved settings except for the default settings, which cannot be erased.</p> <p>NOTE: You can erase saved settings without erasing the memory. To do</p>

Feature	Description
	this, choose NO on the first erase memory screen and you will have the option to erase saved settings.
Events Summary	<p>Use this option to view all events stored in memory. The LCD displays the event number, date, and time of the event. The far right side will display a letter to indicate the mode of operation used when the event was recorded: W for waveform, B for bar graph, C for combo mode, P for calibration pulse.</p> <p>Move the cursor to the desired event and press ENTER to display the results summary for that event. An arrow in the upper right hand corner of the display indicates the presence of other events stored in memory. If the arrow points up, older events are recorded. If the arrow points down, newer events are recorded. If the arrow points both ways, both older and newer events are recorded in memory. Scroll up or down to review the results summaries for these other events.</p>
Flash Wrapping	Use this option if you want to deactivate Flash Wrapping so that the unit will stop monitoring when the memory is full. Under normal operating conditions Flash Wrapping is activated and the unit will continue to monitor when the

Feature	Description
	memory is full, but it will write over the oldest events it has stored in memory.
Flash Stats	Use this option to see how much memory has been used and how much remains at any given time. It also indicates whether or not Flash Wrapping has been activated and how many waveforms or bar graph hours remain at current settings before an overwrite will occur.
Language	Use this option if you want to change the language displayed on the unit. The languages available are English, French, Spanish, Italian and German. After you change the language, all questions and display data will be in that language.
LCD Contrast	<p>Use this option to change the contrast on the LCD:</p> <ol style="list-style-type: none"> 1. Lighter 2. Default 3. Darker 4. Save Changes

Feature	Description
	<p>Press the + and – keys and the bar at the bottom will indicate the change. Select Save Changes to save the settings.</p> <p>You can press the – or + keys at any time to change the LCD contrast without having to use the HELP menu.</p>
LCD Timeout	<p>Use this option to set the LCD to stay on longer than the default of 2 minutes. The 2-minute default is meant to conserve power, but you can select a time up to 60 minutes to keep the LCD on. Use the ↑ or ↓ keys to change the value.</p> <p>Be aware that if you select longer periods of time, the battery life will be reduced.</p>
Modem Set Up	<p>Use this option to configure the instrument for remote communication with a modem. There are 6 questions to answer for this set up. There is a modem unlock code which by default is 0000. This unlock code prevents unauthorized entry by vandals.</p> <p>Please note that if this code is changed from 0000, you must make a note of</p>

Feature	Description
	this code for use in a computer connection using SuperGraphics.
Monitor Log	<p>Use this option to view the dates and times that the seismograph was monitoring. For the Mini-SuperGraph II, the only valid option is VIEW MONITOR LOG. The log will show the start time, the number of events recorded, the event number of each recorded event, and the time the seismograph stopped monitoring. This log is stored within the seismograph and you can use the SuperGraphics program to download it.</p> <p>This feature allows you to prove that the unit was monitoring during a stated period of time.</p>
Pretrigger Size	<p>Use this option to indicate the time that the graph will record before a trigger level is surpassed. This feature allows you to see what was happening just before the trigger level was exceeded.</p> <ul style="list-style-type: none"> • QUARTER SECOND • HALF SECOND • FULL SECOND

Feature	Description
Sensor Gain/Type	Use this option to view the type sensor provided with the unit and the maximum vibration level for that sensor. The sensors available are X1 (20 IPS/508 mm max), X2 (10 IPS/254 mm max), X4 (5 IPS/127 mm max), and X8 (2.5 IPS/63 mm max).
Serial Number	Use this option to view the serial number of the instrument. This serial number can only be set at the NOMIS facility.
Timer Mode	<p>Use this option to choose times the unit will be operating and monitoring for vibrations. When the timer has the instrument turned off, the unit will operate on very little power and will not trigger.</p> <ol style="list-style-type: none"> 1. Make sure the current date and time is correct BEFORE using timer mode. If you change the date and time after timer mode is set, timer mode will automatically be cancelled. 2. Choose ENABLE to use timer mode. 3. Choose one of the following options: <ul style="list-style-type: none"> • 1. ONE TIME – One time on and off of the unit. After this one time, it will not occur again.

Feature	Description
	<ul style="list-style-type: none"> • 2. HOURLY – Once every hour. • 3. DAILY (EVERY DAY) – The same time every day, seven days per week, 365 days per year. • 4. DAILY (WEEKDAYS) – The same time, Monday – Friday, of each week, 52 weeks per year. The instrument will not be operational on Saturday and Sunday of each week. • 5. WEEKLY – This operation will be active for the same day each week that is entered for the start date. • 6. MONTHLY – This operation will be active for the same date (not day) of the month that is entered for the start date. <p>IMPORTANT: For options 2-6 above, the stop date year must be greater than the current year. If the stop date year is the same as the current year, the unit will operate as indicated in option 1 and only turn ON and OFF one time.</p> <p>4. After selecting timer mode settings, the LCD will show this message: TIMER MODE NOW ACTIVE. PLEASE POWER OFF UNIT. Press ENTER to confirm.</p>

Feature	Description
	<p>5. Press ESC to go back to the MAIN MENU and select the recording mode you want to use.</p> <p>6. After selecting the recording mode (self-trigger, bar graph, combo, saved settings), use the EDIT option to view the operating parameters. After you have reviewed these, the LCD will display MONITOR or EDIT.</p> <p>7. Turn the unit OFF. Timer mode will then be active and turn ON and OFF at the set times.</p> <p>If the unit is turned ON, the LCD will display a message that the unit is in timer mode. Press ENTER and another message will ask if timer mode should be cancelled. Press YES if you want to cancel timer mode and operate the unit normally. Press NO to wait for the programmed start time and the unit will automatically turn OFF.</p> <p>If you want to check the timer mode settings while the unit is turned ON, go to the HELP menu and select TIMER MODE. The settings will display and you can cancel or keep these settings.</p> <p>NOTE: 1) The start time must always be earlier than the stop time. 2) You cannot use Timer Mode when the current time is between the start and stop</p>

Feature	Description
	time. In this case, select the next day for the beginning of Timer Mode
Units of Air	Use this option to choose between DECIBEL and MILLIBAR units. All data stored in the unit will be changed to the selection of choice.
Units of Measure	Use this option to choose between INCHES and MILLIMETERS. The data will display in the unit of measure you choose.
Waveform Auto Cal	Use this option to generate a calibration record at the beginning of each monitoring session.

Technical Specifications

Seismic:

- Monitoring with Standard Triaxial Geophone
- Range: 0 - 10in/s (0-254mm/s) - Standard
- Maximum Resolution: 0.00003 in/s (0.00078mm/s) @ 16-bit accuracy
- Accuracy: +/- 3%
- Transducer Density: 108 lbs/ft³
- Frequency Response: 2 - 400 Hz (1Hz optional)

Sound:

- Weighting Scales: Linear (flat)
- Linear Range: 92-148dB
- Linear Resolution: 0.00015625mb @ 16-bit accuracy
- Linear Accuracy: +/- 1dB or +/- 10% whichever is greater
- Linear Frequency Response: 2 - 400Hz

Waveform Recorded Data:

- Record Modes: Waveform, Combo & Manual
- Seismic Trigger Range: 0.02 - 10.24 in/s (0.508 - 260.096mm/s)
X2 sensor low sensitivity
- Sound Trigger Range (Linear): 92 - 148dB, no trigger (other levels optional)
- Sample Rate: 1024 - 16384 Standard, higher rates optional
- Record Time: Up to 895 seconds
- Cycle Time: No wait time in between events
- Storage Capacity: 65k one-second events standard @ 1024 samples/s

Bar Graph Data:

- Record Modes: Bar Graph (Histogram)
- LCD readings: Real time update 1-60 seconds
- Bar Recording Interval: 1,10,20,30,40,50,60 seconds
- Summary Interval: 5,15,30 minutes, 1,2,4,8,12,24 hours
- Summary Data: Peak R,T,V + Sound & Frequencies for each

Physical Specifications

- Dimensions: 6 x 4.25 x 3 in/ (152 x 108 x 76 mm)
- Weight: 4.1 lbs. (1.9 kgs)
- Battery: Up to 7 days duration per recharge (monitor mode)
- Display - LCD: 8 lines x 21 characters w/backlight
- PC Interface: RS-232 & additional 15 pin auxiliary connector / USB
- Auxiliary Inputs & Outputs: External trigger & remote alarm
- Operating Temperature: 0 to 120° F (-18 to 50° C)
- Remote Communications: Full function RS-232 port, compatible with telephone, GSM, satellite, RF
- Warranty: 2 years parts & labor



For questions or information, please contact us:

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