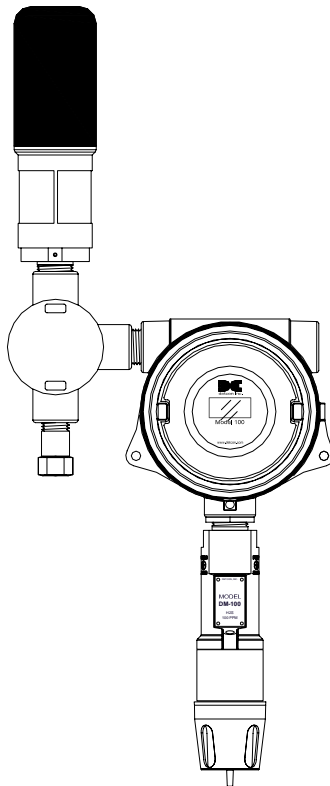




Wireless DM-100 Assembly

DM-100 Toxic Gas Sensors
DM-100 O₂ Deficiency Sensors



Operator's Installation and Instruction Manual

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1. Introduction

1.1 Description

Detcon's Wireless DM-100 toxic gas and O₂ deficiency sensors are non-intrusive 4-20mA loop powered sensors designed to detect and monitor a wide range of toxic gases in air. Ranges of detection for toxic gases are from 0-1ppm up to 0-10,000ppm; typical ranges of detection are 0-10ppm, 0-25ppm, 0-50ppm and 0-100ppm. Ranges for O₂ deficiency are 0-1% up to 0-25% by volume. The basic sensor assembly consists of an electrochemical fuel cell mounted in Intrinsically Safe stainless steel housing, and includes a Splash Guard Cal Adapter. The sensor is installed on an explosion proof aluminum junction box connected to an RXT series wireless transceiver and includes Detcon's Smart Battery Pack. An optional Model 100 Loop Powered LED display can be installed (See Figure 1). Other options are available, contact Detcon for more information.

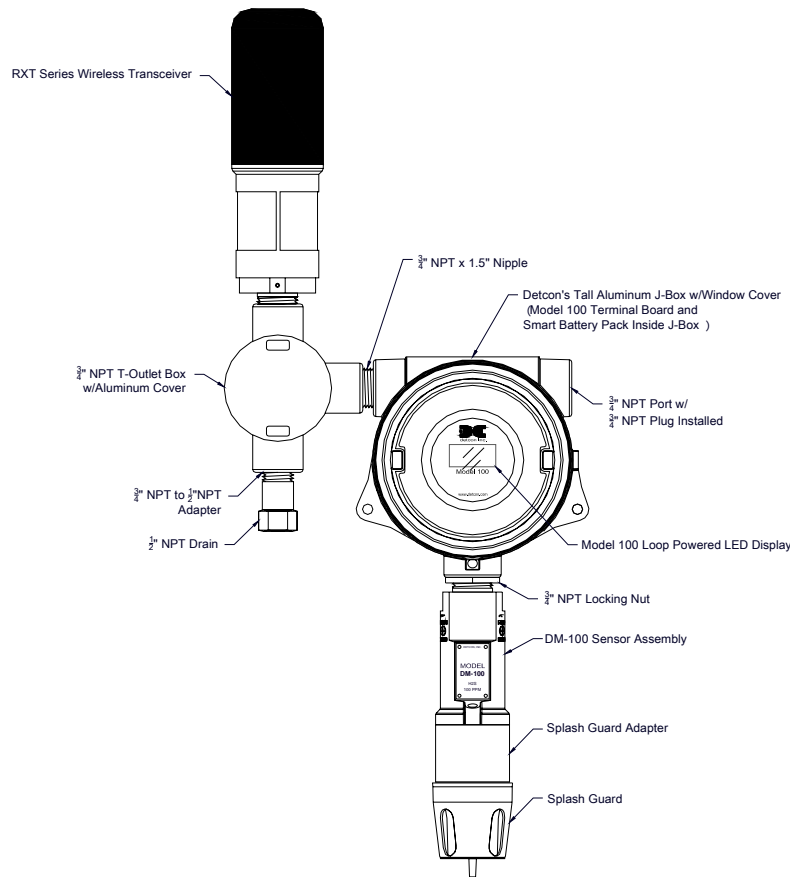


Figure 1 Wireless DM-100 Assembly w/Optional LED Display

The Wireless DM-100 assembly is designed to take Modbus™ communication between devices to a wireless platform. The transceiver takes local Modbus™ communication, and through the use of a wireless network of transceivers, broadcasts this information throughout a wireless network platform, creating a seamless network of Modbus™ devices that need not be physically connected in any way. The wireless transceiver, DM-100 sensor and optional LED display can be powered by Detcon's Smart Battery Pack which consists of rechargeable lithium ion batteries packaged as a plug-in module and provides 12VDC. This battery module is equipped with integrated safety electronics that include fuel gauge, voltage, current and temperature monitoring circuits. This safety circuitry continuously monitors the battery module's condition and reports critical status information to the transceiver. Alternatively, the Wireless DM-100 assembly can also be powered by an external customer provided DC power source or by Detcon's optional 24VDC solar charging panel for continuous operation. The input voltage range for the assembly is 16-30VDC.

Electrochemical Sensor Technology

The Toxic gas sensors are based on electrochemical cells. Each cell consists of three electrodes embedded in an electrolyte solution all housed beneath a diffusion membrane. Sensitivity to specific target gases is achieved by varying composition of any combination of the sensor components. Good specificity is achieved in each sensor type. The cells are diffusion limited via small capillary barriers resulting in a long service life of up to three or more years. The electrochemical cell is packaged as a field replaceable plug-in sensor.

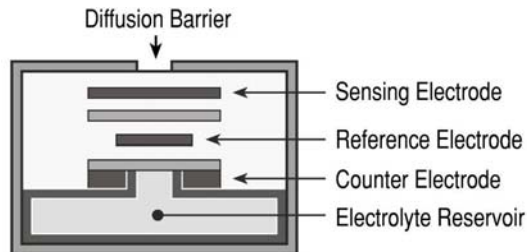


Figure 2 Construction of Electrochemical Toxic Sensor

The O₂ deficiency sensor technology is a two electrode galvanic metal air battery type cell, which is housed as a field replaceable intelligent plug-in sensor. The cell is diffusion limited and functions as a direct current generator proportional to the amount of oxygen adsorption. The sensors are temperature compensated and show good accuracy and stability over the operating temperature range of -20° to 50°C (-4° to +122° Fahrenheit). The sensor is warranted for two years and has an expected service life of up to 2.5 years in ambient air at 20.9% oxygen.

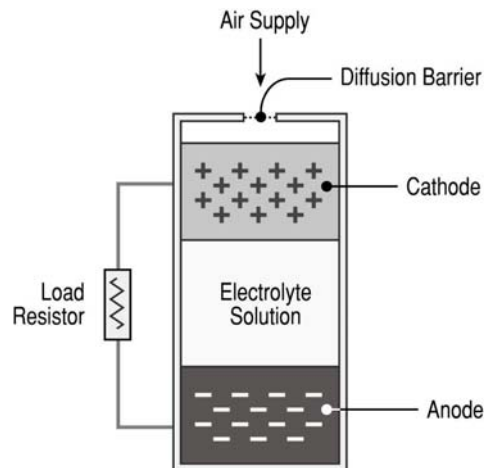


Figure 3 Construction of Galvanic Cell

1.2 Modular Mechanical Design

The Model DM-100 Sensor Assembly is completely modular and is made up of four parts (See Figure 4 for Assembly Breakaway):

- 1) DM-100 Intelligent Transmitter Module (ITM)
- 2) Intelligent Plug-in Sensor (varies by gas type and range)
- 3) 100 Series Bottom Housing Assembly (H₂S assemblies use 100 Series Bottom Housing Assembly with Integral Filter)
- 4) Splash Guard.

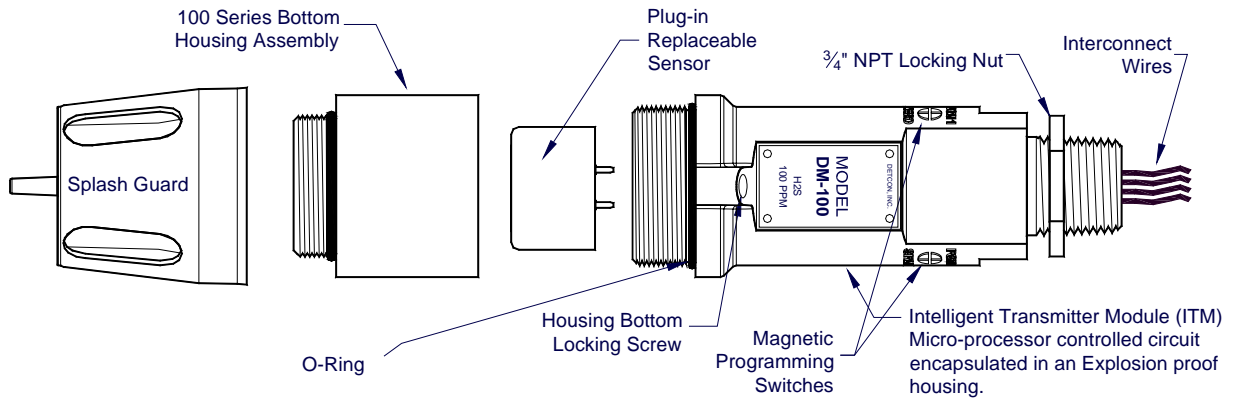


Figure 4 DM-100 Sensor Assembly Breakaway

NOTE: All metal components are constructed from electro polished 316 Stainless Steel in order to maximize corrosion resistance in harsh environments.

DM-100 Intelligent Transmitter Module

The Transmitter Module is a microprocessor-based package that is attached to the explosion proof junction box. Circuit functions include an Intrinsically safe barrier, on-board power supply, microprocessor, magnetic programming switches, and a linear 4-20mA DC output. Magnetic program switches located on either side of the ITM are activated via a hand-held magnetic programming tool, thus allowing non-intrusive operator interface with the Transmitter Module.

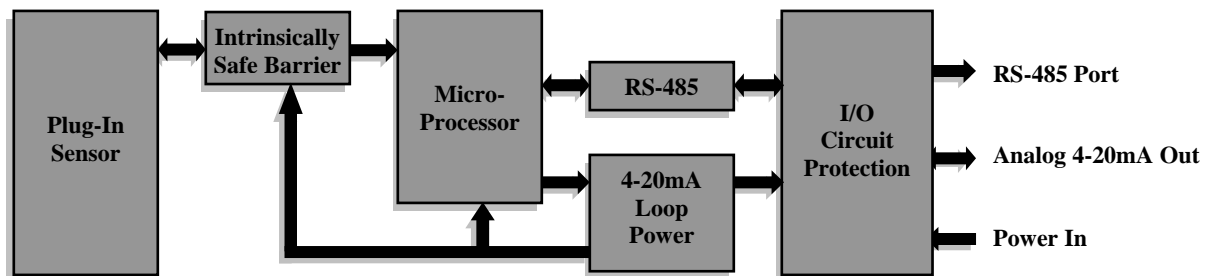


Figure 5 Functional Block Diagram

Field Replaceable Sensor

The Detcon family of electrochemical gas sensors are field proven, plug-in sensors with over-sized gold-plated connections that eliminate corrosion problems. The sensor can be accessed and replaced in the field easily by releasing the locking screw and unthreading the Splash Guard Adapter. Detcon's family of toxic sensors have a long shelf life and are supported by an industry-leading warranty.



Figure 6 Plug-in Sensor

1.3 RXT Series Wireless Transceivers

The wireless function of the Wireless DM-100 assembly is made possible by Detcon's RXT series wireless transceivers. These transceivers transmit signal data such as analog 4-20mA DC or serial Modbus™ and can support up to 32 devices. They operate at 2.4GHz and conform to non-licensed radio frequency appliance usage around the world. Wireless network integrity and security is accomplished using direct sequence spread spectrum wireless mesh technology. Wireless applications can be as simple as a single field device communicating with a host controller or any number of field devices forming a network of subscribers. Every device in the network is capable of functioning as a router and repeater for all other devices in the network. This means that subscribers can "hop" through neighboring devices to communicate with each other thereby widening network access points. This unique and innovative technology is designed to create a robust network that automatically routes around congestion and line-of-sight obstacles while improving throughput as subscriber device density increases.

Detcon offers two models of the wireless transceiver, Model RXT-300 and Model RXT-320. Both models are functionally similar with the major difference that the RXT-300 provides a network wide control processing capability whereas the RXT-320 does not. Refer to each models instruction manual for more detailed information.

1.4 Model 100 Terminal Board

The Wireless DM-100 assembly comes with a Model 100 Terminal Board mounted in a conduit/J-Box (See **Figure 7**). The terminal board includes connector plugs for the following:

- J1 6-Pin Phoenix Connector – RXT Series Wireless Transceiver
- J2 5-Pin Phoenix Connector – DM-100 Sensor
- J3 6-Pin Connector – RXT Programming Port (Detcon Factory use only)
- J4 3-Pin Phoenix Connector – Model 100 Loop Powered LED display
- J5 3-Pin Phoenix Connector – 16-30VDC External power source or 24VDC Solar Panel
- J6 8-Pin Beau Connector – 12VDC Battery Power (Use only Detcon's Smart Battery Pack)
- J7 3-Pin Phoenix Connector – Spare Modbus™ Connection
- J8 3-Pin Phoenix Connector – RXT Programming Interface to Wireless Transceiver

The terminal board provides an easy Digital Volt Meter (DVM) connection for reading the mA output from the sensor. Two test points (TP1 and TP2) provide a connection across a 10Ω resistor that develops a 10mV voltage drop per 1mA output. Thus a reading of 40mV on a DVM equals 4mA of current. This is an alternative method to reading the mA output of the sensor for assemblies that do not include the Loop Powered LED display. Refer to section 2.7 Model 100 Terminal Board Settings for more information about the setup of the Model 100 Terminal Board.

NOTE: Battery pack removal is required to access TP1 and TP2 with a DVM and an external DC power source must be supplied to the J5 connector.

1.6 Quad Battery Charger (Optional)

Detcon's Smart Battery Pack can be charged as needed using Detcon's optional Quad Battery Charger which can charge up to four battery packs at one time. The Quad Battery Charger comes with a plug-in AC/DC adapter that plugs into a standard 120VAC outlet for power. The DC end of the adapter plugs into the DC power jack of the charger providing 24VDC. The Quad Battery Charger has four charging ports, each with 8-pin Beau connectors for battery pack connection. The ports and connectors are keyed to prevent incorrect positioning and connection. Each port has its own "FAULT" LED indicator and "CHARGE" LED indicator and will display either a red light or green light depending on the status of each battery being charged. Charging times will vary depending on the charge state of each battery pack, but a full charge of a depleted battery pack can take up to 24 hours.



Figure 9 Quad Battery Charger

When first powered on and with no battery packs connected to the charger, all the LED indicators on the Quad Charger should be green. When a battery pack is seated into a charging port, the "CHARGE" LED will change from green to red indicating the battery pack is not sufficiently charged. Once fully charged, the LED will change from red to green and the battery pack is ready to be used.

The "Fault" LED should remain green indicating that there are no problems with the battery pack or charging port. If the "Fault" LED turns red with the battery pack connected, then there is a problem or issue with the battery pack and it should not be used and be removed immediately. If the "Fault" LED turns red without a battery pack connected to the charge port, then there is a problem or issue with the port and that port should no longer be used.

Battery packs can remain connected to the charger even after a full charge indication (Green "Charge" LED) is shown due to the protection circuitry of the batter pack which prevents any overcharging issues.

1.7 Model 100 Loop Powered LED Display (Optional)

The Model 100 Loop Powered LED display is a universal 2-wire, 4-20mA, 4-digit LED display that provides a direct display of the sensor readings. The display is mounted inside the aluminum conduit box and can be easily seen through the conduit's window cover. The display is programmed at the factory to match the full scale range of the sensor and is not field-programmable. This factory option must be ordered along with the sensor assembly.



Figure 10 Model 100 Loop Powered LED Display

1.8 Solar Panel (Optional)

Detcon also offers an optional solar panel to be used in conjunction with the Smart Battery Pack. It provides 24VDC output and connects to the J5 connector of the Model 100 Terminal Board (See section 2.6 Field Wiring (External Power Supply Only) for more details). This option enables continuous operation of the wireless sensor assembly and charging of the battery pack eliminating the need for external recharging. It is an ideal choice for virtually any area with sufficient daily average sunlight. Since the solar panel is considered an external power supply, a special conduit installation will be required (See section 2.5 Electrical Installation (External Power Supply or Solar Panel Only) for more details).



Figure 11 Solar Panel

2. Installation

2.1 ATEX Operational Guidelines for Safe Use

1. Install wireless sensor assembly only in areas with classifications matching with those described on the approval label. Follow all warnings listed on the label.
2. Ensure that the wireless sensor assembly is properly mounted in a vertical orientation with sensor facing down. Avoid use of Teflon Tape, or any type of non-conductive pipe thread coating on the NPT threaded connection.
3. Use ¾" NPT plugs properly rated for hazardous locations to block any unused ¾" NPT Ports.
4. Proper precautions should be taken during installation and maintenance to avoid the build-up of static charge on the plastic components of the sensor. These include the Splash Guard, Splash Guard adapter and RXT upper housing.
5. Do not operate the wireless sensor assembly outside of the stated operating temperature limits.
6. Do not operate the wireless sensor assembly outside the stated operating limits for voltage supply.
7. These wireless sensor assemblies meet EN60079-0, EN60079-1, and EN60079-11.

2.2 Wireless Sensor Placement

Selection of sensor location is critical to the overall safe performance of the product. Seven factors play an important role in selection of sensor locations:

- (1) Density of the gas to be detected
- (2) Most probable leak sources within the industrial process
- (3) Ventilation or prevailing wind conditions
- (4) Personnel exposure
- (5) Maintenance access
- (6) RF line-of-sight
- (7) Sunlight exposure

Density

Placement of sensors relative to the density of the target gas is such that sensors for the detection of heavier than air gases should be located within 4 feet of grade as these heavy gases will tend to settle in low lying areas. For gases lighter than air, sensor placement should be 4-8 feet above grade in open areas or in pitched areas of enclosed spaces.

Leak Sources

The most probable leak sources within an industrial process include flanges, valves, and tubing connections of the sealed type where seals may either fail or wear. Other leak sources are best determined by facility engineers with experience in similar processes.

Ventilation

Normal ventilation or prevailing wind conditions can dictate efficient location of gas sensors in a manner where the migration of gas clouds is quickly detected.

Personnel Exposure

The undetected migration of gas clouds should not be allowed to approach concentrated personnel areas such as control rooms, maintenance or warehouse buildings. A more general and applicable thought toward selecting sensor location is combining leak source and perimeter protection in the best possible configuration.

Maintenance Access

Consideration should be given to providing easy access for maintenance personnel. Consideration should also be given to the consequences of close proximity to contaminants that may foul the sensor prematurely.

NOTE: In all installations the gas sensor should point straight down (See Figure 13). Improper sensor orientation may result in false readings and permanent sensor damage.

RF Line-of-Sight

Obstacles between RXT transceivers can impact line-of-sight and may result in communication problems. Each transceiver should be in view of at least one other transceiver. In some cases, it may be necessary to extend and elevate the RXT transceiver away from the J-Box/sensor assembly. Refer to section 2.8 Remote RXT Mounting for such remote mounting applications.

Sunlight Exposure

If the optional solar panel is installed, consideration should be given to position the panel where the most sunlight is available. The solar panel can be mounted remotely to allow for maximum sunlight exposure. If necessary, a sunshade can be used for the wireless sensor assembly to help reduce its operating temperature.

Additional Placement Considerations

The sensor should not be positioned where it may be sprayed or coated with surface contaminating substances. Painting sensor assemblies is prohibited.

Although the sensor is designed to be RFI resistant, it should not be mounted in close proximity to high-powered radio transmitters or similar RFI generating equipment.

When possible mount in an area void of high wind, accumulating dust, rain, or splashing from hose spray, direct steam releases, and continuous vibration. If the sensor cannot be mounted away from these conditions then make sure the Detcon Harsh Location Dust Guard accessory is used.

2.3 Sensor Contaminants and Interference

Electrochemical toxic gas sensors may be adversely affected by exposure to other airborne gases. Depending on the cross-sensitivity relationship, there may be a positive or negative impact on the reading.

The most commonly present gases that potentially cause interference problems are listed in Table 7 Interfering Gases and Table 8 Cross Interference Table.

The presence of cross-interference gases in an area does not preclude the use of this sensor technology, although it is possible that the sensor could experience a false high or false low reading should exposure occur.

Cross-Interference Data Table

Table 8 Cross Interference Table lists the gases typically found in industrial environments that may cause a cross-interference response on members of the Detcon family of toxic gas sensors. Review Table 8 in section 8.2 Interference Table for the correct gas and then scan across the list for possible interference gases. Determine the magnitude of cross-interference that may occur.

2.4 Wireless Sensor Mounting

The Wireless DM-100 assembly should be vertically oriented so that the sensor points straight downward. The explosion-proof enclosure or junction box is typically mounted on a wall or pole.

NOTE: Do not use Teflon Tape or any other type of Pipe Thread material on the 3/4" threads unless the sensor is mounted in a severe or harsh environment. Metal-on-metal contact must be maintained to provide a solid electrical ground path. If Teflon Tape is used the Sensor *must* be externally grounded using a ground strap.

Detcon offers an optional mounting plate that can be used for mounting the wireless assembly on a wall or pole. If ordered with this option, secure the wireless assembly to the mounting plate using two of the four 3/8" diameter holes located on the top face of the mounting plate (If not already done so from the factory). The whole assembly can now be mounted on a secure wall using the four 7/16" diameter holes located on the base of the mounting plate (See Figure 12). The assembly can also be mounted to a pole with two U-Bolts secured through the 7/16" holes on the base.

NOTE: If wall mounting without the mounting plate, make sure to use at least 0.5" spacers underneath the J-Box's 1/4" mounting holes to move the wireless sensor assembly away from the wall and allow access clearance to the sensor assembly.

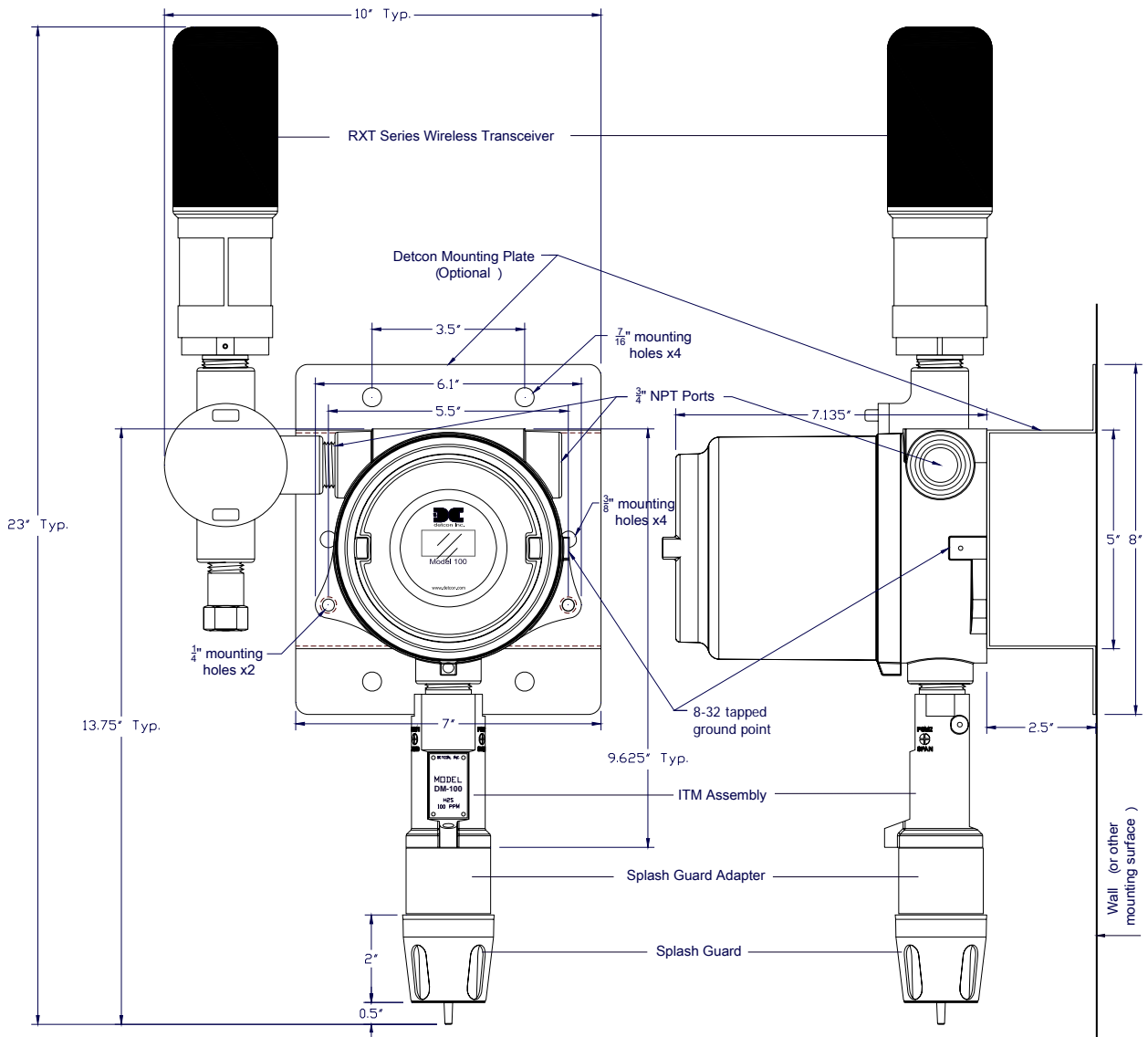


Figure 12 Typical Wireless DM-100 Assembly w/Optional Mounting Plate and Mounting Dimensions

2.5 Electrical Installation (External Power Supply or Solar Panel Only)

The Wireless DM-100 assembly should be installed in accordance with local electrical codes. The DM-100 sensor assemblies are CSA/NRTL approved (US and Canada) for Class I, Division 1, Groups C & D area classifications and ATEX approved for Zone 1, Group IIC area classifications.

Proper electrical installation of the gas sensor is critical for conformance to Electrical Codes and to avoid damage due to water leakage. Refer to Figure 7 and Figure 13 for proper electrical installation.

NOTE: A conduit run is necessary to the secondary port if an external power source is used.

In Figure 13, the drain allows H₂O condensation inside the conduit run to safely drain away from the wireless sensor assembly. The electrical seal fitting is required to meet the National Electrical Code per NEC Article 500-3d (or Canadian Electrical Code Handbook Part 1 Section 18-154). Requirements for locations of electrical seals are covered under NEC Article 501-5. Electrical seals also act as a secondary seal to prevent

water from entering the wiring terminal enclosure. However, they are not designed to provide an absolute watertight seal, especially when used in the vertical orientation.

NOTE: A conduit seal is typically required to be located within 18" of the Wireless Sensor Assembly if a conduit run is required. Crouse Hinds type EYS2, EYD2 or equivalent are suitable for this purpose.

NOTE: The Detcon Warranty does not cover water damage resulting from water leaking into the enclosure.

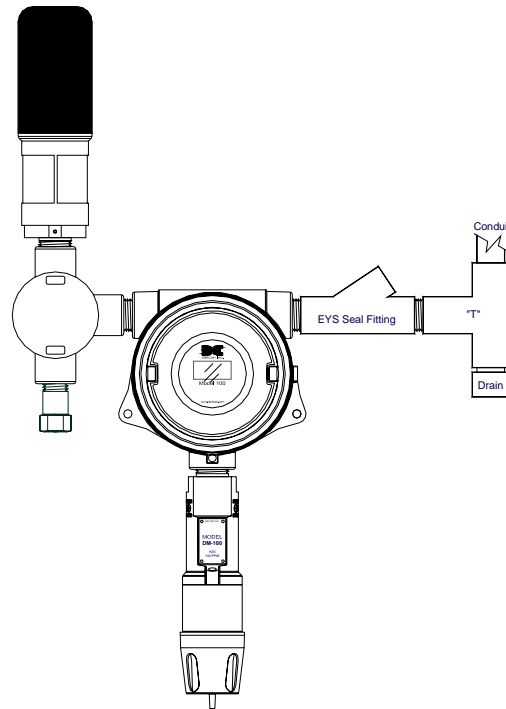


Figure 13 Conduit Installation

NOTE: Any unused ports should be blocked with suitable 3/4" male NPT plugs. Detcon supplies one 3/4" NPT male plug with each J-box enclosure. If connections are other than 3/4" NPT, use an appropriate male plug of like construction material.

2.6 Field Wiring (External Power Supply Only)

The Wireless DM-100 assembly can be remotely mounted without the need for any cables because of its wireless function and battery operation, eliminating any applicable field wiring. However, if an external power source is installed, the Wireless DM-100 assembly requires two conductor connections for the power supply.

External DC power can be customer provided with an output voltage range between 16-30VDC or by Detcon's optional 24VDC solar charging panel. Both of these alternatives will provide continuous operation of the assembly and can be installed in conjunction with the battery pack, providing a constant power source. The external power supply will also maintain the battery pack fully charged with no overcharging issues to be concerned with due to the battery pack's "smart" circuitry. In this configuration, external charging of the battery pack will not be necessary. In the event the external power fails, the battery pack will continue to power the wireless sensor assembly until external power is restored or the battery is discharged.

Wiring designations are ‘+’ and ‘-’ (External DC Power In) on the J5 connector of the Model 100 Terminal Board. The maximum wire length between sensor assembly and a 24VDC source is shown in the Table below. The maximum wire size for termination in the J-Box is 14 AWG.

Table 1 Wire Gauge vs. Distance

AWG	Wire Dia.	Meters	Feet	Over-Current Protection
22	0.723mm	700	2080	3A
20	0.812mm	1120	3350	5A
18	1.024mm	1750	5250	7A
16	1.291mm	2800	8400	10A
14	1.628mm	4480	13,440	20A

NOTE 1: Wiring table is based on stranded tinned copper wire and is designed to serve as a reference only.

NOTE 2: The supply of power should be from an isolated source with over-current protection as stipulated in table. The output voltage range must be between 16-30VDC.

Terminal Board Connections



CAUTION: Do not apply System power to the sensor until all wiring is properly terminated. Refer to section 2.9 Initial Start Up.

1. Remove the junction box cover.
2. If the wireless sensor assembly has the Loop Powered LED Display option installed, unlatch the Loop Powered LED Display to access the Smart Battery Pack. Unplug the battery pack from the terminal board by pulling the battery pack out of the junction box.
3. Identify the J5 3-pin phoenix connector on the terminal board for customer wire connections.
4. Observing correct polarity, terminate the 2-conductor field wiring (‘+’ and ‘-’) at the terminal board connector J5 (External DC Power In) shown in Figure 7.
5. Trim all exposed wire leads if they are not permanently landed in the terminal board.
6. Re-install the battery pack by plugging it back into the J6 Beau connector on the terminal board.
7. If a display was unlatched in step 2, re-install the display by latching it back in place.
8. Replace the junction box cover after Initial Start Up.

NOTE: A 6-32 or 8-32 threaded exterior ground point is provided on most junction boxes for an external ground. If the Sensor Assembly is not mechanically grounded, an external ground strap *must* be used to ensure that the sensor is electrically grounded.

2.7 Model 100 Terminal Board Settings

The Model 100 Terminal Board contains a set of jumpers that must be configured properly for the board to operate properly. These jumpers are normally configured at the factory and should not be changed. Misplacement of these jumpers may cause the sensor to become inoperative. The following tables describe the jumper functions and their position.

Table 2 Model 100 Terminal Board Jumper Descriptions

JP1 – DM-100 Enable	1-2 – Model DM-100 is attached	2-3 – Other Model 100 sensor is attached
JP2 – Loop Display Enable	1-2 – No display or display with battery	2-3 – Display without battery (plug in style)
JP3 – Battery Display Enable	1-2 – No display or display without battery	2-3 – Display with battery
JP4 – Loop-powered Sensor	1-2 – DM-100 with battery	2-3 – DM-100 without battery
JP5 – Modbus Display Enable	1-2 – Not currently used	2-3 – Jumper must be in this position
JP6 – Modbus A	1-2 – Jumper must be in this position	2-3 – Not currently used
JP7 – Modbus B	1-2 – Jumper must be in this position	2-3 – Not currently used

Table 3 Model 100 Terminal Board Jumper Settings

Configuration	DM-100 Battery No Display	DM-100 Battery Display
JP1	1-2	1-2
JP2	1-2	1-2
JP3	1-2	2-3
JP4	1-2	1-2
JP5	2-3	2-3
JP6	1-2	1-2
JP7	1-2	1-2

The Model 100 Terminal Board also contains two rotary switches which are used to set the Modbus™ address for the RXT-320 wireless transceiver only. These switches have no function for the RXT-300 wireless transceiver. Follow the “Terminal Connections” steps in section 2.6 Field Wiring (External Power Supply Only) to access the terminal board and locate the switches shown in Figure 14 (Reference Figure 7). The address selected is a two digit hex value with the first digit represented by the top rotary switch (closest to the J1 connector) and the second digit represented by the bottom rotary switch (closest to the J2 connector). For example, a hex value of ‘9F’ would be represented by a ‘9’ on the top switch and an ‘F’ on the bottom switch. Refer to the RXT-320 transceiver manual for more detailed information on selection of the Modbus™ address.

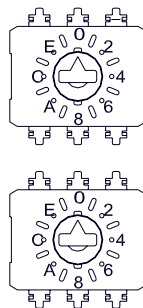


Figure 14 Model 100 Terminal Board Rotary Switches

2.8 Remote RXT Mounting

The RXT Wireless Transceiver is normally connected directly to the J-Box containing the battery/sensor assembly. In situations where RF line-of-sight is diminished by obstructions, it may be necessary to remotely mount the RXT Wireless Transceiver away from this J-Box. Remote separation distances of up to 15 feet are possible with the recommended cable. Such an installation will require an additional J-Box which connects to the separated transceiver and houses Detcon's 8-position terminal board plus additional hardware (See Figure 15).

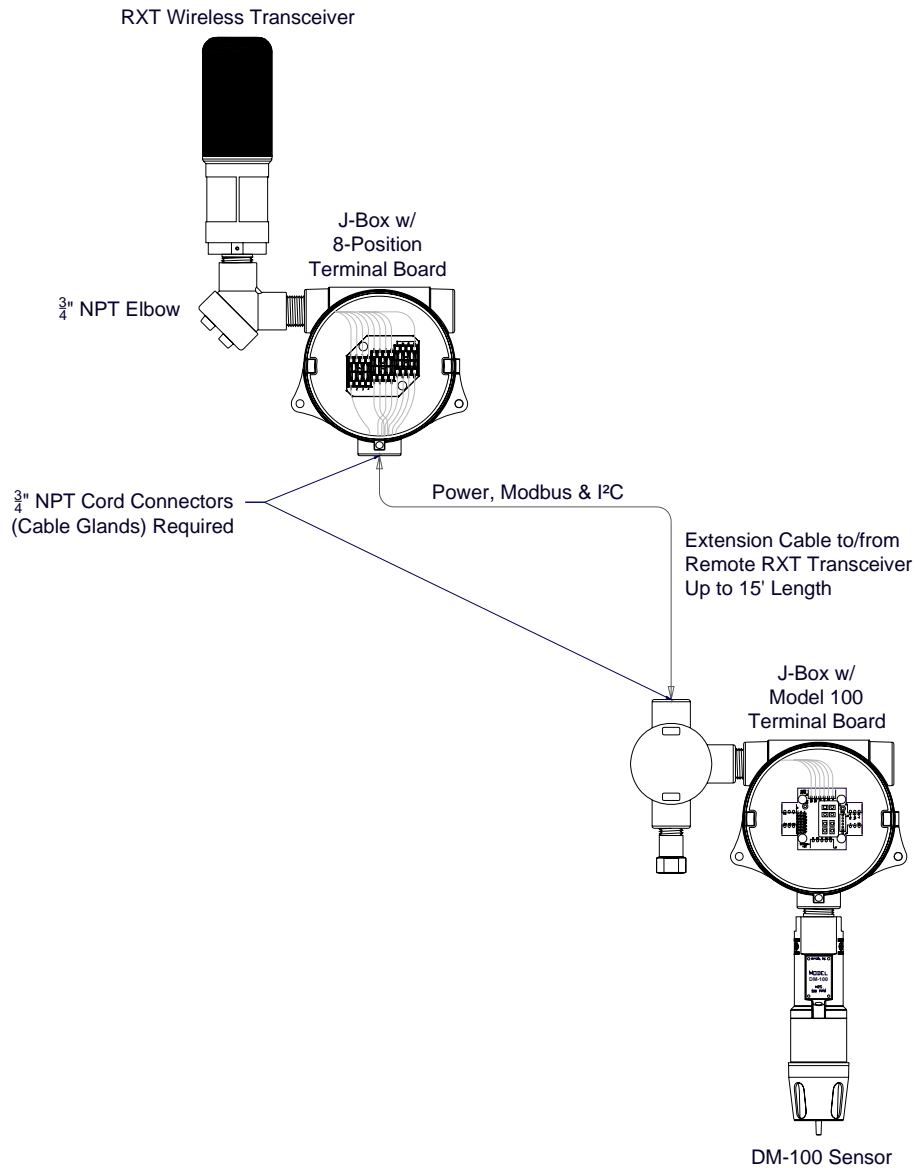


Figure 15 Remote RXT Transceiver Mounting

A custom extension cable needs to be built to interface the remote transceiver to the DM-100 sensor assembly. The recommended cable for remote transceiver separation is Belden 1421A (24AWG shielded twisted pair, 4 pairs w/drain wire).

NOTE: It is highly recommended to install the extension cable inside rigid metal conduit to eliminate potential EMI and RFI interference and to maintain a Class I Division I rating.

Remote Mounting Steps

1. Remove the J-Box cover of the Wireless DM-100 Assembly.
2. If the wireless sensor assembly has the Loop Powered LED Display option installed, unlatch the Loop Powered LED Display to access the Smart Battery Pack. Unplug the battery pack from the terminal board by pulling the battery pack out of the junction box.
3. Identify the J1 6-pin phoenix connector on the Model 100 Terminal Board and disconnect from the board. Remove all wire connections to the connector.
4. Use a wrench at the bottom section of the RXT transceiver and unthread the RXT until it can be removed.
5. Feed the RXT transceiver wires through the $\frac{3}{4}$ " NPT hole of the elbow connected to the remote J-Box and thread the transceiver into the elbow until tight. Remove all 6 of the 4-pin phoenix connectors from the 8-position terminal board in the remote J-Box and connect the RXT transceiver wires to 3 of the phoenix connectors per the wiring diagram in Figure 16. Reference Table 4 RXT Transceiver Wire Identification for color code identification.
6. Reconnect these 3 phoenix connectors to their corresponding places back on the 8-position terminal board.
7. Measure out the cable to be used for the extension cable to be no more than 15 feet long. Feed one end of the cable through a $\frac{3}{4}$ " NPT cord connector (cable gland) and then into the $\frac{3}{4}$ " NPT hole located on the bottom of the remote J-Box.
8. Connect the cable wires to the remaining three 4-pin phoenix connectors from step 5 per the wiring diagram in Figure 16. Reference Table 5 Extension Cable Wire Identification for color code identification.
9. Reconnect these 3 remaining phoenix connectors to their corresponding places back on the 8-position terminal board and thread the $\frac{3}{4}$ " NPT cord connector to the bottom of the remote J-Box.
10. Install the J-Box cover of the remote J-Box.
11. Feed the other end of the cable through another $\frac{3}{4}$ " NPT cord connector and then into the $\frac{3}{4}$ " NPT hole of the T-Outlet box connected to the J-Box housing the Model 100 Terminal Board.
12. Connect the cable wires to the 6-pin phoenix connector from step 3 per the wiring diagram in Figure 16. Reference Table 5 Extension Cable Wire Identification for color code identification.
13. Reconnect the 6-pin phoenix connector back to J1 of the Model 100 Terminal Board and thread the $\frac{3}{4}$ " NPT cord connector to the T-Outlet box.

NOTE: Color coding of the cable will no longer match the color coding on the Model 100 Terminal Board for the J1 connector.

NOTE: Programming of RXT transceiver from the Model 100 Terminal Board will be disabled.

14. Plug battery pack back in and latch the Loop Powered Display back in place if unlatched in step 2.
15. Reinstall the J-Box cover from step 1.

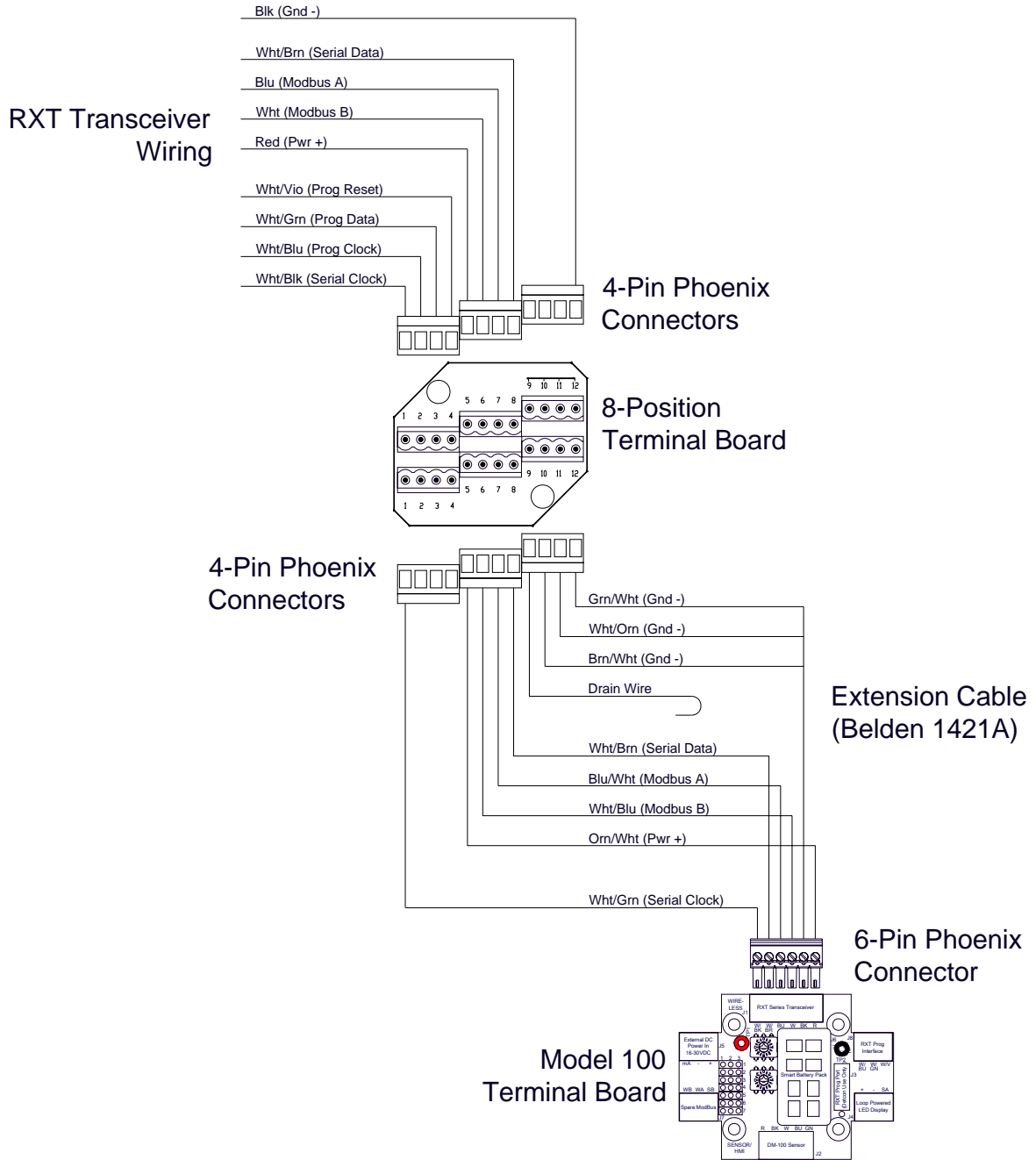


Figure 16 Wiring Diagram for Remote RXT Transceiver Mounting

Table 4 RXT Transceiver Wire Identification

Function	Color Reference
VDC Power (+)	Red
VDC Return (-)	Black
Modbus A (+)	Blue
Modbus B (-)	White
Serial Data Line (SDA)	White/Brown
Serial Clock (SCL)	White/Black
Programming Data	White/Green
Programming Clock	White/Blue
Programming Reset	White/Violet

Table 5 Extension Cable Wire Identification

Function	Color Reference
VDC Power (+)	Orange/White
VDC Return (-)	Green/White
Modbus A (+)	Blue/White
Modbus B (-)	White/Blue
Serial Data Line (SDA)	White/Brown
Serial Clock (SCL)	White/Green
Common Ground	Brown/White
Common Ground	Orange/White
Drain Wire	Bare (No Color)

2.9 Initial Start Up

2.9.1 Toxic Gas Sensors

Upon completion of all mechanical mounting and termination of all field wiring, apply system power in the range of 16-30VDC (24VDC typical) and observe the following normal conditions:

1. If the Loop Powered Display option is installed, the display should read 0.0 upon power up. If a Loop Powered Display is not installed on the sensor, set a DVM to measure millivolts, and connect it across TP1 and TP2 on the terminal board. The DVM will read the voltage drop across a 10 Ω resistor. The resistor develops a 10mV voltage drop per 1mA of current. Thus a reading of 40mV on a DVM equals 4mA of current.
2. A temporary upscale reading may occur as the sensor stabilizes. This upscale reading will decrease to "0" ppm (40mV on the DVM) within 1-2 minutes of power-up, assuming there is no gas in the area of the sensor.

NOTE: The 4-20mA signal is held constant at 4mA for the first two minutes after power up.

3. Sensor cells that use a bias voltage require a longer time to stabilize. This can vary between 1 and 24 hours depending on the sensor type and range. Biased sensors include NH₃, NO, HCl, and VOC gases (ethylene oxide, ethylene, methanol, formaldehyde....etc).

Initial Operational Tests

After a warm up period of 1 hour (or when zero has stabilized), the sensor should be checked to verify sensitivity to the target gas.

Material Requirements

- Detcon PN 613-120000-700 Splash Guard with integral Cal Port with Wind Guard -OR-
 - Detcon PN 943-000006-132 Threaded Calibration Adapter - OR -
 - Detcon P/N 943-01747-T05 Teflon Calibration Adapter for highly reactive gases
- Detcon Span Gas; 50% of range target gas in balance N₂ or Air at fixed flow rate between 200-500cc/min (500cc/min is preferred)
- DVM (if a loop powered display is not installed)

NOTE: Calibration gas generators using perm tubes or electrochemical sources may be used in place of span gas cylinders.

NOTE: The cover of the junction box will need to be removed if there is not a loop powered display. The area may need to be de-classified.

1. If the sensor has a loop powered display installed, the display should read “0”. If a DVM is used to measure the 4-20mA output, set the DVM to measure millivolts and connect the leads across TP1 and TP2 on the terminal board. The DVM should read 40±2mV.

NOTE: Battery pack removal is required to access TP1 and TP2 with a DVM and an external DC power source must be supplied to the J5 connector.

2. Attach the calibration adapter to the Splash Guard adapter or connect tubing to integral cal port. It is recommended that the Wind Guard (Detcon P/N 943-000000-000) in installed over the Splash Guard during calibration. Apply the test gas at a controlled flow rate of 200 - 500cc/min (500cc/min is the recommended flow). If the sensor has a loop powered display attached the reading should increase to 50% of full range (if the range is 100, the display should read 50). Observe that the DVM increases to a level near that of the applied calibration gas value. Typically this would be 50% of full range, a reading of 120±2mV (12mA).
3. Remove test gas and observe that, if the sensor has a loop powered display installed, the display decreases to “0”. If a DVM is used the DVM reading should decrease back to 40mV (4mA).
4. If a calibration adapter was used during these tests, remove them from the unit, and re-install the Splash Guard. If the wind guard was used, remove the wind guard.

Initial operational tests are complete. DM-100 toxic gas sensors are factory calibrated prior to shipment, and should not require significant adjustment on start up. However, it is recommended that a complete calibration test and adjustment be performed 16 to 24 hours after power-up. Refer to zero and span calibration instructions in section 3.2 Calibration.

2.9.2 O₂ Deficiency Sensors

Upon completion of all mechanical mounting and termination of all field wiring, apply system power in the range of 16-30VDC (24VDC typical) and observe the following normal conditions:

If the sensor has a loop powered display installed, the display should read close to 20.9%. If a DVM is used to measure the 4-20mA output, set the DVM to measure millivolts and connect the leads across TP1 and TP2 on the terminal board. The DVM should read 73.4±2mV. The LED display should read close to 20.9%.

NOTE: Battery pack removal is required to access TP1 and TP2 with a DVM and an external DC power source must be supplied to the J5 connector.

The reading should stabilize within 1 to 2 minutes of power-up (assuming a 'normal' ambient O₂ concentration).

Initial Operational Tests

After a warm-up period of 5 minutes the sensor should be checked to verify response to O₂ deficiency.

Material Requirements

- Detcon PN 613-120000-700 Splash Guard with integral Cal Port with Wind Guard -OR-
- Detcon PN 943-000006-132 Threaded Calibration Adapter - OR -
- Detcon P/N 943-01747-T05 Teflon Calibration Adapter for highly reactive gases
- Detcon Zero Gas: 100% N₂ at fixed flow rate of 200-500cc/min
- DVM (if a loop powered display is not installed)

NOTE: The cover of the junction box will need to be removed if there is not a loop powered display. The area may need to be de-classified.

1. Attach the calibration adapter to the threaded sensor housing or connect tubing to the integral cal port. Apply the test gas at a controlled flow rate of 200-500cc/min (500cc/min is the recommended flow).
2. If the sensor has a loop powered display installed, the display reading should drop to "0". If a DVM is used to measure the 4-20mA output, set the DVM to measure millivolts and connect the leads across TP1 and TP2 on the terminal board. The DVM should read 40±2mV.
3. Remove test gas and calibration adapter. If the sensor has a loop powered display installed, the display should return to a reading of 20.9%. The DVM should return to a reading of 173.7mV (17.37mA).

Initial operational tests are complete. DM-100 O₂ deficiency sensors are factory calibrated prior to shipment, and should not require significant adjustment on start up. However, it is recommended that a complete calibration test and adjustment be performed 16 to 24 hours after power-up. Refer to zero and span calibration instructions in section 3.2 Calibration.

3. Operation

The Operator Interface of the Model 100 Series gas sensors is accomplished via two internal magnetic switches located on the left and the right of the sensor (See Figure 18). The two switches, labeled “PGM1” and “PGM2”, allow for complete calibration of the sensor. The addition of the Loop Powered Display allows the ability to calibrate the sensor without the need to de-classify the area or the use of hot permits.



Figure 17 Magnetic Programming Tool

The magnetic programming tool (See Figure 17) is used to operate the magnetic switches. Switch action is defined as momentary contact and 3-second hold. Hold time is defined as the time from the point when the magnet is placed in close proximity with the switch. For momentary contact the programming magnet is briefly held over a switch location. The location of “PGM1” and “PGM2” are shown in Figure 18.

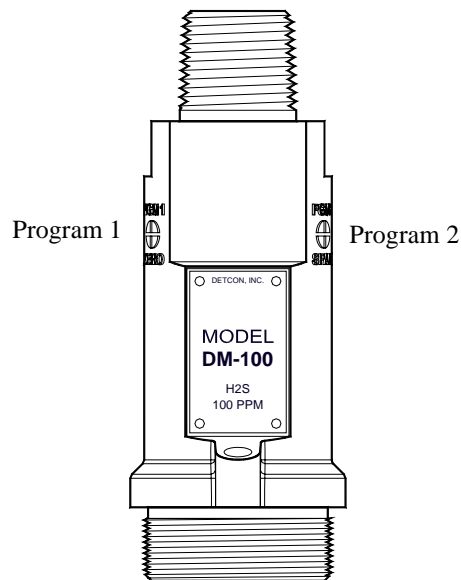


Figure 18 Magnetic Programming Switches

3.1 Normal Operation

In normal operation, the mA output will be the current sensor reading. In normal operation, the 4-20mA current output linearity corresponds with the full-scale range. If the Loop Powered Display option is added to the sensor, the display continuously shows the current sensor reading in ppm or % by volume, which will normally appear as “0”. If the sensor is actively experiencing any diagnostic faults, the mA output will be taken to 1.2mA to designate a fault to the controller. The Loop Powered LED Display will display ‘Lodp’ to signify a fault.

3.2 Calibration

Zero and span calibration should be performed on a routine basis (quarterly minimum) to ensure reliable performance. If a sensor has been exposed to any de-sensitizing gases, or to very high over-range combustible gas levels, re-calibration should be considered. Unless otherwise specified, span adjustment is recommended at 50% of the full scale range.

3.2.1 Zero Calibration

The zero calibration is used to zero the sensor. Zero calibration should be performed periodically or as required. Zero calibration should be considered after periods of over-range target gas exposure. Local ambient air can be used to zero calibrate a toxic gas sensor as long as it can be confirmed that it contains no target or interference gases. If this cannot be confirmed then a zero air or N₂ cylinder should be used. Pure N₂ must be used for zero calibration of the O₂ deficiency sensors.

Material Requirements:

- Detcon PN 327-000000-000 Programming Magnet
- Detcon PN 613-120000-700 Splash Guard with integral Cal Port with Wind Guard -OR-
 - Detcon PN 943-000006-132 Threaded Calibration Adapter - OR -
 - Detcon P/N 943-01747-T05 Teflon Calibration Adapter for highly reactive gases
- Detcon PN 942-001123-000 Zero Air cal gas (or use ambient air if no target gas is present).
- Detcon P/N 942-640023-100 Nitrogen 99.99%
- DVM (if a loop powered display is not installed)

NOTE: The zero gas source may be zero air or N₂ for toxic sensors, but must be pure N₂ (99.99%) for O₂ deficiency sensors

NOTE: The cover of the junction box will need to be removed if there is not a loop powered display. The area may need to be de-classified.

1. If a Loop Powered Display is not installed on the sensor, set a DVM to measure millivolts, and connect it across TP1 and TP2 on the terminal board. The DVM will read the voltage drop across a 10Ω resistor. The resistor develops a 10mV voltage drop per 1mA of current. Thus a reading of 40mV on a DVM equals 4mA of current.

NOTE: Battery pack removal is required to access TP1 and TP2 with a DVM and an external DC power source must be supplied to the J5 connector.

2. For toxic sensors, if the ambient air is known to contain no target gas content, then it can be used for zero calibration. If a zero gas cal cylinder is going to be used, attach the calibration adapter and set flow rate of 200-500cc/min (500cc/min is the recommended flow rate) and let sensor purge for 1-2 minutes before zeroing the sensor. For O₂ deficiency sensors, apply N₂ at a set flow rate of 500cc/min for 3-5 minutes before zeroing the sensor.
3. From Normal Operation, hold the programming magnet over PGM1 for 3 seconds. The display (if connected) will display “Lodp” momentarily (as zero cal is performed) and then should display ‘0.0’. If a meter is attached, the reading will dip momentarily to 2mA (20mV on the meter). The reading will then return to 4ma. (The ideal reading for zero is 4.03mA or 40.3mV.)
4. Observe the reading for a minute or so to ensure that the reading does not drift.
5. If zero gas was used, remove the gas from the sensor.

3.2.2 Span Calibration

Span Calibration is used to adjust the span of the sensor. Span calibration should be performed periodically or as required. Span calibration should be considered after periods of over-range target gas exposure. Unless otherwise specified, span adjustment is recommended at 50% of range.

Material Requirements:

- Detcon PN 327-000000-000 Programming Magnet
- Detcon PN 613-120000-700 Splash Guard with integral Cal Port with Wind Guard -OR-
 - Detcon PN 943-000006-132 Threaded Calibration Adapter - OR -
 - Detcon P/N 943-01747-T05 Teflon Calibration Adapter for highly reactive gases
- Detcon Span Gas (See Detcon for Ordering Information). Recommended span gas is 50% of range with target gas. Other suitable span gas sources containing the target gas in air or N₂ balance are acceptable.
- DVM (if a loop powered display is not installed)

NOTE: The cover of the junction box will need to be removed if there is not a loop powered display. The area may need to be de-classified.

NOTE: Contact Detcon for Ordering Information on Span Gas cylinders.

NOTE: A target gas concentration of 50% of range is strongly recommended. This should be applied at a controlled flow rate of 200 to 500cc/min, with 500cc/min being the recommended flow rate. Other concentrations can be used if they fall within allowable levels of 10% to 100% of range.

NOTE: Ambient air should be used to calibrate O₂ deficiency sensors as long as the oxygen concentration is confirmed to be 20.9%

NOTE: It is generally not advised to use other gases to cross-calibrate for span. Cross-calibration by use of other gases should be confirmed by Detcon.

Span consists of applying the correct gas concentration at the correct flow rate, and adjusting the sensor for the proper output. The recommendation for span gas concentration is 50% of range. If a span gas containing the recommended concentration is not available, other concentrations may be used as long as they fall between 10% and 100% of range.

1. If a Loop Powered Display is not installed on the sensor, set a DVM up to measure millivolts, and connect it across TP1 and TP2 on the terminal board. The DVM will read the voltage drop across a 10Ω resistor. The resistor develops a 10mV voltage drop per 1mA of current. Thus a reading of 40mV on the DVM equals 4mA of current.

NOTE: Battery pack removal is required to access TP1 and TP2 with a DVM and an external DC power source must be supplied to the J5 connector.

2. Install the Calibration Wind Guard, or the appropriate calibration adapter.
3. From Normal Operation, hold the programming magnet over PGM2 for greater than three seconds. The display (if connected) will display “Lodp”. If a meter is attached, the reading will dip to 2mA (20mV on the meter).

4. Apply the span calibration test gas for toxic gas sensors at a flow rate of 200-500cc/min (500cc/min is the recommended flow rate). The DVM reading or display will remain at 2mA or “Lodp” for 2 minutes.
5. When the 2 minute wait is complete, the reading will increase to a level that corresponds to the level of gas the plug-in sensor is detecting. There is a 30 second period to decide if the reading needs to be adjusted. If the reading matches the level of gas applied skip to step 7.
6. To adjust the reading, hold the programming magnet over PGM2. The display (if connected) will start to increase. If a meter is attached, the reading will also start to increase. Continue to hold the programming magnet over PGM2 to make the current increase, or hold the magnet over PGM1 to make the current decrease. Use PGM1 and PGM2 to adjust the output to match the target gas set-point. Assuming 50% of full range was applied adjust the reading to 12mA (120mV on the DVM, or 50% of full range on the display).

NOTE: 12mA and 50% of full range are based on the use of a span gas concentration of 50%. If a different concentration of span gas is used, the mA reading will need to be calculated. i.e. If a 25% concentration span gas is used the reading would be 8mA and the display would be 25% of full range. Use the magnetic tool to adjust the mA reading to the target set-point.

7. When the correct adjustment has been made, wait 15 seconds without holding the programming magnet over either PGM1 or PGM2. The display (if connected) will momentarily decrease to about 80% of the reading and then slowly return to the target reading. If a meter is attached, the reading will momentarily decrease slightly and then return to the target reading. This indicates that the span calibration point has been successfully saved. If a lack of proper signal level change is internally detected the sensor will immediately go into fault. The display (if connected) will show “Lodp”. If a meter is attached, the reading will go to approximately 1.2ma. Only a successful re-calibration will clear this fault (Refer to section 5 Troubleshooting Guide).
8. Remove the span gas and calibration adapter (or calibration wind guard). If a display is installed the display will report a live reading as the sensor clears toward “0”. On the DVM, the reading will fall from the reported span level to 4mA (40mV). The sensor now allows 5 minutes for the reading to clear below 10% of full scale range (5.6mA). If the reading does not meet the clearing test criteria the sensor will go into fault. The display (if connected) will show “Lodp”. If a meter is attached, the reading will go to approximately 1.2ma. Only a successful re-calibration will clear this fault (Refer to section 5 Troubleshooting Guide).
9. Span calibration is complete. If the Splash Guard was removed for calibration, re-install the Splash Guard.

3.3 Fault Diagnostic/Failsafe Feature

If the ITM should incur a fault, the ITM will drop the mA output to 1.2mA. This can occur if the ITM detects a problem with the sensor, detects that there is no sensor connected, or if the ITM has an internal fault. The ITM will hold this 1.2mA output until the problem is resolved. If the loop powered LED display is installed, it will display “Lodp”.

4. Service and Maintenance

Calibration Frequency

In most applications, monthly to quarterly span calibration intervals will assure reliable detection. However, industrial environments differ. Upon initial installation and commissioning, close frequency tests should be performed, weekly to monthly. Test results should be recorded and reviewed to determine a suitable calibration interval.

Visual Inspection

The Sensor should be inspected annually. Inspect for signs of corrosion, pitting, and water damage. During visual inspection, the Splash Guard should be inspected to ensure that it is not blocked. Also, inspect inside the Junction Box for signs of water accumulation or Terminal Block corrosion.

Condensation Prevention Packet

A moisture condensation packet should be installed in every explosion proof Junction Box. The moisture condensation prevention packet will prevent the internal volume of the J-Box from condensing and accumulating moisture due to day-night humidity changes. This packet provides a critical function and should be replaced annually. Detcon's PN is 960-202200-000.

4.1 Replacement of Plug-in Sensor

NOTE: It is not necessary to remove power while changing the plug-in toxic gas sensor in order to maintain area classification, since it is intrinsically safe.

1. Use a 1/8" Allen wrench to release the locking cap head screw that locks the ITM and Splash Guard Adapter together (One turn will suffice - Do not remove cap head screw completely).
2. Unthread and remove the Splash Guard Adapter and Splash Guard from the ITM.
3. Gently pull the plug-in sensor out of the ITM. Orient the new plug-in sensor so that it matches with the female connector pins. Use the alignment marks provided to assure alignment is correct. When properly aligned, press the sensor in firmly to make the proper connection.
4. Thread the Splash Guard Adapter onto the ITM to a snug fit and tighten the locking cap head screw using the 1/8" Allen wrench. Reinstall the Splash Guard.
5. Check and perform zero calibration and span calibration as per section 3.2 Calibration.

4.2 Replacement of ITM

1. Remove the power source to the sensor assembly. Disconnect all sensor wire connections at the Junction Box Terminal Board taking note of the wire connections.

NOTE: It is necessary to remove power to the Junction box while changing the ITM in order to maintain area classification.

2. Use a wrench and the wrench flats provided at the top section of the ITM and unthread the ITM until it can be removed.

3. Use a 1/8" Allen wrench to release the locking cap head screw that locks the ITM and Splash Guard Adapter together (One turn will suffice - Do not remove setscrew completely).
4. Unthread and remove the Splash Guard Adapter and Splash Guard from the ITM. These will be re-used with the new ITM.
5. Gently remove the plug-in toxic gas sensor from the old ITM and install it in the new ITM. Orient the plug-in sensor so that it matches with the female connector pins on the new ITM and press the sensor in firmly to make proper connection.
6. Thread the Splash Guard Adapter onto the new ITM until snug, tighten the locking cap head screw and reinstall Splash Guard.
7. Feed the sensor assembly wires through the 3/4" female NPT mounting hole and thread the assembly into the J-box until tight and the ITM faces toward the front access point. Use the locking nut to secure the ITM in this position. Connect the sensor assembly wires to the Terminal Board inside the Junction Box (Refer to section 2.6 Field Wiring (External Power Supply Only)).
8. Check and/or perform Zero Calibration and Span Calibration per section 3.2 Calibration.

4.3 Replacement of the Model 100 Terminal Board

1. Remove the power source to the sensor assembly.

NOTE: It is necessary to remove power to the Junction Box while changing the Model 100 Terminal Board in order to maintain area classification.

2. Remove the junction box cover and unlatch the Loop Powered Display, if one is installed.
3. Unplug the battery pack from the J6 Beau connector on the terminal board and/or remove the J5 power connector if an external power supply is being used.
4. Unplug all other connectors from the terminal board, noting where they are plugged in.
5. Remove the four 6-32 screws holding the terminal board to the base of the junction box, and remove the Terminal Board.
6. Install the new terminal board using the four 6-32 screws removed in step 5.
7. Ensure that the jumpers on the terminal board are set properly (Reference Table 2 Model 100 Terminal Board Jumper Descriptions and Table 3 Model 100 Terminal Board Jumper Settings).
8. Re-connect the sensor connector to the terminal board and all other connections removed in step 4.
9. Reconnect the J5 power connector to the terminal board and/or plug battery pack back in.
10. Latch the Loop Powered Display back in place if unlatched in step 2.
11. Reinstall the junction box cover, and restore power to the sensor.
12. Check operation of sensor assembly (See section 2.9 Initial Start Up).

4.4 Replacement of the RXT Series Wireless Transceiver

1. Remove the power source to the wireless sensor assembly. Disconnect all RXT Transceiver wire connections at the J-Box Model 100 Terminal Board taking note of the wire connections.

NOTE: It is necessary to remove power to the J-Box while changing the transceiver in order to maintain area classification.

2. Use a wrench at the bottom section of the RXT transceiver and unthread the RXT until it can be removed.
3. Feed the new RXT transceiver wires through the 3/4" female NPT mounting hole of the outlet box and thread the transceiver into the outlet box until tight. Connect the RXT transceiver wires to the J1 connector of the terminal board inside the J-Box (See Figure 7).
4. Check operation of the wireless sensor assembly (See section 2.9 Initial Start Up).

5. Troubleshooting Guide

If the ITM detects any functional errors the ITM will bring the mA output to 1.2mA and hold it there until the problem has been resolved. If the loop powered LED display is installed, it will display "Lodp".

Under-Range Problems

Probable Cause: Sensor Baseline drifted lower, Interference gases,
Perform Zero Calibration. Use Zero Air or N₂ source. (Section 3.2.1 Zero Calibration)
Allow more time for zero stabilization if this is a biased sensor type.
Execute successful Span Calibration. (Section 3.2.2 Span Calibration)
Replace plug-in sensor if error continues.

Stability Problems

Probable Causes: Failed Sensor, empty or close to empty Cal Gas Cylinder, problems with cal gas and delivery
Check validity of span gas using pull tube or other means (check MFG date on cal gas cylinder).
Use proper cal gas regulators and tubing for highly corrosive gases
Check for obstructions affecting cal gas hitting sensor face (including being wet, blocked, or corroded). H₂S sensors assemblies use 100 Series Bottom Housing Assembly with integral filter. Clean or replace if necessary.
Replace the plug-in toxic sensor.

Clearing Problem

Probable Causes: Failed Sensor, Cal Gas not removed at appropriate time, problems with cal gas and delivery, Background of Target Gas.
The sensor must recover to < 5% of range in < 5 min after Span calibration is complete
Use bottled air (zero air or N₂) if there is a known continuous background level.
Check validity of span gas using pull tube or other means (check MFG date on cal gas cylinder).
Use proper cal gas regulators and tubing for highly corrosive gases
Check for obstructions affecting cal gas hitting sensor face (including being wet, blocked, or corroded). H₂S sensors assemblies use 100 Series Bottom Housing Assembly with integral filter. Clean or replace if necessary.
Replace the plug-in toxic sensor.

Poor Calibration Repeatability

Probable Causes: Failed Sensor, use of wrong Cal Gas or problems w/cal gas and delivery, Interference Gases
Check validity of span gas with regulator and sample tubing in place using pull tube or other means (check MFG date on cal gas cylinder).

Use proper cal gas regulators and tubing for highly corrosive gases (HF, HCl, Cl₂, NH₃, HBR, F₂, etc.)

Check for obstructions affecting cal gas hitting sensor face (including being wet, blocked, or corroded). H₂S sensors assemblies use 100 Series Bottom Housing Assembly with integral filter. Clean or replace if necessary.

Replace the plug-in toxic sensor.

Unstable Output/Sudden Spiking

Possible Causes: Unstable power supply, inadequate grounding, or inadequate RFI protection.

Verify Power source is stable.

Verify field wiring is properly grounded if applicable.

Contact Detcon to optimize shielding and grounding.

Add Detcon's RFI Protection Circuit accessory if problem is proven RFI induced.

Nuisance Alarms

Check conduit for accumulated water and abnormal corrosion on terminal board.

If nuisance alarms are happening at night, suspect condensation in conduit.

Add or replace Detcon's Condensation Prevention Packet P/N 960-202200-000.

Investigate the presence of other target gases that are causing cross-interference signals.

Determine if cause is RFI induced.

Unreadable Display (if a Loop Powered Display is installed)

If due to excessive sunlight, install a sunshade to reduce glare.

Replace Loop Power Display.

“Lodp” Reading on Display (if a Loop Powered Display is installed)

Probable Causes: 4-20mA output current < 3mA, ITM detects a problem with the sensor, no sensor connected, ITM has an internal fault, problem with display.

Verify sensor is properly connected.

Replace the plug-in toxic sensor.

Swap with a known-good ITM to determine if ITM is faulty.

Replace Loop Power Display.

“Hidp” Reading on Display (if a Loop Powered Display is installed)

Probable Causes: 4-20mA output current > 22.75mA, ITM detects a problem with the sensor, ITM has an internal fault, problem with display.

Replace the plug-in toxic sensor.

Swap with a known-good ITM to determine if ITM is faulty.

Replace Loop Power Display.

“SENS” Reading on Display (if a Loop Powered Display is installed)

Probable Causes: Display voltage is too low, discharged battery.

Recharge or replace battery.

Replace Loop Powered Display.

(This reading is normally displayed at power on, but goes away within 1 second.)

Transmitter not Responding – No Reading (if a Loop Powered Display is installed)

Verify conduit has no accumulated water or abnormal corrosion.

Verify required DC power is applied to correct terminals.

Swap with a known-good ITM to determine if ITM is faulty.

Faulty 4-20mA Output

Check that wiring is properly connected at terminal board and through to controller inputs.

The 4-20 output loop must be closed (resistance of < 750 ohms).

If the 4-20mA signal output is 0mA to 2mA, there is an ITM fault.

Swap with a known-good ITM to determine if ITM is faulty.

6. Customer Support and Service Policy

Detcon Headquarters

Shipping Address: 3200 A-1 Research Forest Dr., The Woodlands Texas 77381

Mailing Address: P.O. Box 8067, The Woodlands Texas 77387-8067

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Fax: 281.292.2860

- www.detcon.com
- service@detcon.com
- sales@detcon.com

All Technical Service and Repair activities should be handled by the Detcon Service Department via phone, fax or email at contact information given above. RMA numbers should be obtained from the Detcon Service Department prior to equipment being returned. For on-line technical service, customers should have ready the model number, part number, and serial number of product(s) in question.

All Sales activities (including spare parts purchase) should be handled by the Detcon Sales Department via phone, fax or email at contact information given above.

Warranty Notice

Detcon Inc. warrants the Wireless DM-100 assembly to be free from defects in workmanship of material under normal use and service for two years from the date of shipment on the transmitter electronics. See Warranty details in Section 7 DM-100 Sensor Warranty.

Detcon Inc. will repair or replace without charge any such equipment found to be defective during the warranty period. Full determination of the nature of, and responsibility for, defective or damaged equipment will be made by Detcon Inc. personnel.

Defective or damaged equipment must be shipped to the Detcon Inc. factory or representative from which the original shipment was made. In all cases, this warranty is limited to the cost of the equipment supplied by Detcon Inc. The customer will assume all liability for the misuse of this equipment by its employees or other contracted personnel.

All warranties are contingent upon the proper use in the application for which the product was intended and does not cover products which have been modified or repaired without Detcon Inc. approval, or which have been subjected to neglect, accident, improper installation or application, or on which the original identification marks have been removed or altered.

Except for the express warranty stated above, Detcon Inc. disclaims all warranties with regard to the products sold. Including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of Detcon Inc. for damages including, but not limited to, consequential damages arising out of, or in connection with, the performance of the product.

7. DM-100 Sensor Warranty

Plug-in Sensor Warranty

Detcon Inc. warrants, under normal intended use, each new intelligent plug-in sensor per the period specified in the Warranty column of Table 6 Sensor Specific Data (See section 8.2 Interference Table) and under the conditions described as follows: The warranty period begins on the date of shipment to the original purchaser. The sensor element is warranted to be free of defects in material and workmanship. Should any sensor fail to perform in accordance with published specifications within the warranty period, return the defective part to Detcon, Inc., 3200 A-1 Research Forest Dr., The Woodlands, Texas 77381, for necessary repairs or replacement.

Terms & Conditions

- The original serial number must be legible on each sensor element base.
- Shipping point is FOB the Detcon factory.
- Net payment is due within 30 days of invoice.
- Detcon, Inc. reserves the right to refund the original purchase price in lieu of sensor replacement.

ITM Electronics Warranty

Detcon Inc. warrants, under intended normal use, each new Model 100 ITM to be free from defects in material and workmanship for a period of two years from the date of shipment to the original purchaser. All warranties and service policies are FOB the Detcon facility located in The Woodlands, Texas.

Terms & Conditions

- ❖ The original serial number must be legible on each ITM.
- ❖ Shipping point is FOB the Detcon factory.
- ❖ Net payment is due within 30 days of invoice.
- ❖ Detcon, Inc. reserves the right to refund the original purchase price in lieu of ITM replacement.

8. Specifications

System Specifications

Sensor Type:	Continuous diffusion/adsorption type 3-Electrode Electrochemical Sensor (2-Electrode for O ₂) Plug-in Replaceable Type
Sensor Life:	2 years typical
Measuring Ranges:	0-1ppm up to 0-10,000ppm (Toxic Gases) 0-1% up to 0-25% volume (O ₂)
Accuracy/ Repeatability:	±2% of full-range (other Toxic Gases) ±1% of full-range (O ₂)
Response Time:	T90 < 30 seconds typical (See Sensor Table)
Electrical Classification:	CSA and US (NRTL) Class I, Division 1, Groups C, D ATEX Class I, Zone 1, Group IIC Ex d [ib] ib IIC T6
Approvals:	cCSA _{US} , ATEX, CE Marking
Warranty:	Electronics – 2 years Sensor – See Table 6 Sensor Specific Data

Environmental Specifications

Operating Temperature:	-40°C to +50°C typical (See Table 6 Sensor Specific Data)
Storage Temperature:	-35°C to +55°C typical
Operating Humidity:	10-95% RH Continuous Duty (See Table 6 Sensor Specific Data) 0-100% RH Short-Term Duration Only
Operating Pressure:	Ambient ± 10%
Air Velocity:	0-5 meters/second

Electrical Specifications

Input Voltage:	16-30 VDC
Power Consumption:	Normal operation = 4 mA (0.1 watts @ 24VDC); Maximum = 20 mA (0.5 watts @ 24VDC; 0.23 watts @ 11.5VDC)

RFI/EMI Protection: Complies with EN61326

Analog Output: Linear 4-20mA DC current
 750 ohms maximum loop load @ 24VDC
 1.2 mA All Fault Diagnostics
 4-20 mA 0-100% full-scale
 22 mA Over-range condition

Cable Requirements: Power/Analog: 2-wire shielded cable
 Maximum distance is 13,300 feet with 14 AWG

Mechanical Specifications

Length x Width x Depth: 23" (584 mm) x 9.5" (242 mm) x 7.5" (190 mm)
 23" (584 mm) x 10" (254 mm) x 10" (254 mm) with Detcon's Mounting Plate

Wireless Specifications

Frequency: ISM 2.4GHz

Range: Indoor/No Line of Sight – 1,000ft
 Outdoor RF Line of Sight (with directional antenna) – 3 Miles

Spread Spectrum: Digital-Sequence Spread Spectrum (DSSS)

Modulation: 0-QPSK

Sensitivity: -102dBm (1% PER)

Inputs: RS-485 Modbus™ RTU (9600bps)
 Two 4-20mA inputs

Outputs: RS-485 Modbus™ RTU (9600bps)

8.1 Sensor Specific Data

Table 6 Sensor Specific Data

Gas	GasName	Part Number ¹	Response Time (seconds)	SpanDrift	Temperature Range °C	Humidity Range%	Warranty
O ₂	Oxygen	371-343400-025	T95<30	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₂ H ₃ O	Acetyldehyde	371-12EA00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₂ H ₂	Acetylene	371-12EG00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₃ H ₃ N	Acrylonitrile	371-12EM00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
NH ₃	Ammonia	371-505000-100	T90<90	<2%signal loss/month	-40 to+50	15 to 90	2 years
AsH ₃	Arsine	371-191900-001	T90<60	<5%signal loss/month	-20 to+40	20 to 95	1.5 years
Br ₂	Bromine	371-747500-005	T90<60	<2%signal loss/month	-20 to+50	15 to 90	2 years

¹ The last three digits of the Part Number are the range of the sensor cell. I.E. "-100" is a 100ppm range.

Gas	GasName	Part Number ¹	Response Time (seconds)	SpanDrift	Temperature Range °C	Humidity Range%	Warranty
C ₄ H ₆	Butadiene	371-12EB00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
CO	Carbon Monoxide	371-444400-100	T90=30	<5%signal loss/year	-40 to+50	15 to 90	3 years
Cl ₂	Chlorine	371-747400-010	T90<60	<2%signal loss/month	-20 to+50	15 to 90	2 years
ClO ₂ (>10ppm)	Chlorine Dioxide	371-777700-001	T90<60	<2%signal loss/month	-20 to+50	15 to 90	2 years
ClO ₂ (<=10ppm)	Chlorine Dioxide	371-282800-050	T90<120	<1%signal loss/month	-20 to+40	10 to 95	2 years
B ₂ H ₆	Diborane	371-192100-005	T90<60	<5%signal loss/month	-20 to+40	20 to 95	1.5 years
C ₂ H ₅ OH	Ethanol	371-12E000-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₂ H ₅ SH	Ethyl Mercaptan	371-24EZ00-100	T90<45	<2%signal loss/month	-40 to+50	15 to 90	2 years
C ₂ H ₄	Ethylene	371-12ED00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₂ H ₄ O	Ethylene Oxide	371-12EJ00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
F ₂	Fluorine	371-272700-001	T90<80	<5%signal loss/year	-10 to+40	10 to 95	1.5 years
CH ₂ O	Formaldehyde	371-12EP00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
GeH ₄	Germane	371-232500-002	T90<60	<1%signal loss/month	-20 to+40	20 to 95	1.5 years
N ₂ H ₄	Hydrazine	371-262600-001	T90<120	<5%signal loss/month	-10 to+40	10 to 95	1 year
H ₂ (ppm)	Hydrogen	371-848400-100	T90=30	<2%signal loss/month	-20 to+50	15 to 90	2 years
H ₂ (LEL)*	Hydrogen	371-050500-04P	T90<60	<2%signal loss/month	-40 to+40	5 to 95	2 years
HBr	Hydrogen Bromide	371-090800-030	T90<70	<3%signal loss/month	-20 to+40	10 to 95	1.5 years
HCl	Hydrogen Chloride	371-090900-030	T90<70	<2%signal loss/month	-20 to+40	10 to 95	1.5 years
HCN	Hydrogen Cyanide	371-131300-030	T90<40	<5%signal loss/month	-40 to+40	5 to 95	2 years
HF	Hydrogen Fluoride	371-333300-010	T90<90	<10%signal loss/month	-20 to+35	10 to 80	1.5 years
H ₂ S	Hydrogen Sulfide	371-242400-100	T80<30	<2%signal loss/month	-40 to+50	15 to 90	2 years
CH ₃ OH	Methanol	371-12EE00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
CH ₃ SH	Methyl Mercaptan	371-24EK00-100	T90<45	<2%signal loss/month	-40 to+50	15 to 90	2 years
NO	Nitric Oxide	371-949400-100	T90=10	<2%signal loss/month	-20 to+50	15 to 90	3 years
NO ₂	Nitrogen Dioxide	371-646400-010	T90<40	<2%signal loss/month	-20 to+50	15 to 90	2 years
O ₃	Ozone	371-999900-001	T90<120	<1%signal loss/month	-10 to+40	10 to 95	2 years
COCl ₂	Phosgene	371-414100-001	T90<120	<1%signal loss/month	-20 to+40	10 to 95	1.5 years
PH ₃	Phosphine	371-192000-005	T90<30	<1%signal loss/month	-20 to+40	20 to 95	1.5 years
SiH ₄	Silane	371-232300-050	T90<60	<1%signal loss/month	-20 to+40	20 to 95	1.5 years
SO ₂	SulfurDioxide	371-555500-020	T90=20	<2%signal loss/month	-20 to+50	15 to 90	2 years
C ₄ H ₆ O ₂	Vinyl Acetate	371-12EF00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years
C ₂ H ₃ Cl	Vinyl Chloride	371-12EL00-100	T90<140	<5%signal loss/year	-20 to+50	15 to 90	2 years

8.2 Interference Table

Reference Table 7 to match the interfering gas symbol with the gas name. Then refer to Table 8. The Cross Interfering Gas Table extends for 5 pages, with each sensor specific gas repeated in each section of the table, for a column listing of 40 gases. The list is followed by a row of 14 possible interfering gases per page. Review each page for the applicable sensor gas and then scan across the row for possible interference gases.

Table 7 Interfering Gases

Acetylidehyde	C ₂ H ₃ O	Dimethyl Sulfide	C ₂ H ₆ S	Methane	CH ₄
Acetylene	C ₂ H ₂	Disilane	Si ₂ H ₆	Methanol	CH ₃ OH
Acrylonitrile	C ₃ H ₃ N	Epichlorohydrin	C ₃ H ₅ OCl	Methyl-ethyl-ketone	C ₄ H ₈ O
Alcohols	Alcohols	Ethanol	C ₂ H ₅ OH	Methyl Mercaptan	CH ₃ SH
Amines	Amines	Ethyl Mercaptan	C ₂ H ₅ SH	Nitric Oxide	NO
Ammonia	NH ₃	Ethylene	C ₂ H ₄	Nitrogen	N ₂
Arsenic Triflouride	AsF ₃	Ethylene Oxide	C ₂ H ₄ O	Nitrogen Dioxide	NO ₂
Arsenic Pentaflouride	AsF ₅	Fluorine	F ₂	Ozone	O ₃
Arsine	AsH ₃	Formaldehyde	CH ₂ O	Phosgene	COCl ₂
Boron Triflouride	BF ₃	Germane	GeH ₄	Phosphine	PH ₃
Bromine	Br ₂	Hydrazine	N ₂ H ₄	Phosphorous Triflouride	PF ₃
Butadiene	C ₄ H ₆	Hydrocarbons	C-H's	Silane	SiH ₄
Buten-1	Buten-1	Hydrocarbons (unsaturated)	C-H's (μ)	Silicon	Si
Carbon Dioxide	CO ₂	Hydrogen	H ₂	Silicon Tetra Fluoride	SiF ₄
Carbon Disulfide	CS ₂	Hydrogen Bromide	HBr	Sulfur Dioxide	SO ₂
Carbon Oxide Sulfide	COS	Hydrogen Chloride	HCl	Tetrahydrothiophene	C ₄ H ₈ S
Carbon Monoxide	CO	Hydrogen Cyanide	HCN	Thiophane	C ₄ H ₄ S
Carbonyl Sulfide	CS	Hydrogen Fluoride	HF	Toluene	C ₆ H ₅ CH ₃
Chlorine	Cl ₂	Hydrogen Selenide	HSe	Tungsten Hexafluoride	WF ₆
Chlorine Dioxide	ClO ₂	Hydrogen Sulfide	H ₂ S	Vinyl Acetate	C ₄ H ₆ O ₂
Chlorine Trifluoride	ClF ₃	Dimethyl Sulfide	C ₂ H ₆ S	Vinyl Chloride	C ₂ H ₃ Cl
Diborane	B ₂ H ₆	Disilane	Si ₂ H ₇		

Table 8 Cross Interference Table

Gas	C ₂ H ₃ O	C ₂ H ₂	C ₃ H ₃ N	Alcohols	Amines	NH ₃	AsF ₃	AsF ₅	AsH ₃	BF ₃	Br ₂	C ₄ H ₆	Buten-1
C ₂ H ₃ O	n/a	40=340	40=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	40=170	n/d
C ₂ H ₂	340=40	n/a	340=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	340=170	n/d
C ₃ H ₃ N	75=40	75=340	n/a	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	75=170	n/d
NH ₃	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
AsH ₃	n/d	n/d	n/d	n/d	n/d	100=0.01	n/d	n/d	n/a	n/d	n/d	n/d	n/d
Br ₂	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/d	n/d
C ₄ H ₆	170=40	170=340	170=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/d
CS ₂	140=40	140=340	140=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	140=170	n/d
CO	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Cl ₂	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	1=0.55	n/d	n/d
ClO ₂ (>10ppm)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	1=0.18	n/d	n/d
ClO ₂ (=10ppm)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
B ₂ H ₆	n/d	n/d	n/d	n/d	n/d	100=0.013	n/d	n/d	0.15=0.2	n/d	n/d	n/d	n/d
C ₃ H ₅ OCl	50=40	50=340	50=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	50=170	n/d
C ₂ H ₅ OH	180=40	180=340	180=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	180=170	n/d
C ₂ H ₅ SH	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₄	220=40	220=340	220=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	220=170	n/d
C ₂ H ₄ O	275=40	275=340	275=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	275=170	n/d
F ₂	n/d	n/d	n/d	1000=0	n/d	n/d	n/d	n/d	0.1=0	n/d	yes n/d	n/d	n/d
CH ₂ O	330=40	330=340	330=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	330=170	n/d
GeH ₄	n/d	n/d	n/d	n/d	n/d	100=<1	n/d	n/d	0.2=0.14	n/d	n/d	n/d	n/d
N ₂ H ₄	n/d	n/d	n/d	1000=0	n/d	200=0.04	n/d	n/d	0.1=0.1	n/d	n/d	n/d	n/d
H ₂ (ppm)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
H ₂ (LEL)	n/d	n/d	n/d	n/d	n/d	100=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HBr	n/d	n/d	n/d	1000=0	no	n/d	n/d	n/d	0.1=0.3	n/d	n/d	n/d	n/d
HCl	n/d	n/d	n/d	1000=0	no	n/d	n/d	n/d	0.1=0.3	n/d	n/d	n/d	n/d
HCN	n/d	n/d	n/d	1000=0	n/d	n/d	n/d	n/d	0.1=0	n/d	yes n/d	n/d	n/d
HF	n/d	n/d	n/d	1000=0	n/d	n/d	yes n/d	yes n/d	0.1=0	yes n/d	n/d	n/d	n/d
H ₂ S	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CH ₃ OH	415=40	415=340	415=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	415=170	n/d
CH ₃ SH	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	275=170	n/d
NO	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
NO ₂	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
O ₃	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	0.1=0.05	n/d	yes n/d	n/d	n/d
COCl ₂	n/d	n/d	n/d	1000=0	n/d	50=0.5	n/d	n/d	n/d	n/d	n/d	n/d	n/d
PH ₃	n/d	n/d	n/d	n/d	n/d	100=0.01	n/d	n/d	1=1	n/d	n/d	n/d	n/d
SiH ₄	n/d	n/d	n/d	n/d	n/d	100=<1	n/d	n/d	0.2=0.14	n/d	n/d	n/d	n/d
SO ₂	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₄ H ₆ O ₂	200=40	200=340	200=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	200=170	n/d
C ₂ H ₃ Cl	200=40	200=340	200=75	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	200=170	n/d

n/a – not applicable

n/d – no data

Table 8 Cross Interference Table (pg.2)

Gas	CO ₂	CS ₂	CO	COS	CL ₂	CLO ₂	CLF ₃	B ₂ H ₆	C ₂ H ₆ S	Si ₂ H ₆	C ₃ H ₈ OCL	C ₂ H ₅ OH	F ₂
C ₂ H ₃ O	n/d	40=140	40=100	40=135	n/d	n/d	n/d	n/d	40=150	n/d	40=50	40=180	n/d
C ₂ H ₂	n/d	340=140	340=100	340=135	n/d	n/d	n/d	n/d	340=150	n/d	340=50	340=180	n/d
C ₃ H ₃ N	n/d	75=140	75=100	75=135	n/d	n/d	n/d	n/d	75=150	n/d	75=50	75=180	n/d
NH ₃	n/d	n/d	300=8	n/d	1=-1	10%=-15	n/d	n/d	n/d	n/d	n/d	n/d	n/d
AsH ₃	5000=0	n/d	300=0	n/d	0.5=-0.04	n/d	n/d	0.2=0.15	n/d	5=yes n/d	n/d	n/d	n/d
Br ₂	n/d	n/d	300=0	n/d	1=2	1=6	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₄ H ₆	n/d	170=140	170=100	170=135	n/d	n/d	n/d	n/d	170=150	n/d	170=50	170=180	n/d
CS ₂	n/d	n/a	140=100	140=135	n/d	n/d	n/d	n/d	140=150	n/d	140=50	140=180	n/d
CO	n/d	n/d	n/a	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	200=0	n/d
Cl ₂	n/d	n/d	300=0	n/d	n/a	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
ClO ₂ (>10ppm)	n/d	n/d	300=0	n/d	3=1	n/a	n/d	n/d	n/d	n/d	n/d	n/d	n/d
ClO ₂ (=10ppm)	5000=0	n/d	1000=0	n/d	1=0.9	n/a	yes n/d	0.1=0	n/d	n/d	n/d	n/d	yes n/d
B ₂ H ₆	5000=0	n/d	300=0	n/d	0.5=-0.05	n/d	n/d	n/a	n/d	5=yes n/d	n/d	n/d	n/d
C ₃ H ₅ OCl	n/d	50=140	50=100	50=135	n/d	n/d	n/d	n/d	50=150	n/d	n/a	50=180	n/d
C ₂ H ₅ OH	n/d	180=140	180=100	180=135	n/d	n/d	n/d	n/d	180=150	n/d	180=50	n/a	n/d
C ₂ H ₅ SH	n/d	n/d	300=5	n/d	1=-0.6	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₄	n/d	220=140	220=100	220=135	n/d	n/d	n/d	n/d	220=150	n/d	220=50	220=180	n/d
C ₂ H ₄ O	n/d	275=140	275=100	275=135	n/d	n/d	n/d	n/d	275=150	n/d	275=50	275=180	n/d
F ₂	5000=0	n/d	1000=0	n/d	1=1.3	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/a
CH ₂ O	n/d	330=140	330=100	330=135	n/d	n/d	n/d	n/d	330=150	n/d	330=50	330=180	n/d
GeH ₄	5000=0	n/d	300=0	n/d	0.5=-0.04	n/d	n/d	0.2=0.11	n/d	5=yes n/d	n/d	n/d	n/d
N ₂ H ₄	5000=0	n/d	1000=0	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
H ₂ (ppm)	n/d	n/d	300=<30	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
H ₂ (LEL)	1000=0	n/d	50=6	n/d	5=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HBr	5000=0	n/d	1000=0	n/d	5=1	n/d	yes n/d	n/d	n/d	n/d	n/d	n/d	n/d
HCl	5000=0	n/d	1000=0	n/d	5=1	n/d	1=yes n/d	n/d	n/d	n/d	n/d	n/d	n/d
HCN	5000=0	n/d	1000=0	n/d	5=-1	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HF	5000=0	n/d	1000=0	n/d	1=0.4	n/d	yes n/d	0.1=0	n/d	n/d	n/d	n/d	yes n/d
H ₂ S	n/d	n/d	300=1.5	n/d	1=-0.2	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CH ₃ OH	n/d	415=140	415=100	415=135	n/d	n/d	n/d	n/d	415=150	n/d	415=50	415=180	n/d
CH ₃ SH	n/d	n/d	300=3	n/d	1=-0.4	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
NO	n/d	n/d	300=0	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
NO ₂	n/d	n/d	300=0	n/d	1=1	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
O ₃	5000=0	n/d	300=0	n/d	1=1.4	0.1=0.12	1=1(theory)	n/d	n/d	n/d	n/d	n/d	0.1=0.07
COCl ₂	5000=0	n/d	1000=0	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
PH ₃	5000=0	n/d	300=0	n/d	0.5=-0.04	n/d	n/d	0.2=0.15	n/d	5=yes n/d	n/d	n/d	n/d
SiH ₄	5000=0	n/d	300=0	n/d	0.5=-0.04	n/d	n/d	0.2=0.11	n/d	5=yes n/d	n/d	n/d	n/d
SO ₂	n/d	n/d	300=<5	n/d	1=<0.5	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₄ H ₆ O ₂	n/d	200=140	200=100	200=135	n/d	n/d	n/d	n/d	200=150	n/d	200=50	200=180	n/d
C ₂ H ₃ Cl	n/d	200=140	200=100	200=135	n/d	n/d	n/d	n/d	200=150	n/d	200=50	200=180	n/d

n/a – not applicable

n/d – no data

Table 8 Cross Interference Table (pg.3)

Gas	C ₂ H ₄	C ₂ H ₆ O	CH ₂ O	GeH ₄	N ₂ H ₄	C-H's	C-H's (U)	H ₂	HBr	HCL	HCN	HF	I ₂
C ₂ H ₃ O	40=220	40=275	40=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₂	340=220	340=275	340=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₃ H ₃ N	75=220	75=275	75=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
NH ₃	100=0	n/d	n/d	N/d	n/d	n/d	n/d	200=4	n/d	5=-3	10=0	n/d	n/d
AsH ₃	n/d	n/d	n/d	1=0.4	n/d	%range=0	n/d	3000=0	n/d	5=0	10=0.1	4=0	n/d
Br ₂	100=0	n/d	n/d	N/d	n/d	n/d	n/d	100=0	n/d	5=0	10=0	n/d	n/d
C ₄ H ₆	170=220	170=275	170=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CS ₂	140=220	140=275	140=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CO	100=<100	n/d	n/d	N/d	n/d	n/d	n/d	100=<60	n/d	5=0	10=<2	n/d	n/d
Cl ₂	100=0	n/d	n/d	N/d	n/d	n/d	n/d	100=0	n/d	5=0	10=0	n/d	n/d
ClO ₂ (>10ppm)	100=0	n/d	n/d	N/d	n/d	n/d	n/d	100=0	n/d	5=0	10=0	n/d	n/d
ClO ₂ (=10ppm)	n/d	n/d	n/d	1=0	n/d	%range=0	n/d	1%=0	n/d	n/d	n/d	n/d	n/d
B ₂ H ₆	n/d	n/d	n/d	1=0.53	n/d	%range=0	n/d	3000=0	n/d	5=0	10=0.13	4=0	n/d
C ₃ H ₅ OC1	50=220	50=275	50=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₅ OH	180=220	180=275	180=330	N/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₅ SH	100=0	n/d	n/d	N/d	n/d	n/d	n/d	1%=<15	n/d	5=0	10=0	n/d	n/d
C ₂ H ₄	n/a	220=275	220=330	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₄ O	275=220	n/a	275=330	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
F ₂	n/d	n/d	n/d	n/d	n/d	%range=0	n/d	1%=0	n/d	5=0	1=-3	3=0	n/d
CH ₂ O	330=220	330=275	n/a	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
GeH ₄	n/d	n/d	n/d	n/a	n/d	%range=0	n/d	3000=0	n/d	5=0	10=1	4=0	n/d
N ₂ H ₄	n/d	n/d	n/d	n/d	n/a	%range=0	n/d	1000=0	n/d	5=0.1	n/d	3=0	n/d
H ₂ (ppm)	100=˜80	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/d	5=0	10=˜3	n/d	n/d
H ₂ (LEL)	yes n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/d	n/d	10=0	n/d	n/d
HBr	n/d	n/d	n/d	n/d	n/d	%range=0	n/d	1%=0	n/a	1=1	15=1	3=0	n/d
HCl	n/d	n/d	n/d	1=n/d	n/d	%range=0	n/d	1%=0	1=1	n/a	15=1	3=0	n/d
HCN	n/d	n/d	n/d	n/d	n/d	%range=0	n/d	1000=0	n/d	5=0	n/a	3=0	n/d
HF	n/d	n/d	n/d	1=0	n/d	%range=0	n/d	1%=0	n/d	5=3.3	n/d	n/a	n/d
H ₂ S	100=0	n/d	n/d	n/d	n/d	n/d	n/d	1%=<5	n/d	5=0	10=0	n/d	n/d
CH ₃ OH	415=220	415=275	415=330	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CH ₃ SH	100=0	n/d	n/d	n/d	n/d	n/d	n/d	1%=<10	n/d	5=0	10=0	n/d	n/d
NO	100=0	n/d	n/d	n/d	n/d	n/d	n/d	100=0	n/d	5=<1	10=0	n/d	n/d
NO ₂	100=0	n/d	n/d	n/d	n/d	n/d	n/d	100=0	n/d	5=0	10=0	n/d	n/d
O ₃	n/d	n/d	n/d	n/d	n/d	n/d	n/d	1%=0.003	n/d	10=0	10=0.03	5=0	yes n/d
COCl ₂	n/d	n/d	n/d	n/d	n/d	%range=0	n/d	1%=0	n/d	5=0	5=0	3=0	n/d
PH ₃	n/d	n/d	n/d	1=0.4	n/d	%range=0	n/d	3000=0	n/d	5=0	10=0.1	4=0	n/d
SiH ₄	n/d	n/d	n/d	1=1.0	n/d	%range=0	n/d	3000=0	n/d	5=0	10=1	4=0	n/d
SO ₂	100=0	n/d	n/d	n/d	n/d	n/d	n/d	100=0	n/d	5=0	10=<5	n/d	n/d
C ₄ H ₆ O ₂	200=220	200=275	200=330	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₃ Cl	200=220	200=275	200=330	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d

n/a – not applicable

n/d – no data

Table 8 Cross Interference Table (pg.4)

Gas	HSe	H ₂ S	C ₃ H ₈ O	CH ₄	CH ₃ OH	C ₄ H ₈ O	CH ₃ SH	NO	N ₂	NO ₂	O ₃	COCL ₂	PH ₃
C ₂ H ₃ O	n/d	n/d	n/d	n/d	40=415	n/d	40=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₂	n/d	n/d	n/d	n/d	340=415	n/d	340=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₃ H ₃ N	n/d	n/d	n/d	n/d	75=415	n/d	75=275	n/d	n/d	n/d	n/d	n/d	n/d
NH ₃	n/d	15=30	n/d	n/d	n/d	n/d	n/d	35=6	n/d	5=-1	n/d	n/d	n/d
AsH ₃	0.05=0.005	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/d	0.1=0.11
Br ₂	n/d	15=-1.5	n/d	n/d	n/d	n/d	n/d	35=0	n/d	5=-10	n/d	n/d	n/d
C ₄ H ₆	n/d	n/d	n/d	n/d	170=415	n/d	170=275	n/d	n/d	n/d	n/d	n/d	n/d
CS ₂	n/d	n/d	n/d	n/d	140=415	n/d	140=275	n/d	n/d	n/d	n/d	n/d	n/d
CO	n/d	15<0.3	n/d	n/d	n/d	n/d	n/d	35==7	n/d	5=0.5	n/d	n/d	n/d
Cl ₂	n/d	15=-0.75	n/d	n/d	n/d	n/d	n/d	35=0	n/d	5=5	n/d	n/d	n/d
ClO ₂ (>10ppm)	n/d	15=0.25	n/d	n/d	n/d	n/d	n/d	35=0	n/d	5=1.66	n/d	n/d	n/d
ClO ₂ (=10ppm)	n/d	10=-0.015	n/d	n/d	n/d	n/d	n/d	n/d	n/d	yes n/d	yes n/d	n/d	n/d
B ₂ H ₆	0.05=0.006	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/d	0.1=0.14
C ₃ H ₅ OC1	n/d	n/d	n/d	n/d	50=415	n/d	50=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₅ OH	n/d	n/d	n/d	n/d	180=415	n/d	180=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₅ SH	n/d	1:03	n/d	n/d	n/d	n/d	5=8	35<6	n/d	5=-1.5	n/d	n/d	n/d
C ₂ H ₄	n/d	n/d	n/d	n/d	220=415	n/d	220=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₄ O	n/d	n/d	n/d	n/d	275=415	n/d	275=275	n/d	n/d	n/d	n/d	n/d	n/d
F ₂	n/d	1=-1.5	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	1=0.05	0.1=0.2	n/d	n/d
CH ₂ O	n/d	n/d	n/d	n/d	330=415	n/d	330=275	n/d	n/d	n/d	n/d	n/d	n/d
GeH ₄	0.05=0.005	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/d	0.1=0.13
N ₂ H ₄	n/d	1=0.1	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	1=-0.25	0.1=-0.1	n/d	0.3=0.1
H ₂ (ppm)	n/d	15=<3	n/d	n/d	n/d	n/d	n/d	35=-10	n/d	5=0	n/d	n/d	n/d
H ₂ (LEL)	n/d	n/d	yes n/d	1%=0	n/d	n/d	n/d	yes n/d	n/d	10=0	n/d	n/d	n/d
HBr	0.1=0	10=2.75	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	0.1=0	0.1=0.3
HCl	0.1=0	10=2.75	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	0.1=0	0.1=0.3
HCN	n/d	10=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	10=-12	0.1=0	n/d	0.3=0
HF	n/d	10=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	10=0.1	n/d	n/d	0.1=0
H ₂ S	n/d	n/a	n/d	n/d	n/d	n/d	2:01	35=<2	n/d	5=-0.5	n/d	n/d	n/d
CH ₃ OH	n/d	n/d	n/d	n/d	n/a	n/d	415=275	n/d	n/d	n/d	n/d	n/d	n/d
CH ₃ SH	n/d	1:02	n/d	n/d	n/d	n/d	n/a	35=<4	n/d	5=-1.0	n/d	n/d	n/d
NO	n/d	15=-5	n/d	n/d	n/d	n/d	n/d	100=0	n/d	5=<1.5	n/d	n/d	n/d
NO ₂	n/d	15=-0.75	n/d	n/d	n/d	n/d	n/d	35=0	n/d	n/a	n/d	n/d	n/d
O ₃	n/d	1=-.015	n/d	n/d	n/d	n/d	n/d	10=0	100%=0	1=0.7	n/a	n/d	0.3=0.03
COCL ₂	n/d	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/a	0.3=0
PH ₃	0.05=0.005	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/d	n/a
SiH ₄	0.05=0.005	1=0	n/d	n/d	n/d	n/d	n/d	n/d	100%=0	n/d	n/d	n/d	0.1=0.13
SO ₂	n/d	15=0	n/d	n/d	n/d	n/d	n/d	35=0	n/d	5=-5	n/d	n/d	n/d
C ₄ H ₆ O ₂	n/d	n/d	n/d	n/d	200=415	n/d	200=275	n/d	n/d	n/d	n/d	n/d	n/d
C ₂ H ₃ Cl	n/d	n/d	n/d	n/d	200=415	n/d	200=275	n/d	n/d	n/d	n/d	n/d	n/d

n/a – not applicable

n/d – no data

Table 8 Cross Interference Table (pg.5)

Gas	PF ₃	SiH ₄	Si	SiF ₄	SO ₂	C ₄ H ₆ S	C ₄ H ₄ S	C ₆ H ₅ CH ₃	WF ₆	C ₄ H ₆ O ₂	C ₂ H ₃ CL	C ₂ H ₅ SH	C ₆ H ₅ CH ₃
C ₂ H ₃ O	n/d	n/d	n/d	n/d	n/d	n/d	40=45	n/d	n/d	40=200	40=200	n/d	40=55
C ₂ H ₂	n/d	n/d	n/d	n/d	n/d	n/d	340=45	n/d	n/d	340=200	340=200	n/d	340=55
C ₃ H ₃ N	n/d	n/d	n/d	n/d	n/d	n/d	75=45	n/d	n/d	75=200	75=200	n/d	75=55
NH ₃	n/d	n/d	n/d	n/d	5=-0.5	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
AsH ₃	n/d	1=0.56	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Br ₂	n/d	n/d	n/d	n/d	5=-0.1	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₄ H ₆	n/d	n/d	n/d	n/d	n/d	n/d	170=45	n/d	n/d	170=200	170=200	n/d	170=55
CS ₂	n/d	n/d	n/d	n/d	n/d	n/d	140=45	n/d	n/d	140=200	140=200	n/d	140=55
CO	n/d	n/d	n/d	n/d	5=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Cl ₂	n/d	n/d	n/d	n/d	5=-0.05	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
ClO ₂ (>10ppm)	n/d	n/d	n/d	n/d	5=-0.016	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
ClO ₂ (=10ppm)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
B ₂ H ₆	n/d	1=0.72	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₃ H ₅ OC1	n/d	n/d	n/d	n/d	n/d	n/d	50=45	n/d	n/d	50=200	50=200	n/d	50=55
C ₂ H ₅ OH	n/d	n/d	n/d	n/d	n/d	n/d	180=45	n/d	n/d	180=200	180=200	n/d	180=55
C ₂ H ₅ SH	n/d	n/d	n/d	n/d	5=<3	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/d
C ₂ H ₄	n/d	n/d	n/d	n/d	n/d	n/d	220=45	n/d	n/d	220=200	220=200	n/d	220=55
C ₂ H ₄ O	n/d	n/d	n/d	n/d	n/d	n/d	275=45	n/d	n/d	275=200	275=200	n/d	275=55
F ₂	n/d	n/d	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
CH ₂ O	n/d	n/d	n/d	n/d	n/d	n/d	330=45	n/d	n/d	330=200	330=200	n/d	330=55
GeH ₄	n/d	1=1	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
N ₂ H ₄	n/d	n/d	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
H ₂ (ppm)	n/d	n/d	n/d	n/d	5=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
H ₂ (LEL)	n/d	n/d	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HBr	n/d	n/d	n/d	n/d	5=2.5	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HCl	n/d	n/d	n/d	n/d	5=2.5	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HCN	n/d	n/d	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
HF	yes n/d	n/d	n/d	3=4(theory)	yes n/d	n/d	n/d	n/d	yes n/d	n/d	n/d	n/d	n/d
H ₂ S	n/d	n/d	n/d	n/d	5=<1	n/d	n/d	n/d	n/d	n/d	n/d	3=1	n/d
CH ₃ OH	n/d	n/d	n/d	n/d	n/d	n/d	415=45	n/d	n/d	415=200	415=200	n/d	413=55
CH ₃ SH	n/d	n/d	n/d	n/d	5=<2	n/d	n/d	n/d	n/d	n/d	n/d	2=1	n/d
NO	n/d	n/d	n/d	n/d	5=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
NO ₂	n/d	n/d	n/d	n/d	5=-0.025	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
O ₃	n/d	1=0.015	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
COCl ₂	n/d	n/d	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
PH ₃	n/d	1=0.56	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
SiH ₄	n/d	n/a	n/d	n/d	2=0	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
SO ₂	n/d	n/d	n/d	n/d	n/a	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
C ₄ H ₆ O ₂	n/d	n/d	n/d	n/d	n/d	n/d	200=45	n/d	n/d	n/a	200=200	n/d	200=55
C ₂ H ₃ Cl	n/d	n/d	n/d	n/d	n/d	n/d	200=45	n/d	n/d	200=200	n/a	n/d	200=55

n/a – not applicable

n/d – no data

8.3 Spare Parts, Sensor Accessories, Calibration Equipment

Part Number	Spare Parts
897-850902-010	NEMA 7 Tall Aluminum Condulet w/Window Cover
921-245400-000	DM-100 Intelligent Transmitter Module (ITM for Toxic Gas Sensors is universal design for all gas types and ranges via label inscription.)
921-345500-025	DM-100 Intelligent Transmitter Module (ITM for O ₂ Sensors)
371-XXXX00-XXX	Replacement Plug-in toxic gas sensor (Refer to Table 6 Sensor Specific Data)
500-005143-100	Model 100 Terminal Board
976-000300-316	RXT-300 Wireless Transceiver
976-000320-316	RXT-320 Wireless Transceiver
976-000303-012	12V Smart Battery Pack
8522-750	¾" NPT Plug
897-044400-34T	¾" NPT T-Outlet Box w/Aluminum Cover
898-52310	½" NPT Drain
899-07550	¾" NPT to ½" NPT Adapter
899-15075	¾" NPT x 1.5" Nipple
960-202200-000	Condensation prevention packet (For condulet, replace annually)
Part Number	Sensor Accessories
613-120000-700	Sensor Splash Guard with integral Cal Port
602-003552-000	100 Series Bottom Housing Assembly
602-003552-100	100 Series Bottom Housing Assembly with integral filter (Used in H ₂ S sensor assemblies)
943-002273-000	Harsh Environment Sensor guard
327-000000-000	Programming Magnet
Part Number	Calibration Accessories
943-000006-132	Threaded Calibration Adapter
943-000000-000	Calibration Wind Guard
943-01747-T05	Calibration Adapter for highly reactive gases
943-050000-132	Span Gas Kit: Includes calibration adapter, span gas humidifier, 500cc/min fixed flow regulator, and carrying case. (Not including gas).
943-050000-HRG	Highly Reactive Gas Span Gas Kit (Used for NH ₃ , Cl ₂ , HCl, HBr, etc.)
See Detcon	Span Gases – various
943-05AM00-000	500 cc/min Fixed Flow Regulator for span gas bottle
Part Number	Optional Accessories
800-004221-000	Mounting Plate
345-0000DM-100	Model 100 Loop Powered LED Display
976-000304-004	Quad Charger w/AC Adapter
500-003198-000	8-Position Terminal Board (Remote Mounting)
898-424114-200	¾" NPT 90° Aluminum Elbow w/Cap (Remote Mounting)
301-58205	¾" NPT Cord Connector (Remote Mounting)
897-850800-010	NEMA 7 Aluminum Condulet Base (Remote Mounting)
897-850400-010	NEMA 7 Aluminum Condulet Solid Cover (Remote Mounting)

8.4 Revision Log

Revision	Date	Changes made	Approval
0.0	01/12/2011	Initial Release	LU
0.1	04/06/2011	Added references to 100 Series Bottom Housing Assembly with integral filter. Added 100 Series Bottom Housing Assembly with integral filter to spare parts. Modified troubleshooting section to reference use of 100 Series Bottom Housing Assembly with integral filter	BM