The Sentry controller is the heart of the Sentry Gas Risk Management system. It is a microprocessor based system that performs functions including management of the sensor modules, management of alarm relays and interface with the user via the front panel display, printer output, Modbus digital communication, alarm indicators and relay outputs.

Sentry system two-way communication between the sensors and the controller results in the capability to perform one-person calibration and diagnostic checks from the controller. The user-friendly front panel includes a large display of the gas concentration and sensor number. Various scan modes are available to meet the user's specific monitoring needs. A separate 2-line alphanumeric display provides more detailed information including sensor data, error messages and menu prompting for calibration and set-up.

A series of alarm LEDs instantly inform the user of alarm status on any of the eight sensors interfaced to the controller. These LEDs are solid for low alarm and flashing for high alarm. A trouble LED warns that one of 120 diagnostic checks has detected a problem. More information about the trouble will be displayed on the alphanumeric display. A calibrate/change LED indicates that calibration or con-figuration change is being performed on at least one sensor. The remaining sensors will remain on-line providing continuous protection.

The Sentry keypad, together with the user-friendly menu on the alphanumeric display, guides the user through set-up, calibration and maintenance of the Sentry system.
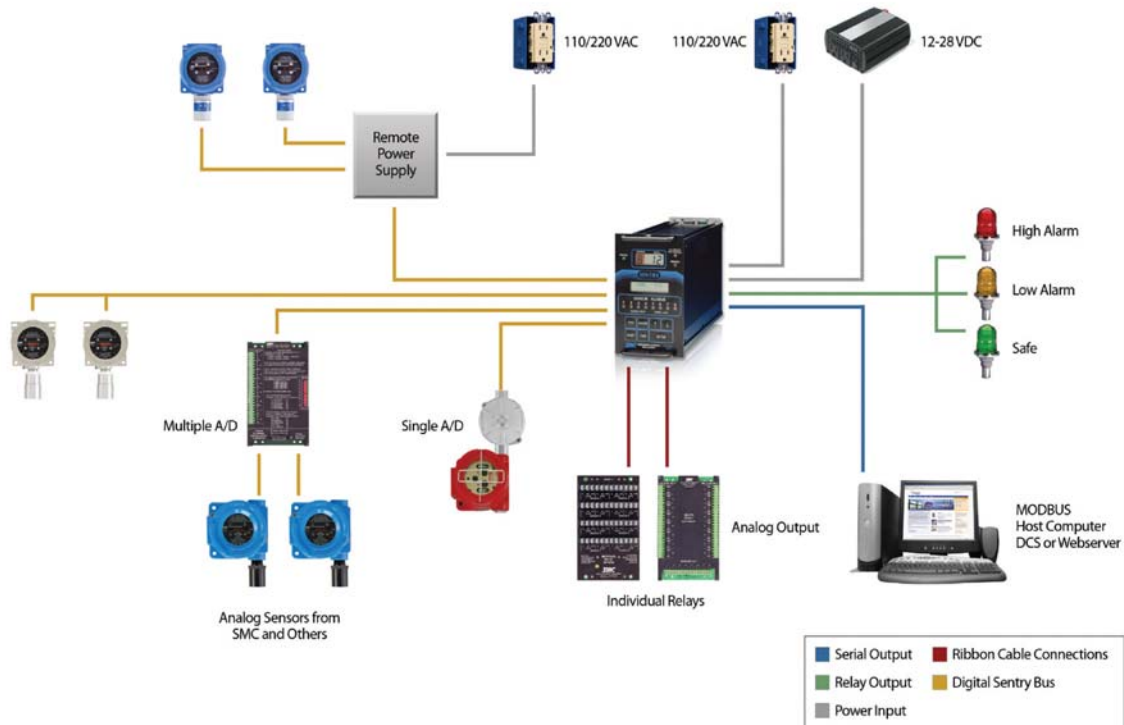
FEATURES AND BENEFITS

Gas Risk Management is the key design philosophy behind SENTRY. The user can employ those features that are most important for a specific application, and, as the application needs grow or change, the system can be reconfigured at the keyboard to satisfy expanded requirements.

Menu Prompting

Menu prompting guides the user through system configuration and operation. Prompting, via the alphanumeric display, keeps the full range of capabilities at the operator's fingertips. When it is necessary to modify the system, prompting will enable the change to be handled quickly and correctly.

> USE ARROWS/ENTER
> HIGH ALARM = 20

System Security

User identification codes prevent unauthorized users from changing the configuration and identify those users who have made changes. Up to eight user codes may be as-

> USE ARROWS/ENTER
> ENTRY CODE = 1234

Diagnostics

An internal self-diagnostic routine makes over 120 checks of operating parameters to ensure the system is performing properly. System performance measurements and key reference voltages can be accessed and presented at the

A TEST function on the front panel allows testing of the alarms, system and display. Warning messages on the alphanumeric display alert users that a condition requires attention without causing a system failure or interruption.

> COMB. % LEL
> FAST ERROR CHECK

During calibration Sentry performs a dynamic range check on every sensor to insure its resolution is sufficient to give an accurate reading. Sentry avoids false alarms by locking out sensor alarms during calibration and not allowing excessive amplification of the signal.

Sensor Scan Display

Current sensor gas exposure readings can be viewed continuously in any one of four scan modes. CONTINUOUS scan displays each sensor in turn.

SAFE scan mode displays CONDITION SAFE and, upon an alarm condition,

> CONDITION
> [SAFE]

switches automatically to display those sensors in alarm. HIGHEST sensor scan will automatically display the sensor recording the highest gas reading - alternately for each gas type. The user can also SELECT SENSOR displays for a sensor of particular interest.

Reduced Installation Costs

Multiplexing of digital signals from the sensors to the controller on a common cable reduces installation cost. Up to eight sensors can be multiplexed on a single cable. Since each sensor has a unique address, the controller can communicate with the sensors in turn. Also, with optional external power supplies to the sensors, two-wire communication with the controller reduces the installation costs and increases the distance allowed between the controller and the sensor modules.
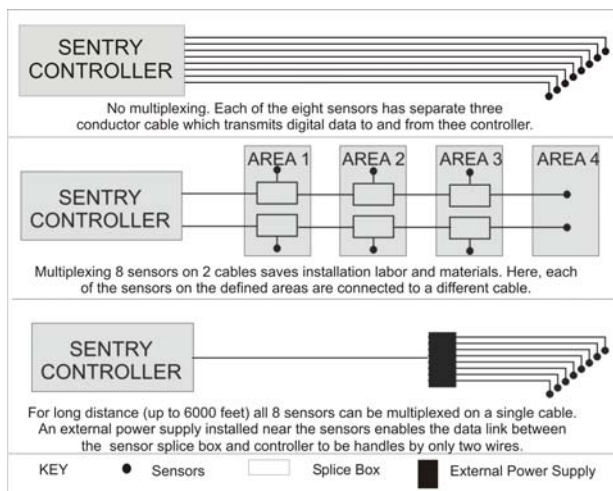
Record Keeping made Easy

Reports can be printed via an optional forty-column printer. There are six types of reports available.

Status Report – a snap–

shot of gas concentrations and alarm conditions that can be pre-set to print hourly, daily, weekly or on demand.

> PRESENT CONFIG.:
> STATUS = 07 DAYS

System Report – lists all

the system parameters including configuration of the software, calibration, printer and sensor modules.

> PRESS ENTER TO:
> [SYSTEM REPORT]

Key Event Report – prints when any sensor module reading exceeds a pre-set threshold level, which may or may not be an alarm level. After the module is above the minimum level, any change greater than a preset, selectable concentration change will cause another Key Event Report to print.

History Report – lists the last time each significant event has occurred. Includes system power interruption, history reset, alarm, concentration and calibration information for each sensor module.

> **USE ARROWS/ENTER**
> **PRINT HISTORY: YES**

Calibration Report – prints automatically when calibration is completed.

Diagnostic Report – lists the critical voltage conditions for each module and can be selected to print periodically.

> **H2S   PPM**
> **DIAGNOSTIC SCAN**

Relay Logic for Customized Response

Standard Relays- the controller has DPDT dry contact relays for low alarm, high alarm, and trouble. Any one sensor can activate the appropriate relay.

Individual Relays – If separate relay action is required for each sensor, then the individual relay option is appropriate. This option provides individual SPDT dry contact relays for each alarm level for all sensor modules.

Custom Configuration Relays – the custom configuration relay option permits decision logic before actuating the relays. Any group of sensors in the same vicinity can actuate the relay designated for that vicinity (zone).

Options to Expand System Flexibility

Battery Back-Up
The battery back-up system provides operating power when AC power drops below 90 VAC. Includes battery, AC line filter, two battery charging modes, and a 12 to 24 VDC converter.

Sensor Modules
Sensor modules available for a wide range of gases;

Combustible Gas*	Sulfur Dioxide
Oxygen*	Nitrogen Dioxide
Hydrogen Sulfide*	Hydrogen Chloride
Carbon Monoxide*	Hydrogen Cyanide
Chlorine*	Ammonia*
Hydrogen	Nitric Oxide
Hydrogen Fluoride	Methane / Propane

* Refer to IT Series Data Sheet

Analog Input
The analog input modules, 5100-90 and 5100-99 enable the user to use any sensing device that produces a 4-20 mA DC signal to communicate with Sentry through an Analog/Digital signal converter.

Output Expansion Module
The output expansion module provides the same capacity as the individual Relay Panel, plus it provides 4-20 mA DC outputs proportional to the concentration for each sensor module.

Software Enhancement Package
The Software Enhancement Package provides the Sentry system with powerful software features by selecting from a menu of factory set options. These features include:
- *MODBUS protocol*
  Provides the MODBUS protocol software to interface with a wide variety of third party software. (Other protocols avalibale)
- *Factory Edit Gas Tags and Module Tag*
  The tags normally selected by the user can be built-in as default tags
- *Enhanced alarm acknowledgment features*
  Provides high and low alarm acknowledgement and an emergency alarm (third alarm) feature

Calibration Systems
Calibration gas can be delivered from a central panel through permanently installed tubing to the sensors. Since Sentry's calibration adjustment is performed in software, it is not necessary to make mechanical adjustments at the sensor. Alternatively individual gas delivery lines can be located near the sensors.

FM APPROVED

REGISTERED
ISO 9001
QUALITY SYSTEM

GENERAL SPECIFICATIONS

Operating

Power (Standard):	120VAC+10%/-15%, 60 Hz
	12 VDC Nom; 10 to 29 VDC
Power (Optional):	*220 VAC +10%-15%, 50 Hz*
	12 VDC Nom; 10 to 29 VDC
Power consumption:	48-Watts nominal
Number of Channels:	2, 4 or 8
Operating Temperature:	32^0 to 122^0 F (0^0 to 50^0 C)
Storage Temperature:	-40^0 to 131^0 F (-40^0 to 55^0 C)
Humidity:	10% to 95% RH
Relays (Standard):	Three DPDT 3A, 115 VAC
(Ind. Relay Option):	16 SPDT 6A, 115 VAC
(Custom Relay Option):	16 SPDT 6A, 115 VAC
(Output Expansion):	16 SPDT 6A, 115 VAC
Analog Outputs:	4-20 mA Current Source
	Loop Resistance 800 Ohms Max.
Displays:	4 digit ½" LCD
	32 character (2x16)
	alphanumeric LCD
RS-232 Port:	Standard Printer
	Option MODBUS

Physical

Dimensions:

Rack Mounted:	7.0" x 4.5" x 12.0" (HxWxD)
	17.5 x 11.2 x 30.0 cm
NEMA 4X Enclosure:	17.5" x 16.2" x 6.3" (HxWxD)
	44.5 x 41.1 x 16.0 cm
NEMA 7 Enclosure:	22.0" x 21.5" x 14.0" (HxWxD)
	55.9 x 54.6 x 35.6 cm

Weight:

Rack Mounted:	7.0 pounds (3.2 kg)
NEMA 4X Enclosure:	25.0 pounds (11.3 kg)
NEMA 7 Enclosure	143.0 pounds (65.0 kg)
Approvals:	FM Approved, CE Mark

Mounting

Rack Mounted:	Shelf for insertion in Instrument Cabinet
Panel Mounted	Panel bracket, bezel
NEMA 4X Enclosure:	Wall or vertical surface
NEMA 7 Enclosure:	Explosion Proof, Class 1, Div I, Group C & D

INSIDE VIEW

EXPLOSION-PROOF SWITCHES

INSTRUMENT RACK

PRINTER

NEMA 4X   **NEMA 7**   **RACK MOUNT**
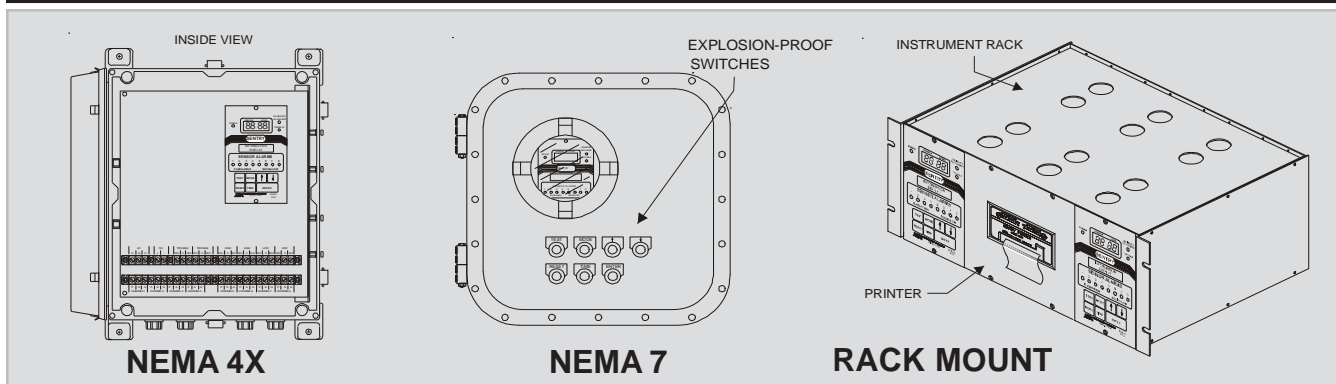
ORDERING INFORMATION

5000-02	Sentry 2-channel Controller*
5000-04	Sentry 4-channel Controller*
5000-08	Sentry 8-channel Controller*
4314-01	Output Expansion Module
5392-00	Individual Relay Panel
5392-01	Custom Configuration Relay Panel
5398-50	Software Enhancement Package
5398-21	Sample Draw System –1 Channel
5398-24	Sample Draw System –4 Channel
5301-XX	Printer Packages
5100-02	Sensor Module – Combustible Gas*
5100-03	Sensor Module – Oxygen*
5100-04	Sensor Module – Carbon Monoxide*
5100-05	Sensor Module – Hydrogen Sulfide*

5100-06	Sensor Module – Chlorine*
5100-07	Sensor Module – Hydrogen
5100-10	Sensor Module – Sulfur Dioxide
5100-12	Sensor Module – Nitrogen Dioxide
5100-16	Sensor Module – CO (H_2 tolerant)
5100-19	Sensor Module – Nitric Oxide
5100-21	Sensor Module – Hydrogen Chloride
5100-22	Sensor Module – Hydrogen Cyanide
5100-25	Sensor Module – Ammonia*
5100-26	Sensor Module – Hydrogen Fluoride
5100-28	Sensor Module – Methane*
5100-90	Analog/Digital Input Module (8-channel)
5100-99	Analog/Digital Input module (1-channel)
* Refer to IT Series Data Sheet	