Instruction Sheet
Micromate® Linear Microphone

The Micromate's Linear Microphone automates the monitoring of air overpressure and vibration monitoring in the same unit, making it a cost effective and flexible device for these applications.

The Linear Microphone is calibrated to the ISEE-2017 standard with a frequency measuring range from 2 to 250 Hertz and an amplitude range up to 500 Pascals (0.0725 psi, or 148 dB).

Range of Applications

- Blasting
- Demolitions
- Quarries
- Construction
- Dynamic Compaction
- Tunnels and Subways

Tools and Materials Required

- Micromate ISEE Base Unit . . . .(P/N: 721A2501) or
- Micromate DIN Base Unit . . . .(P/N: 721A2601) or
- Micromate Swedish Blasting Base Unit . . . .(P/N: 721A3601) or
- Micromate Swedish Pile Driving Base Unit . . . .(P/N: 721A3801)
- Linear Microphone . . . . (P/N: 721A0201)
  (stand and windscreen included)
- Microphone Stand Extension Rod (28 cm/11 in) . . . .(P/N:400-720020-000)
- Extension cables, as required:
  - 10 m (33 ft) . . . . (P/N: 721A0803)
  - 30 m (100 ft) . . . .(P/N: 721A0801)
  - 75 m (250 ft) . . . .(P/N: 721A0802)
  - Custom Extension Cable Kit. . . . .(P/N: 721A3201)
- THOR software (free version included with any Micromate purchase) or
- THOR Advanced software (Additional license purchase required). . .(P/N: 72300201)

Physical Installation
(for a detailed description see page 3.)

1. If required, assemble the 3-piece microphone stand (see Figure 1. on page 3).
2. Point the microphone in the direction of the pressure source.
    - If required, place the windscreen on the end of the microphone.
3. Connect the microphone to the Micromate by aligning the red end of the connector with the indicated red microphone port.
4. Make sure the Micromate has the proper **Setup File** (see THOR Software Setup below) and then perform a sensor check by pressing the **Sensor Check** key on the keypad.

Specifications

Field	Values
Response Standard	ISEE - 2017
Frequency Weighting	Linear
Frequency Range	2 Hz - 250 Hz
Amplitude Range	Up to 500 Pa (0.0725 psi, or 148 dB)
Trigger Levels	2 to 500 Pa (0.00029 to 0.0725 psi, or 100 dB(L) to 148 dB(L))
Sample Rates	1,024 - 4,096 S/s
Resolution	0.0156 Pa (0.05 dB)
Cable Length	2 m (6.5 ft)
Maximum Cable Length	75 m (250 ft)
Temperature Range	-10° to 50°C (14° to 122°F)

Micromate Setup

1. On the Micromate keypad press the **Power** button.
   Note: To navigate the menu, use the **Arrow** keys followed by the **Checkmark** key or tap on the touchscreen display.
2. Press the **Setup** key then tap **View/Edit Current Setup.**
2. Tap **Active Sensors** until either **Microphone** or **Geophone/Microphone** is selected.
3. Tap **Microphone Type** until **Linear** is selected.
4. Select the **Record Mode** (Waveform, Waveform Manual, Histogram or Histogram-Combo).
5. Tap **Trigger Level,** then tap **Microphone Trigger** until **Enabled** is selected.
6. Tap **Trigger Level**, then swipe up or down on the spinner wheel or use the arrow keys.
7. Press the **Checkmark** key, this prompts you to save any changes. Use the **Checkmark** key to save the changes or the **Cancel** key to cancel the changes and return to the previous screen.
8. Tap either the **Save** icon on the touchscreen display or press the **Cancel** key for a prompt to save the changes to a **Setup File**.
9. Select the **Checkmark** and then **Save to Current File/Overwrite File**.

Calibration

Note: The Linear Microphone must be sent to a manufacturer certified calibration facility, or Instantel headquarters for calibration. Please visit our calibration facility locator at www.instantel.com. Instantel recommends calibrating all air overpressure microphones once a year and provides the Next Calibration date on the unit and sensors. The calibration process is the only method to ensure the instrument is performing as it was designed and accurately measuring the air overpressure it receives.

Using a manufacturer certified facility ensures the proper procedures are followed when calibrating your microphone. This removes any uncertainty associated with the reliability and measurement accuracy of your microphone. It also helps ensure the integrity of the measured recorded events if they are ever called upon as evidence in a court of law. Using unauthorized facilities may have negative legal consequences if the reference equipment is not traceable, the proper procedures are not followed or if the certification documents are incomplete. Please visit our calibration facility locator at instantel.com.

Installing the Linear Microphone

(Taken from Section 14.4. of the Micromate Operator Manual)

The microphone installation procedures are based on ISEE field practice guidelines for blasting seismographs. This section illustrates the installation procedures recommended by Instantel. Your particular monitoring activities may employ one, or a combination of all, of the following procedures.

The Linear Microphone is supplied with a 3-piece microphone stand. The top section has a clip to hold the microphone, the extension section is threaded at both ends and the bottom section is pointed to assist in the installation. When the three pieces are assembled the microphone stand is approximately 0.8 m (33 in) tall.   If the air overpressure is to be monitored at a height greater than 0.8 m (33 in), additional extension sections can be purchased. (Microphone Stand Extension Rod, P/N: 400-720020-000)

Installation Steps:

1. Assemble the microphone stand at the desired location (see Figure 1.). Section 1 has a pointed tip to drive the stand into the ground. Section 2 has a male and female thread. Screw in the female threaded end of section 2 into the male threaded end of section 1. Section 3 contains the microphone clip. Screw in the female threaded end of section 3 into the male threaded end of section 2.
2. Push the pointed end of the microphone stand into the ground. If the ground is too hard, use a rubble mallet to install the microphone stand.
    Note: Do not use a metal hammer or other hard object as it may damage the top of the microphone stand.
3. Attach the windscreen to reduce false triggering caused by wind. The windscreen attenuates the microphone reading by approximately 0.2 dB.
4. Install the Linear Microphone in the clip at the top of the microphone stand and point the microphone in the direction of the noise source.
5. Ensure that the microphone cable is securely attached to the Micromate.
6. Press the **Sensor Check** key on the Micromate ensuring the microphone is properly attached and has passed the Sensor Check.

Figure 1.
3-Piece
Microphone Stand

Figure 2.
Soft Ground Installation
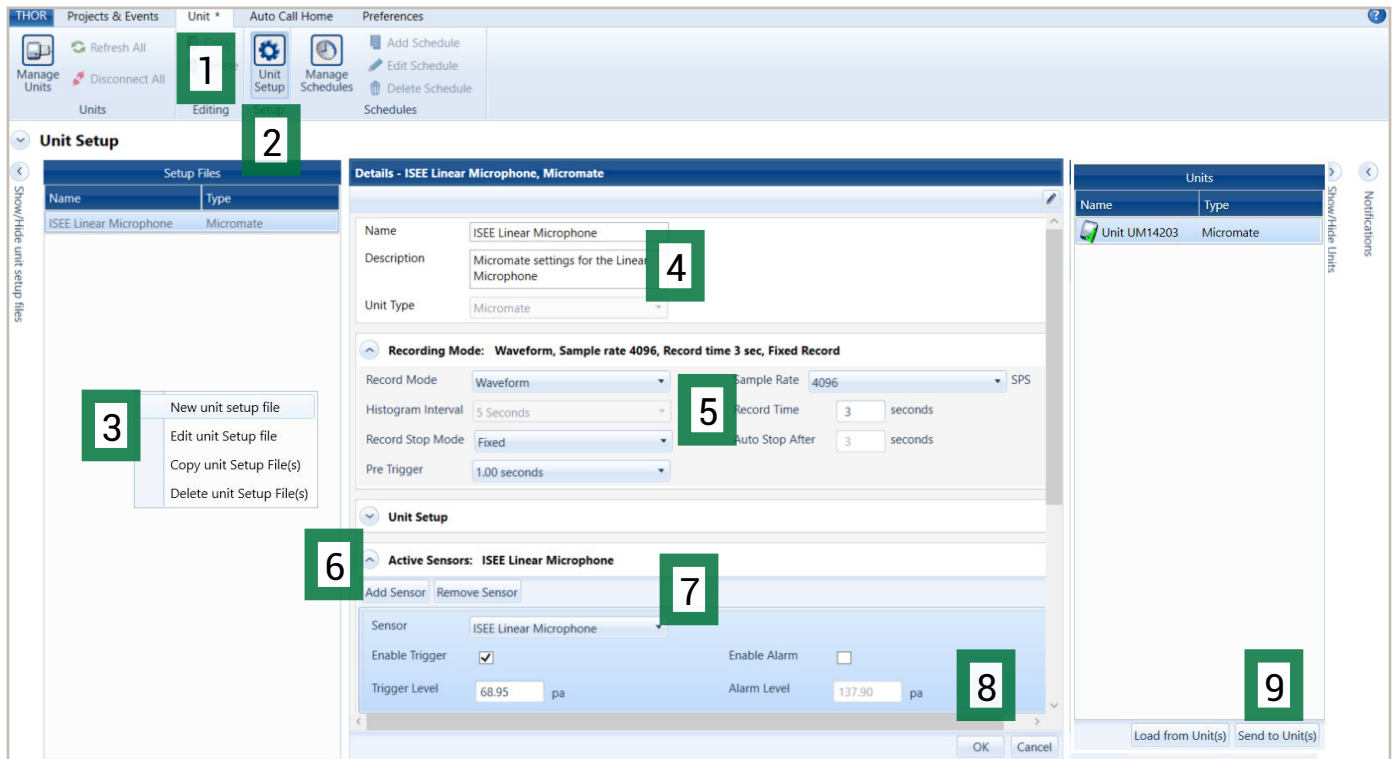

Figure 3.
Hard Ground Installation

Figure 4.
Installing the Microphone

THOR Software Setup

The Linear Microphone can be configured using Instantel's THOR software. Once configured, THOR must send the microphone's setup file to update the Micromate unit.

Installation Steps:

1. Within THOR, click on the **Unit Tab.**
2. Click on the **Unit Setup** icon.
3. In the **Unit Setup** section, right-click and select **New Unit Setup File.**
4. Fill in the details and select **Unit Type: Micromate.**
5. Select the **Record Mode** and fill in the recording details.
6. Under **Active Sensors**, click on **Add Sensor.**
7. Under **Sensor** select **ISEE Linear Microphone**.
8. Fill in any **Trigger and Alarm** details and click **OK**.
9. Select the Micromate unit and click **Send to Unit(s)** to send the configuration file to the Micromate unit.

A visual display of the THOR software installation steps for a Linear Microphone

Warranty

Instantel products come with a one-year warranty. Monitoring units and sensors will have the warranty extended for a second year if they are returned to the Instantel factory for service and calibration within 30 days of the 'Next Calibration' date printed on the calibration label located on the product.

If within a period of one year from the date of shipment to a customer, the instrument fails to perform in accordance with Instantel's published specifications and the operator's manual, due to a defect in materials or workmanship, it will be repaired or replaced at Instantel's option, free of charge. This warranty is void if the equipment has been dismantled, altered or abused in any way. This warranty is nontransferable.

This warranty does not include any implied warranty of functionality for a particular purpose. Instantel assumes no responsibility for damages of any description resulting from the operation or use of its products. Since it is impossible to anticipate all of the conditions under which its products will be used either by themselves or in conjunction with other products, Instantel cannot accept responsibility for the results unless it has entered into a contract for services which clearly define such an extension of responsibility and liability.

Any shipments returned directly to Instantel Inc. must have our prior approval and all packages must display the Return of Material Authorization (RMA) number issued by Instantel. Shipping charges to Instantel's plant will be paid by the customer and those for return to the customer will be paid by Instantel.

To protect your warranty, you must complete and return a Warranty Registration Certificate, or complete the online Warranty Registration Form, within ten days of purchase. Products will be assumed out of warranty if there is no warranty card on file at Instantel. Retain this portion and the proof of purchase for your records.

EC Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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