MODELS: Basic, Standard and Premium
UNI-TRAN
TOXIC GAS TRANSMITTER
UT-X-STXXXX

Premium Model Shown with ST1200 Sensor

ISO 9001:2000

Part Number: MAN-0012-00 Rev. 2
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This manual is a guide for the use of a Toxic Gas Transmitter and the data and procedures contained within this document have been verified and are believed to be adequate for the intended use of the transmitter. If the transmitter or procedures are used for purposes other than as described in the manual without receiving prior confirmation of validity or suitability, Net Safety Monitoring Inc does not guarantee the results and assumes no obligation or liability.

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Net Safety Monitoring Inc products, are carefully designed and manufactured from high quality components and can be expected to provide many years of trouble free service. Each product is thoroughly tested, inspected and calibrated prior to shipment. Failures can occur which are beyond the control of the manufacturer. Failures can be minimized by adhering to the operating and maintenance instructions herein. Where the absolute greatest of reliability is required, redundancy should be designed into the system.

Net Safety Monitoring Inc, warrants its sensors and detectors against defective parts and workmanship for a period of 24 months from date of purchase and other electronic assemblies for 36 months from date of purchase.

No other warranties or liability, expressed or implied, will be honored by Net Safety Monitoring Inc.

Contact Net Safety Monitoring Inc or an authorized distributor for details.
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INTRODUCTION

The Uni-Tran micro-controller based toxic gas detector provides fast, accurate, continuous and cost effective monitoring of toxic gases in harsh industrial environments.

Net Safety selects the very best electrochemical sensors from the world's leading manufacturers for use in its broad line of toxic gas detectors. High performance, proprietary circuits and micro-controller based firmware ensure accurate and repeatable response in the most severe environments and a reduced need for routine calibrations.

The Uni-Tran control module uses advanced micro-controller technology to provide a user interface that is comprehensive, yet very simple to use. The full text LED display of the Premium and Premium Plus versions gives the user complete instructions for routine operation, calibration and relay configuration; without tools.

FEATURES

- Electrochemical sensor technology
- Low power consumption that works with 12 or 24 V dc systems
- Easy, non-intrusive one person calibration
- Sensor can be remotely mounted up to 75 feet from the display module
- Scrolling alpha-numeric LED display available in English, French or Spanish
- Gas specific colour coded enclosure
- Microprocessor based smart transmitter
- Conformal coated circuit boards

SPECIFICATIONS

Sensor Specifications

<table>
<thead>
<tr>
<th>SENSOR ELEMENT</th>
<th>H₂S (ST1200) electro-chemical</th>
<th>H₂S (ST1210) electro-chemical</th>
<th>SO₂ (ST1300) electro-chemical</th>
<th>CO (ST1600) electro-chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature Range</td>
<td>-40°C to +50°C (-40F to +122F)</td>
<td>-40°C to +50°C (-40F to +122F)</td>
<td>-20°C to +50°C (-4F to +122F) to +105°F</td>
<td>-20°C to +50°C (-4F to +122F)</td>
</tr>
<tr>
<td>Range of Detection</td>
<td>0 to 100ppm 0 to 50ppm and 0 to 20ppm</td>
<td>0 to 100ppm 0 to 50ppm and 0 to 20ppm</td>
<td>0 to 20ppm and 0 to 100ppm</td>
<td>0 to 500ppm</td>
</tr>
<tr>
<td>Response Time</td>
<td>&lt;30 seconds to T90</td>
<td>&lt;30 seconds to T90</td>
<td>&lt;15 seconds to T90</td>
<td>&lt;30 seconds to T90</td>
</tr>
<tr>
<td>Linearity/Repeatability</td>
<td>3% of full scale/1% of full scale</td>
<td>3% of full scale/1% of full scale</td>
<td>3% of full scale/2% of full scale</td>
<td>3% of full scale/1% of full scale</td>
</tr>
<tr>
<td>Span Drift</td>
<td>&lt;2% of full scale/month</td>
<td>&lt;2% of full scale/month</td>
<td>&lt;2% of full scale/month</td>
<td>&lt;5% of full scale/year</td>
</tr>
</tbody>
</table>
### Dimensions
Refer to Figures 1, 2, 3 and 4

<table>
<thead>
<tr>
<th>Weight</th>
<th>0.5 Kg (1.0 lb)</th>
<th>0.1 Kg (.25 lb)</th>
<th>0.5 Kg (1.0 lb)</th>
<th>0.5 Kg (1.0 lb)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Certifications</th>
<th>CSA and NRTL/C certified for hazardous locations. Class I, Division 1, Groups C and D. IEC Rating Ex d IIB T6 NEMA 3R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSA and NRTL/C certified for hazardous locations. Class I, Division 1, Groups C and D. IEC Rating Ex d IIB T6 NEMA 3R</td>
</tr>
</tbody>
</table>

| Enclosure Material | Aluminum (optional stainless steel) |

### Controller Specifications

- **Operating Voltage Range:**
  - 10.5 to 32 Vdc

- **Power Consumption (at 24 Vdc):**
  - Nominal (100 mA, 2.4 Watts)
  - Maximum (200 mA, 4.8 Watts)

- **Operating Temperature Range:**
  - -40°C to +85°C (-40°F to +185°F)

- **Humidity Range:**
  - 0 to 100% Relative humidity, non-condensing

- **Enclosure Material:**
  - Copper Free Cast Aluminum

- **Weight:**
  - Basic 0.9 Kg (2.0 lb)
  - Standard/Premium 2.3 Kg (5.0 lb)

- **Certifications:**
  - CSA and NRTL/C certified for hazardous locations. Class I, Division 1, Groups B, C and D, NEMA 4X and 7. IEC Rating Ex d IIB+H2 T5

  **NOTE:** Electronics only - CSA and NRTL/C certified for hazardous locations Class I, Division 2 Groups B, C and D pending.

  **NOTE:** For Basic model - CSA and NRTL/C certified for hazardous locations. Class I, Division 1, Groups C and D. IEC Rating Ex d IIB T5

- **Current Output:**
  - 4-20 mA into a maximum loop impedance of 800Ohms at 32Vdc. Isolated or non-isolated loop supply
Figure 1 - Dimensions for Adalet Enclosure (Standard and Premium Models)
Figure 2 - Dimensions for Red-Dot Enclosure with ST1210 H2S Sensor (Basic Model)

Unit II SYSTEM INSTALLATION

Figure 3 - Dimensions for Red-Dot Enclosure with ST1200 (H2S), ST1300 (SO2), and ST1600 (CO) Sensors (Basic Model)
INSTALLATION

Location of Sensors

There are no absolute rules for determining the quantity and location of gas detection instruments within a particular facility. Care should be taken to locate the sensors in areas where gas escape may be expected and where it is desirable to detect the presence of unwanted gas. Use redundancy where enhanced protection or reliability is desired. Heavy gases such as H2S, CO and SO2 tend to accumulate in low areas. Seek advice from experts who know the characteristics of the gas being detected, air movement patterns and the facility. Use common sense and refer to various publications that discuss general guidelines for your industry.

Unpacking

The UNI-TRAN is made up of two primary components. The housing and terminal board are a single assembly to which the sensor is wired. The control module is a separate plug-in assembly. Since all modern electronic equipment can be damaged by static electricity discharge, it is important to take precautions. Discharge static electricity from your body by touching a grounded metal object before handling the module. Remove the module by loosening the retaining screws. Carefully remove the module from the housing by grasping the centre “pull” knob and pull straight away, then temporarily store the control module in a clean and safe place until after the field wiring has been connected to the terminal strip located in the base of the housing.

Mounting

The housing should be oriented so that the sensor is on the underside of the housing. Water will damage electronic devices. Moisture in the air can condense within electrical conduit and drain into the enclosure.

Wiring

NOTE

Before opening the detector enclosure or junction box, ensure that the area has been declassified, or remove power from the unit.

NOTE

The control module (CPU board and Display Board) with cable should never be totally removed from the Relay board and housing. If it is removed there are bright red alignment markings on the cable and on the Relay board for you to use when re-inserting the cable into the Relay Board connector.

NOTE

The wiring procedures in this manual are intended to ensure proper functioning of the device under normal conditions. However, because of the many variations in wiring codes and regulations, total compliance to these ordinances cannot be guaranteed. Be certain that all wiring complies with applicable regulations that relate to the installation of electrical equipment in a hazardous area. If in doubt, consult a qualified official before wiring the system.
The transmitter is made up of two assemblies. The enclosure / relay board are a single assembly to which the input is wired. The control module (CPU board and Display Board) is a separate assembly. To conduct wiring unscrew the two retaining screws from the front of the display board. The control module is attached to the relay board by a cable. Do not detach the cable during wiring. Detach the module from the housing by grasping the centre (Pull Here) knob and pull straight away. Gently hang the module from the cable while you conduct wiring.

The use of shielded cable is highly recommended for any signal wires to protect against interference caused by extraneous electrical 'noise'. This includes power and current outputs; relay outputs do not require shielded cable. In applications where the wiring cable is installed in conduit, the conduit must not be used for wiring to other electrical equipment.

The maximum distance between the sensor and controller is limited by the resistance of the connecting wiring, which is a function of the gauge of the wire being used. Refer to the manuals on the sensors used (and transmitters if used) for maximum wiring distances and wiring instructions.

**NOTE**

The controller contains semiconductor devices that are susceptible to damage by electrostatic discharge. An electrostatic charge can build up on the skin and discharge when an object is touched. Therefore, use caution when handling, taking care not to touch the terminals or electronic components. For more information on proper handling, refer to the Appendix.

Water-proof and explosion-proof conduit seals are recommended to prevent water accumulation within the enclosure. Seals should be located as close to the device as possible and not more than 18 inches (46 cm) away. Explosion-proof installations may require an additional seal where conduit enters a non-hazardous area. Conform to local wiring codes.

When pouring a seal, use a fibre dam to assure proper formation of the seal. The seals should never be poured at temperatures below freezing.

The jacket and shielding of the cable should be stripped back to permit the seal to form around the individual wires. This will prevent air, gas and water leakage through the inside of the shield and into the enclosure.

It is recommended that explosion-proof drains and conduit breathers be used. In some applications, alternate changes in temperature and barometric pressure can cause 'breathing' which allows moist air to enter and circulate inside the conduit. Joints in the conduit system are seldom tight enough to prevent this 'breathing'.

Refer to applicable wiring codes when installing and wiring. After the field wiring has been carefully connected, check that the correct wires are connected to the corresponding terminals and that voltage levels do not exceed the specifications. When the wiring and voltages have been verified remove power form the system. Set the Display board back in place and tighten the two retaining screws.

**NOTE**

If the 4-20 mA signal is not used, connect a jumper between the 4-20 terminal and the Common terminal.
Sensor Separation

The “ST1200, ST1300, and ST1600” sensors can be installed and wired directly to the UNI-TRAN housing and terminal board as per the wiring diagram (see Figures 5 & 6) or they may be remotely mounted using a sensor separation kit (JB2-2-ASSY) which is composed of a junction box and terminal strip (see Figure 7). The sensor and kit are then connected to the UNI-TRAN.

When sensor separation is required for units using the ST1210 Hydrogen Sulfide sensor use a minimum of 18AWG shielded copper instrument wire for separations up to 50 feet and 16AWG for separations up to 75 feet. Consult factory if greater separations are required (see Figure 8).

Initial LED Status

With power applied, check that the green POWER LED is ON and the FAULT/CAL LED is showing a slow red flash during the first 90 seconds. The power LED will then change to a short green flash every 2 seconds (confidence blip). During the first 90 seconds, the analog output will remain at 3.0mA and then change to 4.0mA when the 90 second warm-up is complete. If after the 90 second warm-up the current is at 2.5mA or any value other than 4.0mA, the sensor requires calibration and the calibration procedure must be initiated.

Observation of the LED status signals and output current levels aid the operator when calibrating the sensor/transmitter as described in Unit III (see Table 3).

For the Premium model, with alphanumeric display, there is a variety of English language commands scrolled across the display to supplement the LED sequences and aid the operator. Please refer to the following list and see the Table of Responses (see Table 3).

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>START DELAY:</td>
<td>Power up delay in progress</td>
</tr>
<tr>
<td>SWITCH ON:</td>
<td>Magnetic reed switch or the manual cal/reset switch activated</td>
</tr>
<tr>
<td>SENSOR FAULT:</td>
<td>Fault present, sensor or sensor wiring failure</td>
</tr>
<tr>
<td>SETTING ZERO:</td>
<td>Zero gas setting in progress</td>
</tr>
<tr>
<td>APPLY 50%:</td>
<td>Apply 50% of full scale calibration gas</td>
</tr>
<tr>
<td>SETTING SPAN:</td>
<td>Span gas detected, automatic span setting in progress</td>
</tr>
<tr>
<td>REMOVE GAS:</td>
<td>Remove calibration gas</td>
</tr>
<tr>
<td>CAL COMPLETE:</td>
<td>Indicates return to normal operation</td>
</tr>
<tr>
<td>FAIL SPAN:</td>
<td>Calibration span setting failed</td>
</tr>
<tr>
<td>CAL TIME-OUT:</td>
<td>Calibration failed, no gas detected in calibration</td>
</tr>
<tr>
<td>SENSOR FAIL:</td>
<td>Sensor or sensor connections failed</td>
</tr>
<tr>
<td>NEG DRIFT:</td>
<td>Excessive negative sensor drift</td>
</tr>
</tbody>
</table>
Figure 4 Uni-Tran Basic ST1200, ST1300, and ST1600 terminal arrangement
Figure 5 Uni-Tran Standard/Premium ST1200, ST1300, and ST1600 terminal arrangement
Figure 6 Uni-Tran Basic ST1210 Terminal arrangement
Figure 7 Uni-Tran Standard/Premium ST1210 terminal arrangement
Figure 8 Uni-Tran Terminal Connection diagram for Non-Isolated current output

Figure 9 Uni-Tran Terminal Connection diagram for Isolated current output
Figure 10 Wiring with sensor separation for ST1200, ST1300, and ST1600 sensors
Figure 11 Wiring diagram with sensor separation for ST1210
The UNI-TRAN Standard and Premium smart transmitters are capable of providing an isolated or non-isolated current output. A jumper must be moved to select between isolated or non-isolated current output on the terminal board.

**Analog Output**

The analog output is precisely controlled by the internal micro-processor and digital to analog converter. Digital control provides the means to include extra features such as automatic calibration, latching output signals and error checking.

**Sensor Drift**

It is a normal characteristic of gas sensors to exhibit a slow drift from zero. When the amount of drift exceeds 10% since the last calibration, the analog output switches to a value of 2.5 mA and the LED flashes red until manually reset and the system is re-calibrated. When the analog output switches to 2.5mA due to drift, the sensor will still respond and transmit reasonable analog output signals if gas is present.

**Sensor Life**

Sensor response normally deteriorates slowly over a period of several years, depending on exposure, until there is no longer sufficient signal. When this condition occurs, calibration will not be possible,
Sensor Cross Sensitivity

The response of the sensing element is highly specific to H₂S. Since many commonly encountered gases have little, if any, effect on the electrical response of the sensor, false indications caused by the presence of these gases is greatly reduced. Below is a list of responses of the H₂S electrochemical sensor to 100 p.m. concentrations of other gases.

Table 1 - Cross Sensitivity of Electrochemical Sensor to 100 p.m. Concentrations

<table>
<thead>
<tr>
<th></th>
<th>0ppm</th>
<th>&lt;1ppm</th>
<th>&lt;15ppm</th>
<th>&lt;30ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCN</td>
<td>CO</td>
<td>SO₂</td>
<td>NO₂</td>
<td></td>
</tr>
<tr>
<td>C₂H₄</td>
<td>NO</td>
<td>H₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HCl</td>
<td></td>
</tr>
</tbody>
</table>

Test Jacks (not available on Basic version)

The UNI-TRAN is equipped with test jacks which allow the operator to make current loop measurements without opening the external current loop. To make measurements, use the following procedure:

1. Attach the current meter leads to the test jacks
2. Apply test gas and make readings as required; set controller to Bypass if necessary
3. Remove meter leads from the test jacks

Unit III SYSTEM CALIBRATION

CALIBRATION PROCEDURES

The UNI-TRAN was calibrated before shipping from the factory, however accurate response to gas must be verified prior to using the device in service.

Response should be checked and if necessary, calibration should be performed whenever any of the following occur:

- Sensor is exposed to contaminants
- Excess sensor drift is indicated by 2.5mA output
- Sensor or transmitter is replaced
Sensor is exposed to a gas concentration above 100% of full scale

When it is necessary to calibrate the UNI-TRAN, or if it is used as a stand-alone device connected to other monitoring equipment requiring a precise 4 to 20mA signal, the following calibration procedure should be followed to ensure an accurate correlation between the 4 to 20mA signal and the gas concentration at the sensor.

**Calibration Procedure for Basic Model**

**NOTE:**

*Use 50% of full scale certified calibration gas.*

- Be sure the UNI-TRAN is powered-up and is not indicating a fault; FAULT/CAL LED is showing a short green flash every 2.0 seconds (confidence blip).

- Ensure that the sensor is in a clean air environment before beginning the calibration procedure. It is recommended to flow certified ZERO AIR at a rate of 0.5 litres per minute through the barbed tubing connector on the end of the sensor calibration cup accessory for one minute to ensure clean air is present.

- Press the CAL/RESET switch (located inside the Red-Dot enclosure) continuously for at least 10 seconds to begin the CALIBRATION sequence. The output current will drop to 3.0mA, the FAULT/CAL LED will be steady GREEN. Release the CAL/RESET switch and the micro-controller immediately begins ZERO readings. When ZERO readings are complete the output current rises to 3.3mA and the LED will flash fast RED to indicate readiness to start the flow of SPAN gas.

- At 3.3mA and a fast RED flash rate, begin flowing 50% of full scale calibration gas (span gas) at 0.5 to 1.0 litres per minute through the barbed fitting of the calibration cup. Within about 2 to 3 minutes the FAULT/CAL LED stops flashing and is steady green and the output current rises to 3.6mA indicating the micro-controller has completed setting the current output level to 12mA.

**NOTE:**

*If span setting does not complete successfully within ten minutes of starting the calibration sequence, the status LED alternates flashes of RED and GREEN and the analog output changes back and forth from 3.0 to 3.3mA. The unit remains in this state until acknowledged by a manual Reset. After manual Reset, the program will return to the normal operation mode using previous calibration values. Since the calibration was unsuccessful, another attempt may be made or replace the sensor and re-try calibration.*

- When the status LED is solid green and the analog output switches to 3.6mA, span setting is complete. Stop the flow of calibration gas and disconnect the hose from the barbed fitting of the calibration cup. When the sensor response level falls to about 7% of full scale (5.2mA), the output current is restored to normal operation and the LED is returned to its normal confidence blip; fast red flash every 2.0 seconds changing to fast green flash when sensor response returns to zero.
Calibration Procedure for Standard & Premium Models

**NOTE:**

*Use 50% of full scale certified calibration gas.*

- Be sure the UNI-TRAN is powered-up and is not indicating a fault; FAULT/CAL LED is showing a short green flash every 2.0 seconds (confidence blip).

- Ensure that the sensor is in a clean air environment before beginning the calibration procedure. It is recommended to flow certified ZERO AIR at a rate of 0.5 litres per minute through the barbed tubing connector on the end of the sensor calibration cup accessory for one minute to ensure clean air is present.

- Place the curved side of the magnet on the side of the enclosure at the 10 o’clock position where marked ([Orient the “cylinder” shape of the magnet perpendicular to the “cylinder” shape of the housing, see Figure 10](#)) to actuate the reed switch or press the CAL/RESET switch (located inside the Adalet enclosure) continuously for at least 10 seconds to begin the CALIBRATION sequence. The output current will drop to 3.0mA, the FAULT/CAL LED will be steady GREEN. Remove the magnet or release the switch and the micro-controller immediately begins ZERO readings. When ZERO readings are complete, the output current rises to 3.3mA and the LED will flash fast RED to indicate readiness to start the flow of SPAN gas.

- At 3.3mA and a fast RED flash rate, begin flowing 50% of full scale calibration gas (span gas) at 0.5 to 1.0 litres per minute through the barbed fitting of the calibration cup. Within about 2 to 3 minutes the FAULT/CAL LED stops flashing and is steady green, and the output current rises to 3.6mA indicating the micro-controller has completed setting the current output level to 12mA.

**NOTE:**

*If span setting does not complete successfully within ten minutes of starting the calibration sequence, the status LED alternates flashes of RED and GREEN and the analog output changes back and forth from 3.0 to 3.3mA. The unit remains in this state until acknowledged by a manual Reset. After manual Reset, the program will return to the normal operation mode using previous calibration values. Since the calibration was unsuccessful, another attempt may be made or replace the sensor and re-try calibration.*

- When the status LED is solid green and the analog output switches to 3.6mA, span setting is complete. Stop the flow of calibration gas and disconnect the hose from the barbed fitting of the calibration cup. When the sensor response level falls to about 7% of full scale (5.2mA), the output current is restored to normal operation and the LED is returned to its normal confidence blip; fast red flash every 2.0 seconds changing to fast green flash when sensor response

---

*Figure 14 - Magnetic Reed Switch Activation (Standard & Premium Models)*
Periodic Response Check (Disable External Shutdowns)

A typical response check involves the application of calibration gas to the sensor, then the observation of the response LEDs, analog output and external monitoring equipment. Be sure to prevent unwanted response of external monitoring devices and equipment during this procedure. If the UNI-TRAN response to calibration gas is within its specified accuracy then it is not necessary to perform a calibration. For example, when 50% of full scale is applied, the response is expected to be between 11.5mA (47% of full scale) and 12.5mA (53% of full scale). An additional consideration is the accuracy tolerance of the calibration gas which may be + or - a few percent. If the calibration gas is + or - 10% of full scale then the reading may be from 10.7mA (42% of full scale) to 13.3mA (58% of full scale).

SENSOR REPLACEMENT

The sensor is not intended to be repaired. When calibration can no longer be performed properly, the sensor must be replaced. Spare sensors should be kept on-hand for field replacement.

Care should be taken in storing spare sensors. For maximum protection against contamination and deterioration, sensing elements should not be removed from the original protective packaging until the time of installation. To ensure maximum storage life, sensors should be stored at a temperature between 5°C and 20°C (40°F and 68°F) and a relative humidity between 15 and 90 percent. A typical refrigerator is a good place for storage. Do not freeze. Storage time should be limited to 6 months or less.

The area must be de-classified or power to the detector must be removed prior to replacing the sensor in a hazardous area.
It is necessary that reliable monitoring and indicating devices or systems be connected to the transmitter. These devices must be designed to produce clear visual and audible danger signals when high signal levels occur. Operating personnel must consider the area to be dangerous until a careful survey of the area has been conducted with a separate and reliable gas indicating device.

**ORDERING INFORMATION**

**FACE PLATE**
- PREMIUM = P
- STANDARD = S
- BASIC = B

**SENSOR TYPE**
- ST1200 (H2S)
- ST1210 (H2S)
- ST1300 (SO2)
- ST1400 (O2)
- ST1600 (CO)

**UT-X-XXXXXXXX-XXX-X-XX**

**LANGUAGE**
- ENGLISH (EN)
- SPANISH (SP)
- FRENCH (FR)

**HOUSING TYPE**
- ADALET = A
- RED DOT = R

**RANGE**
- 0 - 25/50/100ppm
- 0 - 100ppm
- 0 - 20/100ppm
- 0 - 25%
- 0 - 500/1000ppm
Appendix A  Net Safety Monitoring Inc. Electrostatic Sensitive Device Handling Procedure

With the trend toward increasingly widespread use of microprocessors and a wide variety of other electrostatic sensitive semiconductor devices, the need for careful handling of equipment containing these devices deserves more attention than it has received in the past.

Electrostatic damage can occur in several ways. The most familiar is by physical contact. Touching an object causes a discharge of electrostatic energy that has built up on the skin. If the charge is of sufficient magnitude, a spark will also be visible. This voltage is often more than enough to damage some electronic components. Some devices can be damaged without any physical contact. Exposure to an electric field can cause damage if the electric field exceeds the dielectric breakdown voltage of the capacitive elements within the device.

In some cases, permanent damage is instantaneous and an immediate malfunction is realized. Often, however, the symptoms are not immediately observed. Performance may be marginal or even seemingly normal for an indefinite period of time, followed by a sudden and mysterious failure.

Damage caused by electrostatic discharge can be virtually eliminated if the equipment is handled only in a static safeguarded work area and if it is transported in a package or container that will render the necessary protection against static electricity. Net Safety Monitoring Inc. modules that might be damaged by static electricity are carefully wrapped in a static protective material before being packaged. Foam packaging blocks are also treated with an anti-static agent. If it should ever become necessary to return the module, it is highly recommended that it be carefully packaged in the original carton and static protective wrapping.

Since a static safeguarded work area is usually impractical in most field installations, caution should be exercised to handle the module by its metal shields, taking care not to touch electronic components or terminals.

In general, always exercise all of the accepted and proven precautions that are normally observed when handling electrostatic sensitive devices.

A warning label is placed on the packaging, identifying those units that use electrostatic sensitive semiconductor devices.

*Published in Accordance with EIA standard 471*
Appendix B Wire Resistance In Ohms

<table>
<thead>
<tr>
<th>Distance (Feet)</th>
<th>AWG #20</th>
<th>AWG #18</th>
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NOTE: RESISTANCE SHOWN IS ONE WAY. THIS FIGURE SHOULD BE DOUBLED WHEN DETERMINING CLOSED LOOP RESISTANCE.