

PROGRAMMING AND TROUBLE SHOOTING MANUAL No. 16602

FEBRUARY 2007

# **SafetyNet**

# VEHICLE FIRE SUPPRESSION SYSTEM CONTROL COMPONENTS

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# **1** SafetyNet Software Introduction

The SafetyNet system is designed with flexibility in mind. It is backwardly compatible with prior Amerex Fire & Gas Detection systems, but also offers the user the ability to customize an application using the available SafetyNet Configuration Utility software. SafetyNet can also be used as a Data Acquisition system and an Event Recorder. The purpose of this Programming Manual is to explain in greater detail, the building blocks that make up the Amerex SafetyNet System.

SafetyNet is designed to be backwardly compatible to previous Amerex Vehicle Fire Suppression systems through the use of a number of common mechanical characteristics, (cables, sensors, panel size, etc.) but also through its *Self Configuration* capability.

SafetyNet Modules are internally programmed to "recognize" the electrical characteristics of a wide variety of Amerex Vehicle System sensors. Each sensor is identified by SafetyNet as to type of sensor, (Fire, Gas, etc.). SafetyNet then operates using default settings, based upon the type of sensor. For example, a Normally Open Spot Heat Sensor is automatically recognized as a *Fire Sensor*. When that sensor detects a Fire condition, SafetyNet will actuate the Fire Suppression System. The SafetyNet Operator Display will indicate a Fire condition and identify the module and sensor which detected the Fire condition. SafetyNet will also indicate a Trouble condition if the sensor is operating outside of its design parameters. For example, if a wire to a Normally Open Spot Heat Sensor breaks, SafetyNet will indicate a Trouble condition. The SafetyNet Operator Display will identify the module and sensor which has the problem.

SafetyNet PC software takes the basic system operation a step further. After installing SafetyNet software onto your PC setting up the Computer Interface Module, the user has the ability to connect to a SafetyNet System and perform the following:

- a. Modify System Configurations
- b. Download System Events
- c. Use SafetyNet as a Data Acquisition System

<u>Modify System Configurations</u> – Using the SafetyNet PC software, the system user can modify SafetyNet configurations by naming sensors, adjusting relay functions, etc. SafetyNet PC software also allows the designer to pre-configure SafetyNet and upload system design parameters to an existing design.

<u>Download System Events</u> – The Operator Display has the ability to store up to 4095 separate "events". An event is defined as any message which appears on the Operator Display screen. An event is also recorded when a pushbutton is pressed, (i.e. Silence, Relay Reset, Push to Test). The type of event is recorded along with a time and date stamp. For example, a sensor Trouble Condition may be displayed as "Mod 1, Sensor 1, Trouble". This can later be viewed and downloaded using SafetyNet PC software P/N 16609 which allows access to the SafetyNet programming and event log via personal computer. Reviewing system Events is useful in reconstructing previous situations, performing system maintenance and troubleshooting. This saved event log file can also be shared via email.

<u>Using SafetyNet as a Data Acquisition Tool</u> – Real time data is continuously analyzed by the SafetyNet system. The SafetyNet PC software allows the user to tap into this flow of data. The Monitor Mode portion of SafetyNet provides an on screen view of real time sensor data. This is useful when testing a SafetyNet system and can also be used as an engineering analysis tool to assist in the location of combustible gas sensors, spot heat sensors, etc. An additional feature allows the user to capture the sensor data, save the data to a file and then manipulate the data using software such as Microsoft Excel. This saved data file can also be shared via email and printed out.

# SafetyNet Menu Introduction

Once the SafetyNet software is installed on your computer, you can *Run* the program by selecting the SafetyNet Utility icon located on your desktop.



Figure 1 - SafetyNet Utility Program icon



Figure 2 - SafetyNet Start Screen

If you are familiar with Windows pull-down menus, you will recognize the flexibility of the SafetyNet Configuration Utility. The utility screen is made up of the following categories:

# File Menu



Figure 3 - SafetyNet File Menu

The File Menu allows the user to Create, Save and Open SafetyNet Configuration files. You can also change PC to SafetyNet communication ports and change system access password.

# File Menu Options

<u>New File</u> - Allows the user to open a new file and build a new, untitled SafetyNet system configuration. You must add one or more module configuration tabs using the "Add Module" dialog to create a valid SafetyNet configuration which can then be uploaded to a SafetyNet system. If you have made changes to a previously opened configuration, you will be prompted to save them before the new configuration is created. A library of various configurations can be maintained. By default these configurations are stored in the *"C:Program Files\SafetyNet\Config"* sub-folder.

Den Existing File – Allows the user to open an existing system configuration file from disk. A standard Windows file-open dialog is displayed, allowing you to choose an existing configuration file to open and edit. SafetyNet configuration files are stored in a folder named "Config" and have a filename extension of ".cfg"

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Open Configu	ration File		?×
Look jn: 🔂	Config	• 🗈 🗹	
Config1.cfg	3		
J.	<b></b>	1	
File <u>n</u> ame:	I		Upen
Files of type:	Configuration Files	-	Cancel

Figure 4 - Opening an Existing Configuration File

Save – Allows the user to save the current system configuration to a file on disk and optionally upload the configuration to a connected SafetyNet system. If the configuration has not been saved to disk previously, you will be prompted to name the configuration file. The configuration filename can be any name that is valid for the Windows file system ("long" filenames are supported); by convention, SafetyNet configuration files should be stored in the "Config" folder

Save As – This menu item is the same as the "Save" menu item, except that you will be prompted for a new configuration filename. This feature can be used to support "template" configurations: a standard or "template" configuration can be opened, modified, and then saved to a new configuration filename.

Save Configuration F	ile As			<u>?</u> ×
Save in: 🔄 Config		• Ē		* 📰
Config1.cfg				
um conigz.cig				
File name: Config3	.cfg			<u>S</u> ave
Save as type: Configu	ration Files		•	Cancel

Figure 5 - Saving an Existing File

Preferences – Allows the user specify the serial communications port (COM ports 1-32) on their PC to use with the SafetyNet Interface Module (p/n 16609). Normally, the serial communications port is automatically set when the SafetyNet Communications Interface Module is first connected to your computer.



Figure 6 - COM Port Selection

-	7
Enter password:	
	Canad
	Cancer

Figure 7 - Password Input Window

**Exit** – Choose this menu item to exit the SafetyNet Configuration Utility. If you have made changes to the current SafetyNet configuration, you will be prompted to save them before exiting.

<u>Recent Files</u> - This submenu allows you to open the most recently used SafetyNet configuration files from a list, or to clear the list of recently used configuration files.

# Configuration Menu



Figure 8 - SafetyNet Configuration Menu

The Configuration Menu allows you to:

- Create a SafetyNet System from scratch,
- Edit existing configurations,
- Copy and Rename existing configurations,
- Upload-Download configurations to the SafetyNet System.

A "Configuration" is a specific arrangement of sensors, modules and software variables that make up a SafetyNet System. While each individual application may be different, standard SafetyNet components may be arranged in such a way to create a custom configuration.

# **Configuration Menu Options**

Add Module – Allows the user to manually add a SafetyNet Module to a configuration. Once a Module is added to the current configuration, the user can then change the each individual module's characteristics.



Figure 9 - Add Module Menu

<u>Remove Module</u> – Allows the user to delete a module from a SafetyNet system configuration.

<u>Copy Module Data/Paste Module Data</u> - These menu items allow you to quickly copy data from one module configuration tab to another tab. Use the 'Copy module data' menu item to copy the configuration data from the selected module configuration tab; then select another module tab and use the 'Paste module data' menu item to transfer the data. Note that both the source and target module tabs must be the same module type

Erase – Allows the user to erase an existing SafetyNet configuration. Selecting this option connects the user PC to the SafetyNet system and erases the existing configuration. After you erase an existing configuration, the SafetyNet system will reconfigure itself to determine existing modules, sensors, and outputs. SafetyNet software settings (delays, sensor & module names, etc.) are also returned to default values. You must enter the system password to proceed, and you will be prompted to confirm that you want to erase the configuration.

<u>Upload</u> – Allows the user to "Write" a configuration to the SafetyNet system. Selecting this option connects the user PC to the SafetyNet system and replaces the existing configuration with the current PC configuration. You must enter the system password to proceed, and you will be prompted to confirm that you want to upload the configuration. After replacing the existing configuration, SafetyNet will verify that the uploaded configuration matches the actual configuration. The SafetyNet system will resume operations with the new configuration settings in effect.

<u>Download</u> – Allows the user to "Read" an existing configuration as currently loaded on an attached SafetyNet system. Once the configuration is downloaded, it becomes the current configuration in your SafetyNet PC software utility. If you have made changes to a previously loaded configuration, you will be prompted to save the changes to disk before downloading. After a successful download, you can view and modify configuration settings and re-upload to a SafetyNet System or save the configuration to disk.

# Tools Menu



Figure 10 - SafetyNet Tools Menu

The Tools Menu allows the user to perform Maintenance and gather information from the SafetyNet System.

# Tool Menu Options

<u>View Event Log</u> - Each Event, which occurs in the SafetyNet system, is recorded to memory residing in the Operator Display. An event is defined as any condition (except for Fire System Maintenance Due) causing a message on the Operator Display screen. Events are also recorded for Push to Test, System Reconfigurations, and other user modifications. The Operator Display event recorder can store 4095 events. When the Operator Display memory is full, the first event recorded is over written by the most recent event. By choosing this menu item the user can retrieve events from an attached SafetyNet system. The event log feature can be used to track the operation of a SafetyNet system over time. The event log can be saved to disk as text file that can be imported into a word processing or spreadsheet program or exchanged via e-mail.

<u>Maintenance Schedule</u> – Choose this menu item to configure, reset, or disable the SafetyNet maintenance reminder feature. The SafetyNet system can be configured to display a "Maintenance Due" message on the SafetyNet Operator Display Module. You must enter the program password to use this feature. SafetyNet indicates Maintenance Due by pulsing the audible alarm once and briefly displaying "Fire System Maintenance Due" on the operator display. The "Fire System Maintenance Due" reminder will reappear every 10 minutes. Once maintenance has been performed, the user must "Reset" the maintenance warning to a future date. Disabling the Maintenance Warning stops the built-in reminder.

Set Clock – The Operator Display contains an internal clock that is set at the factory for US Eastern Standard Time. The clock function is used during event recording and data logging operations. You can reset the internal system clock using this menu. SafetyNet software uses the current time and date from your PC.

Set Display Brightness – The brightness of the p/n 16389 Operator Display can be adjusted from 1 (dimmer) to 8 (brighter). Default level is 4. Display brightness adjustment affects only the VFD screen display and does not affect the LED brightness. You must enter the program password to use this feature.

Firmware Revision – Choose this menu item to retrieve firmware revision information from all modules of an attached SafetyNet system. Each module contains software which includes a revision level - this utility allows you to check the revision levels of all modules in a SafetyNet system.

<u>Monitor</u> – Using the Monitor Mode allows you to view module, sensor and component data real-time. This function also allows you to record data by "Logging" to an ASCII text format (\*.txt). If the data is to be Logged, it is by default saved to your PC in the "*C:Program Files*\*SafetyNet*\*DataLog*" folder. The data can then be exported to a spreadsheet or other program for manipulation, viewing and charting.

Help Menu

🕤 SafetyNet Configura	tion Utility [UNTITLED]	
<u>File Configuration Tool</u>	> <u>H</u> elp	
日日間 + -	? Contents Ctrl+F1	
V	🙆 Index Shift+F1	
version ID 100	© <u>A</u> bout	
Mod 1		
Module name	Mod 1 Con	nected to: 💿 J1 (F) 🔿 J2 (M)
Sensors		Relays
Туре	Name Discha	rge Delay Enable
1 None	Sens 1	Fire 5 sec. 💌 🗹
2 None	• Sens 2	Gas 5 sec. 💌 🔽
3 None	Sens 3	Trouble 5 sec. 💌 💌
4 None	- Sens 4	
	_,	Discharge
Detection zones		Delay (sec.)
Туре	Name Discha	rge 0 🚔
1 None	Heat 1	🗖 Discharge all
2 None	In Heat 2 □	
Help menu		

Figure 11 - SafetyNet Help Menu

The Help Menu provides information about SafetyNet and can provide assistance in the use of SafetyNet.

<u>Contents</u> – Choose this menu item to display a table of contents for the online help system. There is quite a bit of easily accessible information in the Help Menu. The Contents section allows the user to quickly locate specific information.

Contents Index Find		v	
Click a book, and then click Oper	n. Or click anothe	rtab. such as Inde	ex.
Dverview     Menus     Windows and Dialogs     Technical Information			
	Open	Print	Cancel

Figure 12 - SafetyNet Help Menu Contents

<u>Index</u> – Lists of key terms and subjects relating to SafetyNet. Hyperlinks take you to detailed descriptions.

Contents Index Find	1	~	
1 Type the first few lette	ers of the word you're look	ing for.	
2 Click the index entry y	ou want, and then click D	isplay.	
AddurUtalog Add Module Dialog Battery Module Tab Change Password D Configuration menu Detection and Relez Detection Module T. Driver Panel Tab File menu Film menu Main Menu Main Menu Main Panel Maintenance Sched Monitor Setup Dialog Monitor Window Dverview	ialog se Module Tab ab Dialog ule Dialog		
		1 1	
	Display	Print	Cancel

Figure 13 - SafetyNet Help Menu Index

<u>About</u> – This displays the software revisions level and copyright information for the SafetyNet PC Configuration Utility.

	c.
SafetyNet Configuration U 1.6.2.0	tility
Copyright © 2002-2( All Rights Reserved	Inc.

Figure 14 - Information regarding the SafetyNet Software Configuration Utility

# 2 SafetyNet Software Installation

To use the SafetyNet system to its full extent, you will want to configure and use SafetyNet with a Personal Computer. Before you can communicate with the SafetyNet system, there are a few but important preliminary steps to take. A moderate level of computer experience is helpful when installing SafetyNet Software and the Interface Module (Amerex P/N 16609)..

SafetyNet PC Software Installation Checklist

- ✓ Obtain the Amerex P/N 16609 SafetyNet Interface Module and Software
- ✓ READ THESE INSTRUCTIONS!
- ✓ Determine whether you have Microsoft Windows XP or 2000
- ✓ Contact your network administrator for installation permission if necessary
- ✓ Install SafetyNet software on your PC
- ✓ Install SafetyNet Interface Module to PC's USB Port
- ✓ Install Interface Module USOTL4 Software Driver
- ✓ Install Interface Module USB Serial Port Driver
- ✓ Obtain Authorization Code from Amerex
- ✓ Install Authorization Code on your PC
- ✓ Connect PC to SafetyNet system

# IMPORTANT!!!

Please read this application note before plugging the SafetyNet Interface USB-to-RS485 Converter into your PC's USB port for the first time. This hardware device requires special driver software to be installed on your PC – while the installation process is not difficult, *failure to follow the directions can result in software driver errors on some PC's.* 

# 2.1 Contents:

- 1) Installing the SafetyNet Configuration Utility
- 2) Installing the SafetyNet Interface USB-to-RS485 Converter
  - a) Installation for Windows XP
  - b) Installation for Windows 2000
- 3) SafetyNet Activation Code
- 4) Using Multiple SafetyNet Interface USB-to-RS485 Converters
- 5) Miscellaneous notes



Figure 1 – P/N 16609 SafetyNet Computer Interface Module



Figure 2 - SafetyNet Software CD

# 2.2 Installing the SafetyNet Configuration Utility

Before installing the software, ensure that you have adequate security privileges to install a program in the "Program Files" folder on your PC. Consult your friendly network administrator if you are not sure.



# Step #1

To install the SafetyNet Configuration Utility, place the installation CD-ROM in your PC's CD-ROM drive. The installation should begin automatically – if your PC is not configured to run CD-ROM's automatically, you can use the "Add or Remove Programs" applet in the Windows Control Panel to start the installation. When the installation program begins, the above screen appears – Select *Next* to continue.



The above screen appears, allowing you to choose the folder where the SafetyNet software will be installed. To select the default installation folder (recommended), Select *Next* to continue.

SafetyNet Configuration Utility - InstallShield Wizard 🛛 🛛 🔯
Ready to Install the Program The wizard is ready to begin installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard. Current Settings:
Setup Type:
Destination Folder:
C:\Program Files\SafetyNet\
User Information:
Name: John Q. Public
Company: Amerex Corporation
I IstallShield
< <u>B</u> ack Install Cancel

#### Step #3

When this screen appears, verify that the destination folder is correct and then select *Install*. The SafetyNet software will be installed on your system.



When the SafetyNet software has been installed, the above screen appears. Select *Finish* to complete the installation.

# **IMPORTANT !!!**

Be sure to install the SafetyNet Interface USB-to-RS485 Converter **before** starting the SafetyNet Configuration Utility for the first time – this allows the SafetyNet utility to auto-detect the converter and configure it for communications with your SafetyNet system. Once the converter is installed, you can start the SafetyNet Configuration Utility by double-clicking the "SafetyNet" icon on your PC's desktop.

# 2.3 Installing the SafetyNet Interface USB-to-RS485 Converter

# 2.3.1 Installation for Windows XP

The following instructions assume that the SafetyNet Configuration Utility software has already been installed on your PC. Installing the Configuration Utility from your CD copies the special driver software for the USB-to-485 Converter to a location on your PC's hard drive so that it can be installed by Windows using the following procedure.



# Step #1

Plug the USB-to-RS485 converter into an available USB port on your computer. The screen above appears, telling you that a new device has been plugged into the USB. Select the *Install from a list or specific location (Advanced)* option and select *Next* to continue.



Found New Hardware Wizard		
Please choose your search and installation options.		
Search for the best driver in these locations.		
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.		
Search removable media (floppy, CD-ROM)		
✓ Include this location in the search:		
C:\Program Files\SafetyNet\Drivers S Browse		
○ <u>D</u> on't search. I will choose the driver to install.		
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.		
< <u>B</u> ack Next > Cancel		

The screen above appears. Select "Search for the best driver in these locations", de-select "Search removable media", and select "Include this location in the search". Select the Browse button and navigate to the folder where the software drivers are located (this will typically be the folder "C:\Program Files\SafetyNet\Drivers"). Once this folder is selected, select Next to continue.



#### Step #3

Windows will install the driver software and the above screen will appear (any warnings that appear during the installation can be safely ignored). Select Finish to continue.



The above screen appears, prompting you to install a second driver. Select the *"Install from a list or specific location (Advanced)"* option and select *Next* to continue.

# <u>DO NOT SELECT INSTALL THE SOFTWARE</u> <u>AUTOMATICALLY</u>

und New H	ardware Wizard ose your search and installation options.
Osearce	n for the best driver in these locations.
Use th paths	e check boxes below to limit or expand the default search, which includes local and removable media. The best driver found will be installed. Search removable <u>m</u> edia (floppy, CD-ROM) Include this location in the search:
	C:\Program Files\SafetyNet\Drivers Browse
<u>O</u> _Don't Choos	search. I will choose the driver to install. e this option to select the device driver from a list. Windows does not guarantee tha
the dri	ver you choose will be the best match for your hardware.
	< <u>B</u> ack <u>N</u> ext > Cancel

# Step #5

The screen above appears. Select "Search for the best driver in these locations", de-select "Search removable media", and select "Include this location in the search". Select the Browse button and navigate to the folder where the software drivers are located (this will typically be the folder "C:\Program Files\SafetyNet\Drivers"). Once this folder is selected, select Next to continue.



Windows will install the driver software and the above screen will appear (any warnings that appear during the installation can be safely ignored). Select Finish to complete the driver installation.

Your USB-to-RS485 converter is now ready to use with the SafetyNet Configuration Utility software – anytime you plug the converter into your PC, the converter software drivers will be loaded automatically.

# 2.3.2 Installation for Windows 2000

The following instructions assume that the SafetyNet Configuration Utility software has already been installed on your PC. Installing the Configuration Utility copies the special driver software for the USB-to-485 Converter to a location on your PC's hard drive so that it can be installed by Windows using the following procedure.



# Step #1

Plug the USB-to-RS485 converter into an available USB port on your computer. The screen above appears, telling you that a new device has been plugged into the USB. Select *Next* to continue.



# Step #2

The screen above appears. Select "Search for a suitable driver for my device (recommended)", then select Next to continue.



The screen above appears. Select *"Specify a location"*, de-select all other checkboxes and select *Next* to continue.



# Step #4

When the above screen appears, select the *Browse* button and navigate to the folder where the software drivers are located (this will typically be the folder *"C:\Program Files\SafetyNet\Drivers"*). Once this folder is selected, select *OK* to continue.

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# Step #5

The screen above appears. Select Next to install the software driver.



#### Step #6

Select Finish to complete the installation of this driver.



The above screen appears, prompting you to install a second driver. Select Next to continue.

und New Hardware Wizard
Install Hardware Device Drivers A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
USB Serial Port
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
O <u>D</u> isplay a list of the known drivers for this device so that I can choose a specific driver
< <u>B</u> ack <u>N</u> ext> Cancel

#### Step #8

The screen above appears. Select "Search for a suitable driver for my device (recommended)", then select Next to continue.



The screen above appears. Select *"Specify a location"*, de-select all other checkboxes and select *Next* to continue.

und Ne	w Hardware Wizard	
-	Insert the manufacturer's installation disk into the drive selected, and then click OK.	OK Cancel
	Copy manufacturer's files from:	
	C:\Program Files\SafetyNet\Drivers	<u>B</u> rowse

#### Step #10

When the above screen appears, select the *Browse* button and navigate to the folder where the software drivers are located (this will typically be the folder "*C:\Program Files\SafetyNet\Drivers*"). Once this folder is selected, select *OK* to continue.

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# Step #11

The screen above appears. Select Next to install the software driver.



# Step #12

Windows will install the driver software and the above screen will appear. Select *Finish* to complete the driver installation.

Your USB-to-RS485 converter is now ready to use with the SafetyNet Configuration Utility software – anytime you plug the converter into your PC, the converter software drivers will be loaded automatically.

# 2.4 SafetyNet Activation Code

The SafetyNet Configu can use it to configure contact Total Fire Syst	uration Utility must be activated before you or monitor SafetyNet systems. You must tems to receive an activation key code.
Record the 'Machine I bersonal computer and Activation key code'. anter it below and clici Configuration Utility. Phone (919) 556-916 E-Mail <u>sales-tfs@ear</u>	D code' below - the code is unique to this d will be used to generate the 16-character When you receive the activation code, k 'Activate' to begin using the SafetyNet 1 thlink.net
Machine ID code	D526D1C7

When the SafetyNet Configuration Utility is started for the first time, you will be prompted to enter an "Activation Code" in the above screen. An 8-digit 'Machine ID Code" specific to your PC is generated; this code is used to generate a 16-digit "Activation Code" which unlocks the SafetyNet program. An Activation Code may be obtained by contacting Total Fire Systems, Inc. by phone (919)-556-9161, fax (919) 556-9162 or email:<u>sales-tfs@earthlink.net.</u>

# IMPORTANT!!!

Some auxiliary hardware devices, such as USB "Flash" (or "Thumb") drives can alter the machine code/activation code for the SafetyNet Program, causing the program to prompt for a new activation code. Unplug any auxiliary devices before starting the SafetyNet program to avoid this problem.

# 2.5 Miscellaneous Notes

o Using Multiple SafetyNet Interface USB-to-RS485 Converters

- In some cases, it may be necessary to use one or more different SafetyNet Interface converters with a particular PC; for instance, when several SafetyNet Interfaces must be shared among a group of technicians.

- Please note that each SafetyNet Interface has a unique serial number and must have a separate Windows driver installation specific to this serial number. The reason for this is that Windows must assign a unique virtual serial port number (for example - COM5) to the converter.

- When a new SafetyNet Interface converter is plugged into a USB port on your PC for the first time, Windows will prompt you to re-install the software drivers. Use the procedure outlined in this application note to re-install the drivers.

- In practice, the simplest way to deal with this situation is to install the drivers for each SafetyNet Interface converter that will possibly be used with a particular PC before putting the PC in service on the shop floor. The SafetyNet Configuration Utility will auto-detect the particular converter and prompt you to use it for communications.

- It is a good idea to plug the converter into your PC <u>before</u> starting the SafetyNet Configuration Utility program. This allows the program to "auto-detect" the SafetyNet Interface converter and prompt you to use the converter for communications with a SafetyNet system.
- On some PC's, there may be a delay (up to 30 seconds) between the time that the SafetyNet Interface converter is plugged into the PC and the time that the converter is recognized by the Windows operating system and can be used for SafetyNet communications.
- The SafetyNet Interface converter enclosure has two circular 4-pin connectors provided for connecting to the SafetyNet system: one male connector and one female connector. Either connector can be used for communications with the SafetyNet system.
- If your PC configuration changes, (i.e. new disk drives are installed) it may be necessary to obtain another Authorization Code from Amerex or Total Fire Systems.
- The default location for the SafetyNet Program folder is "C:\Program Files\SafetyNet\. If another location is desired, select "Change" and enter the new location path.



Figure 3 - Microsoft Windows/Program Files Structure

The SafetyNet Software installation program places a new icon on your Windows Desktop. SafetyNet may be started via the icon or by running *SafetyNet.exe* from the SafetyNet folder.



Figure 4 - SafetyNet Desktop Icon

 P/N 16609 SafetyNet Interface Module includes both Male and Female connectors and is cleverly supplied with a 10' p/n 14376 AMGaDS III Cable which can be installed to fit either Male or Female SafetyNet output ports. Every SafetyNet installation will end up with two unused communication ports – either Male or Female - at the first and last modules in the system. Depending upon how the installation was performed you may end up with either the Male or Female connector in the most accessible location. The dual-sex interface module allows you the ability to connect to the most accessible connector port on a SafetyNet system.



# 3 Configuring a SafetyNet System

Design of a SafetyNet system should only be determined after a Vehicle Hazard Analysis or Risk Assessment has been performed. This type of analysis is beyond the scope of this manual and is covered in the appropriate manual for installation of the Amerex Fire Suppression or Gas Detection System (reference manuals 13400, 13980, 16400 or 16601). Design and Configuration of a SafetyNet system can proceed once the Hazard Analysis has been performed and the proper quantity and types of Agent Cylinders, Combustible Gas Sensors, Fire Sensors, etc have been determined. Cable lengths between Module and Sensor and between Modules must also be carefully determined.

A SafetyNet Configuration consists of a combination of the following:

- 1) Types and numbers of system modules,
- 2) Types and numbers of input sensors,
- 3) Relay operation and delays,
- 4) Actuation Delay and Mapping (identifying sensor operation to actuation sequence)
- 5) Sensor and Communication cable positions,
- 6) Identification of Modules and Sensors.

# Remember to Test your Configuration prior to Field Installation!!

There are several ways to set up a SafetyNet system. One particular method may be chosen over another for different reasons in different applications. This portion of the manual will explain and give examples for:

- 1) <u>Hardware Self Configuration</u> Connecting the hardware and letting SafetyNet configure itself
- 2) <u>Hardware Self Configuration with Software Modifications</u> Connecting the hardware and letting SafetyNet configure itself then modifying the Configuration using Software
- Software Configuration for a Specific Hardware design Designing the Configuration using Software then assembling the Hardware Configuration to match the Software Design

# 3.1 Hardware Self Configuration

- 1) System components have been selected,
- 2) Component position and identification are not required,
- 3) Default settings are acceptable.

Procedure:

- 1) Make sure the system is not electrically powered,
- 2) Physically connect the SafetyNet system components,
- 3) If applicable, connect an Amerex p/n 14027 Alarm Test Module to the Actuator Output,
- 4) Power up the system and allow it to Self Configure with no user input,
- 5) SafetyNet allows the user to leave some sensor inputs as unpopulated, but will ask you to confirm that unpopulated inputs are not connected by design – Use the Arrow up or down keys (Alarm Silence & Relay Reset keys) to confirm that an input port is intentionally unpopulated.
- 6) Press the Amerex Logo / Test-Confirm button to select your choice.

Hardware Self Configuration Example – This system will be configured with one module, with (3) sensors. Sensor position #1 will remain unused.

Step #1 - Connect the modules and sensors together via interconnect cables,



Figure 1 - Connect Cables to SafetyNet Modules

Step #2 – Install the Amerex p/n 14027 if applicable,



Figure 2 - Attach Alarm Module if necessary

# Step #3 – Apply Power to the system



Figure 3 - Power to Red Connector



Figure 4 - Green Power LED indicates System Power to the Module

-- The following Screen Shots show the SafetyNet Operator Display as it Self Configures --



Figure 5 - Only (1) module has been detected



Figure 6 - The Operator Display has established Communication with the module



Figure 7 - The system has recognized that Sensor #1 is missing (by design in this example)

	Fire Suppression Gas Concentration
	Power Trouble FIRE Trace Significant
•	Mod 1 S1 missing Confirm? YES
-	Amerex Vehicle SafetyNet
	Relay Reset

Figure 8 - Press either the Relay Reset or Alarm Silence buttons to toggle the screen to "Yes". Press the System Test – Confirm button to acknowledge that you recognize that sensor #1 is missing by design



Figure 9 - After pressing the System Test - Confirm button, the SafetyNet System "memorizes" the new configuration

# 3.2 Hardware Self Configuration with Software Modifications

- 1) System Layout is pre-designed,
- 2) System configuration (module and sensor identification, relay timing, etc. must be modified using a PC)

# Procedure:

- 1) Follow the same steps as above in the Hardware Self Configuration section,
- 2) Connect the SafetyNet Interface module to your PC and the SafetyNet system,
- 3) Download the Designed System configuration to your PC,
- 4) Rename the modules, sensors, change relay timing,
- 5) Save the Configuration,
- 6) Upload the Configuration to the SafetyNet System,
- 7) Test the system to verify correct operation.

Hardware Self Configuration with Software Modifications Example - In this example we will design a system with two modules to include:

- (4) gas sensors,
- (1) SafeIR Optical Flame Detector,
- (x number) Spot Heat Sensors,
- (1) Manual Electric Pushbutton Release
- Fire Relay, Gas Relay and Trouble Relay timer settings
- All of the Sensors, Modules and Detection Zones will be named

Once the system hardware components have been connected and powered up and the system has Self Configured itself, the existing configuration can be downloaded to your PC for Configuration Modification.



Figure 10 - Download the Configuration to your PC



Figure 11 - The Configuration has been downloaded and is ready for editing

Saf	etyNet Configuratio	Utility [UI	ITITLED]	
u	onnguration tools Help			
	📫 + - 🛤	ila 🕒 🐿	2	
ereir				
orsic				
ngir	ne Gas			
	Module name Engine		Connecte	ed to: 🔘 J1 (F) 💿 J2 (M)
Se	ensors			Relays Delay Enable
	Туре	Name	Discharge	Fire 5 sec. 🔽 🗹
1	Optical	✓ Turbo		Gas 10 sec. 🗸 🔽
2	None	V Sens 2		Trouble 10 sec V
3	None	<ul> <li>Sens 3</li> </ul>		
4	None	V Sens 4		Thouse norm, energized
		1.1	10.000	Discharge
D	tables asses			Delay (sec.) Enable
00	Tune	Name	Discharge	
1	Manual release	Manual		Manual rel. discharges all
2	Cast the second at	Cost		Any fire discharges all
2	spor memostat	spor		Advanced Settings
-				

Figure 12 - Module 1 & Sensors have been renamed and the Relay timing has been adjusted

B B +	_ 🚯 🕰 🖎 🛊	h 9		
		9 4		
rsion ID 01	N			
ngine Gas	43			
Module nam	e Gas	Connect	ed to: O.J.1 (F)	() 12 (M)
				0.12(1)
	Sensors			
	Туре	Na	me Discharge	
	1 Gas	V Engl	ne	
	2 Gas	V Fuel		
	3 Gas	V Roo	E1.	
	4 Gas	V Roo	12	
1	🗹 Manual release disch	arges all		
				0
R	lelay			
	Delay E	nable A	dvanced Setting	s
D	etection 10 sec.			_

Figure 13 - Module 2 & Sensors have been renamed and the Relay timing has been adjusted

Beloldik Jeffeld	1000			_		
Add module Ctrl+Ins     Remove module Ctrl+Del			<b>a</b> 1			
Copy m	odule data nodule data	Ctrl+C Ctrl+V				
🛒 Erase			Co	nnected to	x 🔾 J1 (F) 💿 J2	(M)
Dpload		Ctrl+U				
🔁 Downlo	ad 🔓	Ctrl+D			D: 1	
	0.0	Type		Name	Discharge	
	1 Lias	1	~	Engine		
	2 Gas		~	Fuel		
	3 Gas	5	~	Roof 1		
	4 Gas	1	~	Roof 2		
	🗹 Mar	iual release disc	harges all			
Relay Delay			Enable	Advar	nced Settings	
Detection 10 sec		n 🛛 10 sec. 🔽		Land	iced settings	

Figure 14 - The modified Configuration must be uploaded to the SafetyNet System
Passw	ord		
Ente	er <u>password</u> :		
1	I		
1	OK	Cancel	]

Figure 15 - A password is required for any Configuration changes. You will have to contact your system administrator if you do not have password access.



Figure 16 - When uploading a new Configuration, your PC connects to the SafetyNet system

Fire Suppression	Gas Concentration
Power Trouble	RE Trace Significant
New CONT	Iguration
Amerex Veh	icle SafetyNet
A MI	EREN oct Confirm
Relay	Alarm
Reset	Silence

Figure 17 - The SafetyNet system acknowledges the New Configuration



Figure 18 - SafetyNet verifies the Software Configuration matches the Hardware Configuration



Figure 19- SafetyNet recognizes the two Modules in the Configuration



Figure 20 - SafetyNet verifies that the Software and Hardware match

# 3.3 Software Configuration for a Specific Hardware Design

1) System Layout is pre-designed with a specific system configuration (module and sensor identification, relay timing, etc. all are pre-determined)

Procedure:

- 1) Create a New configuration by selecting "File New",
- 2) Select a module by selecting the '+' sign,
- 3) Choose the module to be added,
- 4) Choose the sensor types and zones,
- 5) Choose the Class B Detection Zone if applicable,
- 6) Choose the I/O port (J1 female or J2 male),
- 7) Select the Relay transfer timing,
- 8) Select the Discharge Delay if applicable,
- 9) Name the Module and Sensors,
- 10) Save the Configuration,
- 11) Upload to SafetyNet Hardware







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	File Configurat	Tools Help	
	- Remov	iodule Ctrl+Del	
	Er Copy r	ule data Ctrl+C ule data Ctrl+V	
]	Frase	Celui	) J1 (F) ⊙ J2 (M)
Upload the	Downla	Ctrl+D Type Name D	ischarge
New		1 Gas V Engine	
Configuration		2 Gas 🔽 Fuel	
to the		3 Gas 🔽 Roof 1	
Hardware		4 Gas Roof 2	
		Manual release discharges all	
		Relay Delay Enable Advance	d Settings

Figure 21 - The modified Configuration must be uploaded to the SafetyNet System,

Passwo	rd		×
Enter	password:		_
	1		
L	ОК	Cancel	

Figure 22 - A password is required for any Configuration change. You will have to contact your system administrator if you do not have password access.

After uploading the new configuration to the system, the following screens are displayed,



Figure 23 - When uploading a new Configuration, your PC connects to the SafetyNet system,



Figure 24 - The SafetyNet system acknowledges the New Configuration,



Figure 25 - SafetyNet verifies the Software Configuration matches the Hardware Configuration,



Figure 26- SafetyNet recognizes new Module in the Configuration,



Figure 27 - SafetyNet verifies that the Software and Hardware match,

# 4 Using the SafetyNet Event Log

Event Log data consists of time and date stamped records of SafetyNet "Events". The event data is stored in memory in the Operator Display. An event is defined as any situation (except for Fire and System Maintenance Due) causing a message on the Operator Display screen. Events are also recorded for Push to Test, System Reconfigurations, and other user system modifications. Up to 4095 events can be stored in the Event Log File. The Event Log may be accessed by connecting your PC to a SafetyNet system via the p/n 16601 Interface Module. Once connected, you have the ability to download all or only some of the events in storage. The more events you download, the longer the download takes. Once you begin an Event Download, a progress bar advises you of the download status. After the events are downloaded, you can store the data into a text file (\*.txt) and can later import the event data into Microsoft Word, Excel or other type of software. All saved downloads are by default stored in a Windows folder named EventLog (*C:\Program Files\SafetyNet\EventLog*).

# 4.1 Capturing Event Data

The Event Log is access by,

✓ Connecting your PC to a SafetyNet system via the p/n 16601 Interface Module,



✓ Open SafetyNet Software,

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✓ Select Tools then View Event Log,



✓ After selecting View Event Log, your screen will look like this,

	File	Safety Confi	Net Con guration	figuration Ut Tools Help	ility			(		
View	Event Log	1								×
	Date		Time	Module	Sensor	Eve	ent		Туре	
	Events retrie	eved:								
	Last 20 ev	vents	~	View		Save	Close			
	F	orogram.								

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✓ You can choose the number of Events to view. The Event Log is viewed with the most recent Events first. The default number is 20 which download in approximately 10 seconds. If the Event Log memory is full containing 4095 events, the download time may be as long as 4 minutes.

🦉 SafetyNet Co	nfiguration Utility			
File Configuration	Tools Help			
View Event Log				8
Date Time	Module Sensor	Event	Туре	
Events retrieved:				
Last 200 events 💌	View S	ave Close		
All events Last 20 events				
Last 100 events				

✓ Select View and wait for the data to be downloaded, your screen will look something like this,



✓ By selecting the header button above each of the column, you can sort the data by Date, Time, Module, etc. ✓ Once the Events are downloaded, you can save them to a file by selecting Save,

Date		Select Event	Los Me			?   X	
07/11/03	03:53						*   <b>.</b>
07/11/03	03:37	Save in: 🔄	EventLog	• E 🖉			
07711703	03:36	· .					
07711703	03:36	1					
07711703	03:35						
07711703	03.34						
07/09/03	03.33						
07/09/03	02.40						
07/09/03	08:31						
07/03/03	09:29						
07/02/03	11:09						
07/02/03	11:09						
07/02/03	11:08	1					
07/01/03	12:40	<b>F</b> 1	E		1	~ I	
07/01/03	12:40	Life Trame;	EventLog1.txt			∑ave	- 1
07/01/03	12:30			 		1	
07/01/03	12:30	Save as type:	Text Files (*.txt)	•		Cancel	
·	ad 20						//

SafetyNet will prompt you to save the Event log as *Eventlog.txt* which will be saved in the EventLog folder. You can choose to save this file with another name or in another destination. Any word processing or spreadsheet software can import the \*.txt file format. A list of SafetyNet Event messages and their meaning are listed in the Appendix.

# 4.2 SafetyNet Event Log Messages

The Table below lists the various events for which SafetyNet provides a screen display. These events are also recorded in the Event Logging Feature provided by SafetyNet. The display format is Event Type – Module I.D. – Sensor I.D.

Dis	play	/ and	Driver	/Detectio	on/Rele	ase Mo	odules i	(firmware	v1.6	40)
	piaj	, and	DIIVOI	Deletin	511/1 1 1010		Juuico	mmwarc	v 1.0	70)

Event Type	Operator Display	Event Cause	Event Record	LED Indication	Audible Alarm
Trouble	TROUBLE Mod# Com	Communications Error	No Response Invalid Response Invalid Module Missing Module Invalid command Software error	Yellow Trouble Steady	Single Pulse
Trouble	TROUBLE Mod# Sensor#	Sensor trouble	Sensor missing Sensor wrong Sensor disabled	Yellow Trouble Steady	Pulsed
Trouble	TEMP Level 1	Over-temperature level 1	Variable Overheat Sensor Level 1 Exceeded	Yellow Trouble Steady	Single Pulse
Trouble	TEMP Level 2	Over-temperature level 2	Variable Overheat Sensor Level 2 Exceeded	Yellow Trouble Steady	Steady On
Trouble	TROUBLE Mod# Heat 1 or 2	Class B Sensor Problem	Heat 1 or 2	Yellow Trouble Steady	Single Pulse
Trouble	TROUBLE Mod# Battery	Backup Battery Problem	Battery Fault	Yellow Trouble Steady	Single Pulse
Trouble	TROUBLE Mod# Discharge	Discharge	Open Circuit at Actuator	Yellow Trouble Steady	Pulsed
Trouble	TROUBLE Mod# Press Low	Pressure low	Open Circuit at Pressure Switch Input	Yellow Trouble Steady	Pulsed
Trace Gas	Trace Gas Mod# Sensor#	20% to 50% Gas Level	Trace Gas Level Exceeded	Yellow Trace Flashing	Pulsed
Significant Gas	Significant Gas Mod# Sensor#	50%+ Gas Level	Significant Gas Level Exceeded	Red Significant Steady	Steady On
Fire	FIRE Mod# Sensor#	Fire	Fire	Red Fire Steady	Steady On
None	None	System	Clock set Configuration written Configuration erased Configuration reset Self-test Relays cleared Alarm silenced Reset (at power-on) User reset (logo button) Event log erased Configuration mismatch Power failure Maintenance schedule set Maintenance schedule reset Maintenance disabled	None	None

## 4.3 Event Definitions and Troubleshooting

## 1. Communications Error

This Event consists of module network errors. A network error may include error in data transmission or interruption (break) in the data network. Data transmission errors may arise from electrical interference from an external source (high power radio, GPS system, noisy alternator or other electronic device).

### Trouble Shooting a Module Comm. Problem:

- Check all data cables and connections and verify proper system configuration,
- Ensure that data cables have not been damaged,
- Ensure cables are routed away from possible noisy devices.

## 2. Sensor Trouble – Sensor Missing

This could indicate one of several problems:

- 1) A system sensor in the SafetyNet configuration is missing,
- 2) A system sensor is different than the SafetyNet configuration,
- 3) A system sensor is damaged or disabled,
- 4) A system sensor has become overheated,
- 5) Sensor wiring is broken or disconnected.
- 6) An electrically noisy component is interfering with sensor operation.

### Trouble Shooting a Sensor Trouble Condition:

- Disconnect the p/n 14036 Electric Actuator at the Agent Cylinder and install a p/n 14027 Alarm Module to disarm the fire suppression system,
- Determine which sensor is causing the Trouble condition,
- Check the wiring connections at both the panel and the sensor,
- Determine whether the sensor cable has been damaged. Cable damage may occur due to:
  - the cable being pinched by Ty-Wraps
  - cable routing through a vehicle bulkhead
  - o due to normal vehicle maintenance
  - due to overheat conditions (routing near Turbo, exhaust, etc)
- Wiggle the connections to determine whether the connection is intermittent,
- Check to see if a noisy electrical component is in the area of the sensor,
- Use the SafetyNet Monitor Mode to determine whether the sensor is performing properly,
- After determining the cause of the Sensor Trouble, remove the p/n 14027 Alarm Module and reconnect the p/n 14036 Electric Actuator at the Agent Cylinder to re-arm the fire suppression system.

## 3. Over-temperature level 1

Variable Overheat Sensor warning level 1 is exceeded. This message applies only to an analog heat sensor. A programmed over-temperature alarm level is

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set for each module. If this alarm level is exceeded, the event will be recorded and will be indicated by a yellow Trouble LED and pulsed audible alarm.

### Trouble Shooting an Over-temperature level 1:

- · Determine which sensor is causing the Trouble condition,
- Use SafetyNet Monitor Mode to determine the current sensor reading,
- Check area being monitored for signs of an overheat condition.

## 4. Over-temperature level 2

Variable Overheat Sensor warning level 2 is exceeded. This message only applies to an analog heat sensor. A programmed alarm level is set for each module. If this level is exceeded, the event will be recorded and will be indicated by a yellow Trouble LED and pulsed audible alarm.

### Trouble Shooting an Over-temperature level 2:

- Determine which sensor is causing the Trouble condition,
- Use SafetyNet Monitor Mode to determine the current sensor reading,
- Check area being monitored for signs of an overheat condition.

## 5. Class B (Heat 1 or Heat 2)

This trouble condition applies to the Class B detection circuits. The p/n 16390 SafetyNet Driver Panel includes (2) of these circuits generally consisting of one circuit of spot thermal heat sensors and another circuit including the Manual Release Switch. Initially these circuits are identified as "Heat 1" and "Heat 2".

### Trouble Shooting a Class B circuit Fault:

- Determine which Class B circuit is causing the error condition,
- Disconnect the 14036 Electric Actuator at the Agent Cylinder and install a p/n 14027 Alarm Module Obtain a p/n 14010 End of Line Device,
- Check the resistance of the End of Line Device (should be approx 2.2k ohms)
- Disconnect the Class B circuit with the trouble condition at the end of the 18" Detection Loop pigtail,

Disconnect cable at end of 18" Pigtail



- Attach a p/n 14010 End of Line Device at the end of the 18" Detection Loop pigtail,

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Attach p/n 14010 EOL Device at Pigtail



- Check to see if the Trouble condition has cleared,
- If Yes, then examine the length of Detection wiring and Heat Detectors
- If No, then examine the Control Panel and Pigtail Cable.
- Check for breaks or signs of abrasion in the wiring,
- Check for signs of damage to spot heat sensors or wiring
- Check for signs of overheating

## 6. Battery Fault

The p/n 16390 contains a backup battery which provides power to the system in the event of an electrical failure. The backup battery is continuously supervised for proper operation. In the event of a problem with the battery or the charging circuit a Battery Trouble condition may be displayed.

### Trouble Shooting a Battery Fault:

- Disconnect the p/n 14036 Electric Actuator at the Agent Cylinder and install a p/n 14027 Alarm Module,
- Disconnect the cables on the front of the p/n 16390 SafetyNet Driver panel,
- Remove the label from the back of the Driver panel,



- Remove the (4) #6-32 screws from the back of the Driver panel,

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- Inspect the battery,
  - Make sure the battery is intact



- Check the (2) #4-40 screws holding the battery in place
- Check the electrical connector to make sure it is intact
- Replace the battery if necessary making sure to align the male and female connectors



• Press the battery to reseat and replace the #4-40 screws. Apply Loctite 242 (Blue) as needed.



- Replace the backplate. Note that it is not symmetrical there is a top and bottom. Align the mounting holes with the panel spacers. Replace the #6-32 screws. Apply Loctite 242 (Blue) as needed.
- After determining the cause of the Battery Fault, remove the p/n 14027 Alarm Module and reconnect the p/n 14036 Electric Actuator at the Agent Cylinder.

## 7. Discharge

This could indicate a disconnected actuator cable, open wire in the actuator cable, open or activated actuator. SafetyNet supervises the condition of the electric actuator p/n 14036. If there is a break in the wiring from the SafetyNet system to the Actuator, a Discharge message is displayed.

#### Trouble Shooting a System Discharge Message:

- Check the wiring at the panel and at the first electrical connection to ensure the connectors are tightly fastened

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Electric Actuator p/n 14036 connection at SafetyNet panel



- Check the electrical connection at the p/n 14036 electric actuator



- Check to ensure the p/n 14036 Actuator has not been fired,



- Check wiring to ensure there no breaks or wiring damage

## 8. Pressure Low

This indicates that there is an open circuit between the SafetyNet panel and the agent cylinder pressure switch. The Agent Cylinder Pressure Switch is "closed" when the pressure in the Agent Cylinder is above a minimum pressure. Possible reasons for this break could be a disconnected pressure switch cable, open wire in the pressure switch circuit, or low pressure in the agent cylinder.

### Trouble Shooting a Pressure Low Message:

- Check the pressure status of the Agent Cylinder by looking at the gauge,



Agent Cylinder with Zero Pressure in Cylinder

- Check the condition of the Agent Cylinder pressure switch
- Check the Pressure Switch cable connection at the SafetyNet Panel, ensure that the connection is tight and not damaged,



Agent Cylinder Pressure Switch Connection on SafetyNet Panel

- Check wiring to ensure there are no breaks or wiring damage.

## 9. Trace Gas

This message indicates that the *Trace Gas* Level is exceeded. Combustible gas exists in the area of the sensor. The default SafetyNet Trace Gas set point is 20% of the LEL of Methane in a normal atmosphere which is equivalent to 1% Methane in Air.

## Trouble Shooting a Trace Gas condition:

A problem in tracking down a low level Methane gas leak is that the gas is not visible, often odorless and it disperses readily in atmosphere. A method used to find small leaks is by using electronic combustible gas sensing equipment. Trace Gas conditions may exist for only a short period of time. By the time maintenance personnel are available to search for a leak using handheld gas sensing equipment, the gas causing the alarm may have dissipated. Since Methane Gas is lighter than air, small gas leaks can accumulate in trapped pockets in vehicle compartments.

Possible areas for Methane gas to accumulate are:

- Fuel filler compartments
- Roof Mounted Compartments and Shrouds
- Engine Compartment
- Passenger Compartment

Typical causes for a Trace Gas condition are:

- Loose fittings and tubing
- Pressure Relief Devices
- o Flexing of fittings & tubing as vehicles travels
- o Thermal expansion and contraction due to outside air temperature
- o Thermal expansion and contraction due to fueling
- o Nearby vehicles with poorly tuned exhausts
- o Cold started engines
- Other sources of combustible gas (spilled hydrocarbon fuels, paint spray booths, etc)
- If a Trace Gas condition is still present
  - Identify the sensor in Trace Alarm then use a handheld gas detector to determine the location of the actual gas leak,
  - If a gas leak is not found, check the cable connector at the sensor and SafetyNet panel,
  - Use the SafetyNet Event log to identify the time, date and location of the Trace Gas alarm,
  - o Use the SafetyNet Monitor Mode to examine Gas Sensor voltages,
  - Refer to Section 5-Using the SafetyNet Monitor Mode to determine typical sensor operating voltages.

### 10. Significant gas

This message indicates that the *Significant Gas* Level is exceeded. Combustible gas exists in the area of the sensor. The default SafetyNet Significant Gas set point is 50% of the LEL of Methane in a normal atmosphere which is equivalent to 2  $\frac{1}{2}$ % Methane in Air.

### Trouble Shooting a Significant Gas condition:

Troubleshooting a Significant Gas condition is the same as that for a Trace Gas condition with the exception being that a Trace Gas condition falls between 20% and 50% of the LFL of Methane. A Significant Gas condition may be from 50% to 100% of the LFL of Methane. A Significant Gas condition may indicate that a Combustible level of Methane Gas is present. *Greater care must be taken if a Significant Gas condition exists*. Refer to your local Safety Official for guidance in determining the cause of a Significant Gas leak.

## 11. FIRE

A sensor has recorded a *Fire* event. A Fire condition occurs only when a SafetyNet Fire sensor senses a Fire Alarm condition. Spot thermal, Linear Heat Sensors, Manual Push Buttons, Optical Flame Sensors and Analog Heat Sensors are all capable of sensing a Fire condition. Upon sensing a Fire condition, the SafetyNet system begins an actuation sequence. The SafetyNet Event Log will record the following sequence:

- 1) Fire Module and Sensor identified with a Time and Date stamp,
- 2) Actuator Activated Date and time of actuation signal,
- 3) Actuator fault Date and time of system actuation

Typical Events which would follow a Fire event would include:

- 1) System Alarm Silence Identifies the Date and time that the vehicle operator silenced the audible alarm,
- 2) System Relays Cleared Identifies the date and time that the vehicle operator reset the shutdown relay.
- Sensor Trouble During recovery from a high heat condition, the sensor sensing the fire may present unstable signals which SafetyNet may determine are outside the normal operating parameters for this sensor. The sensor may remain in a Trouble condition until it is replaced or otherwise returns to a normal condition.

## 12. System

A number of conditions can be recorded as *System Events*. Any user interaction (Alarm Silence, Push to Test, etc.) with the Operator Display or Configuration adjustments is recorded as a *System Event*. System events are recorded in the Event Log and <u>do not</u> require troubleshooting.

# 5 Using the SafetyNet Monitor Mode

During normal operation, SafetyNet is constantly checking all module and sensor data. The SafetyNet Monitor Mode option allows you to view this sensor and module data in real time. Monitor Mode also gives you the option of saving this data to a text file that can be viewed at a later time. You can select the Log Interval that determines how often SafetyNet gathers data and records it to a file. The smaller the interval, the more data generated. The longer the interval, the less data generated. This function is useful in system inspection, troubleshooting and general information gathering.

A moderate level of computer knowledge makes this experience a little easier. Using the collected data, transferring it to a spreadsheet and graphing or charting the data takes a bit more experience with multiple software packages.

# 5.1 Operating the Monitor Mode

✓ Open SafetyNet Configuration Software,



✓ Select Tools,

🗑 SafetyNet Con	figuration Utilit	y (UNTIT	'LED]		
<u>File</u> <u>Configuration</u>	<u>I</u> ools <u>H</u> elp				
66 <b>4</b> +	Yiew event	log			
⊻ersion ID 00	Maintenanc	e schedule			
Driver DetRel	<ul> <li>Set clock</li> <li>Set display t</li> </ul>	brightness			
Module na	ŧ 🎐 <u>F</u> irmware rev	vision	nect	ed to: 🔿 J'	1 (F) 💽 J2 (M)
Sensors	Monitor	News	Distant	Relays	Data Saith
1 Gas	Type •	Sens 1	Discharge	Fire	5 sec. V
2 Gas	•	Sens 2		Gas	5 sec. 💌 🔽
3 Gas	•	Sens 3		Trouble	5 sec. 💌 🔽
4 None	•	Sens 4			
				Dischar	rge
Detection zo	mes Type	Name	Discharge		elay (sec.)
1 Heat detec	stor 💌	Heat 1	M		Discharge all
2 Heat detec	otor 💌	Heat 2	M		

✓ Select Monitor,



- Choose whether to Save and Record the Data to a DataLog file or to simply Monitor data,
- ✓ If Log Data is selected, then determine Log File name and determine the Log Interval. The default settings are C:\Program Files\SafetyNet\Datalog\DataLog1.txt with a Log interval of 5 seconds,

SafetyNet Configuration Utility     Image: Configuration Tools Help       File Configuration Tools Help       Image:	
Monitor Setup         Image: Construction of the set	Select Monitor Data Log File  Save in: DataLog DataLog2.txt DataLog3.txt DataLog4.txt DataLog5.txt File name: DataLog1.txt Save Save salings

✓ Select Monitor to begin the Monitor Mode,



	~	wind 0						
Module 1 St	atus		×	1	Hodule 2 Sta	itus		
Nodule type:	Driver			E	Module type:	Detection/r	elease	
Sensor 1A	1.17 V	Pressure switch	0.0 V		Release 1	0.00 V	Power input	
Sensor 1B	3.55 V	Sensor current	160 mA		Pressure 1	0.45 V	RS485 power input	2
Sensor 24	1.39 V	Power input	27.9 V	913	Sensor 1A	1.39 V	Board temperature	
Sensor 2B	3.50 V	RS485 power input	27.7 V		Sensor 18	3.67 V		
Sensor 3A	0.82 V	Battery input	9.79 V	sec	Release 2	0.00 V		
Sensor 38	3.54 V	Board temperature	81 ° F	E.	Pressure 2	0.43 V	Relay Discharge	Sen
Sensor 4A	0.00 V	Discharge Belays	Sensora		Sensor 2A	2.42 V		
Sensor 48	0.00 V			Di	Sensor 28	2.42 V		

 One window will appear on the screen for each of the modules in the SafetyNet system. Drag each window to the side for easier viewing.



✓ To end the Monitor Mode, close each open Monitor window. This returns you to the main menu

# 5.2 Monitor Menu Definitions

- Module Type Shows module type, part number and software revision in the monitor mode window,
- Sensor A & B Sensor and Reference voltages for connected sensor (see chart for typical values)
- Pressure Switch Indicates pressure switch connection status
- Sensor Current Indicates total sensor current usage
- Power Input Voltage input from vehicle battery/charging system
- RS-485 power input SafetyNet regulated network voltage
- Battery Input Indicates Driver internal battery voltage status
- Board Temperature Indicates module temperature via an on-board temperature sensor (if sensor is not present –default temperature is 32 degrees)
- Discharge Indicates the status of the actuation device. Red indicates Activated
- Relays Indicates the status of the module relays. Each module contains from one to three relays. Individual relays are provided for Trouble, Significant Gas and Fire for the p/n 16390 Driver panel. All other modules include only one relay which serves as a local relay for Trouble, Gas and Fire. See application notes for additional relay mapping information

# 5.3 Monitor Mode Typical Sensor Voltages

- This chart is to be used for troubleshooting reference purposes only.
- All voltages are typical at approx 70 deg F.

Voltage Reference	Typical 'A' Voltage	Typical 'B' Voltage
SafeIR Optical Sensor	2.30 - 2.50 vdc	2.30 – 2.50 vdc
Combustible Gas Sensor	0.60 – 1.50 vdc	3.4 – 3.9 vdc
Spot Thermostat	4.00 vdc	0.00 vdc
Manual Release Switch	4.00 vdc	0.00 vdc
Speed Sensor	4.95 vdc	4.95 vdc
Variable RTD (Analog Heat	Not applicable – Temperature	Not applicable
Sensor)	is Displayed	
Setpoint RTD (Fixed	Not applicable	Not applicable
Reference Analog Heat		
Sensor)		
Pressure Switch	0.0 vdc	Not applicable
Sensor Current	Variable depending upon	
	sensor types	
Power Input	Minimum – 10 vdc	Maximum – 50 vdc
RS-485 power input	Minimum – 10 vdc	Maximum – 50 vdc
Battery Input	Normal low – 8.4 vdc	Normal high – 10.5 vdc

# 5.4 Using Monitor Mode with Spreadsheet Software

In order to use, manipulate and display the data you've recorded, you must first have an understanding of how the various Amerex sensors operate and exactly what you are planning to analyze or present.

Amerex sensors operate in two basic patterns: 1) Analog (Combustible Gas, Variable RTD, SafeIR Optical Flame) and 2) Digital (Manual Pushbutton, Spot Thermal, Speed, Linear Wire). Analog sensors continuously provide a varying voltage signal that is collected by SafetyNet. This varying voltage can be used to make some determination as to how the sensor is reacting in its environment. Digital sensors are either on or off and do not give an indication prior to reacting to their designed environment.

#### Analog Sensor Example

The following chart was obtained after importing SafetyNet data into an Excel Spreadsheet. The data was edited and used to create this chart. The Amerex p/n 14198 Methane Gas Sensor provides a continuous stream of voltage which varies depending upon the amount of combustible gas present. The upper lines indicate the various sensor alarm levels, the lower lines indicate the actual gas levels measured by each individual sensor. After viewing the data provided, it was determined that a pressure relief device was venting combustible gas on a periodic basis which was then picked up by Amerex gas sensor #3.



### Analog Sensor Example

The following chart shows the digital off-on-off signal obtained from an Amerex Manual Release Switch p/n 14053. A "Normal" condition for this switch is approximately 4.0 vdc. Upon Switch closure, the voltage rises to approximately 5.0 vdc.



Keep in mind that SafetyNet captures *all* the available data, not just the data you're looking for. Some editing and manipulation is required. A reasonable skill using the applicable computer software is necessary.

The basic steps involved in capturing Real Time data, saving the data, and importing and manipulating the data in Microsoft Excel are as follows:

- ✓ Create a Monitor Mode session using SafetyNet,
- ✓ Setup your Data Capture interval and save the data to a file,
- ✓ Import the \*.txt data into Microsoft Excel,
- ✓ Sort the data if necessary,
- ✓ If the data is to be charted, then
- ✓ Select the Data to be charted
- ✓ Create a chart in Excel
- ✓ Customize the chart (title, axis titles, etc)
- ✓ Export the chart to Word Processing if necessary.

## 5.5 Understanding the Downloaded Data

The SafetyNet Configuration Utility can save module/sensor data downloaded from an attached SafetyNet system to disk. Data monitor files are created in tab-delimited ASCII format, which is compatible with Microsoft's Excel spreadsheet application.

Each data sample is represented by one row of data divided into 24 columns/fields, as follows:

Date - Date the data sample was recorded to disk.

*Time* - Time of day the data sample was recorded to disk.

*Module* - Module reporting this individual data sample.

*Type* - The type of module, "Driver", "Detection", etc reporting data.

Sensor 1 - 4 - The type of sensor attached to this connector, "Optical", "Gas", etc.

Sensor 1A/Sensor 1B - Two separate voltages measured in volts DC, reported by Sensor 1.

Sensor 2A/Sensor 2B - Two separate voltages measured in volts DC, reported by Sensor 2.

Sensor 3A/Sensor 3B - Two separate voltages measured in volts DC, reported by Sensor 3.

Sensor 4A/Sensor 4B - Two separate voltages measured in volts DC, reported by Sensor 4.

*Relays/sensors* - Hexadecimal bitmap representation of the relay enable and sensor enable states, as follows:

- Bit 0 Not used
- Bit 1 Fire relay (0 = de-energized, 1 = energized)
- Bit 2 Gas relay (0 = de-energized, 1 = energized)
- Bit 3 Trouble relay (0 = de-energized, 1 = energized)
- Bit 4 Sensor 1 (0 = disabled, 1 = enabled)
- Bit 5 Sensor 2 (0 = disabled, 1 = enabled)
- Bit 6 Sensor 3 (0 = disabled, 1 = enabled)
- Bit 7 Sensor 4 (0 = disabled, 1 = enabled)

For example "F0" would indicate "all sensors enabled, all relays off".

*Discharge* - Voltage, measured in volts DC, present at the discharge actuator output, if the module has actuator discharge capability.

*Pressure switch* - Voltage, measured in volts DC, present at the pressure switch input, if the module has actuator discharge capability.

*Sensor Current* - The amount of current, in milliamperes (mA), consumed by all sensors connected to this module.

*Module power input* - The voltage, measured in volts DC, supplied to the module by the vehicle main battery. Note that if the module is not connected to the vehicle battery, it receives power from the RS485 bus cabling; the module power voltage will be 0.0 volts in this case.

*RS485 power input* - The voltage, measured in volts DC, supplied by the module's RS485 bus; for modules not attached directly to the vehicle battery, this is the module's power voltage.

*Battery input* - The voltage measured in volts DC, supplied by the system backup battery (Driver Panel and Battery Backup modules only).

*Board temperature* - The temperature, in degrees Fahrenheit, measured inside the module enclosure.

## 5.6 Using the Monitor Mode Data with Microsoft Excel

The following example describes the basic method used in importing and manipulating the data,

Example – Chart gas sensor voltages over time using a Microsoft Excel spreadsheet for a SafetyNet system consisting of:

- (2) Modules (p/n 16390 Driver Panel and p/n 16391 Detection Module)
- (4) p/n 14198 Combustible Gas Sensors
- (1) p/n 15799 SafeIR Optical Flame Detector
- (1) p/n 14053 Manual Release Switch
- (1) p/n 17360 Speed Sensor
- (1) p/n 16603 Analog Heat Sensor

This example assumes you've already captured and saved the data as described earlier.

Step 1 – Start Microsoft Excel and open the file previously saved. The default location is *C:\Program Files\SafetyNet\DataLog\DataLog1.txt.* Excel by default looks only for \*.xls files, be sure to allow Excel to look for "All File Types - \*.\*".

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Step 2 – Excel will automatically import \*.txt format files. Accept the default values of delimited starting at row 1.

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Step 3 – Excel imports the data as it was recorded by SafetyNet. As mentioned earlier, SafetyNet records quite a bit of data. Initially the data is sorted by time so in order to separate the gas sensors data from the rest of the data – you'll have to do some editing.

Page5-10
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5 9/20/2006	14 55 25	5	1 Driver	Gas	Optical	Thermosta	Vanable R	1	3.81	2.4	24	4.04	0	26	0.77	¢.	0	0
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19 9/20/2006	14:55:38	5	1 Driver	Cass	Optical	Thermosta	Vanable H	0.98	3.81	2.4	2.42	4.04	3.00	1.00	2.77.0	2 	0	0
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26 9/20/2006	14-66-4	0	2 Detection	Speed	Gas	Gas	Gas	4.86	4.06	0.92	3.77	1.04	3.75	1.02	3.77 0	e	0	0
27 9/20/2006	14 55 4	1	2 Detection	Speed	Gas	Gas	Gas	4.96	4 36	0.92	3.77	1.04	3.75	1.02	3,77.0	F	ů.	0
28 9/20/2006	14 55 4	1	1 Driver	Gas	Ontical	Thermosta	Variable R	0.96	3.81	2.4	24	4.04	0	76	6	F	0	0
29 9/20/2006	14 55 4	3	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.01	2.4	2.42	4.04	0	80	0	F	0	0
30 9/20/2006	14:55:43	3	2 Detection	Speed	Gas	Gas	Gas	4.86	4.88	0.92	3.77	1.02	3.75	1.02	3.77 0	F	0	0
31 9/20/2006	14.55.44	4	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.42	2.42	4.04	0	76	C	F.	0	0
32 9/20/2006	14:55:4	4	2 Detection	Speed	Gas	Gas	Gas	4.96	4.86	0.92	3.77	1.02	3.75	1	3.77 0	F	0	0
33 9/20/2006	14:55:48	6	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.42	4.04	0	80	0	f.	0	0
34 9/20/2006	14.55.48	6	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.02	3.75	1	3.77 0	F	0	0
35 9/20/2006	14:55:47	7	2 Detection	Speed	Gas	Gas	Gas	4.96	4.96	0.92	3.77	1.02	3.75	1	3.77 0	F	0	0
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38 9/20/2006	14:55:50	0	2 Detection	Speed	Gas	Gas	Gas	4.96	4.86	0.92	3.77	1.02	3.75	1	3.77 0	F	0	0
39 9/20/2006	14:55:53	2	2 Detection	Speed	Gas	Gas	Gas	4.86	4.00	0.92	3.77	1.02	3.75	1	3,77 0	£	0	0
40 9/20/2006	14.55.5	2	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.42	4.04	0	76	0	F	0	0
41 9/20/2006	14.55.5	3	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.42	4.04	0	76	0	F	0	0
42 9/20/2006	14:55:5	3	2 Detection	Speed	Gas	Gas	Gas	4.66	4.86	0.92	3.77	1.02	3.75	1	3.77.0	<u> </u>	0	0
43 9/20/2006	14 55 52	5	2 Detection	Speed	Gas	Gas	Gas	4.86	4.85	0.92	3.77	1.02	3.75	1	3.77.0	8	0	0
44 9/20/2006	14.55.58	5	1 Driver	Gas	Optical	Thermoste	Vanable R	0.96	3.81	2.4	2.42	4.04	0	76	0	<u></u>	0	0
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Step 4 – To begin the clean up, Select all the data and use the Tools menu to Sort the data. One method would be to sort by Module. This separates all of the sensor/module data by module.

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5 9/20/2006	14.55.25	1 Driver	Gas	Optical	Thermosta	Variable R	1	3.81	24	24	4.04	0	76	OF	0	0
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13 9/20/2006	14:55:31	1 Driver	Gas	Optical	Thermosta	Variable R	0.98	3.81	2.4	2.42	4.04	0	80	OF	0	0
9/20/2006	14:55:31	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.04	3.75	1.02	3.77 OF	0	0
15 9/20/2006	14.55.32	1 Driver	Gas	Optical	Thermosta	Variable R	0.98	3.81	2.4	2.42	4.04	0	80	OF	0	0
16 9/20/2006	14:55:33	2 Detection	Speed	Gas	Gas	Gas	4.86	4.85	0.92	3.77	1.04	3.75	1.02	3.77 OF	0	0
17 9/20/2006	14:55:34	2 Detection	Speed	Gas	Gas	Gas	4.86	4.06	0.92	3.77	1.04	3.75	1.02	3.77 OF	0	0
18 9/20/2006	14.55.34	1 Driver	Gas	Optical	Thermosta	Variable R	0.98	3.81	24	2,42	4,04	0	80	OF	0	0
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9/20/2006	14.55.41	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.04	3.75	1.02	3.77 OF	0	0
23 9/20/2006	14:55:41	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.4	4.04	0	76	OF	0	0
23 9/20/2006	14:55:43	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.01	2.4	2.42	4.04	0	80	OF	0	0
9/20/2006	14:55:43	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.02	3.75	1.02	3.77 OF	0	0
9/20/2006	14.55.44	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.42	2,42	4.04	0	76	OF	0	0
9/20/2006	14:55:44	2 Detection	Speed	Gas	Gas	Gas	4.95	4.86	0.92	3.77	1.02	3.75	1	3.77 DF	0	0
9/20/2006	14.55.46	1 Driver	19.85	Optical	Thermosta	Variable H	0.96	101	2.4	2.42	4.04	0	00	0.77 007	0	0
0.00.0000	14.00.40	2 Detection	Deeed	Cas	Cas	Cas	4.00	4.00	0.92	3.77	1.02	3.75	-	3.77.05	0	0
9/20/2006	14-55-48	1 Driver	Gar	Ontical	Thermosta	Variable P	0.00	3,81	2.62	24	4.04	3.75		0.77 OF	0	0
9/20/2006	14 55 50	1 Driver	Gas	Ortical	Thermosta	Variable R	0.96	3.81	24	2.42	4.04	ő	80	OF	0	õ
9/20/2006	14:55:50	2 Detection	Speed	Gas	Gas	Gas	4.96	4.96	0.92	3.77	1.02	3.75	1	3.77 OF	Ö	0
39 9/20/2006	14:55:52	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.02	3.75	t	3.77 OF	0	0
40 9/20/2006	14 55 52	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	24	2.42	4.04	0	76	OF	0	0
41 9/20/2006	14 55 53	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.42	4.04	0	76	OF	0	0
42 9/20/2006	14:55:53	2 Detection	Speed	Gas	Gas	Gas	4.66	4.86	0.92	3.77	1.02	3.75	1	3.77 OF	0	0
43 9/20/2006	14.55.55	2 Detection	Speed	Gas	Gas	Gas	4.86	4.86	0.92	3.77	1.02	3.75	1	3.77 OF	0	0
9/20/2006	14.55.55	1 Driver	Gas	Optical	Thermosta	Variable R	0.96	3.81	2.4	2.42	4.04	0	76	OF	0	8
BIZOV2006	14:55:57	1 Driver	695	Optical	inemosta	vanable R	0.96	3.61	24	2.42	4.04	0	76	0*	0	2
Ready	and a start													Sume 19552579-92		
Station 1				1 marca		I man and		-	a la companya da companya d	-	1.000		Concession of the local division of the loca	C. C	I AR	and the second
stan	Support					and cons		Here:	orrende	- Addition		Printer of		P. consection.	Ow Olde	and the second second

Step 5 – In this step, the data has been cleaned up by deleting a few unused columns and by moving all of the gas sensor data together.

	DataLog1.txt										/ Handveriting	Drawing Pad	0: 9
En Eas An	a paset rg	rmat Look	Data Merdow	1949 1941 - 1941 - 1941	AL-81100-2	A 1000 - 2 40	1 And	210.2	B 7 H			Not a dresport in	THE A
	3 11 4 11	1 A -1	3.9.14.	3 4	Z+ X+ 14 -	6 100 H 2 H	E	10 2	B 1 9 1		3 78 7 .0	0 4-8 / 8 <del>7</del> / 111	
1200	100		<ol> <li>To Supervise.</li> </ol>	ghungesEnd Ri	Contraction of the local distance of the loc								
A2 •	A 9/2,	/2006	0				- N - F		4	V.			M
120	Time	Cancel	Canada 2	Sancor 1	Conterd	Canzar LA	Sancor 18		3	R	L	00	PN.
9/20/2006	14.55.00	One .	Geo.	Gen.	Con.	1.02	301	0.04	3.77	1.04	3.76	1.04	.9.71
0/00/0000	14-55-22	Che	Gae	Cas	Chi	1.04	3.01	0.04	3.77	1.04	3.75	1.04	3.71
9/20/2006	14.55.25	Gas	Gas	Gas	Gas	1	3.01	0.94	3.77	1.04	3.75	1.04	3.77
9/20/2006	14 55 27	Gas	Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3.75	1.02	3.77
9/20/2006	14 55 28	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.04	3.77
9/20/2006	14-55-30	Gas	Gas	Gas	Gas	0.90	3.81	0.92	3.77	1.04	3.76	1.02	3.77
9/20/2006	14 55 31	Gan	Gas	Gan	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006	14 55 32	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006	14-55-34	Gas	Gas	Gas	Gas	0.90	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006	14 46 36	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.02	3.75	1.02	3.77
9/20/2006	14 55 37	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1.02	3.77
9/20/2006	14-55-38	Gas	Gas	Gat	Gas	0.96	3.61	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006	14:55:40	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.04	3.75	1.02	3.7
9/20/2006	14 55 41	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1.02	3.7
9/20/2006	14-55-43	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.7
9/20/2006	14-55-44	Gas	Gas	Gat	Gas	0.96	3.81	0.92	3.77	1.02	3.25	1	37
9/20/2006	14 55 46	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	37
9/20/2006	14-55-48	Gas	Gas	Gat	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.7
9/20/2006	14-55-50	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.22	1.02	3.75	1	37
9/20/2006	14 55 53	Gas	Gas	Gas	Ger	0.96	3.81	0.92	3.77	1.02	3.75	1	97
9/20/2006	14 55 53	Gae	Gae	Gan	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	37
9/20/2006	14-66-66	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.26	1	3.7
9/20/2006	14 55 57	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	4	37
9/20/2006	14 56 00	Gat	Gae	Gas	Gat	0.96	3.81	0.92	3.77	1.02	3.75	1	37
9/20/2006	14-56-01	Gas	Gas	Gat	Gas	0.96	3.81	0.92	3.77	1.02	3.76	1	37
9/20/2006	14.46.03	Cas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		37
9/20/2006	14.56.04	L Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	37
9/20/2006	14-50-05	Gas	Gas	Gas	Gas	0.90	3.01	0.92	3.77	1.02	3.75		37
9/00/0006	14 46 07	Gas	Gas	Gan	Gas	0.96	3.81	0.92	3.77	1.02	3.76		- 27
9/00/2006	14.66.00	Oas	Gas	Gas	Gas	0.96	2.01	0.92	3.77	1.02	3.75	1.4	97
0/00/2000	14-50-10	Cast .	Gas	Gas	Gas	0.00	3.01	0.92	3.77	1.02	3.75		3.7
9/20/2006	14.50.10	Gar	Gas	Gas	Gas	0.96	3.01	0.92	3.77	1.02	3.75		3.7
9/20/2000	14-56-13	Cas	Gas	Gas	Gas	0.96	3.01	0.9	3.77	1.02	3.75		37
0/00/0006	14-50-14	C Sta	Gas	Che	Chi	0.00	3.01	0.0	3.77	1.02	3.75	1	37
9/20/2006	14.60.10	Gas	Gas	Gas	Gas	0.90	3.61	0.92	3.77	1.02	3.75		17
9/20/2006	14 56 17	Care	Gas	Gas	Gas	0.96	3.81	0.92	9.77	1.02	3.75	4	37
9/20/2006	14-50-10	Gu	Gas	Gas	Gas	0.00	3.01	0.92	3.77	1.02	3.75	1	37
9/20/2006	14-56-20	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	37
9/20/2006	14 56 21	Gas	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	37
9/20/2006	14 56 23	Gase	Gas	Gae	Gas	0.96	3.81	0.97	3.77	1.02	3.75	1	37
0/00/2006	14-60-23	Gw	Gas	Gas	Gas	0.90	3.01	0.92	3.77	1.02	3.75		3.7
0000000	14.60.20	One	Gas	Cas	Cas	0.90	2.01	0.9	2.77	1.02	3.75	1	- 37
9/00/2006	14 56 27	CH .	Gas	Gate	Gas	0.96	3.01	0.93	3.77	1.02	3.75	1	37
9/20/2006	14-50-27	Gas	Gas	Gas	Gas	0.90	3.01	0.92	3.77	1.02	3.75		3.7
Batal on	1 / 10 25		043			0.50	3.01	10.52	3.11	1.02	3.75		3.11
								-					

Step 7 – In order to chart the data, it must first be selected. This example shows the selection of both the A & B voltages for all four p/n 14198 Combustible Gas Sensors.

The Date	el DataLog1.ts	d Format Tools	Data Window H							-	/ Handwriting 🔮	Drawing Pad	0:	-
	104 13 122	1911 X 171 (H		- 19. E - 1	1.51.00 -5 1005	2 M B	1 Anni	÷ 10 ÷	B 7 U		5 16 1 28	-121 (801)		Ā
den site (11)	and the second	1 1 10 10 10 10				E		101.00.000						-
02	- 61	02	Place reaction service from	1275-11-L012-FITT										
D	E	F	G	н		1	K	L	M	N	0	P	0	-
Sensor 2	Sensor 3	Sensor 4	Sensor 1A	Sensor 1B										-
Gas	Gas	Gas	1.02	3.81	0.94	3.77	1.04	3.75	1.04	3.77				
Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3.75	1.04	3.77				
ias 🛛	Gas	Gas	1	3.61	0.94	3.77	1.04	3.75	1.04	3.77				
las	Gas	Gas	1	3.81	0.94	3.77	1.04	3.75	1.02	3.77				
ias:	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.04	3.77				
jas	Gas	Gas	0.98	3.61	0.92	3.77	1.04	3.75	1.02	3.77				
ias	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3.77				
as	Gas	Gas	0.98	3.61	0.92	3.77	1.04	3.75	1.02	3.77				
-95	Gas	Gas	0.90	3.81	0.92	3.77	1.04	3,75	1.02	3.77				
38	Gas	Gas	0.98	3.81	0.92	3.77	1.02	3.75	1.02	3.77				
93	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1.02	3.77				
35	Gas	Gas	0.96	3.81	0.92	3.77	1.04	3.75	1.02	3.77				
35	Gas	Gas	0.96	3.81	0.92	3.77	1.04	3.75	1.02	3.77				
35	Gas	Gas	0.96	3.61	0.92	3.11	1.02	3.75	1.02	3.77				
45	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75		3.77				
as	Gas	Gas	0.90	3.01	0.92	3.77	1.02	3.75		3.17				
33	Gas	Cas	0.90	3.01	0.92	3.//	1.02	3./5	-	3.77				
95	Gas	Gas	0.96	3.01	0.92	3.77	1.02	3.75		3.77				
1015	Čas.	Cars.	0.50	201	0.02	377	1.02	375	1	3.77				
45	Gas	Oas	0.96	2.01	0.92	277	1.02	3.75		2 77				
35	Gas	Gas	0.96	3.01	0.92	3.77	1.02	3.75	24	3.77				
	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3.77				
ani.	Gae	Gae	0.96	3.81	0.92	3.77	1.02	3.75	840	3.77				
as .	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3.77				
las	Gas	Gas	0.96	3.81	0.92	377	1.02	3.75	1	3.77				
41	Gas	Gas	0.95	3.61	0.92	377	1.02	3.75	240	3.77				
ac	Gas	Gas	0.96	3.61	0.9	3.77	1.02	3.75	1	3.77				
45	Gas	Gas	0.96	381	0.92	3.77	1.02	3.75	1	3.77				
45	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77				
95	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75	1	3.77				
35	Gas	Gas	0.96	3.61	0.9	3.77	1.02	3.75	510	3.77				
85	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77				
35	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77				
35	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77				
49	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77				
iad	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77				
ias .	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75	1	3.77				
as	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77				
98	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77				
-05	Gas	Gas	0.96	3.61	0.9	3.77	1.02	3.75	1	3.77				
-98	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	0.18	3.77				
Nati	Gas	Gas	0.96	3.81	0.92	3.11	1.02	3./5		3.17				
105 Det-	logi	0.95	0.96	3.61	0.95	3.11	1.02	3.75	100	3.771				
Alfendea	and a local second							1.			Same Of the Of			
					T				1.00		JUE # 7027.10	-		f
	Monsort i	Atti 🔘 Ci	secular - Maria	PE Monstoft		2	scresoft Exce	Harus Place	* P II		E Detelogi Lit-	- «		
Step 8 – The data is now ready to be easily charted. Select the charting option and choose the charting method of your choice. This example shows a Trend Line Chart.

Martin Contraction	Deternitiet									/ Handwitting	Drawing Pad	0: 300
ing the flot	yess preset Format	Toole Data Mardo	w Deb	AL 21 199		Land	210 211				pe a question fue	100 A - 0 A
		-1 12 · 0 1 -1		74 X4 24	ay turn to the E	T Mila	• 10 • 1	B 2 U		3 76 9 766	14/第/四	· ·· · ·
<u>a</u> 9 9 0	2512	地 由 Print st		alesta a fillion								
A2 •	9/20/2006											
A	B	C D	E	F	G	H	1	J	ĸ	L	M	N
1 Date	Time Sent	sor 1 Sensor 2	Sensor 3	Sensor 4	Sensor IA S	iensor 18	0.04	0.00		0.95	1.01	0.00
2 9/20/200	14.55.22 Gas	Gas	Gas	Gas	1.02	3.81	0.94	3.77	1.04	3.75	1.04	3.77
3 9/20/20	36 14:55:23 Gas	Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3./5	1.04	3.77
4 51201200	14 55 25 Gas	Gas	Cas	Gas	-	3.01	0.54	3.77	1.04	3.75	1.00	3.77
6 9/20/202	14.55 28 Gas	C tharts	Strard - Step 1 of a	- Chart Type		(T) (B) (T)	0.92	3.77	1.04	3.75	1.04	3.77
7 9/20/200	14.55.20 Gas	6	And Sector of	and the second second			0.92	3.77	1.04	3.75	1.02	3.77
8 9/20/200	14 455 31 Gan	Rand	lard Types Custom	Types			0.92	3.77	1.04	3.75	1.02	3.77
9 9/20/200	14 55 32 Gas	6 0.4		Chatek	heat	1	0.92	3.77	1.04	3.75	1.02	3.77
10 9/20/200	14 55 34 Gas	GLAC	ohumo.	Chieft Sta	())ei		0.92	3.77	1.04	3.75	1.02	3.77
11 9/20/200	16 14 55 35 Gas		our in	100		1	0.92	3.77	1.02	3.75	1.02	3.77
12 9/20/200	06 14 55 37 Gas	d E.					0.92	3.77	1.02	3.75	1.02	3.77
13 9/20/200	06 14:55:38 Gas	G Z	64.FT			1	0.92	3.77	1.04	3.75	1.02	3.77
14 9/20/200	16 14:55:40 Gas	d .	All and and	1	I ALC		0.92	3.77	1.04	3.75	1.02	3.77
15 9/20/200	06 14.55.41 Gas	G 655 *	r (seacter)	1275	M MATIN	A 1	0.92	3.77	1.02	3.75	1.02	3.77
16 9/20/200	06 14:55:43 Gas	G 🛤	100		$\sim$	1	0.92	3.77	1.02	3.75	1	3.77
17 9/20/200	14:55:44 Gas	G Q	oughnut	Kan	- Lessen he	1	0.92	3.77	1.02	3.75	1	3.77
18 9/20/200	06 14.55.46 Gas	0 gr	adar	1		1	0.92	3.77	1.02	3.75	- 1	3.77
19 9/20/200	14:55:48 Gas	G 🖉 🤅	urface	I PAG	2	1	0.92	3.77	1.02	3.75	1	3.77
20 9/20/200	06 14:55:50 Gas	G 🟗 P	ubble	<u> </u>		1	0.92	3.77	1.02	3.75	1	3.77
21 9/20/200	06 14.55.52 Gas	q					0.92	3.77	1.02	3.75	1	3.77
22 9/20/200	06 14.55.53 Gas	G		Line, Disp	lays brend over time or	1	0.92	3.77	1.02	3.75	1	3.77
23 9/20/200	14:55:55 Gas	q		categorie	5,	1	0.92	3.77	1.02	3.75	1	3.77
24 9/20/200	14.55.57 Gas	q				1	0.92	3.77	1.02	3.75	1	3.77
25 9/20/200	06 14.56.00 Gas	G		- Dec	or and mold to Many Saw	1	0.92	3.77	1.02	3.75	1	3.77
26 9/20/200	14.56.01 Gas	9			and read to Date Sat	1	0.92	3.77	1.02	3.75	1	3.77
27 9/20/200	16 14 56 03 Gas	9			(The second seco		0.92	3.77	1.02	3.75	1	3.77
28 9/20/200	35 14:56:04 Gas	9	Cancel	< \$840.	Mext >	ensh	0.92	3.77	1.02	3.75	1	3.77
29 9/20/200	36 14:56:05 Gas	Chr.	007				0.9	3.77	1.02	3.75	1	3.77
30 9/20/200	35 14:56:07 Gas	Gas	Gas	Gas	0.96	3.61	0.92	3.17	1.02	3.75	1	3.77
31 9/20/200	30 14.50.00 Gas	043	Gas	Gas	0.96	3.01	0.9	0.77	1.02	3./5		3.77
32 9/20/200	36 14:56:10 Gas	Gas	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75		3.77
33 37/0/200	x0 14:00 12/038	Gas	Gas	Cas	0.96	3.01	0.9	3.17	1.02	3.75	1	3.77
35 0/20/200	0 14:00:13 U88	Cas	Cas	Cas	0.96	2.01	0.0	3.(/	1.02	3.75	1	3.77
9/20/200	14.56.14 Gas 14.60.10 Gas	Gas	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75		3.77
37 9/20/200	14 56 17 Gas	Gas	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75	4	3.77
38 0/20/200	14 55 10 G to	Gas	Gas	Gas	0.00	3.01	0.92	3.77	1.02	3.75	1	3.77
39 9/20/20	14:56:20 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
40 9/20/200	14 56 21 Gas	Gas	Gas	Gas	0.96	3.61	0.9	3.77	1.02	3.75	1	3.77
41 9/20/200	14 56 23 Gat	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
42 9/20/200	14 56 24 Gas	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77
43 9/20/200	14 56 26 Gas	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77
44 9/20/200	06 14 56 27 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
45 9/20/200	6 14:56:29 Gas	Gas	Gas	Gas	0.96	3.61	0.92	3.77	1.02	3.75	1	3.77
e e + H Datal	log1						CARCELO		a state			>1
Ready												
the start	O Norself Att	Calendar - Maria	Wet Houseft	- Inco	eletotos.	Arrestell Form	Contract Proto	10/1	and Million	E Deterort but		
												and the second sec

Step 9 – The results of the data and charting selection is shown below.



Step 10 – Selecting the data column for Time for the X-axis allows us to view the chart over a given time period.

Construction of the second sec	lating Life!	t our linds								Handwriting 🐩	Drawing Pad	
Cal Da Fox New	fuser admin Tor	se fraça Mercos	6ab						-	198	e a quescion na	
	ALL MIN ALL	13-01-2-	to a low E		100.00	W/ai	- 10 -	B Z U I		5 % • %	리에파	· · · · ·
099000	9115 わ1当地	31 Walkash with	changes Ent	Series.i.								
82 •	£ 1.02											
A	B C	D	E	E	G	н		J	K	L	M	N
2 9/20/2006;	14 55 22 Gas	Gas	Gas	Gas	1.02	3.81	0.94	3.77	1.04	3.75	1.04	3.77
3 9/20/2006	14:55:23 Gas	Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3.75	1.04	3.77
4 9/20/2006	14:55:25 Gas	Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3.75	1.04	3.77
5 9/20/2006	14:55:27 Gas	Gas	Gas	Gas	1	3.81	0.94	3,77	1.04	3.75	1.02	3.77
6 9/20/2006	14.55.28¦Gas	Source Data			ក្រាត	3.81	0.92	3.77	1.04	3.75	1.04	3.77
7 9/20/2006;	14.66.30(Gas				1.14	3.81	0.92	3.77	1.04	3.75	1.02	3.77
8 9/20/2006;	14:55:31 Gas	Data Range 1	ieries			3.81	0.92	3.77	1.04	3.75	1.02	3.77
9 9/20/2006;	14.55.32[Gas				- 10 I	3.81	0.92	3.77	1.04	3.75	1.02	3.77
10 9/20/2006	14.55.34 Gas	451			- Lotart	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006	14:55:35 Gas	35			- Loted	3.81	0.92	3.77	1.02	3.75	1.02	3,77
9/20/2006	14:55:37 Gas	.:			lafar3	3.81	0.92	3.77	1.02	3.75	1.02	3.77
13 9/20/2006	14.55.38¦Gas	1			- 34640	3.81	0.92	3.77	1.04	3.75	1.02	3.77
14 9/20/2006	14:55:40¦Gas				- 1444	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20/2006;	14:55:41[Gas	85	101025		- Satar	3.81	0.92	3.77	3.02	3.75	1.02	3.77
16 9/20/2006;	14.00.43§Uas	40.0		*******	A	3.81	0.92	3.77	1.02	3.75		2.77
9/20/2006;	14:55:44(Gas	4 y y y g g	N. S. S. S. S. S. S.	48833888	e	3.61	0.92	3.77	1.02	3.75	- 3	3.77
18 9/20/2006;	14:55:46(Gas	444				3.81	0.92	3.77	1.02	3.75	1	377
9/20/2006	14.55.48 Gas					3.81	0.92	3.77	1.02	3.75	1	3.77
20 9/20/2006	14:55:50[Gas	Sories				3.81	0.92	377	1.02	3.75	1	3.77
21 9/20/2006	14:55:52 Gas	Series1	Norte	н 🔄	<b>1</b>	3.81	0.92	3.77	1.02	3.75		3.77
22 9V20/2006	14:55:55(Uas	Series2				3.81	0.92	3.0	1.02	3.75		3.77
23 9/20/2006	14.55.55,035	Sarie c4			1.00	3.81	0.92	3//	1.02	3./5		3.77
9/20/2006;	14:55:574Gas	Series5	M Yaka	s: =DetaLog11\$4	82:868505	3.01	0.92	3/1	1.02	3.75		2.17
5 9/20/2006;	14:56 U040as	Add	emove			3.81	0.92	3//	1.02	3.75		3.77
28 9/20/2006	14.56.01(0.05	<u> </u>				3.81	0.92	3.11	1.02	3.75	1	3.77
9/20/2005	14.56.05/Gas	Calanta (1) and	e labales	-Cistal call/DidD	5	3.61	0.92	3.77	1.02	3.75		3.77
20 0/20/2006	14 55 05 035	Calegory (v) and	s happens.	-concerdation to		3.61	0.92	3//	1.02	3.75	-	3.77
0 0/20/2000	14 50 00;085					2.01	0.9	3.11	1.02	3.75	1.1	3.77
9/20/2005	14.56.0/20as					3.01	0.92	2.11	1.02	3.75		2.17
0/20/2000;	14:50:00(048	1	Cancel	< Back Next	> Erish	3.01	0.00	3.11	1.02	3.75		3.77
32 9/20/2000;	14.50.10(085			an de la companya de		3.01	0.92	3.11	1.02	3.75		3.77
9/20/2006	14:40-1000as	Gas	Gar	Gas	0.96	3.01	0.9	3.77	1.02	3.75		3.77
5 900,000	14-56-14-044	Gas	Gas	Gas	0.96	3.01	0.97	377	1.02	3.75		3.77
C 0/00/2000s	14-50-101044	Gas	Cat	Cas	0.96	3.01	0.02	3.77	1.02	3.75	-	3.77
20000000	14-60-171Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3.77
9/20/2006	14.56 1910 44	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3.77
00000000	14-50-2010-44	Gas	Gas	Gas	0.00	3.01	0.02	377	1.02	3.75	1	3.77
40 9/20/2006	14-56-212Gar	Gas	Gas	Gas	0.96	3.81	0.9	377	1.02	3.75	1	3.27
41 9/20/2006	14 56 23 Gas	(Cas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3.77
42 9/20/2006*	14 55 24 Gas	Gas	Gae	Gas	0.96	3.81	0.9	377	1.02	3.75	1	3.77
43 9/20/2006	14:56 26 Gas	Gas	Gas	Gas	0.96	3.81	0.9	377	1.02	3.75	1	3.77
4 9/20/2006	14 46 27 Gas	Gas	Gas	Gas	0.96	3.81	0.92	377	1.02	3.75		3.77
45 9/20/2006	14-56-291634	Gas	Gat	Gas	0.96	3.81	0.92	377	1.02	3.75		3.77
46 9/20/2006	14:56:311Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
t + + H DataLog1		100010	111212		10.000	1000	C					2
toint												010
	ACCOUNTS OF THE		Landstown	Second and second		000104223	Long to the local division of the local divi	1.0	and the second se	the second second	I a	
Caratin S		Sector (1987-1987)	Mars Section	in the const		resort Exce	- Astastento	Pins	The second s	P. nonscoli 111-		No. (199184

Step 11 – Customize the chart by adding a title and descriptions for the x & y axis.

and the second second		1 A -3	B. 314.	1.1.1.1.1.1.1	- 11 (1 Mail 40	100m . W E	SALUE .	. 10 .	B 2 0 1	a a 4075	3 76 1 76	121/ Sel 111	-
191213	2150	当地市	3 Polish at	Querans Ent	(Review,								
-	A 1.02	6				0 1	N. I			V 1		M	N
0/20/2006	14-66-22	Gw.	Gas	Cas	Gas	102	70 101	0.94	9.22	1.04	1.76	1.04	N
9/20/2000	14.55.00	Oas.	Cas	Cas	(Can	1.02	3.01	0.04	2.77	1.04	3.75	1.04	
0.0000000	14.55.00	Case.	Cas	Cas	Cat	-	3.01	0.04	3.77	1.04	3.75	1.04	3
9/20/2006	14-55-27	Gas	Gas	Gas	Gas	1	3.81	0.94	3.77	1.04	3.76	102	ă
9/20/2006	14 55 28	Gas	Gas	Gas	Gas	89.0	3.81	0.92	377	1.04	3.75	1.04	ă
9/20/2006	14 55 30	Gat	Gae	Gas	Gae	0.98	3.81	0.92	3.77	1.04	3.75	1.02	
9/20/2006	14-55-31	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	
9/20/2006	14 55 30	Gan	Gas	Gas	Gas	0.99	3.81	0.92	3.77	1.04	3.75	102	ñ
9/20/2006	14 55 34	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3
9/20/2006	14-55-35	Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.02	3.75	1.02	3
9/20/2006	14:55:37	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1.02	3
9/20/2006	14 55 38	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.04	3.75	1.02	3
9/20/2006	14:55	hart Wizard	1-Step 3 of 4-1	hart Options		(E) (	3.81	0.92	3.77	1.04	3.75	1.02	3
9/20/2006	14:55				100		3.81	0.92	3.77	1.02	3.75	1.02	3
9/20/2006	14.55	Titles	Axes Gridines	Legend De	sta Labels 🛛 Data Tabi	•	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	Chart stle:		1000		diama di	3.01	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	A chart o	of Gas Sensor Data		A chart of Gas Sea	For Data	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	A	Sector 1	100 C			3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	Pacedory Cr.	1805				3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	1819		- 3=		Losurt	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14.55	Yalue (Y) and	8:			- Letesi	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14.66	Sensor V	otage	12 13	the second second second	- Subat	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:55	Cannod rate	and the solution	85		- Dated	3.81	0.92	377	1.02	3.75	1	3
9/20/2006	14:56			0	*****	- Durist	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14.56			133		A leist	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:56	Second view	e (v) and i		The	200 (d - 10)	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14.56						3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:56						3.61	0.9	3.77	1.02	3.75	1	3
9/20/2006	14.56						3.81	0.92	3.77	1.02	3,75	1	3
9/20/2006	14:56			Canad	c Back Haut	Deith	3.81	0.9	3.77	1.02	3.76	1	3
9/20/2006	14:56			Carce	« Bank Dave	2 Drist	3.81	0.92	3.77	1.02	3.75	1	3
9/20/2006	14:56:12	Gas	Gas	Gas	Gas	0.96	3.01	0.9	3.77	1.02	3.75	1	3
9/20/2006	14 56 13	Gas	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3
9/20/2006	14:56:14	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3,75	1	3
9/20/2006	14:56:16	Gas	Gas	Gás	Gas	0.96	3.81	0.9	3.77	1.02	3.75	1	3
9/20/2006	14:56:17	Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3
W20/2006	14.56.19	Uikk	Gas	Gas	Gas	0.96	3.81	0.95	377	1.02	3.75		3
9720/2006	14:56:20	635	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3
9/20/2006	14:56:21	685	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3.75		3
97/07/006	14 56 23	Gas	Gas	588	Gas	0.96	3.81	0.92	3.77	1.02	3.75		3
972072006	14.56.24	0.95	649	0.00	Gas	0.96	3.81	0.9	3.77	1.02	3./5		3
9/20/2006	14:56:26	Gas	Gas	Gas	Gas	0.96	3.81	0.9	3.77	1.02	3,75	3	-3
97202006	14 56 2/	Uss	Gas	088	Gas	0.96	3.81	0.92	3.//	1.02	3.75		3
9/20/2006	14.56.25	0.95	Gas	Gas	0.95	0.96	3.81	0.92	3.77	1.02	3./5	1	3
972072006	14:56:31	0.95	0.35	0.35	635	0.96	3.61	0.92	3.77	1.02	3.75		- 3

Step 12 – Further customization can be done by identifying sensors, adding comments, etc. This chart shows in graphical format what raw data cannot. This Monitor Mode session shows perfectly behaving p/n 14198 Combustible Gas Sensors. This is the typical pattern with the actual gas levels at approximately 1 vdc and the individual sensor alarm levels at approximately 3.8 vdc.

Microsoft	Excel Da	talog1.tkt	Taula Chest Min	Annual Market						_	/ Handwriting	Traing Pad	3 3
	ala	DIT DIA	Town Dian The	- (N - [ (0, 1))	- 01 11 (00 -45		Atlal	- 10 - B	/ U	東府	1.5.15.1	11 (30 (30 ) (10 ) (11 )	· 01 · A ·
1 21 21	000		B B Tolkades	th Churges End	Ravins								
Chart Area		£ .											
A		B	C D	E	F	G	H	1	J K		L	M	N
9/21	1/2006	14:55:22 Gas	Gas	Gas	Gas	1.02	3.81	0.94	377	1.04	3.75	1.04	3.77
97.0	1/2006	14:55:25 (38)	Gas	Gas	Gas	1	3.61	0.94	377	1.04	3./5	1.04	3.77
9/2	3/2006	14.55.25 Gas	Gas	Gas	Gas	1	3.61	0.94	3.77	1.04	3.75	1.04	3.77
9V,0	82006	14:55:27 Gas	Gas	Gas	Gas		3.01	0.94	3.11	1.04	3.75	1.02	3.77
9420	82006	14.55.28 Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1,04	3.77
9721	1/2006	14:55:30 Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3./5	1.02	3.17
9/21	1/2006	14:55:31 Gas	Gas	Gas	Gas	0.90	3.61	0.92	3.77	1.04	3.75	1.02	3.77
9724	1/2/006	14:55:32 Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/21	1/2006	14.55.34 Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.04	3.75	1.02	3.77
9/20	3/2006	14.55.35 Gas	Gas	Gas	Gas	0.98	3.81	0.92	3.77	1.02	3.75	1.02	3.77
9/20	1/2006	14:55:37 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1.02	3.77
9/21	1/2006	14:55:38 Gas	Gas							1.04	3.75	1.02	3.77
9/20	1/2006	14:55:40 Gas	Gas		A cl	hart of Gas	Sensor D	ata		1.04	3.75	1.02	3.77
9/20	1/2006	14:55:41 Gas	Gas							1 02	3.75	1.02	3.77
9/21	1/2006	14.55.43 Gas	Gas	Churt Beach						1.02	3.75	1	3.77
9/20	1/2006	14.55:44 Gas	Gas	Chart wrea					1	1.02	3.75	1	3.77
	1/2006	14:55:46 Gas	Gas	4					Period	1.02	3.75	1	3.77
9/20	1/2006	14:55:48 Gas	Gas	20	CONTRACTOR OF A				- Deries I	1.02	3.75	- 1	3.77
9/20	1/2006	14:55:50 Gas	Gàs	35					-Series2	1.02	3.75	1	3.77
9/21	1/2006	14:55:52 Gas	Gas	8.3					Series3	1.02	3.75	1	3.77
9/20	1/2006	14:55:53 Gas	Gas	# 25					Series	1.02	3.75	1	3.77
9/20	3/2006	14.55.55 Gas	Gas	3					Outret	1.02	3.75	1	3.77
9/21	1/2006	14:55:57 Gas	Gas							1.02	3.75	1	3.77
9/20	1/2006	14:56:00 Gas	Gas	\$ 1.5					- Seriesti	1.02	3.75	1	3.77
9/20	1/2006	14 56 01 Gas	Gag	S .	- TRANSPORT				-Series7	1.02	3.75	1	3.77
9/20	1/2006	14-56-03 Gas	Gas				-		Cariacil	1.02	3.75	1	3.77
9/2	1/2006	14-56-04 Gas	Gas	0.5					- 361630	1 02	3.75	1	3.77
9/2	1/2006	14.56.05 Gas.	Gas	0						1 02	3.75	1	3.77
9/76	1/2006	14-56-07 Gast	Gas	100		and the second second	655 2 Ch (1997)	a an ann an Anna an Anna A	3	1.02	3.75	4	3.77
9/3	1/2006	14 48 08 Gas	Gas	10 m	N. 6 8 8 8 5 0	20 8 10 9	A. 8. 8.	8 3 3 3 3 3 3		1 02	3.76	1	3.77
9/2	1/2006	14 55 10 Gas	Gas	P.P	9999999	0.0.00	5.8.8	00000		1 02	3.75	1	3.77
0.73	1/2000	14-56-12 Gas	Gas	"a. "a. "	a. Va. Va. Va. Va. Va. V.	3. 12. 12. 12.	222.	13. 13. 13. 13. 13.		1.02	3.75		3.77
9/7	1/2006	14.50 12 Gar	Gar			Time				1 02	3.75	1	3.77
9/00	1/2006	14.55 14 Geo	Gas							1.02	3.75		3.77
0.00	2000	14-55-16 (0.44	Gas	Gas	Ger	0.96	2.01	0.0	3.77	1.02	3.75	4	3.77
0,7%	1/2006	14-56-17 Com	Gar	Gas	Gas	0.90	3.01	0.9	3.77	1.02	3.75		3.97
3723	1/2000	14.50 10 0085	Cas	Can	Care .	0.96	2.01	0.92	311	1.00	3.75		3.77
0.00	1/2000	14-50-20 Cas	Cas	Cas	Cha	0.96	3.01	0.92	3.77	1.02	3.75		3.77
372	12000	14:50:20 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3./5		3.17
972	12000	14.50.21 (585	Gas	Gas	Cas .	0.96	3.01	0.9	3.77	1.02	3.75		3.17
372	#2005	14:56:25 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
972	3/2006	14:56:24 Gas	644	695	0.95	0.96	3.81	0.9	3.77	1.02	3./5	1	3.77
9/21	#2006	14:56:26 Gas	Gas	Gas	635	0.96	3.81	0.9	3.77	1.02	3.75	1	3.77
9/21	1/2006	14:56:27 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
9/20	1/2006	14:56:29 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
9/21	1/2006	14:56:31 Gas	Gas	Gas	Gas	0.96	3.81	0.92	3.77	1.02	3.75	1	3.77
<ul> <li>MU/D</li> </ul>	hataLog1/							CONTRACTOR					
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# 6 SafetyNet Relay Operation & Sensor Mapping

#### 6.1 Relay Operation

Each SafetyNet Module contains either a single or multiple relays. All of the relays are single pole double throw (SPDT)/ Form C type devices. Depending upon the type of SafetyNet module, the module relay may perform separate or multiple functions. The system designer should consider how relay communication from module to vehicle electronics may best be performed.

Module Type	# of Relays	Relay Functions
p/n 16390 Driver Module	1	Fire
"	1	Gas
"	1	Trouble
p/n 16391 Detection Module	1	Fire, Gas
p/n 16392 Releasing Module	1	Fire, Gas
p/n 16395 Detection-Release Module	1	Fire, Gas

Relay Logic

Each module relay operates <u>specific</u> to that module and is not common across the network of modules with the exception of the Trouble Relay. An event on a single module which causes that module's relay to transfer will not cause all of the other module relays to also transfer. It is recommended that relay logic/shutdown is bench tested once a system configuration is developed. SafetyNet relay logic is best explained using a series of examples:

- A system includes a Driver Module and a Detection Module. The Detection module includes all Gas Sensors. If a single Gas Sensor reaches a Significant gas level, the relay in the Detection Module will transfer but the Gas relay in the Driver panel *will not* transfer.
- A system includes a Driver Module and a Detection Module. The Detection module includes all Gas Sensors. If a single Gas Sensor cable becomes damaged, the relay in the Detection Module will not transfer but the Trouble relay in the Driver panel *will* transfer.
- A system includes a Detection Module only. The Detection Module includes only Gas Sensors. If a single Gas Sensor cable becomes damaged, there is No Trouble relay indication. Trouble is only indicated on the Operator Display.

## 6.2 Sensor Mapping

A SafetyNet system may consist of a number of different modules and sensors providing Detection and Agent cylinder releasing capability to different Hazard Areas or Zones. The term *Sensor Mapping* is used to describe the logical operation between Fire Sensors and Fire System Activation. Sensor Mapping allows the system designer to choose which sensors on a selected detection input module are to be used to trigger the actuator for a particular release zone. This release zone may be on one or multiple modules.

An example would be individual detection and suppression zones consisting of a vehicle engine compartment, battery compartment and exhaust compartment. Each zone may be considered a separate hazard and may be provided with separate detection and suppression systems.

The SafetyNet Configuration utility software must be used to determine which sensors are used to trigger the fire suppression system designated for a particular release zone. Only those sensors designated as Fire sensors may be used to trigger a suppression system.

Assume a two module system (module A & module B) with two separate Fire Suppression systems (zones) on each module.



Option 1 (Default Setting): A fire detected on module A activates A and B, but a fire detected on B only activates B but not A,



rsio	n ID 01				
390	0 16395				i
	Module name 16390		Connecte	ed to: 💿 J1	(F) 🔾 J2 (M)
Se	nsors Type	Name	Discharge	Relays Fire	Delay Enable
1	Optical 💌	Sens 1		Gas	15 sec. 💌 🗹
2	Variable RTD 🛛 🗸	Sens 2		Trouble	15 sec. 🗸 🗹
3	Spot thermostat 🛛 💌	Sens 3		Troul	ole norm, energized
4	Gas 🗸	Sens 4			
De	etection zones Type apot thermostat	Name Heat 1 Heat 2		Dischar De Manu Any I	ge Hay (sec.) Enable U U V Val rel. discharges all ire discharges all

ersion ID	01						
16390 1	6395					0	
Mo	idule name	16395		C	onnected to:	⊙ J1 (F) O J2 (I	M)
Detec	tion zone	s Tupe		Name	Discharge	Relay Delay	Enable
Zone 1	Variable	RTD	~	Sens 1		0 sec. 💌	
Zone 2	Optical		~	Sens 2			
Mar	ual reliase	e discharges a	all		-		
Releas	e zones	L	1				
7 1	Name Rol 1	Delay (sec	Enable	e Detec	tion input	Advanced Se	ttings
∠one i	nell	0		All	×	)	
Zopp 2	Rel 2	0 3		All	~	/	

Assume a two module system (module A & module B) with two separate Fire Suppression systems (zones) on each module.



Option 2: A fire detected on ether module (A or B) activates both modules



		-
∋ ¤a + - !	9 <b>4</b> 45 🕒 🎦	
sion ID 01		
550 16395		
Module name	390 Co	nnected to: 💿 J1 (F) 🛛 J2 (M)
Sensors		Relays Delay Enable
Туре	Name Disch	arge Fire Osec. 🛩 🗹
1 Optical	Sens 1	Gas 15 sec. 🗸 🗹
2 Variable RTD	Sens 2	] Trouble 15 sec. V
3 Spot thermostat	Sens 3	Trouble norm, energized
4 Gas	Sens 4	
		Discharge
Detection zones		Delay (sec. ) Enable
Туре	Name Disch	
Spot thermostat	V Heat 1	Any fire discharges all
2 Manual release	V Heat 2	
		Advanced settings

ersion ID 01 6390 16395 Module name 16555 Connected to: ③ J1 (F) J2 (N Detection zones Zone 1 Variable RTD V Sens 1 Zone 2 Optical V Sens 2 V Manual release discharges all	4)
ersion ID 01 6330 16335 Module name 16555 Connected to: ③ J1 (F) ③ J2 (N Detection zones Type Name Discharge Zone 1 Variable RTD ♥ Sens 1 Zone 2 Optical ♥ Sens 2 ♥ Manual release discharges all	4)
6330     16335       Module name     16555       Connected to:     0 J1 (F)       Detection zones     Type       Name     Discharge       Zone 1     Variable RTD       Zone 2     Optical       Variable RtD     Sens 2	4)
Module name [1555] Connected to: (•) J1 (F) J2 (N Detection zones Zone 1 Variable RTD V Sens 1 Zone 2 Optical V Sens 2 Variable Rtp Sens 2	4)
Detection zones     Type     Name     Discharge       Zone 1     Variable RD     Sens 1     Delay       Zone 2     Optical     Sens 2     Image: Construction of the sens 2       Variable RD     Sens 2     Image: Construction of the sens 2	
Detection zones Type Name Discharge Zone 1 Variable RTD V Sens 1 Zone 2 Optical Sens 2 Variable Rtp Sens 2	
Zone 1 Variable TD V Sens 1 Zone 2 Optical Sens 2 Variable release discharges all	Fushis
Zone 2 Optical Sens 2	
Manual release discharges all	1000
Release zones	
Name Delay (sec.) Encole Detection input	tings

Assume a two module system (module A & module B) with two separate Fire Suppression systems (zones) on each module.



Option 3: A fire detected on ether module (A or B) activates only that module, but a Manual Release button located anywhere in the system releases all Fire Suppression systems.



2	🐴 + - 🛤 🖏	<b>b *</b>	a ?	
sia	n ID 01			
39	0 16395			
	Module name 16390		Connecte	ed to: 💿 J1 (F) 🛛 J2 (M)
Se	ensors Type	Name	Discharge	RelaysDelayEnableFire0 sec.V
	Optical 💌	Sens 1		Gas 15 sec. 🗸 🗹
2	Variable RTD 🛛 💉	Sens 2		Trouble 15 sec. 🗸 🔽
3	Spot thermostat	Sens 3		Trouble norm, energized
1	Gas 💌	Sens 4		-
				Discharge Delau (sec.) Enable
De	etection zones			
	Туре	Name	Discharge	Manual rel, discharges all
	Spot thermostat 💉	Heat 1		Any fire discharges all
2	Manual release 🛛 🗸	Heat 2	Image: A start of the start	

sion ID	01			
390 16	395			
Mo	dule name	e 16395	Connected to:	⊙ J1 (F) ○ J2 (M)
Detect	ion zon	es Type	Name Discharge	Relay Delay Enable
Zone 1	Variable	RTD 😽	Sens 1	0 sec. 💌 🗹
Zone 2	Optical	~	Sens 2	
🗹 Mani	ual releas	e discharges all		
Releas	e zones			
	Name	Delay (sec.) En	ble Detection input	Advanced Settings
Zone 1	Rel 1	0 0	Local (Both) 💌	
Zone 2	Rel 2	0 😂 🔪	All 💙	
	1			

Assume a two module system (module A & module B) with Multiple Detection and Releasing Zones.



SafetyNet has the capability of tying specific detection zones to specific releasing zones. In this example we show a p/n 16391 Detection Module and a p/n 16392 Releasing Module. Using the SafetyNet software utility the release zone number is displayed in the the window titlebar ("Zone 1-4"). The name of the selected (or "mapped") detection module is displayed above the sensor checkboxes

(for example, "Mapped module: Mod 1). To enable/disable a particular sensor for this release zone, click the checkbox next to the name of the sensor. When a sensor is enabled, if it detects a fire condition, the actuator for this release zone will be triggered.

By default, all available sensors are enabled. Some sensors (for example, gas sensors) are not used to detect fire conditions; these sensors will appear disabled in the dialog and cannot be enabled.

Ba + - B	A C . B .	?			DBB	+ -	- 64 0	5 B 10	?			DBB	a + ·	- EA C	A 14 19	7			
ID 01					⊻ersion ID	01						Ymian I 16790	16392						
16392					 16391 16	392						 	fodule name	16292		Corvect	edia (0.1	B ORM	
Module name 1635	91	Connect	ed ta: 💽	J1 (F) OJ2 (M)	Moc	tule name	1823		Connec	ted to: 💿 J1	(F) OJ2(M)		Release	Name	Delay (sec.)	Enable	Detection #	Seroor put mapping	
Senaor	Turne		ne fiiri	harm		Release	zones	Delay Inec 1	Frahle	Detection in	Sensor		Zone 1	Rel 1	0 2	Ø	16391	-	
1 Man	wal release	¥ Ser	1 5	2		Zone 1	Rel 1	0 2		16391			Zone 2	Rel2	1 2	2	16391	· 🖃	
2 Vana	able RTD	¥ Ser	2			Zone 2	Rel2	1 0		16391			2000.3	Red 4	1.4	B	16,291		
3 Optio	ical	✓ Ser	3			Zone 3	Rel 3	0.0		16391			Mas	al release d	ischarges al	-	140		
4 Optio	ical	v Ser	4			Zone 4	Rel 4	1.0		Al							-	Sensor Map	ping [7
Mans	ual release dischar	ges all				Manus	l release d	ischarges all						n	Helease 0	Delay I ni 💌	(rable	Happed	nodule. Sensors
Relay	Delay En	sbie	dvanced S	ietting:			8	elay D	elay	Enable		-							Sera 2

When you have enabled/disabled the desired sensors, press the "OK" button to save the selections. Press the "Cancel" button to exit without making any changes to the configuration.

# 7 Miscellaneous Menu Functions

#### 7.1 Change Password

Configuration Utility Menu	File
Advanced Features?	No
Password Required?	Yes

Salecynet co	nfiguration Utili	ty			
le Configuration	n Tools Help				
New	a 🕰	🗈 翰	?		
Open	Ctrl+O				
Save	Ctrl+S				
Save as					
Preferences					
Change passw	ord				
Exit	Ctrl+X	-			
Recent files	•		2		
<	AN	TE	RI		>
		_			
			/		
To get started: 1 - Select 'FileINe	ew' from the main m	nenu to specify	a new system	configuration	
2 - Select 'FileIOp	pen' from the main i	menu to open	an existing sav	ed system configura	ition.
3 . Select 'Config	juration Download"	from the main	menu to retriev	e configuration data	from an
attached dienlau					
attached display 4 - Select 'Helpl0	Contents' from the n	nain menu to re	ead the instruct	ion manual for this u	utility

Figure 1 - Select change password from File Menu

Pa	ssword	×
	Enter password:	
	****	
		;
	OK Calzel	

Figure 2 - Enter original password

ange Passw	ord		
Enter new p	assword:		
I			
<u>C</u> onfirm new	password:		
		-	-

Figure 3 - Enter NEW password & confirm

# 7.2 Erase Event Log (Advanced Features)

Configuration Utility Menu	Tools
Advanced Features?	Yes
Password Required?	Yes



Figure 4 - Select Erase Event Log from Tools Menu

Pas	sword 🔨	
	Enter password:	
	OK Cancel	

Figure 5 - Enter password

Confirm	8
<u>.</u>	All events stored in the display will be erased. Are you sure?
	Yes No

Figure 6 - Acknowledge Erase Event Log

## 7.3 Set Clock

Configuration Utility Menu	Tools
Advanced Features?	No
Password Required?	Yes



Figure 7 - Select Set option in Tools Menu

SaletyNet Configuration Utility
Hile Configuration Tools Help
🗅 🖻 🖳 🕂 — 🖧 Ū, 🖻 檜 🥐 🧧
Password Fine gassword Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK Cancel CK CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CANCEL CA

Figure 8 - Enter password



Figure 9 - Enter time and date

## 7.4 Set Maintenance Schedule

Configuration Utility Menu	Tools
Advanced Features?	No
Password Required?	Yes



Figure 10 - Select Maintenance Schedule from Tools menu

📲 SafetyNet Config	juration Utility		
File Configuration	B P D b	• •	
	- 🖛 🗛 🖙 🛍	<b>*</b>	
	Maintenance Schedule Stat date [12/20/2006] V Use today's date Warning interval 6 months	E Set Schedule Reset Warning Disable Warning	
		ose 🔓	
To get started 1 - Select 'File(New') 2 - Select 'File(Dpen' 3 - Select 'Configura attached display unit 4 - Select 'Help(Cont program.	rom the main menu to spec from the main menu to ope ion pownload' from the main ents' from the main menu to	ify a new system configura n an existing saved system n menu to retrieve configu read the instruction manu	tion. configuration. ation data from an al for this utility





Figure 12 - Enter password to set the Maintenance Schedule

## 7.5 Set Display Brightness

Configuration Utility Menu	Tools
Advanced Features?	No
Password Required?	Yes



Figure 13 - Select Set Display Brightness

sword	×
Enter password:	
****	
OK Cancel	
	Sword Enter password: XXXXX OK Cancel

Figure 14 - Enter password to change brightness

Set Disp	lay Brightness	×
	Display brightness	
	Level 4 📉 📉	
Set L	Auto-level <sup>V</sup> Level 1 Level 2 Level 3	ose
	Level 4 Level 5 Level 6 Level 7	
main men	Level 8	system cor

Figure 15 - Select brightness level

Set Display Brig	ntness 🔀
Display br	ightness
Level 1	~
Set Level	Close

Figure 16 - Select Set Level to change brightness

## 7.6 Upload Display Text (Advanced Features)

Configuration Utility Menu	Tools
Advanced Features?	Yes
Password Required?	Yes



Figure 17 - Select Upload display text to modify Operator Display text

Enter <u>p</u> asswor	d:	
****		

Figure 18 - Enter password to change the display text

Upload Display Text	×
Display text string file iles (x86)\SafetyNet\MenuStringsEn.txt 👄	
Upload Close	

Figure 19 - Select the Display Text file \*.txt to upload. This example lists English as the chosen text file

## 7.7 Check Firmware Revisions

Configuration Utility Menu	Tools
Advanced Features?	No
Password Required?	Yes



Figure 20 - Select Firmware Revisions to view module firmware revision status

rmware Rev	risions	
Module VFD 1	Part number 220412 220414 220474	Revision 1.640 3.300 2.200
2	220474	5.500

Figure 21 - This lists the module firmware revision levels