

# Instruction Sheet

## Wire Make/Break Trigger Cable

A Make/Break trigger cable allows you to trigger a measurement in sync with an event. This cable controls when a unit starts recording an event by using either a switch or a break in a wire referenced from the last activity or from a unit.

The unit's auxiliary channel senses the wire trigger signal via a 22 gauge Make/Break wire and starts recording. A signal occurs when the Make/Break trigger wires separate or create a contact. For example:

- A **Break** signal occurs when a blast physically breaks the trigger wire.
- A **Make** signal occurs when the trigger wires make contact, such as an operator pressing on a push-button switch.



### Range of Applications

- Civil Projects
- Dynamic Compaction
- Pile Driving
- Blasting
- Underground Mines
- Demolition
- Construction
- Quarries
- Tunnels/Subways
- Underwater

### Physical Installation

See following pages for a detailed description of installation instructions.



### DANGER - Exercise Extreme Caution

This unit can supply up to a maximum of 10 mA of electrical current and 7 volts to the cable. You are responsible for ensuring that this amount of electrical current and/or voltage is safe for the type of detonator and explosives used. Calculate the compatibility of the detonators being used to ensure a charge delivery that is under the minimum firing currents of the blasting accessories being used. Properly trained and skilled personnel in explosives must assess and approve the use of this instrument.

**DO NOT** connect a Wire Make/Break Trigger Cable to the AUXILIARY connector until all other components are installed and ready to operate. Ensure that area safety is performed by properly trained and skilled personnel, and that unauthorized personnel keep clear of the blast area.

**DO NOT** install, use, or allow the Wire Make/Break Trigger Cable to remain in place if there is any possibility of an electrical storm.

Please refer to the applicable safety regulations for more information and guidance on the use of this product.

### Tools and Materials Required

- Minimate Pro4 monitoring unit . . . . (P/N: 720A2301)
- Minimate Pro6 monitoring unit . . . . (P/N: 720A2401) up to six units (Pro4/Pro6) may be connected.
- Wire Make/Break Trigger Cable. . . . (P/N: 720A3501) one for each connected unit.

### Supplementary Tools

- Red and black, 22 gauge wire (up to 152 m /500 ft)
- Wire strippers
- A two-way switch, for each **Make** trigger setup
- Electricians tape, as required
- Volt meter/ammeter

## THOR Software Setup

The Make/Break Trigger can be enabled using InstanTel's THOR software. Once configured, THOR must send the setup file to update the Minimate Pro unit. Depending on the active THOR License, the interface will vary. In both cases the procedure is the same.

### Installation Steps:

1. 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: Minimate Pro**. **Setup Type: Compliance** or **Advanced**.
5. Under the **Unit Setup** subsection, click the **Auxiliary IO** dropdown list and select **External Trigger**.
6. Click **OK** (save the changes in the popup dialog box).
7. Send the **Setup File** to the unit by selecting the unit from the list and clicking the **"Send to Unit(s)"** button.
8. Note: If you prefer to trigger the Minimate Pro exclusively from the external wire, you can disable the triggers on the sensors by unchecking the field "Enable Trigger".

The screenshot displays the THOR software interface with several numbered callouts (1-8) indicating the installation steps:

- 1**: Click on the **Unit** tab in the top navigation bar.
- 2**: Click on the **Unit Setup** icon in the left sidebar.
- 3**: Right-click in the **Setup Files** list and select **New unit setup file** from the context menu.
- 4**: In the **Details - Minimate Pro, Minimate Pro** window, set **Unit Type** to **Minimate Pro** and **Setup type** to **Compliance**.
- 5**: In the **Unit Setup** subsection, set **Auxiliary IO** to **External Trigger**.
- 6**: Click the **OK** button at the bottom of the **Unit Setup** window.
- 7**: Click the **Send to Unit(s)** button in the bottom right corner.
- 8**: In the **Active Sensors: ISEE Triaxial Geophone** section, check the **Enable Trigger** checkbox.

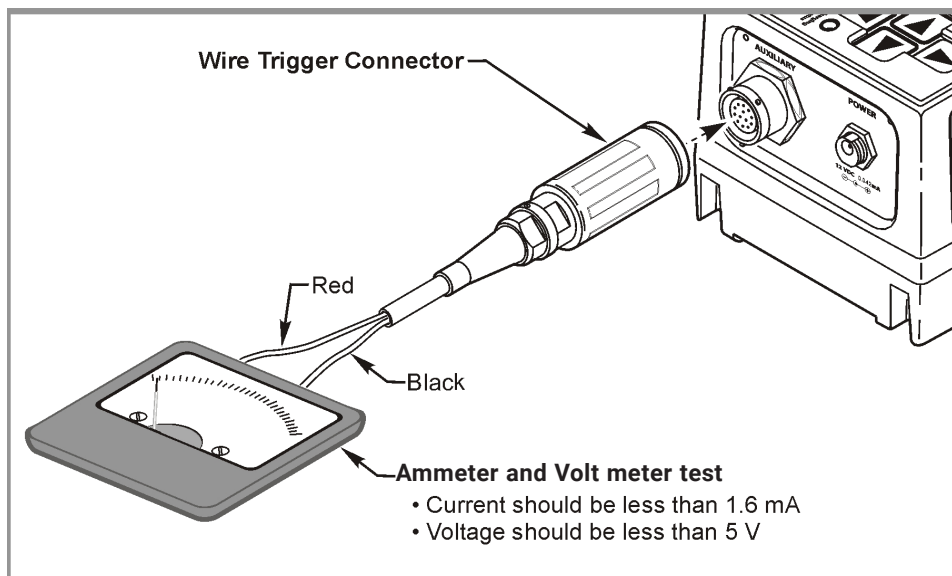
The interface also shows a list of units on the right, including **Unit MP13908 Minimate Pro**.

THOR software installation steps to enable the External Trigger (Compliance Mode)

## Installing the Wire Make/Break Trigger Cable

**WARNING:** The Wire Make/Break Trigger Cable (P/N: 720A3501) should be tested prior to each use.

Attach the Wire Make/Break Trigger Cable to the unit as shown:



Shown is the Minimate Pro test configuration to check the circuitry

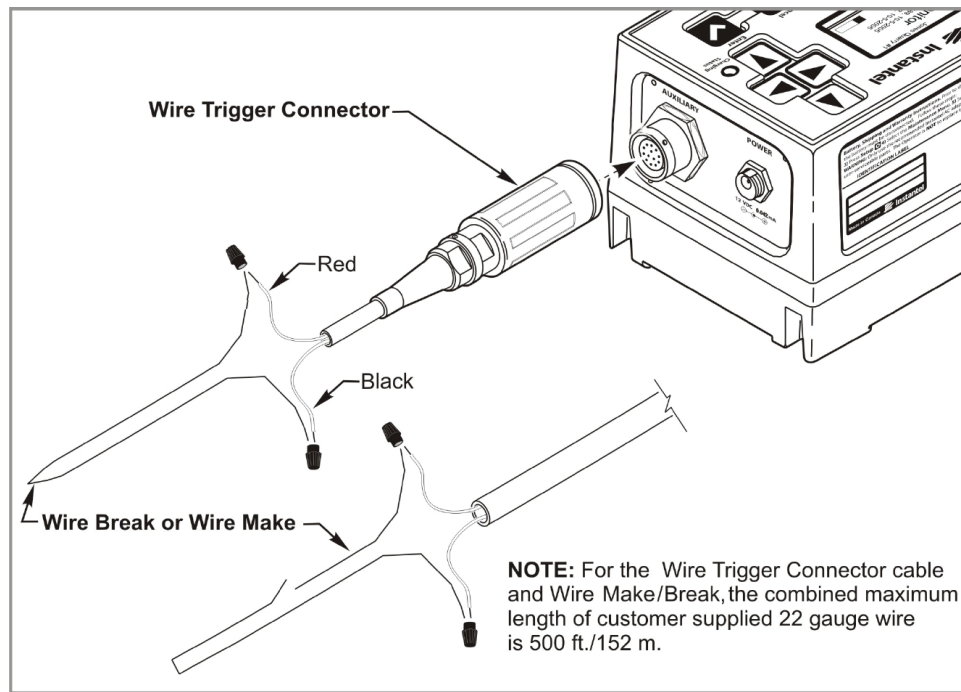
- Test the open circuit voltage of the Wire Make/Break Trigger Cable while attached to the Minimate Pro. The voltage should be less than 5 V.
- Test the short circuit current of the Wire Make/Break Trigger Cable while attached to the Minimate Pro. The current should be less than 1.6 mA.

## Single Wire Make/Break Trigger Cable Setup

**WARNING:** DO NOT connect a Wire Make/Break Trigger Cable (P/N: 720A3501) to the AUXILIARY connector until all other components are installed and ready to operate. Ensure that area safety is performed by properly trained and skilled personnel, and that unauthorized personnel keep clear of the blast area. Visually check all connections.

1. Measure the required length of 22 gauge wire, strip the protective covering from the ends, and connect to the corresponding red and black wires of the **Wire Break/Make Trigger Cable** to complete the sensing loop.
2. Use the supplied connectors to secure the wires and ensure the leads are not exposed. Use electrician's tape, as required.
3. For a **Make** trigger setup, add a two-way switch to complete the sensing loop. Recording begins when the operator presses the button.
4. For a **Break** trigger setup, carefully wrap the wire trigger around a zero time delay detonator.
5. Turn the unit On.
6. Press the **Setup** key, then press the **Down Arrow** key until **View Edit/Setup File** is highlighted. Press the **Enter** key to access this menu.
7. Press the **Down Arrow** key and scroll down to highlight **Auxiliary**. Press the **Right Arrow** key to enter the menu item.
8. With **Auxiliary I/O** highlighted, press the **Right Arrow** key. Press the **Right Arrow** key again until **External Trigger** appears as the selection. Press **Enter** to save this setting.
9. Press the **Up/Down Arrow** key to scroll and highlight **Trigger Level**. Press the **Right Arrow** key to enter this menu item.
10. Press the **Up/Down Arrow** key to scroll and highlight **Vibration** or **Pressure Trigger On/Off**. Press the **Right Arrow** key to turn these options **On** or **Off**, as required.

11. Press the **Up/Down Arrow** key to scroll and highlight **Vibration** or **Pressure Trigger Level**. Press the **Right Arrow** key to turn change the **Trigger Level** values for these options.
12. Install the cables and detonators. Ensure that the blast area is clear.
13. For a single **Break** trigger setup, connect the **Wire Make/Break Trigger Cable** to the communications port on the unit labeled **AUXILIARY**.
14. The unit regards interruptions in sensing current as a trigger signal. The unit will fail to trigger if there is an improper connection.



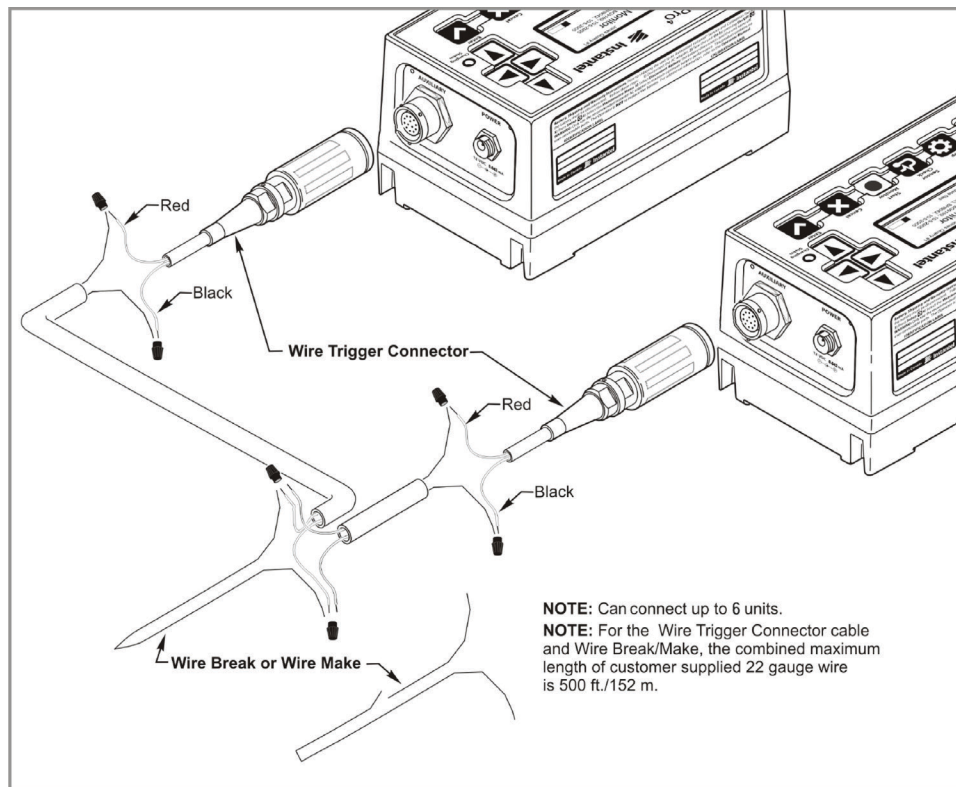
Single Wire Make/Break Trigger Cable Setup

## Multiple Wire Make/Break Trigger Cable Setup

**WARNING:** DO NOT connect a Wire Make/Break Trigger Cable (P/N: 720A3501) to the AUXILIARY connector until all other components are installed and ready to operate. Ensure that area safety is performed by properly trained and skilled personnel, and that unauthorized personnel keep clear of the blast area. Visually check all connections.

1. Supply 22 gauge connecting cable to each unit being added to the sensing loop (connect up to six units), as required, and strip the protective covering from the ends. Connect to the corresponding red and black wires of the **Wire Make/Break Trigger Cable** to complete the sensing loop.
2. Use the supplied connectors to secure the wires of the connecting cable and wire **Make** or **Break** and ensure the leads are not exposed. Use electrician's tape, as required.
3. For a **Make** trigger setup, add a two-way switch to complete the sensing loop. For **Make** trigger applications, recording begins when the operator presses the button.
4. For a **Break** trigger setup, carefully wrap the wire trigger around a zero time delay detonator.
5. Turn the unit On.
6. Press the **Setup** key, then press the **Down Arrow** key until **View Edit/Setup File** is highlighted. Press the **Enter** key to access this menu.
7. Press the **Down Arrow** key and scroll down to highlight **Auxiliary**. Press the **Right Arrow** key to enter this menu item.
8. With **Auxiliary I/O** highlighted, press the **Right Arrow** key. Press the **Right Arrow** key again until **External Trigger** appears as the selection. Press **Enter** to save this setting.
9. Press the **Up/Down Arrow** key to scroll and highlight **Trigger Level**. Press the **Right Arrow** key to enter this menu item.

10. Press the **Up/Down Arrow** key to scroll and highlight **Vibration** or **Pressure Trigger On/Off**. Press the **Right Arrow** key to turn these options **On** or **Off**, as required.
11. Press the **Up/Down Arrow** key to scroll and highlight **Vibration** or **Pressure Trigger Level**. Press the **Right Arrow** key to turn change the **Trigger Level** values for these options.
12. Install the cables and detonators. Ensure that the blast area is clear.
13. For a multiple **Make** or **Break** trigger setup, connect the **Wire Make/Break Trigger Cable** to the communications port on the unit labeled **AUXILIARY**.
14. The unit regards interruptions in sensing current as a trigger signal. The unit will fail to trigger if there is an improper connection.



**Multiple Wire Make/Break Trigger Cable Setup**

## Warranty

Instantel products come with a limited one-year warranty against defects in materials or workmanship unless otherwise stated. The warranty begins on the date of shipment from the Instantel factory to the customer and is subject to certain exclusions and conditions as stated below. 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 under normal use and operating conditions, it will be repaired or replaced at the sole discretion of Instantel free of charge. Components subject to fair wear and tear in regular use, as solely determined by Instantel, are excluded from this coverage. This warranty will not apply if the damage or malfunction occurs due to (i) adjustments, additions, alternations, abuse, misuse or tampering of the instrument; (ii) instrument operation or use contrary to the operating instructions; (iii) power fluctuations; or (iv) any other cause not within the cause or control of Instantel. If inspection by Instantel fails to disclose any defect covered by this limited equipment warranty, the instrument will be repaired or replaced at customer's expense and Instantel's regular service charges will apply. This warranty is non-transferable.

Any shipments returned directly to Instantel must have prior approval, and all packages must display the Return of Material Authorization (RMA) number issued by Instantel. Shipping charges to Instantel's factory will be paid by the customer and return shipment 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 no warranty card is on file at Instantel. Retain this warranty statement and the proof of purchase for your records.

Except for the foregoing limited equipment warranty, Instantel makes no other warranties and hereby disclaims and excludes all other warranties, whether statutory, express or implied, whether arising under law or equity or custom or usage, including any implied warranty of merchantability, fitness for a particular purpose, non-infringement, satisfactory quality, or quiet enjoyment, and any warranty that the product supplied may not be compromised, or that the product will in all cases provide the function for which it is intended.