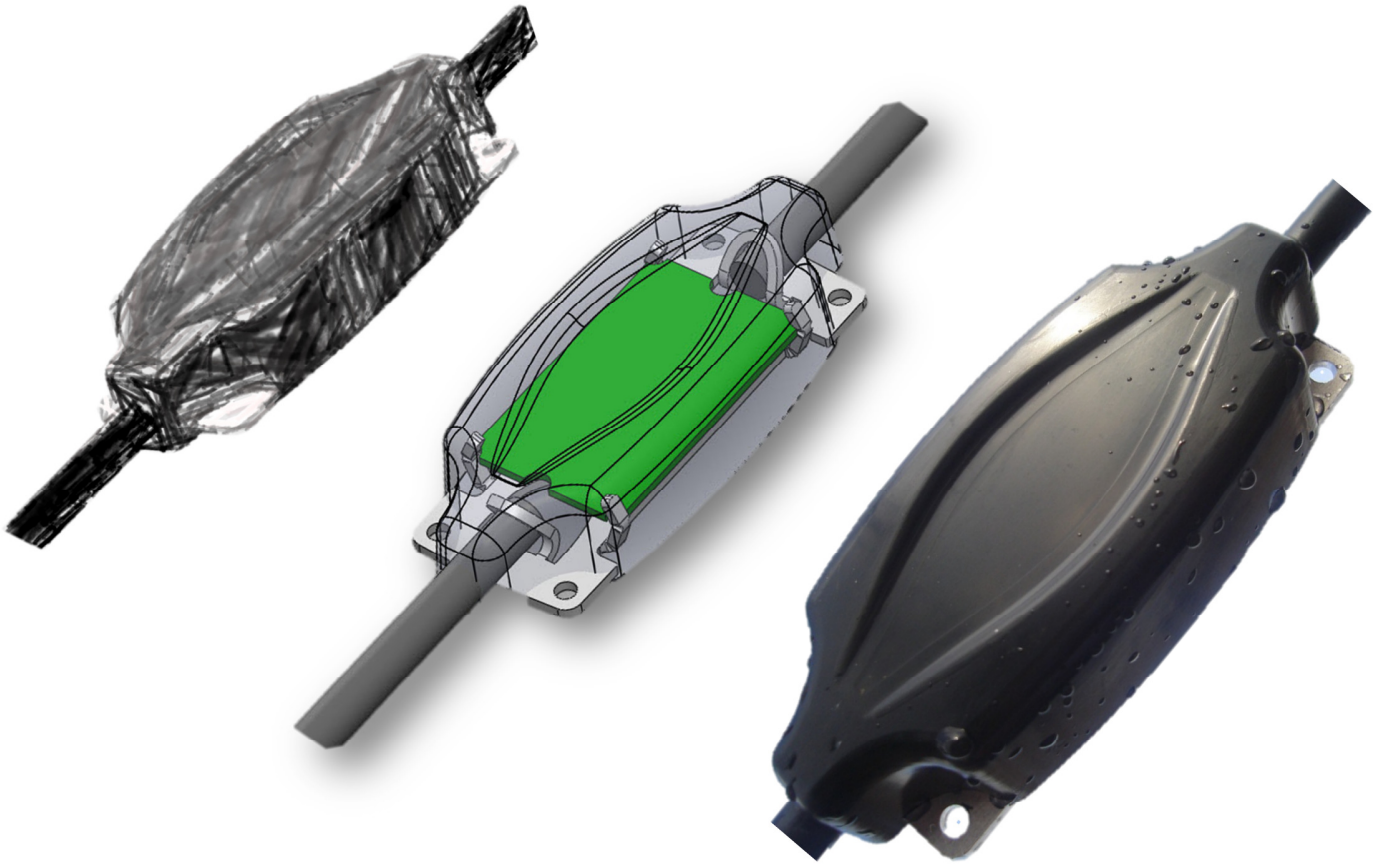
# G.M. AFCON Security Technologies L.P.



VALERT
MULTI-FUNCTION SENSOR

## Card & Sensor Settings Manager Manual


***G.M AFCON Security Technologies Limited Partnership***
*PO Box 2327, Kfar Sava Industrial Area 44425, Israel*
*Tel +972-9-7662965  Fax + 972-9-7662964*
*E-mail: info@gmsecurity.com  Website: www.gmsecurity.com*
*Company Number:  550249312*

## 1. Introduction

1.1. The CARD & SENSOR SETTINGS MANUAL will be used after the installer is completely familiar with the operation of the V-AlertCOMM Settings Manager (See separate manual).

1.2. The CARD and SENSOR SETTINGS features of the V-Alert System will be used when it is required to "fine-tune" the V-Alert Sensor settings to optimize the performance of the system or when it is required to read the sensor data from V-Alert sensors installed in a new type of installation.

1.3. Changes to the CARD and SENSOR settings should be made only after all the default Sensitivity Settings (Sensitivity Settings 1 to 5 options) of the V-AlertCOMM Setting Manager Manual have been used to try to get the system to operate at the optimal level, or when there is a specific problem with the sensitivity of the V-Alert sensor(s) due to a specific problem or condition on site.

1.4. The DATA STORAGE Application has replaced the DOCKLIGHT Application. These software applications are used to read the data values from the V-Alert Sensors (a complete explanation to follow below).

1.5. The user should be familiar with the DATA STORAGE Application which is a proprietary Software Utility Application that has been made specifically for use with the V-Alert Intrusion Detection System.

1.6. The DATA STORAGE Application is used to read the raw data flow from the V-Alert Sensors to the V-Alert Zone Processor Card.

1.7. The DATA STORAGE application will provide the installer with the required data from each individual sensor that will give the installer the ability to decide which values to change in the CARD and SENSOR SETTINGS windows of the V-AlertCOMM Settings Manager in order to match the capability of the V-Alert Sensor technology with the actual installation.

1.8. It is necessary to understand the raw data flow coming from the sensors in order to understand the logic behind the system and in order to understand how to make changes to the system's settings.

1.9. This manual will explain the following:

- How to analyse the raw data flow received from the DATA STORAGE Application.
- How to change the parameters in the CARD & SENSOR SETTINGS windows of the V-AlertCOMM Settings Manual.

1.10. It is very important to differentiate between the CARD and SENSOR SETTINGS windows. Please take into account the following:

- The CARD SETTINGS window enables changing the detection capability of the system based on the data flow coming from the sensors.
- The SENSOR SETTINGS window enables changing the SENSITIVITY OF THE SENSOR ITSELF. Changing the sensitivity of the sensor itself will affect the values of the data flowing to the Processor Card and as such will affect the detection capabilities of the CARD SETTINGS window parameters.

1.11. This manual explains the initial method of operation of the system and the initial steps that need to be taken to change the sensitivity and the detection capability of the V-Alert System. We believe that the majority of what can be called standard installations will perform satisfactorily with the standard default settings of the V-AlertCOMM Settings Manager, whilst the minority of projects will require the use of the CARD and SENSOR SETTINGS features.

1.12. PLEASE TAKE INTO ACCOUNT THAT FURTHER TRAINING MAY BE REQUIRED FROM GM'S TECHNICIANS IN ORDER TO PROVIDE THE MOST ADVANCED LEVEL OF TRAINING.

## 2. V-Alert Technology - What is the V-Alert Sensor checking ?

2.1. The V-Alert Sensor's electronic components measure movement or vibrations of the sensor along 2 separate axes – the X-Axis and the Y-Axis as can be seen in the diagram below.

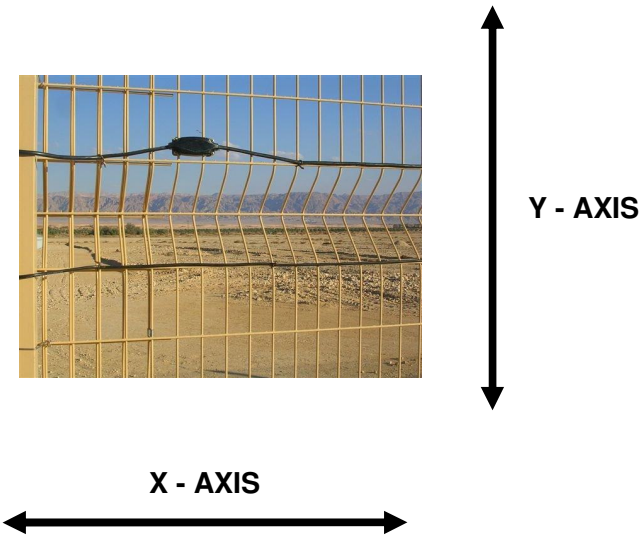
2.2. The Sensor checks the X and Y axis values 250 times every second and then once every second transmits 4 separate data values or numbers FROM EACH V-ALERT SENSOR to the V-Alert Zone Processor Card. That means that 100 sensors connected to the V-Alert Zone Processor Card will transmit a total of 4 x 100 data values for processing by the V-Alert Zone Processor Card EVERY SECOND.

2.3. An explanation of the 4 separate data values that the V-Alert Sensor provides is explained in paragraph (5) below.

2.4. The V-Alert Sensor capability is based on an analysis of the data flow from all the sensors using sophisticated alarm detection algorithms.

2.5. The CARD Settings and SENSOR settings parameters can be adjusted using the V-Alert COMM Settings Manager to change the detection parameters as

well as change the sensitivity of each individual V-Alert sensor (explained in paragraphs (6) and (7) below).




## 3. Data Storage Application

3.1. In order to be able to read the Data Flow from each of the V-Alert sensors it is necessary to use either the DATA STORAGE Application. If you are using the DATA STORAGE Application please refer to the DATA STORAGE Installation Manual and User Guide.

3.2. If you are going to use the DATA STORAGE APPLICATION please refer to the following Manuals **AND THEREAFTER CONTINUE:**

- DATA STORAGE INSTALLATION MANUAL
- DATA STORAGE USER GUIDE

3.3. The Data String numbers are data readings taken from each individual sensor as follows:

| 001 010 010 000 000 | | | | |
|---|---|---|---|---|
| SENSOR NUMBER | PEAK X | PEAK Y | TEAK X (WIDTH) | TEAK Y (WIDTH) |

The numbers shown above represent the sensor's status when there is no movement on that particular sensor.

The following table provides an explanation of the numbers or values received in each field:

| | |
|---|---|
| SENSOR NUMBER | Displays the sensor number from which the values or data is being received. |
| PEAK X | Displays the highest data value received from that specific sensor's X-axis value per second. |
| PEAK Y | Displays the highest data value received from that specific sensor's Y-axis value per second. |
| TEAK X (WIDTH) | Displays the amount of times the highest data value received from that specific sensor's X-axis per second. In other words this value represents the amount of time or width of the event from that sensor's X-axis each second. The sensor analyses itself 250 times per second. The TEAK X value counts the number of times the highest value occurred (# number of times out 250). |
| TEAK Y (WIDTH) | Displays the amount of times the highest data value received from that specific sensor's Y-axis per second. In other words this value represents the amount of time or width of the event from that sensor's Y-axis each second. The sensor analyses itself 250 times per second. The TEAK Y value counts the number of times the highest value occurred (# number of times out 250). |

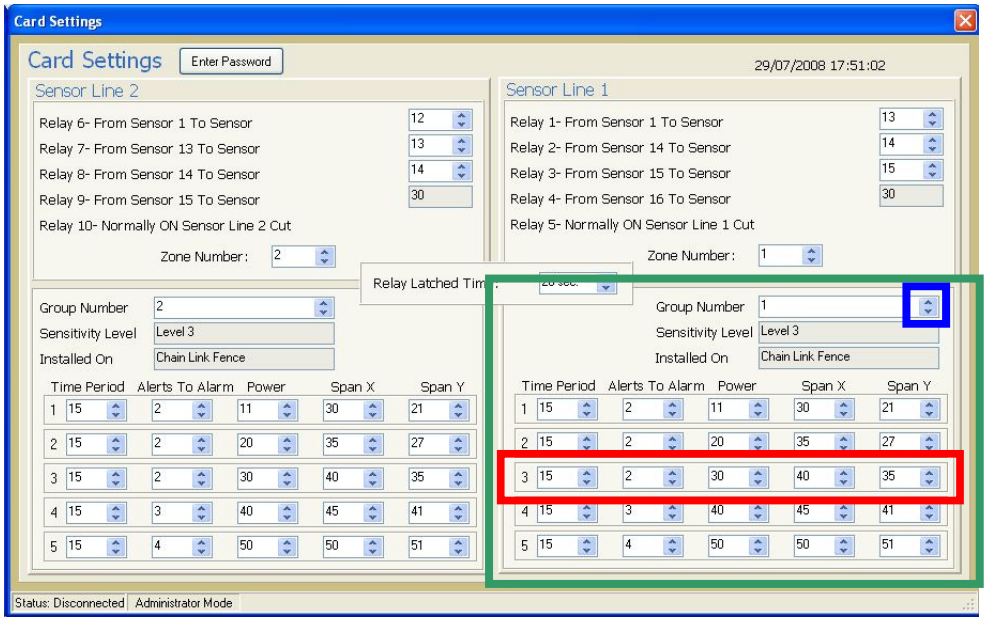
3.4. The Data String from each sensor will enable the installer to decide what settings to enter or change in the CARD SETTINGS WINDOW of the V-AlertCOMM Settings Manager.

3.5. Using the data strings to adjust the Card and Sensor settings parameters will be explained during training provided by GM's technicians.

3.6. The logic and operation of the system will be explained below.

## 4. V-Alert CARD SETTINGS WINDOW – ALARM DETECTION PARAMETERS

4.1. Before explaining the relationship between the numbers from the Data String and the numbers in the card settings window it is necessary to understand the parameters of the cards settings window:




4.2. The Sensor Line 1 marked in the **GREEN** rectangle above refers to the settings for GROUP 1, LEVEL 3, and CHAIN LINK FENCE. More specifically the **RED** rectangle refers to the specific setting that has been chosen by the installer when using the standard settings of the V-AlertCOMM Settings Manager.

4.3. It is possible to scroll up or down to different groups of sensor Line 1 using the arrows marked in the **BLUE** rectangle above.

4.4. The numbers that appear in the Time Period, Alerts to Alarm, Power, Span X and Span Y settings are the standard default settings of the system for that particular "INSTALLED ON" setting and "SENSITIVITY LEVEL".

4.5. An analysis of the Data String received from the DOCKLIGHT application will give the installer the information required to decide how to change these numbers in order to improve the performance of the V-Alert System.

4.6. The following table provides an initial explanation of the numbers in the **RED** rectangle. Please refer to the example below in which the ALARM DETECTION STAGES are explained in detail:

| | |
|---|---|
| SPAN Y (PEAK Y) | In order to pass the FIRST stage of an alarm detection, the sensor must provide a value that is greater than the number in the SPAN Y field. In other words the PEAK Y value provided by the sensor is compared with the SPAN Y value. If the PEAK Y value is greater than the SPAN Y value then the FIRST STAGE has been passed.<br><br>**Using the Group 1, level 3 example below, if the PEAK Y value is greater than 35, then the first stage has been passed.** |
| SPAN X (PEAK X) | In order to pass the FIRST stage of an alarm detection, the sensor must provide a value that is greater than the number in the SPAN X |

| | |
|---|---|
| | field. In other words the PEAK X value provided by the sensor is compared with the SPAN X value. If the PEAK X value is greater than the SPAN X value then the FIRST STAGE has been passed.<br><br>**Using the Group 1, level 3 example below, if the PEAK X value is greater than 40, then the first stage has been passed.** |
| POWER | In order to pass the SECOND stage of an alarm detection, the sensor must provide a POWER value that is greater than the number in the POWER field multiplied by 100.<br><br>From the Data String values:<br><br>PEAK X multiplied by TEAK X equals POWER (X)<br>(PEAK X) X (TEAK X) = POWER (X)<br>and<br>PEAK Y multiplied by TEAK Y equals POWER (Y)<br>(PEAK Y) X (TEAK Y) = POWER (Y)<br><br>  <br><br><br>IF (PEAK X) multiplied by (TEAK X) IS GREATER THAN POWER multiplied by 100 THEN GO TO THE NEXT STAGE OF AN ALARM DETECTION.<br><br>IF (PEAK Y) multiplied by (TEAK Y) IS GREATER THAN POWER multiplied by 100 THEN GO TO THE NEXT STAGE OF AN ALARM DETECTION.<br><br>**In the example above the POWER value is 30 multiplied by 100 equals 3000.**<br><br>**If the PEAK X value is 55 and the TEAK X value is 59, then the power value is 55 x 59 = 3245. This number is GREATER than the POWER value of 3000, therefore the system will progress to the next stage.**<br><br>**If the PEAK Y value is 36 and the TEAK Y value is 59, then the power value is 36 x 59 = 2124. This number is SMALLER than the POWER value of 3000, therefore the system will NOT progress to the next stage.**<br><br>**HOWEVER IF ANY ONE OF THE POWER VALUES CALCULATED FROM THE X & Y PEAK/TEAK VALUES IS GREATER THAN THE CARD SETTINGS POWER VALUE THEN THE SYSTEM WILL MOVE ON TO THE NEXT STAGE.**<br><br>**To summarise the example above:** |

| | |
|---|---|
| | **POWER from X values: 3245 > 3000 – go to next stage**<br>**POWER from Y values: 2124 < 3000 – do not go to next stage**<br><br>**BUT BECAUSE THE X POWER VALUE IS GREATER THEN THE SYSTEM WILL GO TO THE NEXT STAGE.** |
| ALERTS TO ALARM | The number of ALERTS TO ALARM is the number of times the specific sensor MUST pass the detection criteria of the FIRST and SECOND STAGES. |
| TIME PERIOD | The TIME PERIOD is the amount of time in SECONDS during which the specified number of ALERTS TO ALARM must be received.<br><br>The actual TIME PERIOD is the value in the TIME PERIOD field multiplied by 2<br><br>TIME PERIOD equals the TIME PERIOD value multiplied by 2<br>(TIME PERIOD) = (TIME PERIOD) X 2<br><br>In the example above the TIME PERIOD value is 15 multiplied by 2 equals 30 seconds.<br><br>**In the example, STAGES 1 AND 2 MUST OCCUR AT LEAST 2 TIMES IN A TIME PERIOD OF 30 SECONDS** |

4.7. Paragraph 4.6 can be summarised as follows:

| | |
|---|---|
| STAGE 1 | [PEAK X] > [SPAN X]<br>OR<br>[PEAK Y] > [SPAN Y] |
| STAGE 2 | [PEAK X] x [TEAK X] > [POWER] x [100]<br>OR<br>[PEAK X] x [TEAK X] > [POWER] x [100] |
| STAGE 3 | [N] ALERTS TO ALARM RECEIVED<br>in the<br>[TIME PERIOD] x 2 |

4.8. From the explanation provided above we can therefore make the following conclusions:

- ❑ DECREASING the SPAN X and SPAN Y values INCREASES the sensitivity of the system (and vice versa)
- ❑ DECREASING the POWER value INCREASES the sensitivity of the system (and vice versa).
- ❑ DECREASING the ALERTS TO ALARM value INCREASES the sensitivity of the system (and vice versa).
- ❑ DECREASING the TIME PERIOD value DECREASES the sensitivity of the system (and vice versa).

**PLEASE NOTE:**

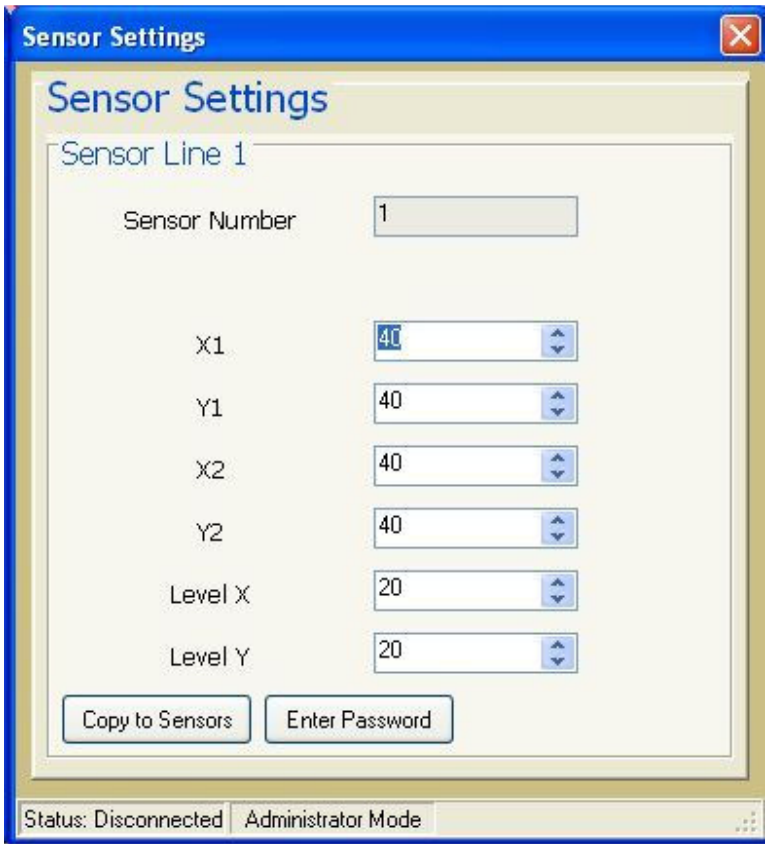
**CHANGING THE PARAMETERS IN THE CARD SETTINGS WINDOW ACTUALLY CHANGES THE DETECTION PARAMETERS OF THE SYSTEM AND IN THIS WAY CHANGES THE SENSITIVITY OF THE SYSTEM, HOWEVER THE ACTUAL SENSITIVITY OF THE SENSOR CAN BE CHANGED IN THE SENSOR SETTINGS WINDOW**

4.9. We must at this stage mention that the detection algorithms of the V-Alert System are very sophisticated and this manual does not attempt to explain the complete workings of the technology.

4.10. As an example, the WELDED MESH and CHAIN LINK default settings algorithm includes an additional feature which serves to provide better performance of the system in for example high wind conditions. The settings for WELDED MESH and CHAIN LINK take an AVERAGE of the data values generated by all the V-Alert Sensors. In order to pass the first stage of an alarm detection, the average data values of the X and Y Axis PLUS the SPAN X or SPAN Y value will cause the system to go to the next stage. The use of averages serves as a mechanism to prevent false alarms in high wind situations.

4.11. We have mentioned this here, because the WELDED MESH and CHAIN LINK default settings with the use of averages will operate properly in longer run fences of 20-30 sensors or more. Averages of a small amount of for example 5 sensors will not necessary provide a good indication of the events on the fence. This feature of the technology can best be explained during training provided by a GM technician.

## 5. V-Alert SENSOR SETTINGS WINDOW




5.1. The SENSOR settings window enables the installer to change the SENSITIVITY of the sensor, or in other words change the level of the raw data that is being generated by the V-Alert Sensors.

5.2. The PEAK X and Y values that are generated by the V-Alert sensor are actually a function of two X values (X1 and X2) and similarly a function of two Y values (Y1 and Y2).

5.3. Changing the value of the X1/X2 and Y1/Y2 values must be done carefully because the PEAK X and Y values are generated by the V-Alert Sensor by multiplying the X1 by the X2 value and multiplying the Y1 by the Y2 value.

**Example:**

**The X1/X2/Y1/Y2 default value is 40.**

**X1 MULTIPLIED BY X2 = 40 X 40 = 1600.**

**If you wish to INCREASE the sensitivity of the V-Alert Sensor you need to INCREASE the X1/X2/Y1/Y2 values.**

**Increasing X1 and X2 values to 50 will result in the following:**

**X1 MULTIPLIED BY X2 = 50 X 50 = 2500.**

**We can now see that the increase from 1600 to 2500 is a very large increase in the sensitivity of the system.**

**We recommend that the increase of the X1/X2/Y1/Y2 values be done with small incremental increase or decreases of 2 to 3 points.**

5.4. The Level X and Level Y default value is 20. This means that any value under 20 will be disregarded by the system and will not be counted by the system. In this case the TEAK X and Y values will be zero. This provides an initial filter of the data values being transmitted to the zone processor card. Lowering the Level X and Y values will increase the sensitivity of the system. Please note that changing the Level X and Y values should only be completed together with GM's technical support as this feature is almost never required to fine-tune the system.

## 6. V-Alert PASSWORD generator

6.1. In order to change any of the parameters of the CARD and SENSOR Settings windows it is necessary to enter a PASSWORD.
6.2. GM will provide authorized installers and dealers with a small Software Application called the PASSWORD generator.
6.3. The PASSWORD generator automatically provides a password that is valid for 24 hours. The next day the installer must generate a new password.
6.4. This system prevents the end-user from independently making changes to the data values in the CARD and SENSOR Settings windows.

## 7. Conclusion

7.1. This manual has explained the way the V-Alert Sensor detects and the method of adjusting the sensitivity of the V-Alert Sensors.
7.2. We would recommend that at some stage more advanced training be carried out with GM's technicians.
7.3. This manual should provide the initial tools to the installer providing a more in-depth understanding of the system and logic behind the technology.
7.4. In our experience the use of the explanation provided in this manual on an actual installation will provide the installer with the initial experience needed to start working with the V-Alert System.
7.5. Kindly contact GM or any GM authorized dealer for additional Technical Support at any time.
7.6. GM would like to thank you the installer for using the V-Alert System for your Intrusion Detection requirements.