ECO SENSORS

RAP7800 Remote Alarm Annunciator
Operation Manual
(Revised: January-16-02)

Description   **"Refer to Drawings on pages 3 & 4"**

The **RAP7800** is a remote mount alarm annunciator panel. It has been designed for use with any gas detection system that has an output signal. The primary use is with the Ozone detector model **C-30Z to C-30ZX**, (EE-1 to EE-2 enclosure options). The **RAP7800** provides remote annunciation in the form of a LED digital display, LED indicating lights for "Power" and "Alarm", audible alarm with silence button, red strobe light and 4 - 20 mA analog output signal. It also provides alarm set point control for the 5 amp relay located in the **C30Z.EE1** Ozone detector panel. The following is a complete detailed explanation of the operation and maintenance of the **RAP7800**.

Operations

The **RAP7800** is designed to monitor an Ozone sensor module mounted at a remote location and indicate an alarm when the threshold rises above a preset alarm point such as 0.1 ppm. The unit displays the Ozone level in "ppm", sounds an alert, flashes a strobe and gives an LED alarm indication. A push button is provided to silence the alarm sounder only. The sounder will be re-armed once the level drops below the pre-set threshold.

Master/Slave

The **RAP7800** may be daisy-chained together via the *"Link"* port (JP4) to provide reciprocal alarms between units. This will activate the sounder, strobe, display and LED status on all units if any one unit goes into alarm. The unit reaching alarm condition first will become the *Master* and all others will be *Slaves*. The LED status will flash on the slaves only and remain steady on the master.

The display on all *Slaves* will show the value or level of the *Master*. The flashing LED will indicate the display is reading the *Master* unit alarm status and <u>not it's own alarm status.</u>

The *Master* unit on the system will broadcast alarm status and display information to all other *Slave* units on the system, over-riding any existing display and status settings. The audible silence button may be used to silence each unit separately. Pressing the silence button on the master will silence all the audible alarms on all *Slave* units. The strobe and display will remain active until the *Master* shuts down, once the level drops below the alarm threshold.

The 4 to 20 mA loop output signal will not be altered on the *Slave* units. It will represent the level detected by the local Ozone detector that is directly connected to a specific *Slave* unit. If there is no local Ozone detector connected to a specific *Slave* unit, the 4 - 20 mA output will remain at 4 mA all the time.

The alarm status LED will "flash" on *Slave* units and remain "steady" on the *Master* that caused the alarm condition. A flashing LED means that a remote *Master* unit created an alarm condition and that the *Slave's* display reading is a remote level.

Slaves are held in slave mode by the *Master* sending updates every second. The *Master* is responsible for shutting down all the alarms of the *Slave* units by sending a proper shut-down command. If this is not received by the *Slaves* within 10 seconds, all *Slaves* will shut down and resume normal operation.

Link Details

Units are either in *Slave* or *Master* mode depending on the control level placed on Link input/output JP4. Default is *Master*, pin 1 of JP4 sits normally high. A low from an external source will force the unit to *Slave* mode and ready to receive a communications packet.

Master/Slave Programming Details

Default setting is *Master* mode. In this mode (JP4) is used to output control information to other units on the system. In *Master* mode, and non gas alarm state, each unit monitors (JP4) it's input and processes the incoming signal. The information sent will determine which mode the unit will switch to.

A unit that is in *Slave* mode is constantly looking for an incoming signal from the *Master*. A timeout occurs if there is any interruption in the incoming signal of 10 seconds or longer. After 10 seconds, the *Slave* unit assumes there is no longer an incoming signal and switches back to "default" *Master* mode.

A unit in *Master* mode will generate a serial control signal every second until the local alarm is cleared (when the input level reaches 3 bits below the alarm threshold). This alarm condition will force all other units on the system into *Slave* mode. Once the alarm has cleared, the *Master* will send a shut-down command to place all the *Slaves* on the system back to normal operation (default *Master* mode).

Alarm Acknowledge

The acknowledge button will have a 500ms (milli-second) response delay. When pressed it will silence the audible alarm leaving the strobe flashing and relay energized.

1. Alarm audible will be silenced when *a)* the input level goes 5 counts below threshold or *b)* the silence acknowledge button is pressed or *c)* unit receives shut-down data from a master unit.

2) Alarm audible is reset to activate when level is below alarm threshold, or switches from slave operation to normal operation.

3) Pressing the audible alarm silence button on a unit that is in *Master* mode, will automatically silence audible alarms on all other units on the system which are in Slave mode.

Alarm Threshold

The alarm threshold setting can be set or changed by adjusting the alarm "set point" (RV3) potentiometer located on the far left side of the RAP7800 circuit board. The microprocessor detects when this potentiometer is being adjusted and automatically displays the changes in alarm set point, as it is being adjusted. Once the desired alarm level, in ppm, has been achieved and adjustment of this potentiometer has stopped for longer than 4 seconds, the microprocessor automatically switches to displaying the incoming signal from either a local Ozone detector or another RAP7800 that has assumed *Master* mode. Maximum alarm threshold setting is ".450 ppm".

Display Reading

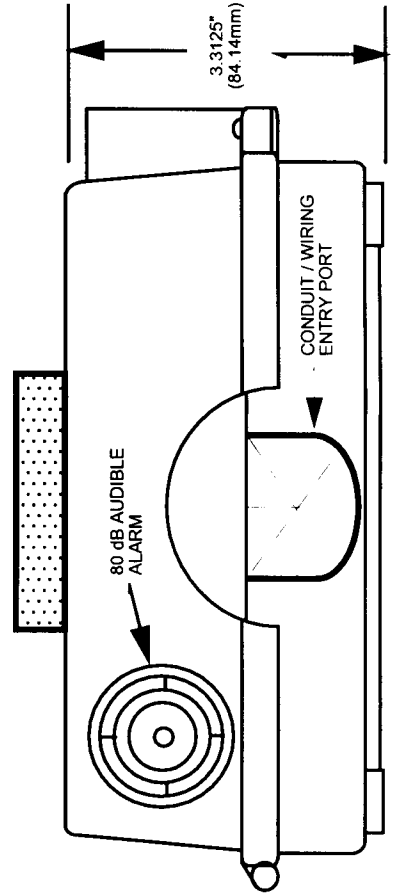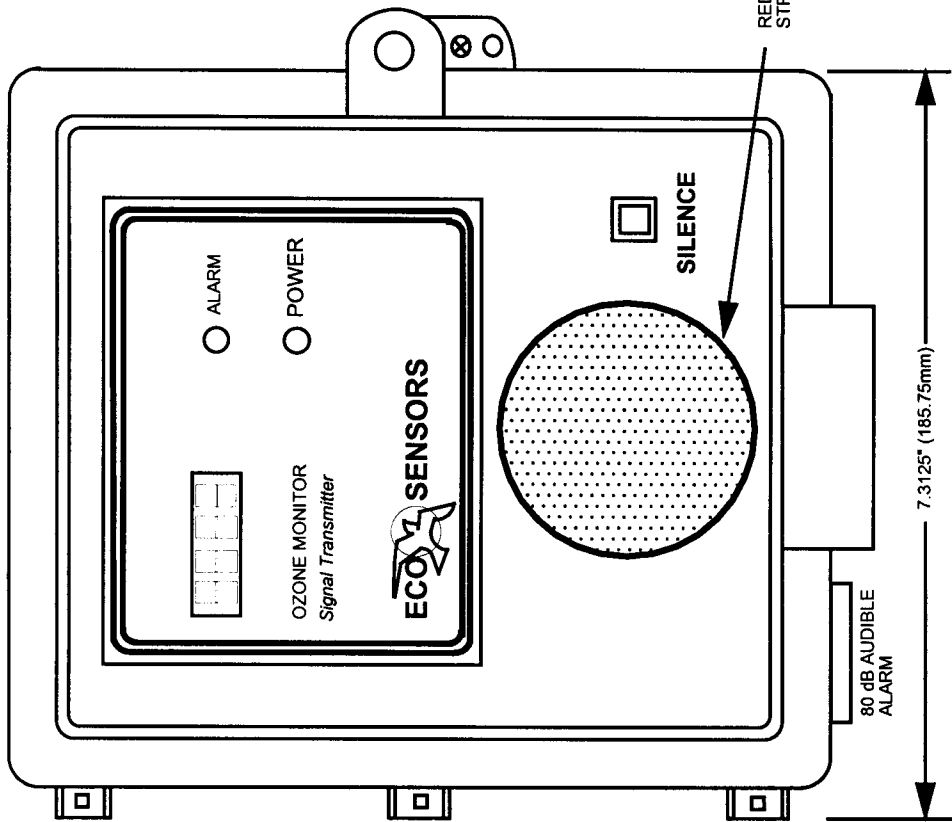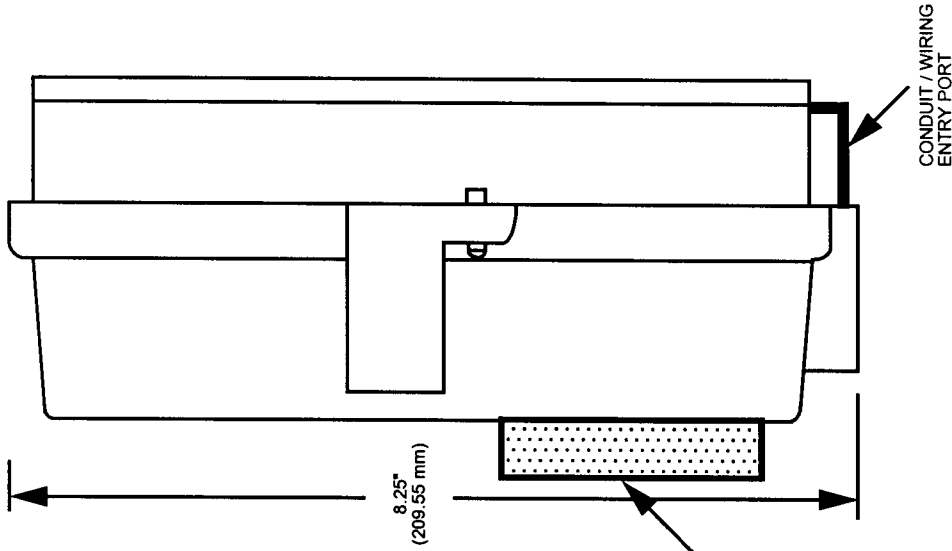The digital display indicates readings in ppm with a fixed decimal point (three digits after decimal). The maximum display count possible is ".999".
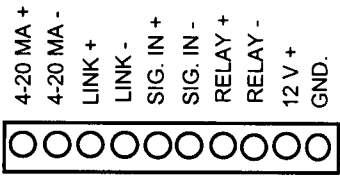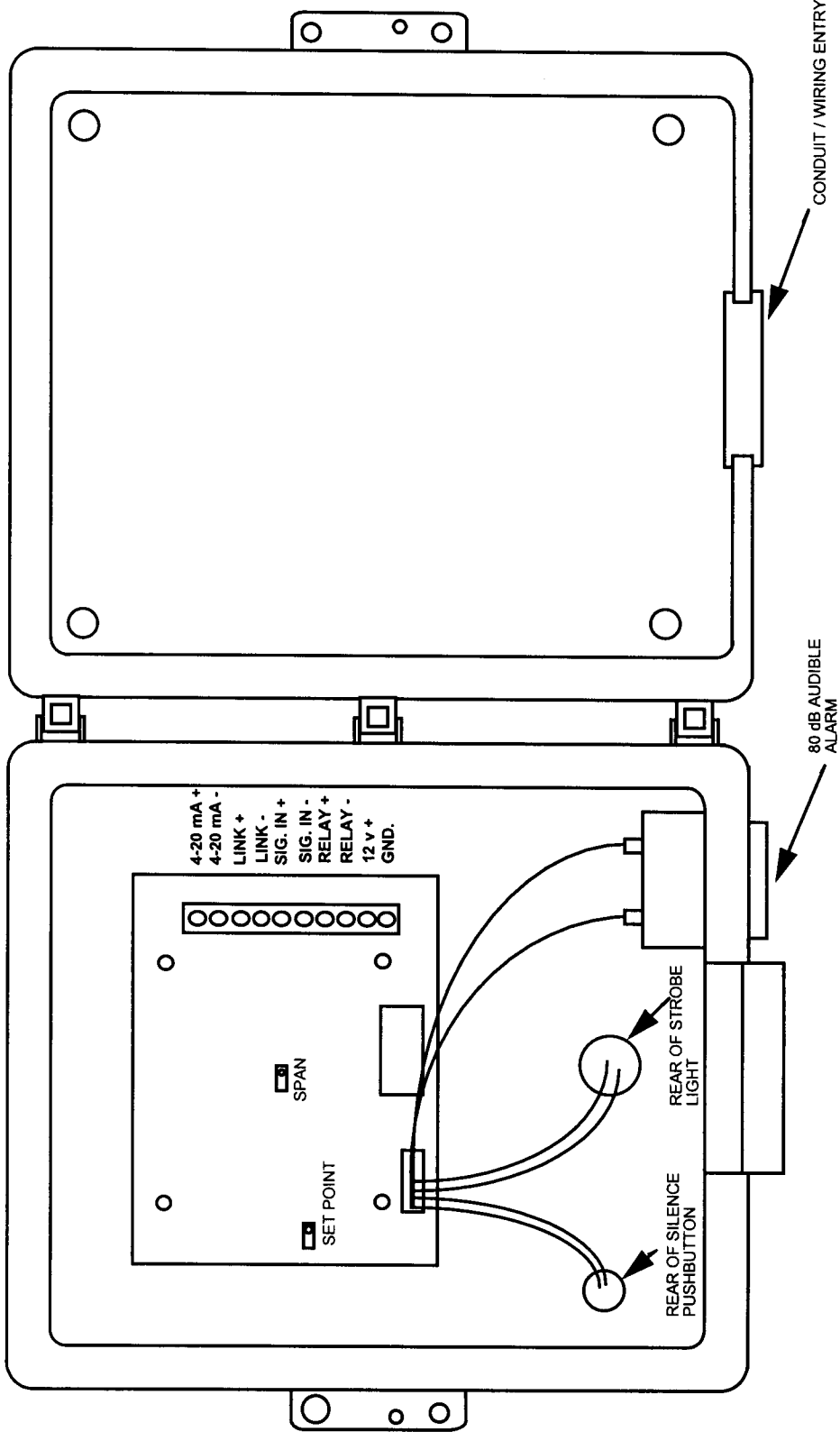
4 - 20ma Current Loop

A 16 bit DAC converts the input signal data to a current output for transmission to remote monitoring equipment such as a Building Automation System. The 4 - 20 mA linear output signal represents a range of 0 ppm (4.0 mA) to .400 ppm (20.0 mA).

Calibration

RAP7800 alarm panels are factory calibrated and do not require field adjustment unless the C-30Z or C-30ZX Ozone detector is field calibrated. To achieve calibration, first run a jumper wire from "PWR-" to "SIG-" then introduce a 1.0 VDC source across the "SIG- & +". Adjust the "SPAN" (RV1) potentiometer until the display reads ".100 ppm". Remove jumper and 1.0 VDC source. Calibration is complete.

CONDUIT / WIRING
ENTRY PORT

8.25"
(209.55 mm)

RED ALARM
STROBE LIGHT

ALARM

POWER

OZONE MONITOR
Signal Transmitter

ECO SENSORS

SILENCE

80 dB AUDIBLE
ALARM

7.3125" (185.75mm)

3.3125"
(84.14mm)

80 dB AUDIBLE
ALARM

CONDUIT / WIRING
ENTRY PORT

ECO SENSORS
www.ecosensors.com

TITLE: REMOTE ALARM ANNUNCIATOR PANEL
RAP7800 ENCLOSURE DIMENSIONS

DRAWING NUMBER: RAP001		REV: F
SHEET: 1 OF 1		
DATE: JAN-16-02		ENGINEER: R.B. & F.A.
DRAWN BY: F .B.		

CONDUIT / WIRING ENTRY PORT

80 dB AUDIBLE ALARM

4-20 mA +
4-20 mA -
LINK +
LINK -
SIG. IN +
SIG. IN -
RELAY +
RELAY -
12 V +
GND.

SPAN

SET POINT

REAR OF STROBE LIGHT

REAR OF SILENCE PUSHBUTTON

4-20 MA +
4-20 MA -
LINK +
LINK -
SIG. IN +
SIG. IN -
RELAY +
RELAY -
12 V +
GND.

WIRING CONNECTIONS FOR TERMINAL STRIP ON CIRCUIT BOARD

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TITLE: REMOTE ALARM ANNUNCIATOR PANEL
RAP7800 ENCLOSURE INTERIOR LAYOUT

DRAWING NUMBER: RAP002 | REV: E

DATE: MAR-22-99 | SHEET: 1 OF 1

DRAWN BY: F.B. | ENGINEERS: R.B. & F.A.