SenseNET communications system overview

Introduction

AirSense Technology Ltd made history in 1999 by becoming the first manufacturer of fire alarm products to receive the Queen's Award for Technological Achievement. This award was in recognition of the innovative design of the Stratos-HSSD® detector and the effectiveness and reliability of its Artificial Intelligence system, known as ClassiFire®. Today, AirSense have developed another product that will compound the company's position as leaders in the field of High Sensitivity aspirating Smoke Detection.

SenseNET is a Windows based program that provides central management and monitoring of up to 127 detectors on a fault tolerant communications loop with extensive error checking and correction for the utmost in reliability. For larger sites multiple loops, with up to 127 detectors on each loop, can be used.

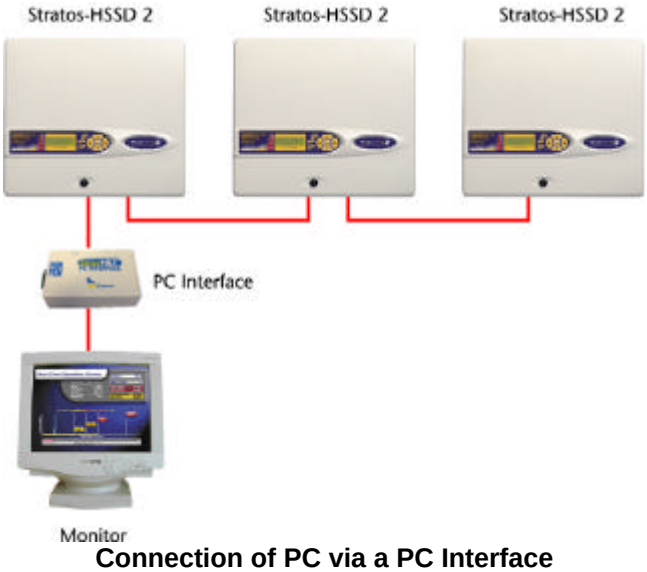
Such is the level of sensitivity of the latest generation Stratos system, the source of smoke within a protected building may not always be immediately obvious. Consequently, the ability of SenseNET to produce site maps, warning sounds, and spoken instruction messages, which may be unique to each detector is highly beneficial. Detectors may also be grouped together in zones with an associated zone map, allowing Alarms or Faults to be quickly and easily located.

The latest object-orientated programming technologies have been used to create the SenseNET system, resulting in a fast, reliable and easy to use programme that has many innovative technologies integrated into its core.

Communications

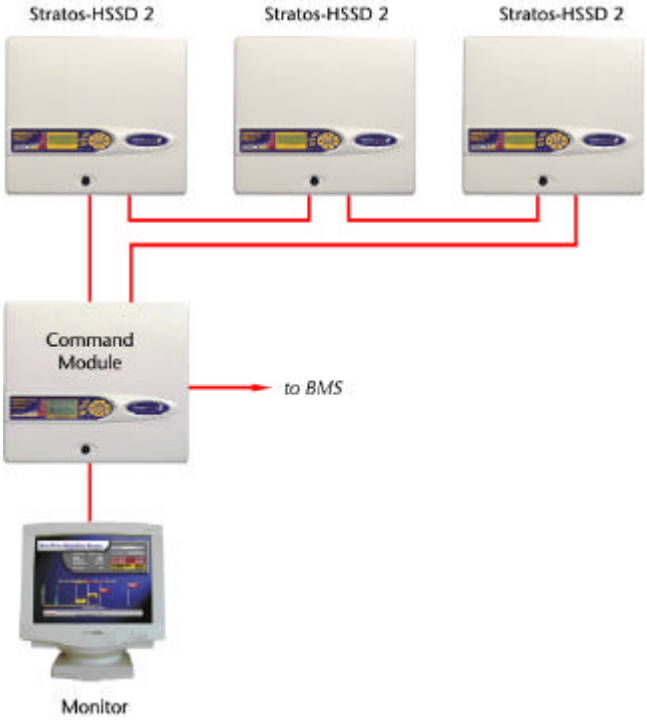
Detector-to-detector communication uses standard RS485, which allows a cable length of up to 1.2 Km to be used between each of 127 detectors. The Stratos detector contains an innovative design of repeater which adds negligible delay to the RS485 signal, unlike conventional RS485 repeaters that will often delay the signal by one byte or character time at each repeater and therefore limit the number of times the signal may be boosted.

Connection of the PC running SenseNET to the detectors can be either through a standard RS232 to RS485 converter called a PC Interface or, if full fault tolerance is required, through a device known as the Command Module. This device monitors the looped communications bus and signals any loop short or break.



Connection of PC via a PC Interface

Any fault on the loop can be isolated by the Command Module to the loop segment that the problem occurs on. SenseNET and the Command Module will display this information. The Command Module also gives Common Alarm and Fault notification for all detectors on the loop so that relay outputs on the Command Module can be connected directly to the Fire Panel if desired.

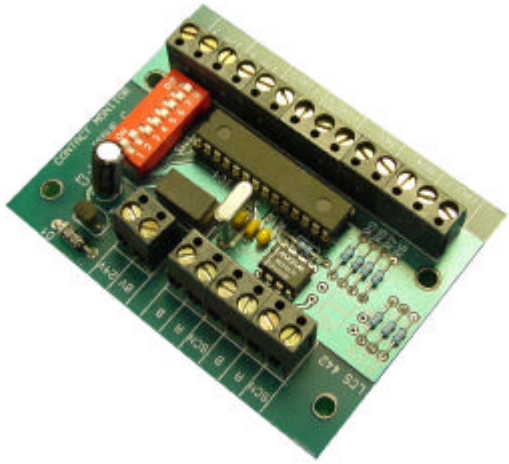


Connection of PC via a Command Module

Other monitoring devices, such as a Building Management System (BMS) connect to the Command Module to monitor system status by decoding the SenseNET messages passed along the bus. Future improvements to the Command Module, which are currently in development with the co-operation of a major supplier of BMS systems, will add support for specific native BMS protocols for true plug and play monitoring.

Field Devices

Monitoring of third party detectors through SenseNET is done using the Contact Monitor. This interface (shown right) allows four Alarm levels, Fault and two additional inputs. The first major installation of SenseNET involved upgrading the world's largest microelectronic manufacturing plant; Samsung in Korea, by adding Stratos-HSSD detectors to an existing installation of aspirating smoke detectors. The existing aspirating detectors being monitored by one Contact Monitor for each detector.



Sometimes a hardware display is demanded in addition to a PC screen. In this instance, Remote Display Units (RDU's, shown left) can be connected at any point on the bus. The RDU is set to a specific detector address and monitors the detector at that address, irrespective of its physical position on the bus. Alarm, Fault and bargraph levels are shown on the front panel of the RDU. RDU's are 19-inch rack mounting units that may be stacked into rows of eight at a time onto a rack. Each RDU has optional relay switching which may be used for a multitude of purposes.

Monitoring

In normal operation SenseNET monitors all connected bus devices (detectors, power supply/chargers, RDU's and Contact Monitors). Any device failing will cause the Alarm/Fault Viewer to be displayed, which will indicate the device address and the nature of the problem. If the PC on which SenseNET is running stops receiving data from the bus, which could happen if the RS232 cable became broken or disconnected, then 'Communications Fail' will be displayed.

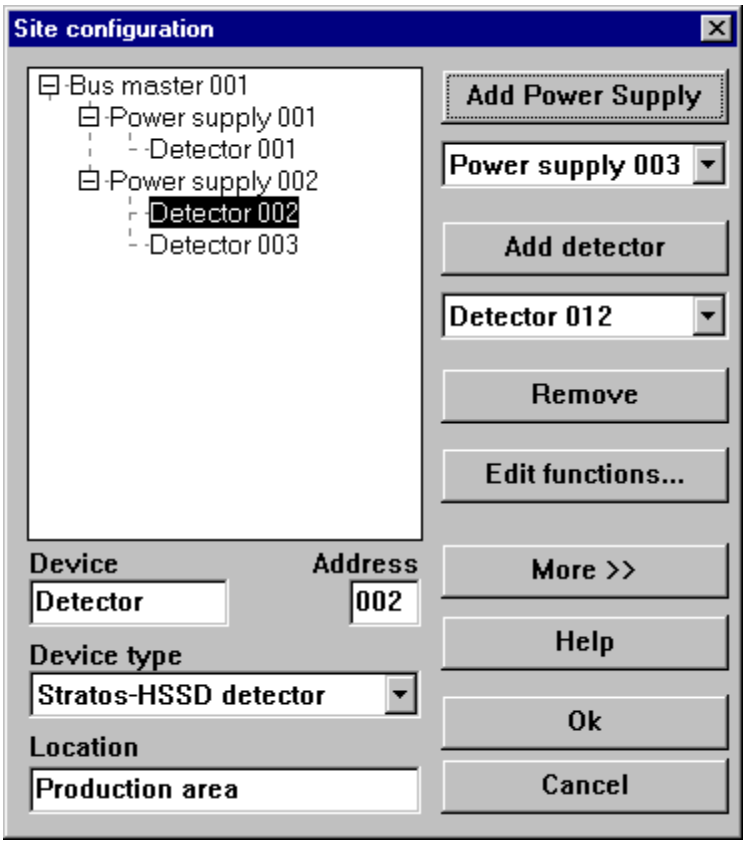
Warning messages when events occur may be sent to a pager or GSM mobile telephone using a modem, or via email if the PC running SenseNET is connected to a network. This allows site personnel to react quickly and specifically to service requests such as failing standby batteries.

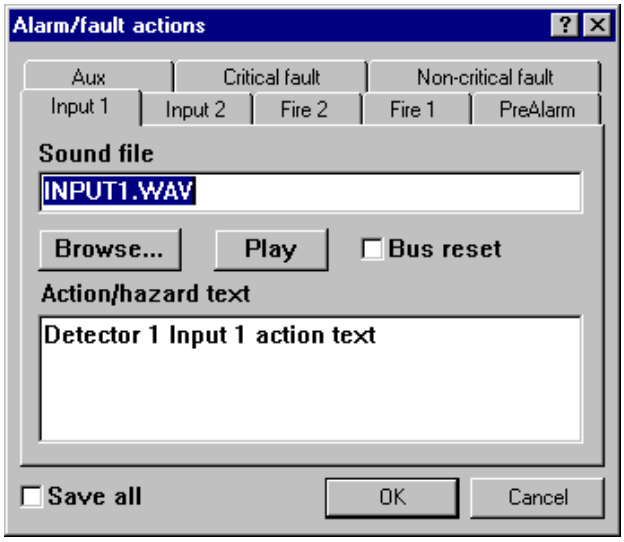
Configuration

One of the problems normally associated with management systems of this type is the amount of configuration needed to set-up the detectors and other bus devices so that they are recognised by the software. SenseNET has an auto-discover mode called SiteScan™ which finds all connected bus devices and reads their configuration settings (which includes information as to the device type) into SenseNET.

For a simple installation this may be all that is required to set-up a site. The site editor, (shown right), has a simplified mode that allows only these functions, minimising complexity.

If more detailed set-up is required selecting the 'More>>' button will cause the advanced functions to become available. Maps may then be allocated for each device and may be grouped together with other devices into zones with an associated zone map.





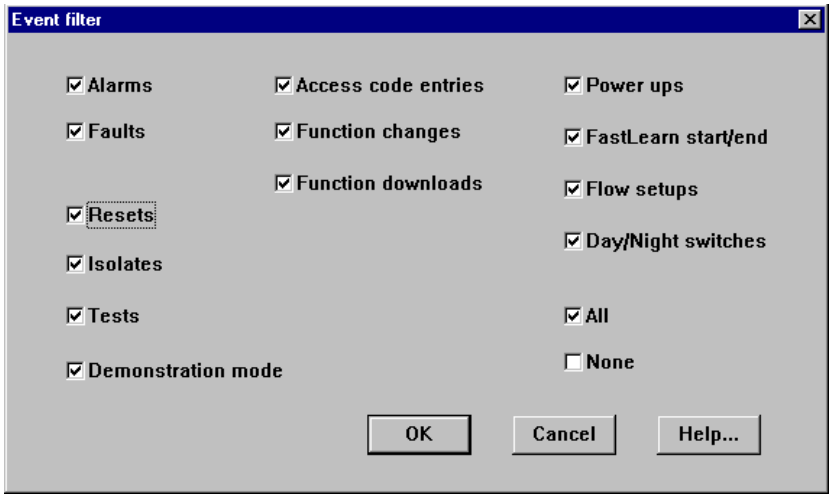
One of the important features of SenseNET is that specific text and/or sound files, such as spoken instructions can be displayed/played on specific events such as an Alarm or Fault. These may be unique to each detector and zone.

Other Features

SenseNET also includes features from the standard Remote Software supplied with every AirSense detector to help commissioning and maintenance.

The detector can be programmed directly from within SenseNET and groups of detectors can be simultaneously set as might be required when, for example, synchronising the time and date held in all detectors. Typical programming settings set the time and date, change alarm levels and control how the detector responds to an alarm threshold being reached.

Event logging on SenseNET is extremely flexible. Generated events are stored in the detectors even when the PC is powered off, or SenseNET is not running. An event log may be read from a detector or group of detectors and a filter applied to the events to show, as an example, all alarms or a certain type of fault only, ensuring that only relevant event information is shown.



Event logs may be saved to disc for later recall or printed at any time. In addition to the storage of events in a detector, SenseNET stores all events to a log file on disc as they occur. The size of this log file is only limited by hard disk space. Also stored in this log are all user inputs that change the state of SenseNET such as changes in access levels or device resets.

All AirSense detectors have extensive built in diagnostic tests to verify the correct operation of the various sections of the unit and these tests may be performed from within SenseNET. All detectors' diagnostics status are listed in the diagnostics viewer screen and the results may be printed out for reference purposes.

ClassiFire®

When used with Stratos detectors, SenseNET has the ability to display the real-time ClassiFire viewer screen that graphically illustrates how the detector continuously sets its alarm levels and scales its smoke density bargraph. The importance of the ClassiFire system cannot be overemphasised. It allows Stratos detectors to automatically set, and MAINTAIN a constant level of performance, irrespective of the condition of particle 'knock-out' devices such as filters, which can often occur with high sensitivity aspirating detectors that have fixed, absolutely scaled alarm thresholds.