I. TROUBLESHOOTING

The Sensor system will provide uninterrupted and reliable operation when used as designed. Note the following steps for troubleshooting sensor nodes or Gateways:

- The User Interface is not responding:
  - Ensure gateway is attached to PC and has completed its startup sequence.
  - Ensure the terminal emulator (PuTTY) is started and running.
- Alarm indications are received when no targets are present:
  - Ensure sensors are placed far enough away from the TOC and known units so that self-detection is not occurring. Generally, 125 - 150m is the minimum distance a sensor should be placed from known bipeds; 300m minimum distance to prevent own vehicle detection.
  - In gusty wind conditions, false detections can be reported as “vehicle” due to movement of tree and bush root systems. The vehicle detection mode can be deactivated to decrease these nuisance alarms.
- Target detection ranges are significantly decreased:
  - If sensors are deployed in areas with trees and bushes, wind can increase seismic noise due to movement of tree and bush root systems. This additional seismic noise from plant root systems will negatively impact detection ranges.
  - Sensors should be greater than 1 km from major roads, highways, high voltage towers, windmills, etc. as significant seismic energy is generated from these structures. Emplacements closer than 1 km will negatively impact range of detection.
- No Red or Green LED lights following activation of sensor:
  - In some activation situations, LED light illumination following button activation may take up to 10 seconds.
  - Shade the sensor to observe the LED light operation.
  - Depress the On/Off/Reset button and hold for 10 seconds to ensure sensor is off; reinitiate activation sequence and observe LED light Sequencing.
- Solid Red or blinking Red LED exceeding 30 seconds following activation of the sensor:
  - Can indicate that the sensor has not established a good wireless link with the gateway antenna. Move the sensor to ensure line of sight with the TOC antenna. When emplacing sensors, your body, vehicle or other significant obstructions between the sensor and TOC antenna can negatively impact good wireless connections. Note that the Phalanx Shield sensor system can communicate with the TOC antenna up to 15 km line-of-sight, therefore, a compass with known direction to the TOC is helpful when emplacing and troubleshooting sensors.
  - Ensure that the gateway, terminal emulator (PuTTY) and User Interface are activated.
  - Ensure that the sensor being activated is factory paired to the Gateway. Each Gateway will have documentation indicating serial numbers of factory paired sensors. The user can add additional sensors to a given network (if they are ordered to match) but cannot move sensors to another gateway without sending them back to the factory for re-programming.
  - Could indicate improper startup of sensor firmware; restart and/or reset sensor. Observe proper light startup sequence.

- Power light not illuminated on Gateway:
    - Check for proper power connection.
    - Unplug gateway, wait one minute, plug power cord back into gateway.
- Interruption of power to Gateway:
    - Restore power to the Gateway.
    - Restart Terminal Emulator (puTTY) session; complete login/activation steps.
    - Reset sensor(s) by holding the on/off button for 3 to 5 seconds, or conduct a complete shutdown and restart of sensor(s).
- Sensor does not default to Human Walker upon restart, following a previous session in which mode was changed and then sensor shut off:
    - Select sensor number in Active Sensors section, select edit details, select/check at least one additional mode in addition to Human Walker, select save changes.
    - "Tamper" sensor or wait for next comm check.
    - Select sensor number in Active Sensors section, select edit details, select/check only Human Walker, select save changes.

II. MAINTENANCE

The Phalanx Shield Sensor system requires very little maintenance. The following maintenance steps should be taken to ensure trouble free operation.

1) Clean dirt and dust from around sensor button. Do not use chemicals or excessive air pressure to clean. Dislodge soil from the sides of the button well; take great care not to damage the button or protective silicon membrane. Low pressure water or air can also be used to clean the button area; care should be taken to not introduce water directly into the SMA antenna connector when the antenna is removed.
2) Clean dirt and dust from around the antenna connector. Do not use chemicals or excessive air pressure to clean. A small screwdriver or similar tool can be used to dislodge soil from inside the connector well; take care not to damage the SMA antenna connector. Low pressure air can also be used to clean the antenna connector area; care should be taken to not introduce water directly into the SMA antenna connector.