VMS-200E Elevator Vibration Analysis System

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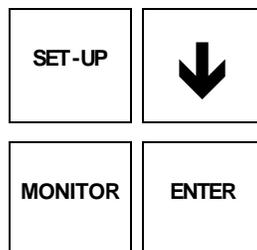# Reference Manual

POWER UP OF VMS-200E

When the VMS-200E is powered up, the LCD will first display the battery voltage level. If the battery voltage drops below 5.6 volts, the VMS-200E is designed to shut down until the battery is recharged to a proper operating value. This protection will prevent your battery from being drained to such a point that it will no longer retain a proper charge thus rendering your battery useless. When the battery is at a proper operating level, the LCD will appear as follows.

```
BATTERY VOLTS: 6.000
   BATTERY IS O.K.

     PLEASE WAIT
```

Next the model number and serial number of the unit are displayed. This is the main display screen.

```
THOMAS INSTRUMENTS
VMS-200E      VER  3.00
SERIAL#:    V2ED266001
12-23-96         12:30:01
```

The VMS-200E will remain at this message until the user presses the **SETUP,** ↓ or **MONITOR** key on the keypad. The VMS-200E incorporates a 4 line by 20 character LCD and a keypad labeled as follows:

SET-UP	↓
MONITOR	ENTER

SET-UP

To change parameter settings press the *SET-UP* key. The LCD will display the different available settings. Simply press the ↓ key to select the setting you wish to alter. Once your desired selection is pointed at by the **>** sign, press the *ENTER* key.

```
> TRIGGER SETTINGS
  EVENT RECALL
  EXTERNAL CHANNEL
  END SETUP MODE
```

TRIGGER SETTINGS

The trigger settings allows the VMS-200E to be altered in the field without the necessity of a computer. When selected; by pressing the *ENTER* key, the screen appears as follows:

```
> *AUTO RECORD
   MANUAL TRIGGER
   SELF TRIGGER
   END TRIGGER MODE
```

Press the ↓ key to select which setting to change, then press *ENTER*.

AUTO RECORD

When *AUTO RECORD* is selected an asterisk will appear to confirm selection. You may now exit by selecting *END TRIGGER MODE* and press *ENTER*.

For recording an elevator ride it is generally most convenient to operate in the **AUTO RECORD** mode. This allows the operator exact determination of when the unit begins and stops recording. When ready to record the operator presses the **MONITOR** key on the keypad, then simply pushes the trigger button to the ON position; located on the microphone, and moves the button to the OFF position at the end of the ride.

MANUAL TRIGGER

In this mode when the operator is ready the button on the microphone is pushed to the ON position and pushed back to the OFF position, or the **MONITOR** key is pressed on the keypad. The unit records for a pre-set period of time that is set. The VMS-200E will record the event for the duration of time specified. The choices of Record Time are provided after making the Manual Trigger selection. Note: the number in brackets indicates how many available events are left for memory storage for the selected record time. Once selected the LCD will appear as follows:

```
- RECORD TIME -
USE ARROW TO CHANGE
10 SECONDS [55]
PRESS ENTER TO END
```

Line 3 of the LCD will change with each press of the ↓ key. The available selections are as follows:

```
10   SECONDS [55]
20   SECONDS [29]
30   SECONDS [19]
40   SECONDS [14]
50   SECONDS [11]
60   SECONDS  [9]
120  SECONDS  [4]
```

If you miss the desired selection, continue pressing the ↓ key and the selection will "roll around" again. Once the proper value is displayed, press the **ENTER** key.

SELF TRIGGER

If the Self Trigger mode has been selected, the unit starts recording after a selected acceleration level is reached. The choices of trigger level are provided after making the Self Trigger selection. Once selected the LCD will appear as follows:

```
-SELF TRIGGER -
USE ARROW TO CHANGE
12 mg
PRESS ENTER TO END
```

Line 3 of the LCD will change with each press of the ↓ key. The available selections are as follows:

<div align="center">

20   mg
50   mg
100 mg
150 mg
200 mg

</div>

If you miss the desired selection, continue pressing the ↓ key and the selection will "roll around" again. Once the proper value is displayed, press the *ENTER* key.

The VMS-200E will record the event for the duration of time specified. The choices of Record Time are provided after making the Trigger Level selection. The LCD will appear as follows:

<div align="center">

-RECORD TIME -
USE ARROW TO CHANGE
30 SECONDS [19]
PRESS ENTER TO END

</div>

Line 3 of the LCD will change with each press of the ↓ key. The available selections are as follows:

<div align="center">

10   SECONDS [55]
20   SECONDS [29]
30   SECONDS [19]
40   SECONDS [14]
50   SECONDS [50]
60   SECONDS [9]
120 SECONDS [4]

</div>

NOTE: After escaping from SETUP MODE and returning to Main Display, Pressing the *MONITOR* key on the keypad will start the VMS-200E into this mode. When the trigger level is exceeded, the unit will record the event for the duration of time specified.

The VMS-200E is now in recording mode. Whenever the selected trigger level is exceeded, the event will be recorded and stored in memory. After a trigger condition has occurred and recording of the event is complete, the VMS-200E will automatically save it.

Then it will return to monitoring mode, making the VMS-200E perfect for long time monitoring of several events.

The LCD will display the following:

```
        MONITORING IN
          PROGRESS
     TO EXIT PRESS ENTER
    MONITORING EVENT:  1
```

EXITING MONITORING FROM ALL MODES

To exit from the monitoring mode, press *ENTER* on the keypad. The VMS-200E will then record the date and time that it exited from the monitoring mode. To review all previous events stored in memory, refer to EVENT RECALL from the SET-UP menu.

Note: A non-triggered event, (exiting from monitoring) will be recorded in EVENT RECALL as "operator exited from monitoring without a trigger."

MEMORY STORAGE

After selecting any of the Trigger Setting options; except **AUTO RECORD**, the LCD will display memory **STORAGE MODE**. The number of separate recordings the VMS-200E can retain in memory is dependent on the **RECORD TIME** setting. Once the memory is full the VMS-200E can either record over the oldest event in memory or it can be programmed to stop recording so that all previous events are saved. The LCD will appear as follows:

```
     -  STORAGE MODE  -
    USE ARROW TO CHANGE
    STOP MONIT WHEN FULL
    PRESS ENTER TO END
```

Line 3 of the LCD will change when the ↓ is pressed. The options are:

STOP MONIT WHEN FULL
RECORD OVER OLDEST

NOTE: In general it is safest to operate the VMS-200E using the **STOP MONITORING WHEN FULL** mode. This will ensure that all previous events will be retained in memory.

END TRIGGER MODE

Selecting this will return you to the SETUP menu.

EVENT RECALL

To recall an event and display the results on the LCD, choose **EVENT RECALL** from the **SETUP** menu. Pressing the ↓ key enables you to scroll from the latest event occurrence, through to the oldest event in memory. This will enable the on site user to physically record all data if necessary. When you have completed viewing all records, press the **ENTER** button to exit back to the main menu. Below is a listing and explanation of information displayed on the LCD of the VMS-200E.

<div style="text-align:center">

Line 1:
Line 2:
Line 3:
Line 4:

```
VER   166.7mg      H1 12mg
MIC   64dBA        H2 16mg
                        (2)
12-19-96           13:38:15
```

</div>

Line 1:   In the example above VER indicates the vertical axis recorded the highest peak value and it's value was 166.7 millig's. The peak value for H1 12 millig's.

Line 2:   displays the peak value for the MIC and H2 channels.

Line 3:   (2) Indicates that this event is the second stored in memory. To view the next event occurrence, press the ↓ key.

Line 4:   indicates the event occurred on December 19, 1996 and the time of the event was on the 13*th* hour, 38*th* minute, 15*th* second of that day. (1:38:15 PM)

If the trigger level was never exceeded, and the VMS-200E was exited from **MONITOR** mode, a message such as the following will be stored in memory:

<div style="text-align:center">

```
OPERATOR EXITED
FROM MONITORING  (3)
WITHOUT A TRIGGER AT
11-11-96   10:45:01
```

</div>

Line 2 shows (3) indicating this occurrence (or lack thereof) is third in memory and the VMS-200E was removed from monitor mode on November 11, 1996 at 10:45:01 am. If you miss the desired selection, continue pressing the ↓ key and the selection will "roll

around" again. Once the proper value is displayed, press the **ENTER** key.

Press the **ENTER** key to return back to the Main Display.

MONITORING

REAL TIME MODE

The VMS-200E can display "real time" vibration levels on the LCD screen. The screen automatically updates itself constantly. No information is stored in memory while operating in this mode.

To select this operation mode: Turn unit on. Wait for the MAIN SCREEN and press the ↓ key. The VMS-200E will Autozero.

MONITOR MODE

> *_IMPORTANT_ – **Before going into _MONITOR_ mode make sure that the microphone switch is in the _OFF_ position**

To place unit in **MONITOR** mode, press the **MONITOR** key on the keypad. The following screens will scroll: **Autozeroing Sensors**, **Record Mode**, **Memory Option**, and **Event Storage**. The final screen then appears as follows:

> *_IMPORTANT_ – _DO NOT_ **move the unit or cause any vibration while the unit is _AUTOZEROING_. Any movement will cause any Data collected to be inaccurate.**

> **Monitoring in Progress**
> **To Exit Press Enter**
> **Monitoring Event 1**

Monitoring will continue based on which operation mode was selected.

Note: the **Event Storage** memory will be displayed when the unit scrolls through the screens after the monitoring key is pushed. It appears as follows:

```
-EVENT STORAGE-
EVENTS LEFT:          14
STORED EVENTS:         3
12-19-96         11:35:06
```

Line 2 displays the total number of events capable of being stored in the memory. This number is dependent on the record time. If the record time is increased, the number of events that can be stored in memory is decreased. The third line of the LCD indicates the number of events currently stored in memory. (Note: Events stored in memory are cleared via computer only.)

IMPORTANT – **Do not stop recording ride until *AFTER* the elevator doors fully open and all motion has completely ceased.**

VMS-200E
TECHNICAL SPECIFICATIONS

SYSTEM

Measurement
      Vibration: Acceleration (g)
      Sound Level: Decibels (dB[A]) True RMS A-weighted
Microprocessor Based
      Display: 4 Line by 20 Column LCD
      A/D Converter: 12 bit
Resolution: .001g (.0098 m/s², .0322 ft/s²)
Anti-Aliasing Filters: Low Pass (-6dB @ 100 Hz)
Frequency Response: 1-100 Hz
Non-Linearity: less than 0.05%
Cross Axis Sensitivity: less than 3%
Range: -1.90 to 1.90 g
                        40 to 80 dB(A)
Time/Date Clock: Internal Lithium Battery
Battery: Gel Cell, Rechargeable
Sampling Rate: 256/512 samples/second

OPERATIONS

WIN200E Software for Windows 3.1™ and Windows 95™
Recommended System: 486DX-66, 8 MB RAM, SVGA Display
Modes: Self Trigger
                        Manual Trigger
                        Auto Record
Record Time: 10 to 120 seconds per recording
Data Output: Printer or ASCII File

PHYSICAL

Dimensions: L 9.3" x W 7.2" x H 4.1"
                        L 23.6cm x W 18.3cm x 10.4cm
Weight: 7 lbs.