SHERLOCK
204/404/804 CONTROL

Operations Manual
Part # 44-0219

GENESIS INTERNATIONAL INC.

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THE SHERLOCK REFRIGERANT GAS MONITOR

The American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc Standard *ANSI/ASHRAE 15-1994 Safety Code for Mechanical Refrigeration* states:

> 8.13.2 Each machinery room shall contain a detector, located in an area where refrigerant from a leak will concentrate, which shall activate an alarm and mechanical ventilation ....

The International Conference of Building Official *Uniform Mechanical Code, 1997* states:

> **SECTION 1120 - DETECTION AND ALARM SYSTEM**
>
> 1120.1 General. ...Refrigerant vapor alarms shall be activated whenever the refrigerant vapor Permissible Exposure Limit (PEL) is exceeded. In other than machinery rooms, such systems shall also automatically stop the flow of refrigerant to evaporators within the space and stop the flow of refrigerant in all supply lines leaving the machinery room whenever the refrigerant vapor concentration is detected at or above 50 percent of the IDLH [Immediately Dangerous to Life or Health] or 25 percent of the lower explosive limit (LEL).

The ***SHERLOCK*** 204, 404, and 804 Refrigerant Gas Monitor was designed to meet these and other requirements.

Monitoring Panel

The ***SHERLOCK*** 204, 404, and 804 Control Module is an ETL listed, hardwired, electronic control panel that is capable of monitoring the analog output signal of up to eight ***SHERLOCK*** Refrigerant Gas Sensor or ***SHERLOCK*** Oxygen Depletion Sensors and four digital dry-contact switches. The Control Module can activate eight, with an optional additional four, eight, or sixteen Form C SPDT relay contacts based upon the programmed alarm level setpoint levels of each sensor. The ***SHERLOCK*** Control Module has an optional 0-10VDC/ 4-20ma Output Signal Generator for DDC monitoring applications. The Control Module can be located in the area to be monitored, or in a seperate location, typically outside of the monitored room.

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ETL Listed
Conforms To UL Std. 3111-1
Certified To CAN/CSA
C22.2 Std. No. 1010.1

9800995 **44-00-0313**

Monitoring Points

Each monitoring point consists of an analog signal generating sensor connected to the control module via discrete, three conductor cable. Each sensor can be mounted up to 800 feet (longer run with special cable) away in locations where leaked refrigerant is likely to concentrate.

The gas sensors are available in three varieties:

Ceramic Metal Oxide Semiconductor (CMOS) or Solid State Sensor
Non-Dispersive, Pyro-Electric Infrared Sensor.
Oxygen Depletion Electro-chemical Sensor.

CMOS or Solid State Sensor

The ***SHERLOCK*** CMOS (Solid State) Sensor utilizes a Tin -Oxide filiment, heated to 400°F, to detect the presence of oxygen molecules within the air. At this temperature, Oxygen molecules cling to the filament. When a molecule of an organic compound or a halogen strikes the filament, it displaces an oxygen molecule thus increaseing the resistive value of the filament. This change in resistance is processed by the sensor circuitry to produce an analog output signal, which sent to the Control Module as the sensor reading.

Sensors are available in configurations that detect refrigerant gases by class; CFC/HCFC - HCF and Ammonia.

These sensors produce a non-linear output signal that generally corresponds to the concentration of refrigerant in the air.

NOTE: These sensors, due to their nature, are susceptible to detection of non-refrigerant gases and cannot distinguish the presence of different refrigerant gases, only that there is a gas present.

Infrared Sensor

The ***SHERLOCK*** Non-Dispersive, Pyro-Electric Infrared Sensor utilizes a detection chamber with an infrared light emmiter and an infrared Pyro-Electric photo sensor with a filtering lens. The IR sensor will detect the presence of a certain gas by measuring the change in the intensity of light measured by the photo sensor. Each sensor is designed to detect only infrared light of a specific wavelength corresponding to the refrigerant gas to be monitored. This change in light intensity is processed by the sensor circuitry to produce an analog output signal, which sent to the Control Module as the sensor reading.

Sensors are available in specific configurations that detect certain refrigerant gases. Check with Genesis International for a current list a available gas sensors.

These sensors produce a linear output signal that corresponds to the concentration of refrigerant in the air. The Control Module will translate the analog signal and display the readings in Parts per Million values.

Oxygen Depletion Sensor

The ***SHERLOCK*** Oxygen Depletion Electro-chemical Sensor utilizes a chemical cell to determine the concentration of oxygen in the air. The chemical cell produces small chemical reaction with oxygen molecules, thus producing a voltage drop across the cell. When the concentration of oxygen changes, the voltage drop across the cell changes. This change in voltage is processed by the sensor circuitry to produce an analog output signal, which sent to the Control Module as the sensor reading.

Alarm Level Settings

The ***SHERLOCK*** *4-Series* allows you to set three unique **Alarm Setpoints** for each individual sensor throughout their operating range. When an **Alarm Setpoint** is exceeded, a corresponding set of alarm relays are activated Each **Alarm Setpoin**t has a programable **Alarm Delay,** 1 to 120 minutes. Sensor readings are required to exceed an Alarm Setpoint for the programmed amount of time before the control activates the corresponding alarm relay contacts. For example, if the **Alarm Setpoint** is 200 and the **Alarm Delay** is five minutes, the control will enter an alarm condition only if the sensor detects a level of 200 or higher for more than five minutes.

Alarm level #1 and Alarm Level #2 on every sensor has the option of using the Time Weighted Average (TWA) reading as the input reading. Time Weighted Average reading of a sensor is the average reading of a sensor input over a period of time.

Alarm Indication

All alarms are logged to indicate which sensor went in and out of any of the three alarm levels, the time and date of the alarm. The alarm log stores the last 32 alarms. When a sensor is in alarm, an LED on the front panel will turn to red color, the onboard beeper will be beeping and the display will go into “IN ALARM” screen every five seconds. The individual sensor causing the alarm also displays the “ALARM” message.

Alarm Relay Contacts

The SHERLOCK *4-Series* provides two fused SPDT (Single Pole Double Throw) relay outputs for each alarm level that switch positions in the event of an alarm condition. The ‘B’ relay for each alarm level can be temporarily or permanently silenced by pushing the respective alarm silence button on the front panel. The relay will re-activate after a programmed period of time, if the alarm condition is not cleared. The ‘A’ relay will remain active until the alarm condition is cleared. The SHERLOCK *4-Series* can be programmed so that the alarm is cleared automatically when the refrigerant level is below the alarm setpoint (UNLATCHED) It can also be programmed so the alarm is latched “ON” until the alarm is manually reset. Each alarm level can be configured so the relays are "Energized to Alarm" (where the C-NC contacts open on alarm) or "De-Energized to Alarm" (where the relay is energized during normal operations and the C-NC contacts close on alarm).

Analog Signal Generator

The SHERLOCK *4-Series has* two sets of relay output contacts on each alarm level and also an optional 0-5 V / 0-10 V / 4-20 mA analog output for each sensor. Either of these signals can be incorporated to any commercially used monitoring and alarming system or in-house Data Management System.

Systems Fault Monitoring

The SHERLOCK *4-Series* constantly monitors the wiring to the sensors. Should any of the activated sensor wires be cut or disconnected, “OPEN” will appear on the SHERLOCK display, the alarm #1 and system alarm are activated and the condition is logged. In addition to the three alarm levels the SHERLOCK *4-Series* is also equipped with a SYSTEM FAULT ALARM. This alarm is triggered when the system malfunctions (i.e. The sensor wire is cut or inter-connect cable is cut).

Setback Alarm Settings

In some locations the sensor may be expected to function in two different environments. For example, the sensor may have to perform in still air (i.e. with the exhaust fan off) and in moving air (i.e. with the exhaust fan on), or the sensor may be used in a location where changes in air quality, perhaps caused by the use of propane powered floor buffers, elevates the sensor readings. The SHERLOCK *4-Series* provides a feature called SETBACK to accommodate alternate environments under which the sensor would operate. SETBACK provides a second ALARM SETPOINT and a second ALARM DELAY enabling the sensor to perform in this second environment. The SHERLOCK *4-Series* switches to the second set of parameters when a dry contact (i.e. air flow, sail switch or timer) closes or on a daily time schedule.

Each sensor can be programmed with one of five SETBACK options:

1) No SETBACK
2) SETBACK triggered by setback input 1 only
3) SETBACK triggered by setback input 2 only
4) SETBACK triggered by setback input 1 or the setback time clock
5) SETBACK triggered by the setback time clock only

Each sensor can be programmed with only one SETBACK option; however, different sensors may be programmed to follow different options.

Genesis International Inc. offers a variety of external alarms for office use - the Remote Alarm, the Remote Alarm & Strobe, as well as for mechanical room use - a Strobe Light and a combination Horn / Strobe.

SHERLOCK 204/404/804 CONTROL MODULE

NEMA 1 TYPE ENCLOSURE

NEMA 4X / IP-67 ENCLOSURE

LISTINGS ETL, Conforms to UL Std. 3111-1
Certified to CAN/CSA
C22.2 Std. No. 1010.1

Model#	Nema/IP Rating	Size Inches (mm)	Electrical Category	Pollution Protection
204	1	12x14x7(305x356x178)	II	2
204-4	4x/Ip67	12.3x15x8.2(312x381x208)	II	3
404	1	12x14x7(305x356x178)	II	2
404-4	4x/Ip67	12.3x15x8.2(312x381x208)	II	3
804	1	12x14x7(305x356x178)	II	2
804-4	4x/Ip67	12.3x15x8.2(312x381x208)	II	3

OVERVIEW

The SHERLOCK 4-Series is compliant with ASHRAE 15-1994 and the UNIFORM MECHANICAL CODE requirements for refrigerant gas monitoring.

NEMA 1 Compliant Enclosure - This enclosure is intended for indoor use only primarily to provide a degree of protection against contact with the enclosed equipment. The enclosure is not designed to provide protection from water or to be placed in a hazardous environment. Mount only in Pollution Level 2 environments, ie. environmentally controlled offices, control rooms, or environmentally controlled machine rooms.

NEMA 4X Enclosure - This enclosure is intended for either indoor or outdoor use, 0 to 50 °C, to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water.

POWER 100 to 240vac, 50/60 hz, 2.5 Amps

INPUTS Up to 8 ***SHERLOCK*** sensors *Cmos, IR, Oxygen*
Four dry contacts
2 Setbacks, Alarm Silence, Alarm Clear

OUTPUTS Eight SPDT, 1 Form C, 250Vac, 3.15Amp relays
Optional4-20Ma/0-10Vdc signal
Optional Auxilliary (Zone cutoff) relays

ALARMS System fault (2 relays)
Three alarm levels (2 Relays per level)

DISPLAY 4 lines by 20 characters
Alphanumeric LCD with back light

KEYPAD 8 tactile pushbuttons
Scroll up Scroll down Select/Edit/Change
Exit function-menu Alarm level silence

ALARM INDICATORS

LCD Name, description, and current reading of alarming sensor

STROBE Built-in, blue, 60-90 fpm, 100,000 candle power (Stays on for duration of alarm condition)

BUZZER piezo-electric, 90db @10ft (3.05M), silenceable

STATUS LED Four on front panel of control. Indicates alarm level status
Red-active
Amber-silenced
No light--not in alarm

COMPONENTS

FACTORY INSTALLED OPTIONS

Analog Output Board

SHERLOCK *4-Series* has an optional 0-5V DC / 0-10V DC / 4-20 mA analog output for each sensor. Either of these signals can be incorporated to any commercially used monitoring and alarming system or in-house Data Management System.

Part #88-0167 for SHERLOCK 204 and 404
Part #88-0168 for SHERLOCK 804:

This option can be factory installed inside the housing before shipment or can be installed in the field.

Auxiliary Relay Board

The relays on this board option will be turned on when their corresponding sensors are in alarm condition. 2 relays for each sensor with 1 being silenceable. One example of using these outputs is to cut off refrigerant flow to piping in troubled sensing areas while leaving unaffected areas alone and able to continue operating. This option is factory installed and tested prior to shipment.

Part #88-0313 for SHERLOCK 204.
Part #88-0314 for SHERLOCK 404.
Part #88-0166 for SHERLOCK 804

SENSORS

(See manuals 44-0221 IR Sensor and 44-0295 NH_3 & R-123 IR Sensor for more information)

WARNING!!!! The infrared sensor is not to be applied into all refrigerated storage applications where other toxic gases are used in the same room. Some installations are not suitable for Infrared technology. Misapplication may result in damage to sensor. Contact the factory for a specific list of approved applications.

***SHERLOCK* IR REFRIGERANT GAS SENSOR** was designed to detect for the presence of certain refrigerant gases within an enclosed space. The sensor is mounted within the space to be monitored and connected by cable to the monitoring device. Each sensor is calibrated to monitor for a specific refrigerant gas. There are three models of IR sensor for each gas depending upon the monitoring environments: machine room (NEMA 1), water-tight (NEMA 3R), and low temperature refrigerated applications (NEMA 3R-Low Temp).

The IR Sensor is a reliable method of monitoring for refrigerant gas leaks in environments that have air quality problems. The IR sensor will eliminate many false alarms in environments that contain gasoline, diesel, and propane exhaust and fumes from solvents, paints, cleansers, and others.

ENCLOSURE RATING (Short chamber for refrigerants, and Long chamber for **R123** and **NH_3**)

DIMENSIONS Inches (mm)

NEMA1 SHORT	8.13 x 4.38 x 2.5 (207 x 111 x 64)
NEMA 3R SHORT	8.25 x 4.75 x 2.5 (210 x 120 x 64)
NEMA 3R LONG	12.75 x 5.0 x 2.75 (324 x 127 x 70)

POWER INPUT 12VDC, 250 mAMPs

OUTPUTS 0 to 5 VDC

EFFECTIVE RANGE 0 to 1000 ppm

SENSITIVITY ±1 ppm at 25 ° C, 45% RH

RESOLUTION 1 ppm

AVAILABLE GAS SENSORS

R11 R12 R22 R114 R123 R134A
R401A(MP39) R401B(MP62) R402A(HP 80)
R404A (HP62) R408A(HP62) R409A(FX56)
R500 R502 R507A(AZ50) R717 (AMMONIA)
Call factory for list of additional refrigerants

OPERATING ENVIRONMENT

TEMPERATURE

Standard Model	30 to 120°F (8 TO 50°C)
Low Temp Model	-30 to 45°F (-35 to 8°C)

HUMIDITY 0 TO 95% RH NON-CONDENSING

CALIBRATION Every 6 Months

WARM-UP TIME Readings will stabilize after 2 hours.

Infrared Sensor Component Description & Use.

See IR Sensor Manual 44-0221 for more.

Dip Switch - Switches 1 to 8 are set to off at the factory. This is the standard dip switch setting for normal operation Switches 7 and 8 are temperature and application dependent. ***Switches 1, 2, and 3*** - Switches 1, 2, and 3 are for communications port addressing.

Switch 4 - Switch 4 is for auto long term offset compensation. It will re calibrate up to 10 ppm every 7 days. No more than 100 ppm between manual calibrations. Disable for low level detection.

On Offset Compensation	SW4 = **OFF**
Disabled	SW4 = **ON**

Switch 5 - Switch 5 is for field testing at a set level.

Normal	SW5 = **OFF**
Fixed 200 ppm output	SW5 = **ON**

Switch 6 - Switch 6 is for factory calibration.

Normal	SW6 = **OFF**
Default Factory setting	SW6 = **ON**

Switch 7 - Switch 7 is used to tell the microprocessor on board the sensor whether the sensor will be operation in a Room Temperature (32°F to 120°F) application or in a Cold Temperature (-40°F to 32°F).

Room Temperature	SW7 = **OFF**
Cold Temperature	SW7 = **ON**

Switch 8 - Switch 8 is used to tell the microprocessor on board whether the sensor will be utilized as a Sherlock/Wizard control system sensor or a stand-alone sensor. Used in conjunction with Switch J6.

Sherlock/Wizard	SW8 = **OFF**
Standalone (4-20mA)	SW8 = **ON**

Jumper J5 - Jumper J5 is a two pin header located near the microprocessor (Square Chip). This header is used to reset or restart the processor. There is a 5 Minute warm up 0 ppm reading period for a Machine room sensor and a 10 minute warm up restart for a Cold room sensor.

Switch J6 - Switch J6 is used to configure the sensor to be used as a Sherlock/Wizard control system sensor or as a stand-alone 4-20mA Analog Output sensor.

Switch J6 position 1-2	4-20mA Stand-Alone Sensor applications
Switch J6 position 2-3	All Sherlock or Wizard applications

Push button - Located just above the DIP Switch. It is used for offset calibration. See IR Sensor Manual 44-0221 for more.

Potentiometers. The Sherlock IR Sensor contains seven (7) potentiometers labeled POT 1 through POT 7. Potentiometers are utilized during factory calibration and testing and should not be adjusted unless instructed to do so by a factory authorized service technician or engineer.

Light Emitting Diodes

LED L1 - LED L1 will indicate if the sensor microprocessor is operating and if the sensor is operating in the correct temperature environment. When the microprocessor goes through start-up, it will turn on L1 and keep it on unless the microprocessor detects incorrect temperature range.

Status	Condition
Off	Sensor is not powered up. Microprocessor detects an error in the sensor hardware. Microprocessor Failure
ON Steady	Sensor is operating properly and is operating in correct temperature range.
ON Flashing	Temperature range is incorrect. Sensor is set for Room Temp and the sensor chamber temperature is below 32°F or the sensor is set for Cold Temp and the ambient temp is above 32°F.

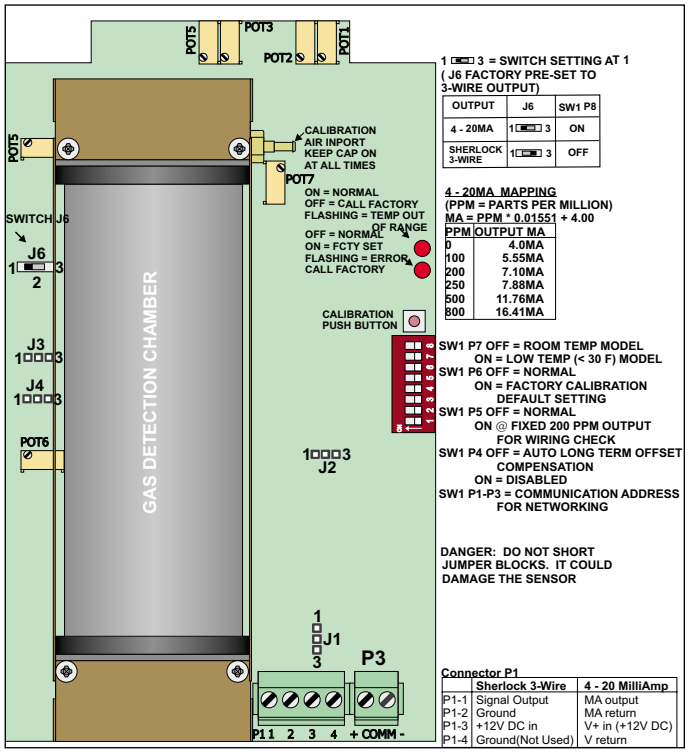
LED L2 - LED L2 is used for zero calibration

Status	Condition
Off	Normal operation
ON Steady	Factory Calibrated Setting.
ON Flashing	Microprocessor error. Call factory.

Operating Range.

The IR Sensor has an effective range of 0 to 1000 ppm.

0 to 0.3 VDC	-	Sensor Malfunction
0.5 VDC	-	0 ppm
5 VDC	-	1000 ppm

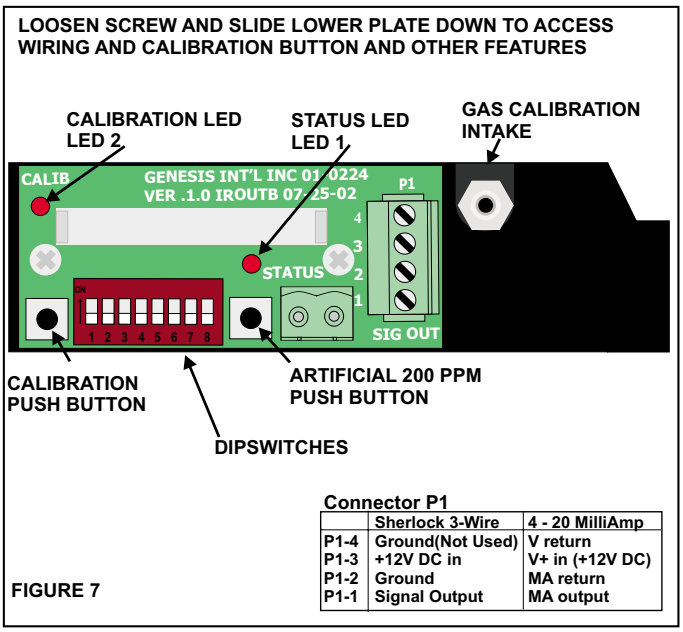


LED L2 - LED L2 is

Status	Condition
Off	Normal operation
ON Steady	Factory Calibrated Setting
ON Flashing	Microprocessor error. Call Factory.

Large Housing Components Description and Use. (Please see 44-0295 Infrared sensor Manual for more information on the Large Housing IR for R-123 & NH3)

Dip Switch -- Switches 1 to 8 are set to off at the factory. This is the standard dip switch setting for normal operation



Connector P1

	Sherlock 3-Wire	4 - 20 MilliAmp
P1-4	Ground(Not Used)	V return
P1-3	+12V DC in	V+ in (+12V DC)
P1-2	Ground	MA return
P1-1	Signal Output	MA output

FIGURE 7

Switches 1, 2, and 3 - Switches 1, 2, and 3 are for communications port addressing.

Switch 4 - Switch 4 is for auto long term zero compensation. It will recalibrate up to 10 ppm every 7 days. No more than 100 ppm between manual calibrations. Disable for low level detection.

On zero Compensation	SW4 = **OFF**
Disabled	SW4 = **ON**

Switch 5 - Switch 5 is for field testing at a set level.

Normal	SW5 = **OFF**
Fixed 200 ppm output	SW5 = **ON**

Switch 6 - Switch 6 is for factory calibration.

Normal	SW6 = **OFF**
Default Factory setting	SW6 = **ON**

Switch 7 - Switch 7 is used to tell the microprocessor on board whether the sensor will be utilized as a Sherlock/Wizard control system sensor or a stand-alone sensor.

Sherlock/Wizard	SW7 = **OFF**
Standalone (4-20mA)	SW7 = **ON**

Switch 8 - Switch 8 is not used

Push buttons - Located just on either side of the DIP Switch.

Push button 1 It is used for testing the sensor with a 200 ppm false signal. Dipswitch 5 can be used for the same function.

Push button 2 It is used for sensor calibration and is used in conjunction with LED 2

Light Emitting Diodes

LED L1 - LED L1 will indicate if the sensor microprocessor is operating and if the sensor if the sensor is in test mode. When the microprocessor goes through start-up, it will turn on L1 and keep it on unless switch 5 is on or pushbutton 1 is depressed.

Status	Condition
Off	Sensor is not powered up. Microprocessor detects an error in the sensor hardware. Microprocessor Failure
ON Steady	Sensor is operating properly.
ON Flashing	Switch 5 is set to on or pushbutton 1 is depressed or microprocessor error.

LED L2 - LED L2 is used for zero calibration. When pushbutton 2 is pressed, LED 2 will light after 8 seconds and turn off once the button is released.

Status	Condition
Off	Normal operation
ON Steady	Factory Calibrated Setting. Turn switch 6 off
ON Flashing	Microprocessor error. Call factory.

Potentiometers. The Sherlock IR Sensor contains seven (7) potentiometers labeled POT 1 through POT 7. Potentiometers are utilized during factory calibration and testing and should not be adjusted unless instructed to do so by a factory authorized service technician or engineer.

They are located inside the main part of the housing and there should be no need to open the sensor. It is not recommended to do so as this could void the warranty.

GENERAL

(See manual 44-0283 CMOS Sensor for more) SHERLOCK CERAMIC METAL OXIDE SEMICONDUCTOR REFRIGERANT GAS SENSOR was designed to detect for the presence of a refrigerant gas within an enclosed space. The sensor is mounted within the space to be monitored and connected by cable to the monitoring device. Each sensor is calibrated to a clean air base zero level at the factory prior to shipment. There are three models of the CMOS sensor, one for CFC/HCFC gases, one for HFC gases and one for Ammonia. The CMOS Sensor should be utilized as a signal source for a SHERLOCK REFRIGERANT GAS MONITORING SYSTEM.

APPLICATIONS

Typical applications include:

- HVAC Chiller Equipment Rooms
- Refrigeration Mechanical Rooms
- Refrigerated Rooms
- Wineries
- Bakeries
- Food Processing Plants

SPECIFICATIONS

ENCLOSURE RATING	NEMA1 4.3in x 2.4in x 1.2in
POWER INPUT	12VDC, 250 mAMPs
OUTPUT	0 to 5 VDC
DETECTION RANGE	30 to 1000 ppm Control and Refrigerant Gas Type Dependent
SENSITIVITY	+- 10% of reading
AVAILABLE GAS SENSORS	CFC/HCFC HFC Ammonia
OPERATING ENVIRONMENT	
TEMPERATURE	-25 to 120° F
HUMIDITY	0 TO 85% RH Non-Condensing
CALIBRATON	Every 6 Months
WARM-UP TIME	Reading will stabilize after 3 hours
LIFE EXPECTANCY	3 to 5 years depending upon ambient conditions

NOTE: These sensors, due to their nature, are susceptible to detection of non-refrigerant gases and cannot distinguish the presence of different refrigerant gases, only that there is a gas present. The CMOS sensor will detect concentrations of gasoline, diesel, and propane exhaust and fumes from solvents, paints, cleansers, and others (Please call Genesis Customer Support for more information.)

NOTE: These sensors have a life expectancy from 3 to 5 years, but continued exposure to refrigerants and other gases and humidity and other adverse conditions can severely decrease sensor life.

CMOS SENSOR SELECTION CHART

Model 82-0100 -- CFC/HCFC gases

R-11	R-400(Lintern)	R-412A(TP5R)
R-12	R-402B(Hp81)	R-411B(G2108B)
R-13	R-403A(R-69S)	R-500(AZ50)
R-22	R-403B(R-69L)	R-502
R-32	R-405A(G2015)	R-508A(Klea5R3)
R-113	R-406A(CHG)	R-509A(TP5R2)
R-124	R-409A(FX56)	
R-142B	R-411A(G2108A)	

Model 82-0101 -- HFC gases

R-23	R-401C(MP62)	R-410B(9100)
R-123	R-404A(HP62)	R-413A
R-125	R-407A(Klea60)	R-503
R-134A	R-407B(Klea61)	R-507A(AZ50)
R-143A	R-407C(9000)	R-508B(SUVA95)
R-152A	R-407D(Klea)	R-401A(Mp89)
R-408A(FX10)	R-401B(Mp66)	R-410A(AZ20)

Model 82-0102 -- Ammonia

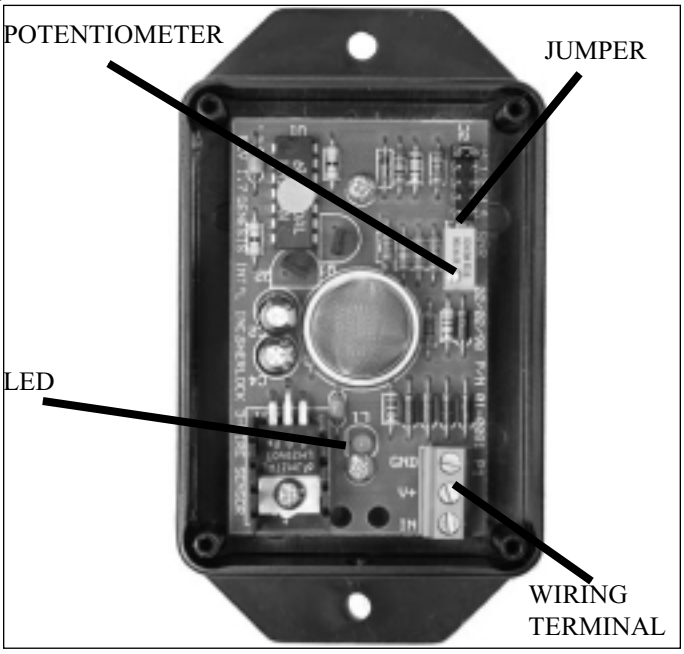
R-717

COMPONENTS

CMOS Sensor Component Description and Use.

Jumper Shorting Pins

The Sherlock CMOS Sensor has a ten pin, five position jumper block, marked as position 0 to 4. This jumper block allows the user to adjust the performance of the CMOS sensor based upon the ambient temperature. The normal, factory set position is position 0.



Once the sensor has "warmed-up" (at least 30 minutes), set the jumper so the sensor reading is between 0 and 80. Once the reading has stabilized, perform the Zero Calibration procedure.

Potentiometers. The Sherlock CMOS Sensor contains a potentiometer used for field calibration procedures.

Light Emitting Diode

LED L1 - LED L1 will indicate whether if the sensor is connected properly and is powered up.

Status	Condition
Off	Sensor is not powered up.
ON Steady	Sensor is operating properly.

Operating Range.

The Sherlock CMOS Sensor has an effective range of 0 to 1000 ppm (gas and control dependant)

0 to 0.3 VDC - Sensor Malfunction

Temperature Adjustment: Jumper Placement

#0	60 to 120 F
#1	50 to 120 F
#2	30 to 80 F
#3	0 to 40 F
#4	-20 to 20 F

Set the jumper at the temperature range the sensor will most likely experience.

(When adjusting the potentiometer, the jumper needs to be at setting number one or no adjustment will be seen.)

OVERVIEW

The SHERLOCK OXYGEN DEPRIVATION SENSOR (O_2 SENSOR) was designed to monitor concentrations of Oxygen levels within an enclosed space. The sensor is mounted in the space to be monitored and connected by cable to a SHERLOCK monitoring control system. Each sensor is factory calibrated to a sea level concentration of 20.9% oxygen clean air base zero level at the factory prior to shipment. The O_2 Sensor should be utilized as a signal source for the SHERLOCK 2-SERIES or SHERLOCK 4-SERIES REFRIGERANT GAS MONITORING SYSTEMS.

SENSOR TYPE	Electrochemical
ENCLOSURE	NEMA 1 4.3”H x 3.4” x 1.2”D
ENVIRONMENT	50 to 95 °F (10 to 35 °C), 0 to 95 % RH non condensing
POWER INPUT	12VDC, 250 mAmps
OUTPUT SIGNAL	0 to 5VDC
DETECTION RANGE	15% to 25% Oxygen by volume
SENSITIVITY	0.5 % of full scale reading.
CALIBRATION	Every 6 Months
WARM-UP TIME	Readings will stabilize after 3 hours.

OVERVIEW
SHERLOCK VENTLINE REFRIGERANT GAS SENSOR (VENTLINE) was designed to detect the presence of high concentrations of refrigerant gas in the vent lines of refrigeration systems. The sensor warns the user to investigate for possible leaks in relief valve or to check the systems for overpressure. The sensor is is designed to be installed in refrigeraton vent lines and is supplied in a NEMA 3R rated housing with 3/4" NPT female connections. There are three models of the Ventline Sensor, one for CFC/HCFC gases, one for HFC gases, and one for Ammonia. The Ventline Sensor should be utilized as a signal source for the SHERLOCK 2-SERIES or SHERLOCK 4-SERIES REFRIGERANT GAS MONITORING SYSTEMS or the WIZARD EVAPORATOR CONTROL SYSTEM.

ENCLOSURE	NEMA 3R - 4.3"H x 3.5"W x 4.0"D
ENVIRONMENT	-25 to 120 °F (-30 to 50 °C), 0 to 95% RH non condensing
POWER INPUT	12V DC, 250mA
OUTPUT SIGNAL	0 to 5VDC
DETECTION RANGE	30 to 1000 ppm (gas dependent)
SENSITIVITY	10 % of full scale reading.
CALIBRATION	Annually
WARM-UP TIME	Readings will stabilize After 3 hours.

SHERLOCK HIGH PRESSURE VENTLINE REFRIGERANT GAS SENSOR (VENTLINE) was designed to detect the presence of high concentrations of refrigerant gas in the vent lines of refrigeration systems. The sensor warns the user to investigate for possible leaks in relief valve or to check the systems for overpressure. The sensor is is designed to be installed in refrigeraton vent lines and is supplied in a NEMA 3R rated housing with a 1 1/4" NPT female connection.

DIMENSIONS

ENCLOSURE	NEMA 3R 6.5"H x 4.5"W x 5.0"D
SENSOR HEAD	Nickel Plate 4.0"Lx2.0W"x2.25D" Opening is 1 1/4" NPT Female Connection
CABLE	36" Long Belden #8443 3-22 AWG Twisted
ENVIRONMENT	-25 to 120 °F (-30 to 50 °C), 0 to 95 % RH non condensing
POWER INPUT	12VDC, 250 mAmps
OUTPUT SIGNAL	0 to 5VDC
DETECTION RANGE	30 to 300 ppm (gas dependent)
SENSITIVITY	10 % of full scale reading.
MAX. PRESSURE	300 psi
CALIBRATION	Every 6 Months
WARM-UP TIME	Readings will stabilize after 3 hours.

SENSOR WIRING

The sensors will not work if improperly wired and may be damaged if wired improperly. We suggest using a three-wire color-coded cable for identification. For consistency, connect the black wire to GND on the sensor as well as the SHERLOCK *4-Series*, the red wire to V+ and the green/white wire to IN (i.e. Match the same color wire with the same input/output identity). The sensor covers are connected to the housing using either plastic snap-on connections or screws. ***Always replace the cover after maintenance!.*** **Do not run the sensor wire near power lines or high voltage wiring, otherwise control may act erratically!!**

SENSOR WIRE TECHNICAL SPECIFICATIONS

For Wiring Runs of 0 to 100 ft CMOS Sensor

Twisted, Triad (3-wire) 22 AWG

Belden part number 8443 or 9407 (For shielded applications - 9363. For Plenum installations - 83395)

For Wiring Runs of 100 to 1000 ft CMOS Sensor

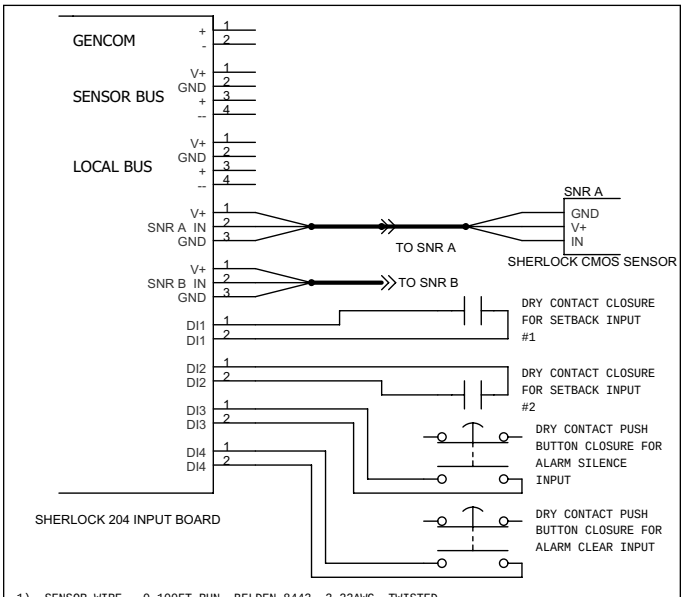
Shielded, Twisted Triad (3-wire) 18 AWG

Belden part number 8770 (For Plenum installations - 83335)

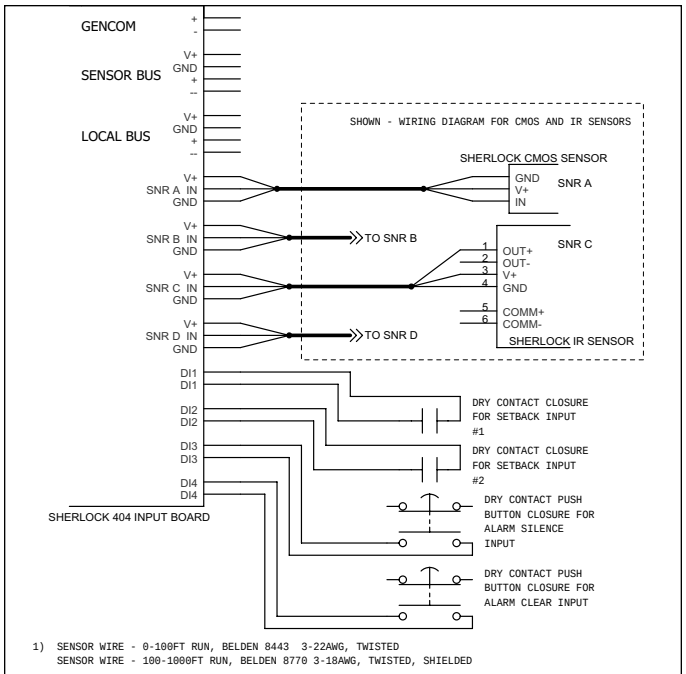
For Runs 0 to 1000ft Infrared Sensor

Shielded, Twisted Triad (3-wire) 18 AWG

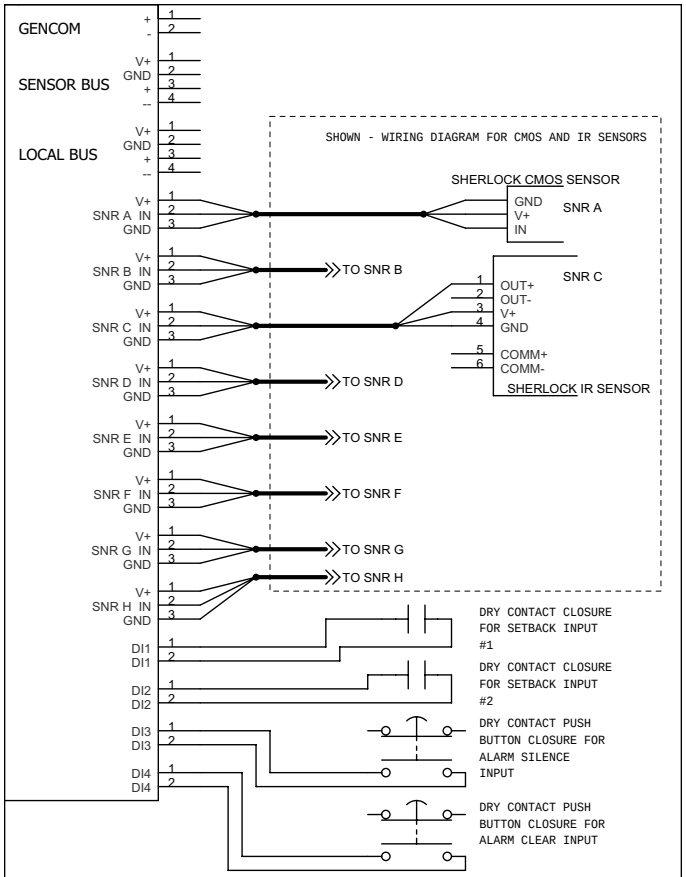
Belden part number 8770 (For Plenum installations - 83335)



WIRING DIAGRAM - SHERLOCK 204 INPUT



WIRING DIAGRAM - SHERLOCK 404 INPUT



WIRING DIAGRAM - SHERLOCK 804 INPUT

DIGITAL INPUTS

There are four (4) digital inputs. Each input must be a dry (no voltage, on/off switch) contact type. Wire this dry contact to the respective DIGITAL INPUT terminal block on the SHERLOCK *4-Series*. **Do not run the SETBACK INPUTS near power lines or high voltage wiring. Otherwise the control may act erratically!!**

DIGITAL INPUT WIRE SPECIFICATIONS

Twisted Pair (2-wire)

18 AWG

Belden part number 9318 (For shielded applications - 9363. For Plenum installations - 83321)

Digital Inputs can include: Fan Sail Switch, Pushbutton, or a Timeclock

POWER TERMINAL

The power terminal is a dual use terminal block. The five terminals are marked:

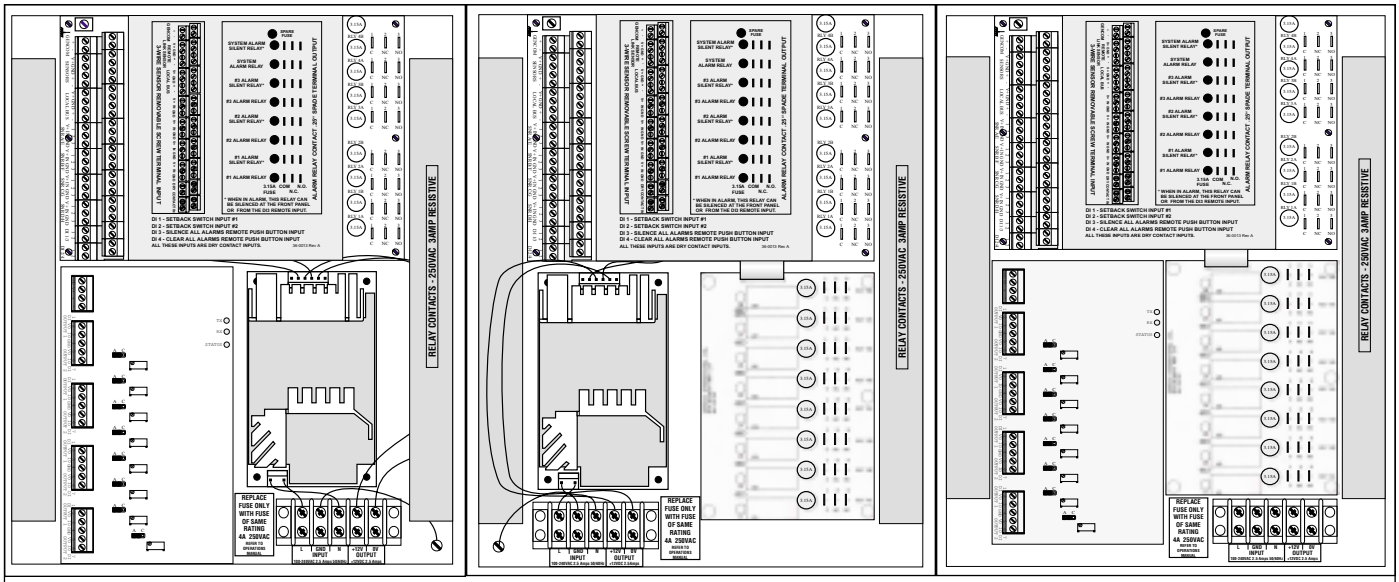
INPUT

L1	Input Line Voltage	100 to 240VAC 2.5 Amps 50/60 Hz
N	Input Neutral	Grounded Neutral
G	Earth Grounding Connection	

OUTPUT

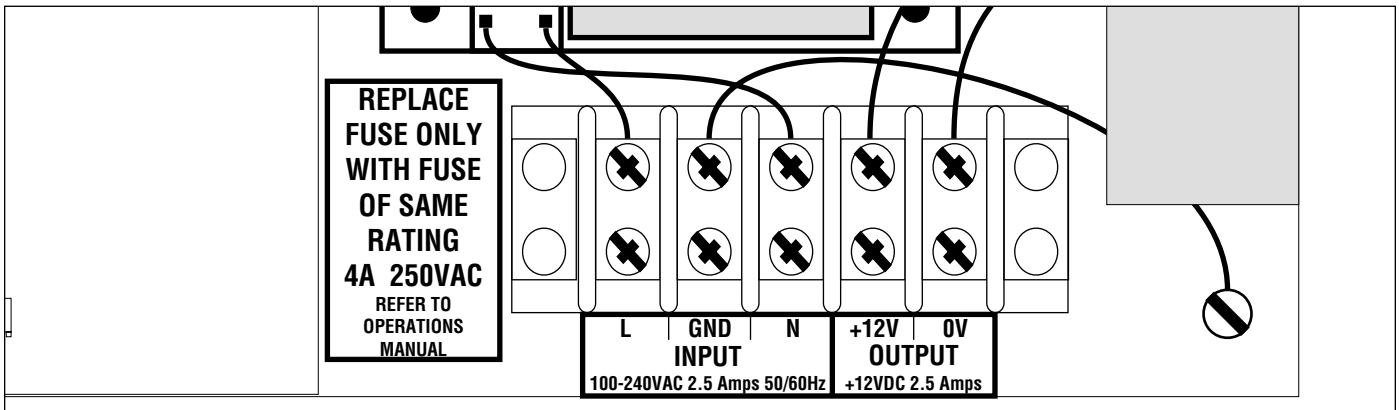
+12V	Output Voltage Supply	+12VDC 2.5amps
0V	Output Voltage Return	

Connections to the terminal block are made utilizing 1/4" (6.35mm) wide, 0.032"(0.81mm) thick female spade terminal.



BACKPLATE WITH ANALOG ONLY | BACKPLATE WITH AUXILLIARY RELAY | BACKPLATE WITH BOTH

DRAWINGS OF CONTROL MODULE BACKPLATE VERSIONS
(NOT SHOWN, BASIC MODEL)



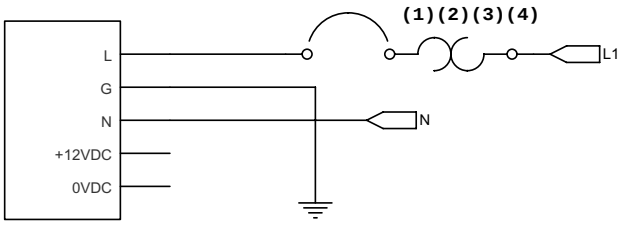
POWER TERMINAL STRIP

POWER TERMINAL - INPUT

LINE VOLTAGE CONNECTIONS

For the ***SHERLOCK*** 204/404/804, the power input needs to be between 100 VAC and 240 VAC (Universal voltage) with a maximum current of 2.5 Amps. Bring the power into the control and connect it as it appears on the power terminals labeled at the bottom of the control.

Connections must utilize wire with a minimum insulation value rating of 300 VAC.



4-SERIES POWER TERMINAL

(1)INPUT POWER CAN BE 120VAC OR 208/240VAC,3 AMP

(2)100 TO 240 VAC, 2.5 AMPS 50/60 HZ

(3)GROUNDED NEUTRAL

(4) THE 4-SERIES CONTROL SYSTEM IS A PERMANENTLY CONNECTED DEVICE. ENSURE THAT THE CONTROL POWER SOURCE IS WIRED THROUGH AN EXTERNAL ELECTRICAL CUT-OFF SWITCH OR THROUGH A 15AMP CIRCUIT BREAKER. LOCATE THE CUT-OFF SWITCH OR CIRCUIT BREAKER NEAR THE CONTROL UNIT AND MARK AS THE DISCONNECTING DEVICE FOR THE UNIT.

NOTE: The ***SHERLOCK*** 204/404/804 Control System is an ETL listed Permanently Connected device. Ensure that the control power source is wired though an external electrical cut-off switch or through a 15 amp circuit breaker. Locate the cut-off switch or circuit breaker near the control unit.

GROUNDING REQUIREMENTS

The Earth Grounding Terminal on the Input Power Terminal must be grounded in accordance to NEC and UL requirements.

Connect the grounding to the **G** Earth Grounding Connection

POWER TERMINAL - OUTPUT

OUTPUT (+12VDC) VOLTAGE CONNECTIONS

These terminals are supplied to power only Genesis International, Inc. supplied alarm components.

These components include:

SHERLOCK STROBE LIGHT
SHERLOCK HORN AND STROBE ASSEMBLY
SHERLOCK STACKED BEACON AND HORN

Installation Requirements

1) The equipment connected to this terminal shall have no live, accessable parts.

2) The wire used to connect these devices to the Sherlock Monitoring System shall have, at the minimum, an insulation rating of 300VAC.

3) The wiring connection at the device connections shall not be grounded.

ALARM RELAY OUTPUTS

The Alarm Relay Outputs on the *4-Series* are a set of two SPDT alarm relays for each alarm level labeled "A" & "B" for each level. The "A" relays are Non Silence-Able and the "B" relays are Silence-Able (De-energized) by pushing the alarm silence button on the front of the control or remotely using the DI3 input. The alarm levels are labeled K1, K2, K3 and System Alarm: Typical uses are:

K1 Lower Alarm Level - Normally indicates the "Permisible Exposure Limits (PEL)" conditions. Connect to an audio-visual alarm and the Building Automation System or an alarm dialing system.

K2 High alarm function - Normally indicates 50% of the "Immediate Danger to Life and Health (IDLH)" levels. Connect to an audio/visual alarm and Emergency Ventilation System.

K3 Emergency alarm function. - Normally indicates 25% of the "Lower Explosive Limit" or the "Immediate Danger to Life and Health (IDLH)" level, whichever is lower. Connect to the Building Automation System or an alarm dialing system and a Refrigeration and Electrical shutdown scheme.

System Alarm. Indicates a system failure. Connect to a Buidling Automation System or Visual Alarm

Optional Auxilliary Alarm Relays. 2 relays Activate during an alarm for a specific sensor. (Relays AUX 1 and AUX 2 will activate when Sensor A its Alarm Level, Relays AUX 3 and AUX 4 for Sensor B Alarm Level conditions, etc....) The odd numbered relays counting from the bottom to the top of the board are silence-able in the same way the "B" relays on the main input/output board can be silenced by pressing a button on the control or by wiring a remote pushbutton. The even numbered relays are non silence-able like the "A" relays. Typically connected to either Refrigeration and Electrical Shutdown scheme or an audio/visual alarm installed near the particular sensor.

The Silence-Able Auxilliary Relays are set at alarm level 1 "L1" Which means they will alarm at levels 1, 2 and 3.

The Non Silence-Able Auxilliary Relays are default set at alarm level 3 "L3" but can be field configured to alarm at levels 2 and 3 "L 2,3"or to levels 1, 2 and 3 "L123".

Each relay circuit is connected via spade terminals (1/4” wide, 0.032” thick). Each circuit is a dry contacts signal with a 3.15Amp Time Lag fuse connected to the common leg.

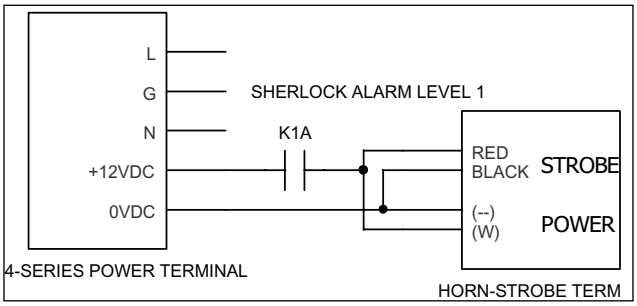
Alarm schemes K1, K2 and K3 can be configured as "fail-safe" alarm schemes where the relay is "energized" (Opening the NC contact) during non-alarm conditions and "de-energized" (Closing the NC contact) during alarm conditions. This scheme will allow a alarm signal to be produced if the Sherlock system were to fail.

HORN AND STROBE

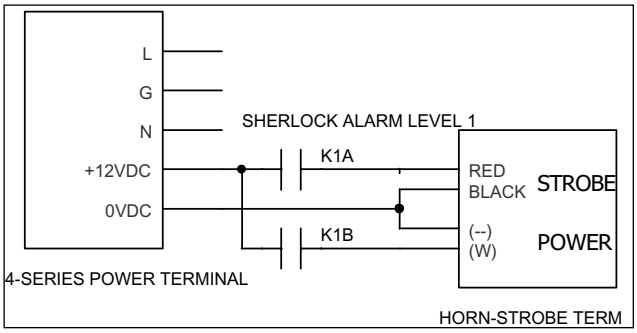
SHERLOCK HORN AND STROBE ASSEMBLY
Consists of a strong and rust free aluminum die-cast cover housing, a 122db output horn driver, a NC plunger type tamper switch, and a strobe light.

ENCLOSURE RATING	Indoor/Outdoor 5.8" x 8.1" x 4.8" (147mm x 206mm x 123mm)
POWER INPUT	12v dc, 670ma
SOUND OUTPUT	122db(a) @ 10 ft (3.05M)
FLASHING RATE	20 - 100 flashes/min
LENS COLOR	blue standard, red and amber available

STANDARD HORN AND STROBE WIRING



HORN AND STROBE WIRING WITH SILENCEABLE HORN

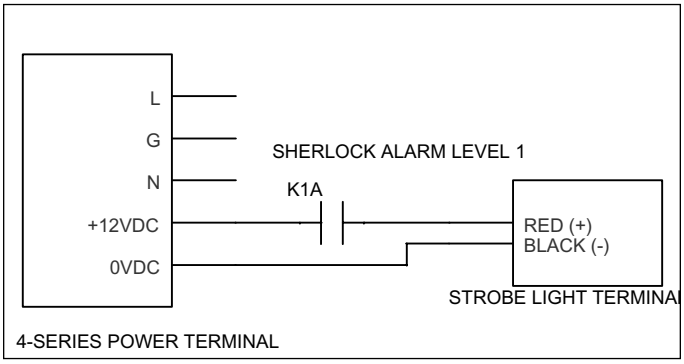


STROBE LIGHT

STROBE LIGHT

Makes any alarm visible during an emergency. High-powered "**U**" shaped xenon bulb flash is visible for miles. .

HOUSING:	raintight; high impact resistant, clear blue, red or amber lens; black, high impact resistance ABS base
SIZE:	4" x 3" (102mm x 76mm)
POWER INPUT:	12vdc, 150ma +-20%
FLASH RATE:	approx. 60 to 100 flashes/min



COMPONENTS

OVERVIEW
SHERLOCK HORN ASSEMBLY consists of a strong and rust free aluminum die-cast cover housing, a 122dB output horn driver, a NC plunger type tamper switch.

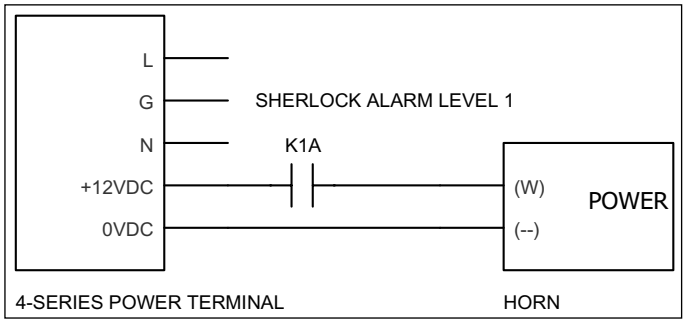
ENCLOSURE RATING	INDOOR/OUTDOOR 5.79" X 8.1" X 4.84" 147mm X206mm X123mm
POWER INPUT	6 - 12V DC, 560mA
STARTING VOLTAGE	4.2V DC MAX
OPERATING VOLTAGE	9.6V TO 14.4V DC
SOUND OUTPUT	122dB(A) @ 10ft (3.05M)
OPERATING ENVIRONMENT	
TEMPERATURE	14 TO 140 °F (-10 TO 60 °C)
HUMIDITY	0 TO 95% RH NON-CONDENSING

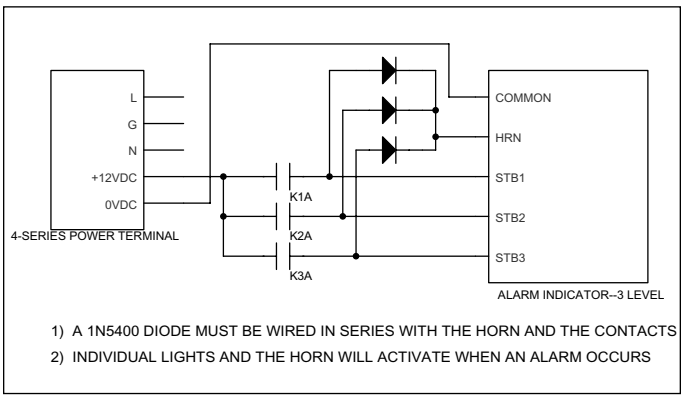
STACKABLE BEACON

A unique signaling appliance which contains three strobe modules, blue, red and amber, stacked onto a single base unit.

ENCLOSURE:	indoor/outdoor - NEMA 3R
POWER INPUT:	
HORN	12 v dc, 0.05 Amps max
STROBE	12 v dc, 0.5 Amps max Each
SOUND OUTPUT:	85 db at 10 ft. (3.05 m)
FLASH RATE:	65 flashes/min

LENS COLORS: red, blue, amber (must be different colors)





The ***SHERLOCK*** **FAIL SAFE REMOTE ALARM** and **REMOTE ALARM WITH STROBE** will alert the user to an alarm condition it is activated by opening up a self looping dry contact signal. The base has a built-in red led, and blue strobe light to signal an alarm. The unit is equipped with a test and silence button. After the silence action, the buzzer is silent for 30 minutes and will be reactivated if the alarm condition still exists. The remote alarm with strobe comes standard with a wall mountable bracket.

HOUSING	Indoor Remote Alarm - 5.125"x5.375"x1.5" (130mm x 137mm x 38mm) With Strobe - 5.125"x5.375"x 5" (130mm x 137mm x 127mm)
POWER INPUT	remote alarm - 12vdc, 200ma with strobe - 12 vdc, 500ma wall mounted transformer
SOUND OUTPUT	90db at 2 ft (51mm)
FLASHING RATE	60 to 100 flashes/min
LENS	High impact resistant, standard blue lens. Red and amber available

REMOTE ALARM WITH STROBE

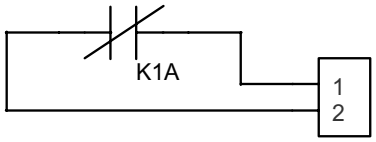
REMOTE ALARM

SHERLOCK AUTO ALARM DIALER MODEL 1104

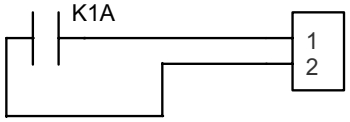
Calls up to four numbers to verbally report alarm conditions and can have up to four inputs. The inputs include being used in conjunction with sherlock monitors. A battery backup in case of power failure. The unit is compatible with any standard telephone system that operates on tone/pulse dialing. For special applications, please contact Genesis.

HOUSING	Indoor, 8"x 8.5" x 2" (200mm x 210mm x50mm)
POWER	110 vac, 60 hz wall outlet transformer, battery backup included
INPUTS	Can have up to 4 external hookups. Inputs are configured as either dry contact normally open (N.O.) or normally closed (N.C.) connected to genesis control
OUTPUTS	dials up to 4 programmed telephone numbers in orderpossible alarm conditions

SHERLOCK ALARM LEVEL 1
COMMON/NORMALLY CLOSED



SHERLOCK ALARM LEVEL 1
COMMON/NORMALLY OPEN

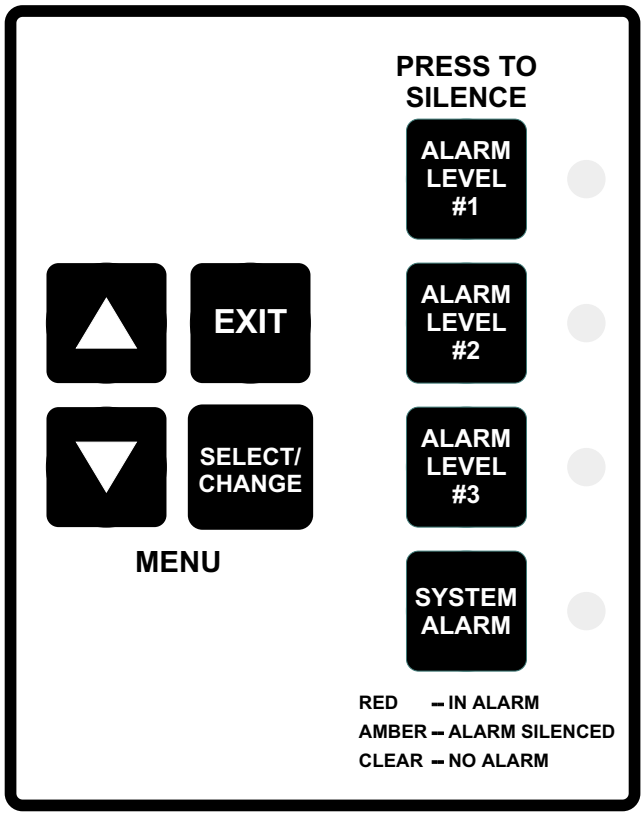


REMOTE ALARM
REMOTE ALARM WITH STROBE
AUTOALARM DIALER
BUILDING AUTOMATION SYSTEM
ALARM MONITORING PANEL

SETUP

KEYPAD DESCRIPTION

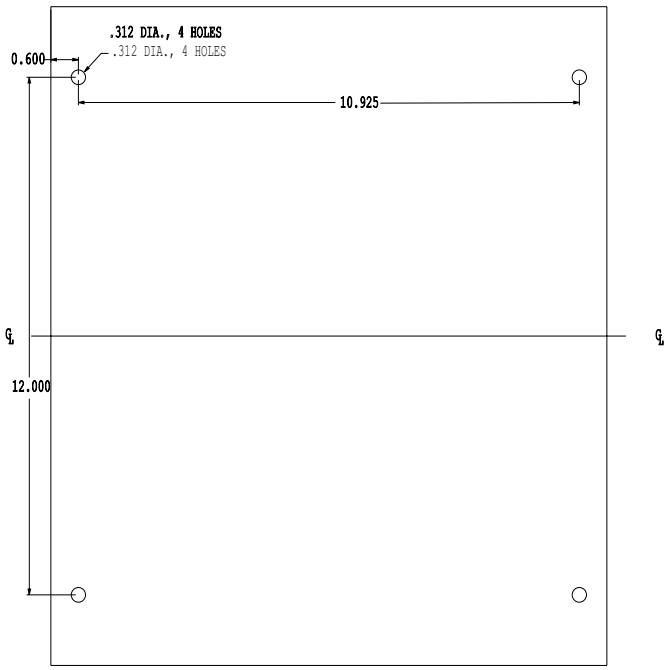
EXIT	Takes the user out of a submenu to the previous submenu or main main menu or abort changes.
SELECT/CHANGE	Enters the user into a submenu, allows the user to change a value or accepts a value.
ALARM LEVEL #1	Allows the user to silence one of the alarm relays (the 'A' relay) for alarm level #1.
ALARM LEVEL #2	Allows the user to silence one of the alarm relays (the 'A' relay) for alarm level #2.
ALARM LEVEL #3	Allows the user to silence one of the alarm relays (the 'A' relay) for alarm level #3.
SYSTEM ALARM	Allows the user to silence one of the alarm relays (the 'A" relay) for alarm the system alarm.
UP/DOWN KEYS	Change values or settings, move around menu or sub-menu.



COMPONENT INSTALLATION

MONITOR AND SENSOR LOCATION

The ***SHERLOCK*** *4-Series* can be located in any convenient location within 1000 feet (254 Meters) of each sensor. For single runs under 250 feet, a standard 3 wire, 22 AWG cable should be used. For single runs over 250 feet and below 1000 feet, a shielded, 18 AWG 3 wire cable should be used. Ideally the ***SHERLOCK*** 4-Series should be mounted outside the room being monitored. This way the user can check the room conditions without putting themselves in any danger.



NEMA 1 ENCLOSURE MOUNTING DIAGRAM

Any location for the ***SHERLOCK*** 4-Series and the sensors must be free from contact with the elements such as steam, water, oil, rain or snow.

Control Mounting Locations

NEMA 1 Compliant Enclosure - This enclosure is intended for indoor use only primarily to provide a degree of protection against contact with the enclosed equipment. The enclosure is not designed to provide protection from water or to be placed in a hazardous environment. Mount only in Pollution Level 2 environments, ie. environmentally controlled offices, control rooms, or environmentally controlled machine rooms.

NEMA 4X Enclosure - This enclosure is intended for either indoor or outdoor use, 0 to 50 °C, to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water.

The monitor should be kept within a temperature range of 32^{O}F and 120^{O}F. While the IR sensors can operate in a range of 45^{O}F to 120^{O}F. For low temperature models, consult the factory.

Sensor Placement.

The ***SHERLOCK*** Refrigerant Gas Sensor must be placed in locations where a refrigerant gas leak is likely to occur and where leaked refrigerant gas is likely to concentrate so as to provide warning of a potentially hazardous condition. Mounting locations are dependent upon the application and type of refrigerant gas.

All mounting locations must be a fixed, well supported wall, pole or frame with little or no vibration. Sensors must be placed in locations that will prevent damage from fork trucks, carts, and other moveable devices.

For Halocarbon refrigerants, such as R11, R22, R123, etc..., place the sensor 18 to 24 inches (457mm to 610mm) off of the floor. For Ammonia, place the sensor 18 to 24 (457mm to 610mm) inches from the ceiling.

HVAC/Refrigeration Machinery Room -- Prior to placement of the Refrigerant Gas Leak Sensors, the room air currents need to be determined. Air currents can be determined through the use of smoke candles or any other accepted field-expedient method. The air currents of every potential condition should be determined.

Exhaust Fan On -- The air currents with the machinery room exhaust fan must be determined. Identify locations that are "downwind" of the portential leak source. Located one sensor near the air intake duct of the exhaust fan, but not directly in the duct so the sensor is not subject to the full force of the duct air.

Exhaust Fan Off -- In applications where the machinery room exhaust fan can be shut off, identify air currents of the machine room with the fan off. Locate a position "downwind" of the potential leak source with the fan off. This location may be ommited if the exhaust fan is to be operated contiuously.

Refrigerated Room -- Determine the direction of the discharge air from the evaporator coil.

Halocarbon Refrigeraton Systems -- Mount the sensor on a wall near the return air vents of the evaporator coil or within ten to twenty feet from a doorway exiting the room to another space.

Ammonia Refrigeraton Systems -- Mount the sensor on a wall in the downwind air path of the discharge air, at least 20 feet or more from the coil or on the wall on the opposite side of the room. Don not place the sensor closer than 10 feet from the coil or directly in the discharge air path to avoid temperature fluctuations due to defrost and violent air circulation.

Mounting

The sensor must be mounted with the wire terminal blocks oriented to the lower right and the sampling chamber in a vertical position. Failure to mount the sensor in this fashion may result in false or inaccurate readings and can allow moisture to enter the housing and destroy the sensor.

Halo-Carbon, NEMA 1/Ammonia, R123, NEMA 1

Wall Mount. Use locally available wall mounting hardware, such as molly-bolts or toggle bolts, to firmly affix the sensor to the wall. The sensor can be mounted using the available screw holes or a combination of the keyhole and the two bottom screw holes.

Pole Mounting. The sensor can be mount to a support pole by utilizing Uni-Strut C braces. Attach the C-braces to the back of the housing, perpendicular to the sensing chamber direction. Attach clamps to the C-brace and run stainless steel band straps around the pole and through the straps.

The housing has a ½" conduit knockout hole in the bottom.

All Sensors, NEMA 3R

Wall Mount. Use locally available wall mounting hardware, such as molly-bolts or toggle bolts, to firmly affix the sensor to the wall. The sensor should be mounted using the mounting feet mounted on the back of the housing. Ensure that all four sets of mounting feet are accessible. Hold down the mounting feet with the locally available wall mounting hardware.

Pole Mounting. The sensor can be mount to a support pole by utilizing Uni-Strut type C braces available from Genesis. Attach the C-braces to the back of the housing, perpendicular to the sensing chamber direction. Attach clamps to the C-brace and run stainless steel band straps around the pole and through the straps.

All access holes must be drilled by the installation personnel.

Use only watertight fittings, either conduit fittings or cable retention fittings. Mount conduit on the bottom side of the housing to prevent moisture from dripping on the control board.

The sensors should be located as close to potential leaks as possible. Refrigerants that are heavier than air will tend to settle at the lowest point. Where there is a ready flow of air, a leak will mix with the air and flow with the air stream. Under certain circumstances the best sensor location may require some experimentation; however, we suggest the following sensor locations:

Machine rooms with cycling exhaust fans:

Position the sensor about waist high, below the fan. DO NOT mount the sensor in the fan housing. The sensor setback should be assigned to any sensors mounted in a high air flow path. A dry contact from the fan relay or a sail switch will be needed to switch the ***SHERLOCK*** *4-Series* to the SETBACK mode.

Refrigeration pits piping troughs:

Position the sensor at least 12 inches above the lowest point. If the piping trough is subject to the effects of the machine room exhaust, use the sensor SETBACK feature.

Return air duct to the HVAC system:

Most any location in the main return duct will pick up leaks in the sales area of the store. See **NOTE** below.

Ammonia, being lighter than air, will rise from the source; therefore, ammonia sensors should be mounted above and down wind from the source. Since halocarbon based refrigerants are heavier than air, the sensors detecting the presence of these refrigerants should be located low and down wind from a potential leak.

NOTE: When the sensor are mounted in an area that has air of high velocity, measures must be taken to prevent the sensor from being cooled while still allowing the sensor to sample the air. One method is to mount the sensor inside a 3" diameter by 9" length plastic sewer pipe. A second method is to mount a baffle in the air stream just ahead of the sensor. Air flow across the sensor should never exceed 2 feet per second.

WARNING: Sensors will be damaged by liquids. Mount the sensors away from possible contact with any liquid.

Cable Runs.

(See Sensor Wiring Page 14 for more)

All cabling must avoid running parallel to high voltage (48VDC or greater) or any AC voltage wiring. Cable must be greater than 12 inches from high voltage wiring or conduit. Avoid running cable near all inductive loads, such as motors, fluorescent fixtures, transformers. Depending upon local codes, sensor cabling may be run loose or be placed into conduit used exclusively for low voltage control wiring.

Sensor cable shall have the ***minimum*** specifications:

For Wiring Runs of 0 to 100 ft CMOS Sensor

Twisted, Triad (3-wire) 22 AWG

Belden part number 8443 or 9407 (For shielded applications - 9363. For Plenum installations - 83395)

For Wiring Runs of 100 to 1000 ft CMOS Sensor

Shielded, Twisted Triad (3-wire) 18 AWG

Belden part number 8770 (For Plenum installations - 83335)

For Runs 0 to 1000ft Infrared Sensor

Shielded, Twisted Triad (3-wire) 18 AWG

Belden part number 8770 (For Plenum installations - 83335)

HELPFUL HINTS

When the monitor is first turned on, it will count down from 90 seconds in order to warm up the sensors. Allow the sensors to run for at least two hours after the initial start up to read accurately.

For the initial start up, begin with the **ACCESS MENU, SETUP MENU, SETPOINT MENU** and then the **SET CLOCK MENU**. When the sensor reading is stable, calibrate the sensors in the **CALIBRATE MENU**.

You cannot make changes in any menu unless you are in **ALL ACCESS MODE**.

The monitor has an internal buzzer in addition to a blue strobe light that can be mounted on the monitor. The buzzer can be silenced during an alarm condition by pushing any button on the monitor. However the strobe light will remain active as long as alarm #1 is activated.

Each alarm level has its own silence button on the front panel. During an alarm condition when you push the respective button, it will silence the 'B' relay for that alarm level. Keep this in mind when wiring the relays. If you do not want that output to be silenced, do not wire that output to the 'B' relay, use the 'A' relay. (i.e. Do not wire the exhaust fans to the 'B' relay.)

The 'B' relay has a programmable silence period after which it will reactivate, if the alarm condition remains. The silence period can be programmed from 0 to 48 hours - 0 being permanently.

The relays for each alarm level can be programmed to energize in an alarm condition (N.O.) or de-energize in an alarm condition (N.C.). If N.C. mode is selected, power loss to the control will activate the alarm.

Each alarm level has its own latching feature. Therefore if the user would like for alarm levels 1 and 2 to reset themselves but have alarm level 3 be manually reset, they can program it this way.

All the menus and sub-menus wrap around.

The submenu that you are in will always appear at the top of the display. If you are looking in a submenu at the settings for a particular sensor that will also appear at the top of the display (SR-A).

The time in the control is military time. i.e. 11:00 a.m. = 11:00 and 11:00 p.m. = 23:00.

The alarm delays are measured in minutes.

An alarm cannot be silenced while in a submenu.

The display backlight will automatically turn off to save energy after the control has been dled for 2 hours, and it will automatically turn on when any key is pressed afterwards.

BASIC MENU STRUCTURE

ACCESS MENU	Allow the user gain access to the control. This is a program protections feature.
STATUS MENU	Allows the user to view the system setup, settings, version number, etc.
ALARM MENU	Allows the user to clear individual alarms and view the alarm logs as well as manually activate the alarm levels.
SETPOINT MENU	Allows the user to change the setpoints, alarm delays, and setback levels for each sensor.
CALIBRATION MENU	Allows the user to view the raw (ABS) value for each sensor and zero each sensor.
SET CLOCK MENU	Allows the user to set the time, the day (Monday, Tuesday, etc) and date (day/month/year).
SETUP MENU	Allows the user to activate sensors, select sensor type, sensor link method, activate setback, activate alarm action (N.O. / N.C.), latching feature, communications and clear the alarm log or the memory.

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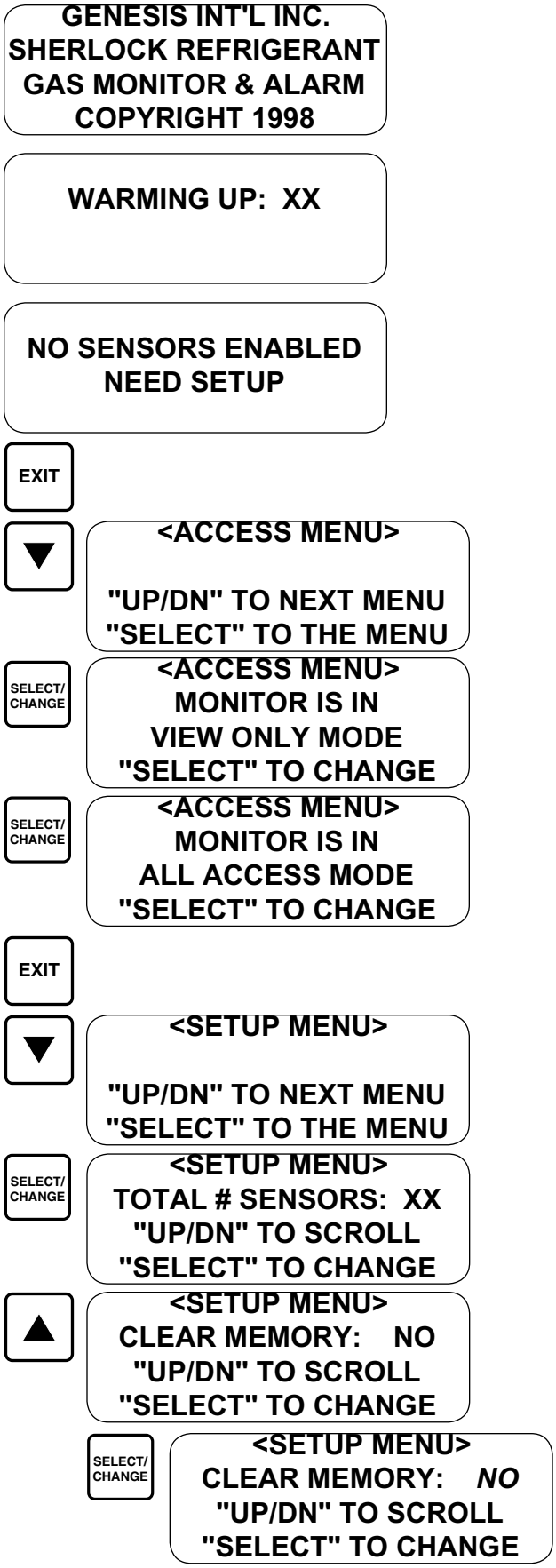


When the Sherlock 4-Series Control Module is first powered up, the unit will display its initialization screens. The control module with then conduct a Warm-Up cycle of 90 seconds.

If the unit has not been pre-programmed, it will display a message that it must be configured prior to operation.

PLACE CONTROL INTO THE "ALL ACCESS" MODE

Press the **EXIT** key. Press the **DOWN** arrow until the <ACCESS MENU> screen appears.

Press the **SELECT** key to enter the <ACCESS> menu. The control should be in the "VIEW ONLY" mode.

Press an hold the **SELECT** key for about 10 seconds to change the control to "ALL ACCESS".

Press the **EXIT** key.

CONFIGURE THE CONTROL IN THE <SETUP> MENU
Press the **DOWN** arrow until the <SETUP MENU> screen appears.

Press the **SELECT** key to enter the <SETUP> menu.
It is recommended that before the Sherlock Control Module is initially programmed, the memory should be cleared. If you do not want to clear the controller's memory, skip to the **SENSOR SETUP** section on the next page.

CLEAR MEMORY
To get to the "CLEAR MEMORY" routine, press the **UP** arrow TWICE.

Press the **SELECT** key to activate the "CLEAR MEMORY" routine. The entry "NO" will begin to flash, indicating that the controller is in the change mode.

<SETUP MENU>
CLEAR MEMORY: YES
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

While the "NO" is blinking, press the **DOWN** arrow. The blinking "NO" should change to a blinking"YES".

<SETUP MENU>
CONFIRM CLEAR: NO
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

Press the **SELECT** key to enter your decision. The controller will ask you to verify your desire to clear the memory. If you do not want to clear the memory, press the **DOWN** arrow.

<SETUP MENU>
CONFIRM CLEAR: ***NO***
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

If you want to continue with the "CLEAR MEMORY" routine, press the **SELECT** key. The "NO" will begin to blink.

<SETUP MENU>
CONFIRM CLEAR: ***YES***
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

While the "NO" is blinking, press the **DOWN** arrow. The blinking "NO" should change to a blinking"YES".

<SETUP MENU>
CLEARING EERPOM...
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

Press the SELECT key to begin the clearing routine. The controller must clear two types of memory, EEPROM and ALM RAM.

<SETUP MENU>
CLEARING ALM RAM...
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

<SETUP MENU>
MEMORY CLEARED
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

<SETUP MENU>
CLEAR MEMORY: YES
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

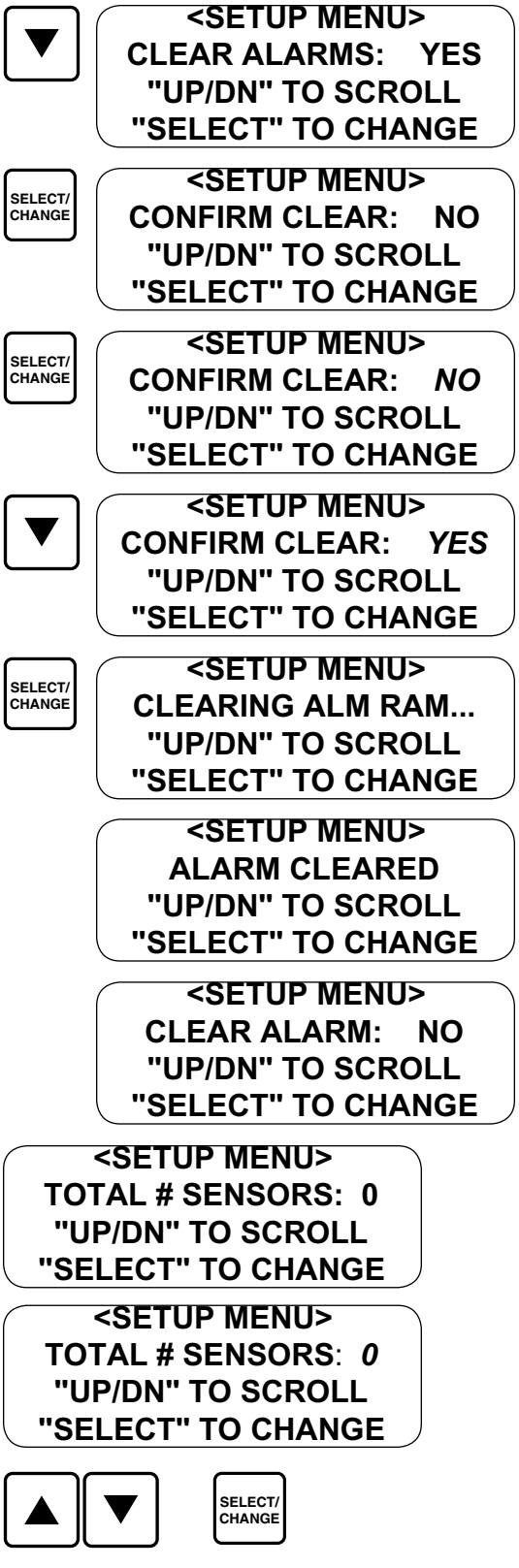
When the controller has completed the routine, it will display this message.

<SETUP MENU>
CLEAR ALARMS: NO
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

Press the DOWN arrow.
Press the **SELECT** key to enter the <SETUP> menu.
It is recommended that before the Sherlock Control Module is initially programmed, the Alarm Log should be cleared. If you do not want to clear the controller's Alarm Log, skip to the **SENSOR SETUP** section on the next page.

<SETUP MENU>
CLEAR ALARMS: ***NO***
"UP/DN" TO SCROLL
"SELECT" TO CHANGE

CLEAR ALARM LOG
Press the **SELECT** key to activate the "CLEAR ALARM" routine. The entry "NO" will begin to flash, indicating that the controller is in the change mode.



While the "NO" is blinking, press the **DOWN** arrow. The blinking "NO" should change to a blinking"YES".

Press the **SELECT** key to enter your decision. The controller will ask you to verify your desire to clear the memory. If you do not want to clear the memory, press the **DOWN** arrow.

If you want to continue with the "CLEAR ALARMS" routine, press the **SELECT** key. The "NO" will begin to blink.

While the "NO" is blinking, press the **DOWN** arrow. The blinking "NO" should change to a blinking"YES".

Press the SELECT key to begin the clearing routine. The controller must clear the ALM RAM.

When the controller has completed the routine, it will display this message.

Press the DOWN arrow to abegin the "SENSOR SETUP" Routine

SENSOR SETUP

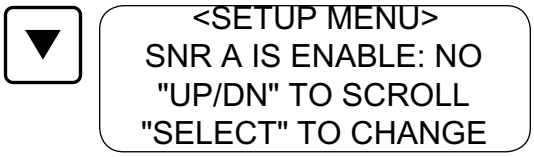
At this point, the controller has no sensor configuration programmed into it. The control module needs to be told how many sensors will be connected.

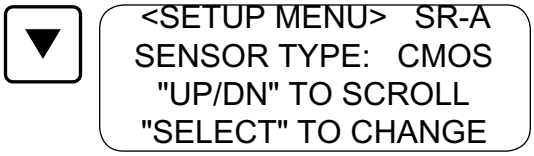
Press the **SELECT** key. The "0" will begin to blink indicating that the controller is in the Change mode.

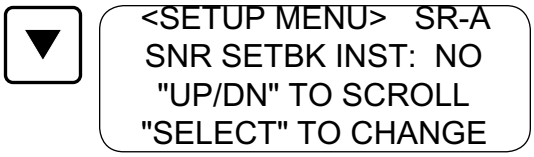
Press the **UP/DOWN** arrows until the correct number is blinking. The following monitoring systems have the maximum number of available sensor points:

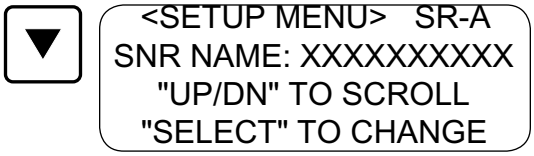
Sherlock 204 2
Sherlock 404 4
Sherlock 804 8

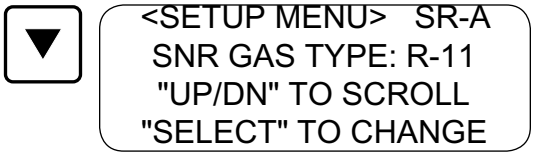
Once the desired number is displayed, press the **SELECT** key to set the value.











SENSOR A SETUP

After setting the total number of sensors, press the DOWN arrow.

Each sensor will indicate that they have no been "ENABLED". To enable a sensor, press the SELECT key. The "NO" will begin to blink. Press the DOWN arrow. The blinking "NO" will change to a blinking "YES". Press the SELECT key to save this entry.

If Sensor A is not enabled, the controller will not display the following functions and skip to Sensor B.

Press the Down arrow to move to the next option. Set the type of sensor inwhich Sensor A. The options are:

CMOS	Solid State-CMOS Ref Sensor
NDIR	Infrared Refrigerant Sensor
OXGN	Oxygen Depletion Sensor

To set the sensor style, press the SELECT key. The "CMOS" will begin to blink. Press the DOWN arrow. The blinking "CMOS" will change to a blinking "NDIR" or "OXGN". Press the SELECT key to save this entry.

Press the Down arrow to move to the next option. Determine whether Sensor A shall have a Setback Option. **FOR CMOS AND SDIR ONLY** (See SETBACK in the GLOSSARY). Set the type of setback option for Sensor A. The options are:

NO	No Setboack Optionr
TMCK	Setback controlled by the internal timeclock.
DI1	Setback controlled by Digital Input #1
DI2	Setback controlled by Digital Input #2
T/D1	Setback controlled by Digital Input #1 and time clock

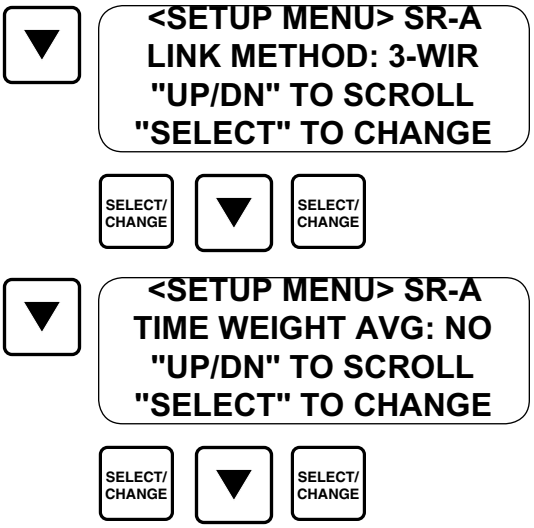
To set the setback option, press the SELECT key. The "NO" will begin to blink. Press the DOWN arrow. The blinking "NO" will change to a blinking "T/D1", "DI2", "DI1, or "TMCK". Press the SELECT key to save this entry

Press the Down arrow to move to the next option. Program a name for Sensor A. The name is a 10 character alpha-numeric name. To set the name, press the SELECT key. The first character will begin to blink. Press the UP/DOWN arrows to scroll to the desired value. Press SELECT to set the character and move to the next space. Repeat for all ten positions. Program blank spaces for blank positions.

Press the Down arrow to move to the next option. Determine the refrigerant that Sensor A shall monitor. Set the gas type for Sensor A. The options are:

R11	R12	R22	R123	R134a
R402A	R404A	R407A	R502	R507A
	R-NH3		R-OTHR	

To set the setback option, press the SELECT key. The "R-11" will begin to blink. Press the DOWN arrow. The blinking "R-11" will scroll through the options. Press the SELECT key to save this entry



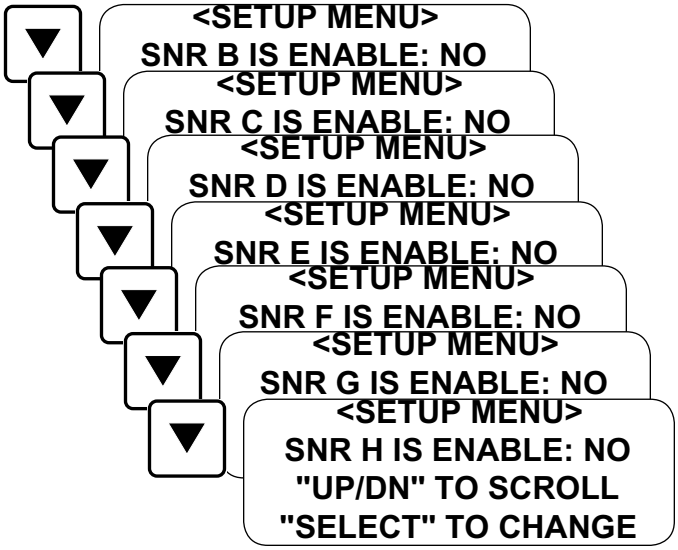
Press the Down arrow to move to the next option. Determine how Sensor A is connected to the monitor. ***ENSURE THAT THE OPTIONS IS SET FOR*** **"3-WIR"**.
To set the Link Method, press the SELECT key. The value will begin to blink. Press the DOWN arrow until the value "3-WIR" is displayed. Press the SELECT key to save this entry

Press the DOWN arrow to move to the next option. Determine whether Sensor As Alarm Levels shall be calculated as current reading or as Time Weighted Average. See TIME WEIGHTED AVERAGE in the GLOSSARY). Set the TWA option for Sensor A. The options are:

NO	No TWA Optionr
#1	Alarm Level 1 Only
1&2	Alarm Levels 1 and 2

To set the TWA option, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow. The blinking "NO" will change to a blinking "#1" or "1&2". Press the SELECT key to save this entry

END OF SENSOR A SETUP



SENSOR B SETUP Repeat setup procedures for Snr B.

SENSOR C SETUP Repeat setup procedures for Snr C

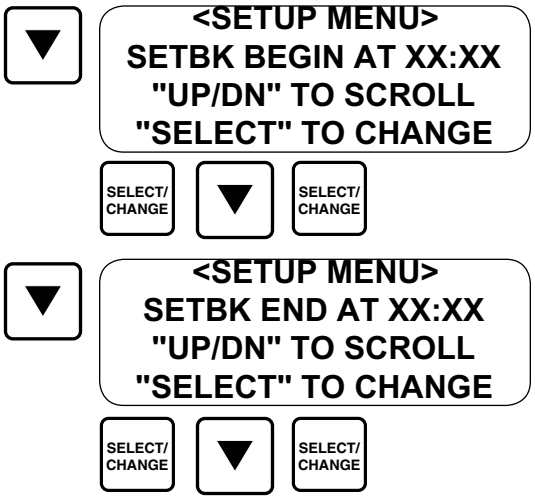
SENSOR D SETUP Repeat setup procedures for Snr D

SENSOR E SETUP Repeat setup procedures for Snr E

SENSOR F SETUP Repeat setup procedures for Snr F

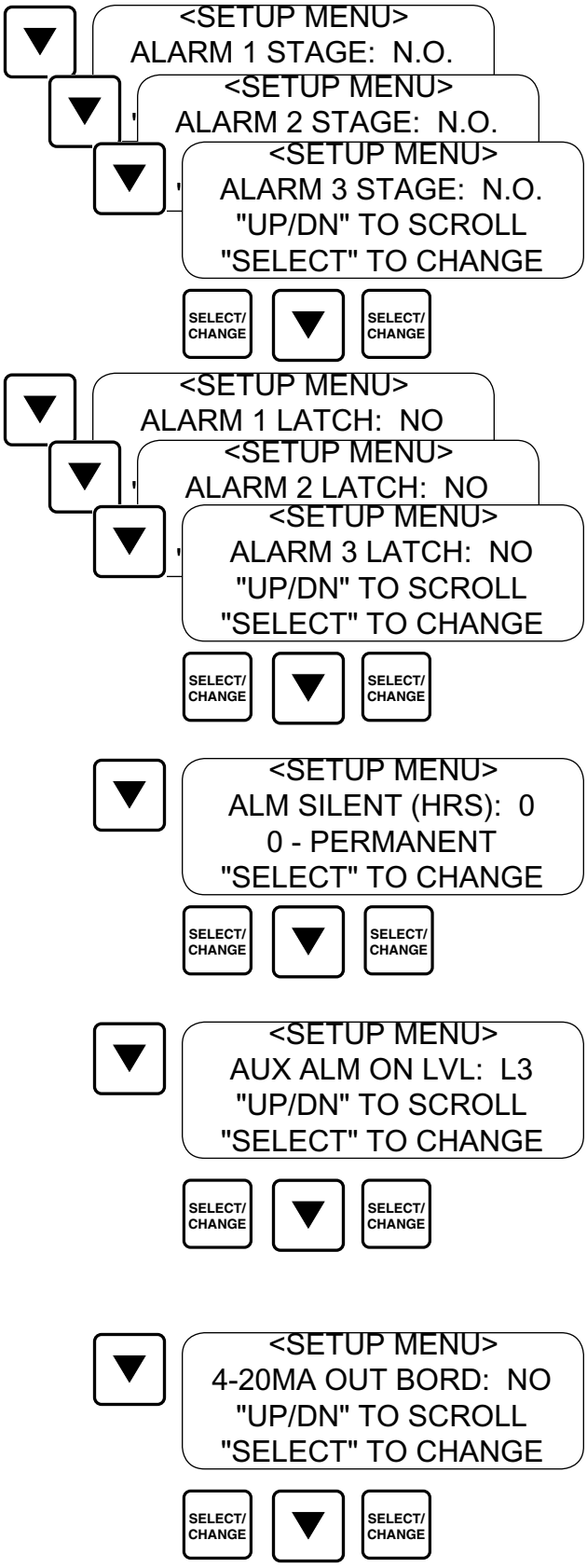
SENSOR G SETUP Repeat setup procedures for Snr G

SENSOR H SETUP Repeat setup procedures for Snr H



Press the DOWN arrow to move to the next option. Set the start time for the Setback TimeClock to initiate the Setback function. (See SETBACK TIMECLOCK in the GLOSSARY). To set the timeclock, press the **SELECT** key. The time will begin to blink. Press the **UP/DOWN** arrow to the desired value. Press the **SELECT** key to save this entry

Press the DOWN arrow to move to the next option. Set the end time for the Setback TimeClock to stop the Setback function. To set the timeclock, press the **SELECT** key. The time will begin to blink. Press the **UP/DOWN** arrow to the desired value. Press the **SELECT** key to save this entry



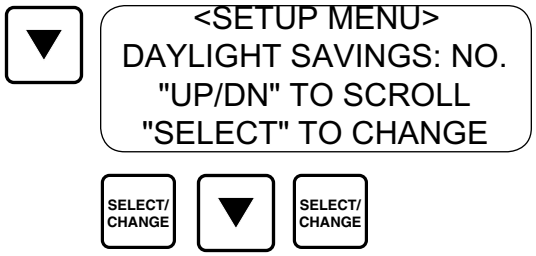
Press the **DOWN** arrow to move to the next option. Set the relay action for Alarm Level 1. The alarm relays can be in the "NO" (energize to alarm-close the NO contact when in alarm) or the "NC" (de-energize to alarm-close the NC contact when in alarm) modes.
To set the Alarm Relay Action, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change the blinking "NO" to a blinking "NC". Press the **SELECT** key to save this entry
Repeat for Alarm Levels 2 and 3.

Press the **DOWN** arrow to move to the next option. Set the Latch Action for Alarm Level 1. The alarm relays can be set to "YES" (Alarms stay active until reset by a technician) or the "NO" (Alarm will autoclear when alarm conditons clear) modes.
To set the Latch, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change the blinking "NO" to a blinking "YES". Press the **SELECT** key to save this entry
Repeat for Alarm Levels 2 and 3.

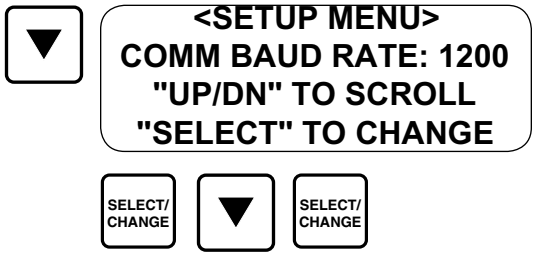
Press the **DOWN** arrow to move to the next option. Set the Alarm Silence Reset delay. Each alarm level has a relay that can be silenced (reset) when a button is pressed. This relay can re-activate after a set delay or remain silenced. Setable range = 0-120 hours when 0 means "No Reset"
To set the delay, press the **SELECT** key. The "0" will begin to blink. Press the **UP/DOWN** arrow to the disired value. Press the **SELECT** key to save this entry

Press the **DOWN** arrow to move to the next option. Settings for the Auxilliary Relay Board (AUX) option (See Auxilliary Relay Board). This is a factory installed option. Default alarm level setting is for Alarm Level 3 (L3) for the non silence-able relays. To change this option, press the **SELECT** key. The "L3" will begin to blink. Press the **DOWN** arrow to change the blinking "L3" to a blinking "L2,3" for the auxilliary board to alarm at levels 2 and 3 or to a blinking "L123" for the auxilliary board to alarm at levels 1, 2 and 3. Press the **SELECT** key to save this entry. **NOTE:** The Silence-Able Auxilliary relays are not changeable and will alarm at level 1, 2 and 3. (See page 16 "Alarm Relay Outputs" for more.)

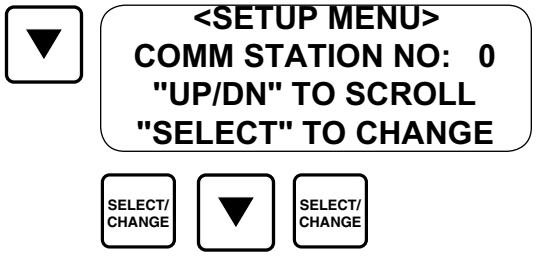
Press the **DOWN** arrow to move to the next option. Activate the Analog Output Board (AO) option (See Analog Output Board). This is a factory installed option. If the controller has an AO board, and this option is set to "NO", no signal will be produced by the board. If this options is set to "YES" and the board is not installed, the controller will go into System Alarm for **Comm Error**. To set this option, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change the blinking "NO" to a blinking "YES". Press the **SELECT** key to save this entry.



Press the **DOWN** arrow to move to the next option. Automatic Daylight Savings Rollover option ***THIS OPTION NOT AVAILABLE WITH ALL MODELS***. If this option is set to "NO", the internal timeclock will remain unchanged. If this options is set to "YES", the internal timeclock will automatically change on the Spring Forward and Fall Back days each year.
To set this option, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change the blinking "NO" to a blinking "YES". Press the **SELECT** key to save this entry



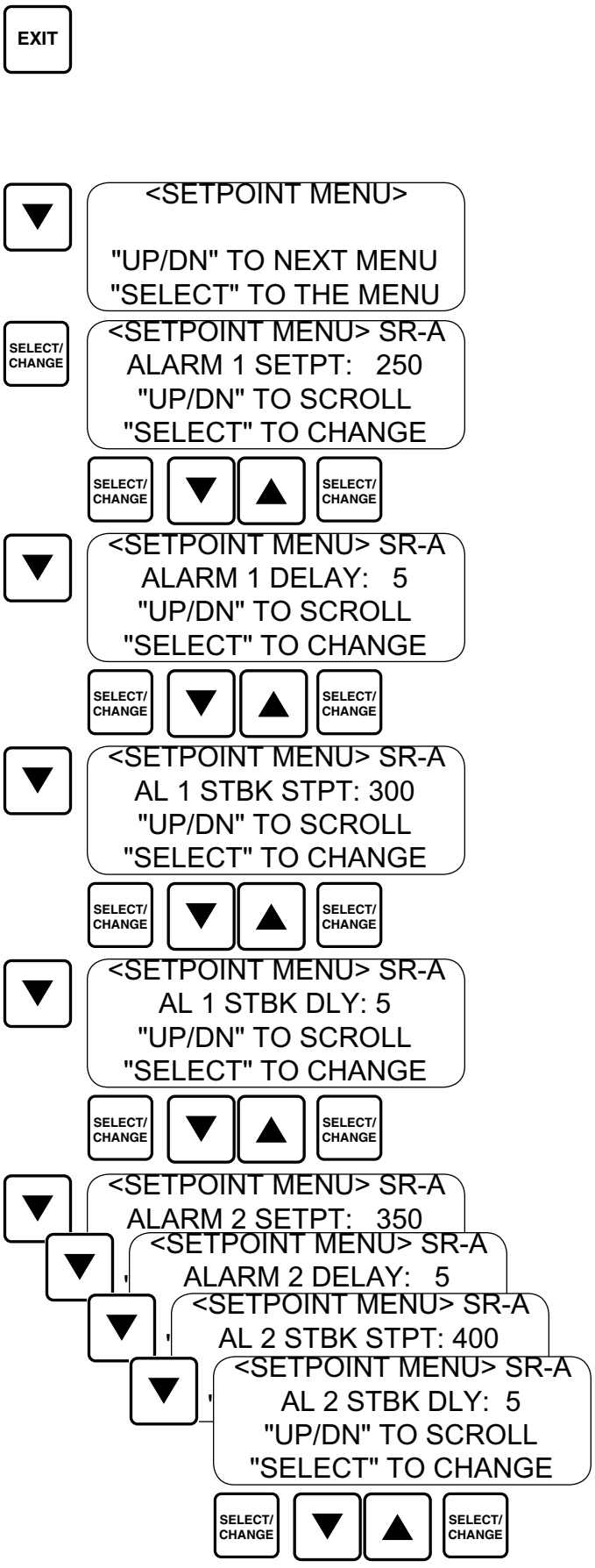
Press the **DOWN** arrow to move to the next option. Communications Baud Rate ***THIS OPTION IS ONLY REQUIRED FOR GENCOM COMMUNICATIONS.***
To set the baud rate, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change to the desired value. Press the **SELECT** key to save this entry



Press the **DOWN** arrow to move to the next option. Communications Station Number ***THIS OPTION ONLY REQUIRED FOR GENCOM COMMUNICATIONS.***
To set the baud rate, press the **SELECT** key. The "NO" will begin to blink. Press the **DOWN** arrow to change to the desired value. Press the **SELECT** key to save this entry

Press the EXIT key

SETPOINT



These procedures are to be followed if the setpoints and alarm delays for one or all of the control systems are to be changed Prior to changing the control setpoint, ensure that the control system is in the "DATA ACCESS" Mode. (See Page 55 for more on Setpoints)

PLACE CONTROL INTO THE "SETPOINT MENU"
Press the **EXIT** key. Press the **DOWN** arrow until the <SETPOINT MENU> screen appears.

Press the **SELECT** key to enter the <SETPOINT> menu. The control should be in the "DATA ACCESS ONLY" "ALL ACCESS" mode.

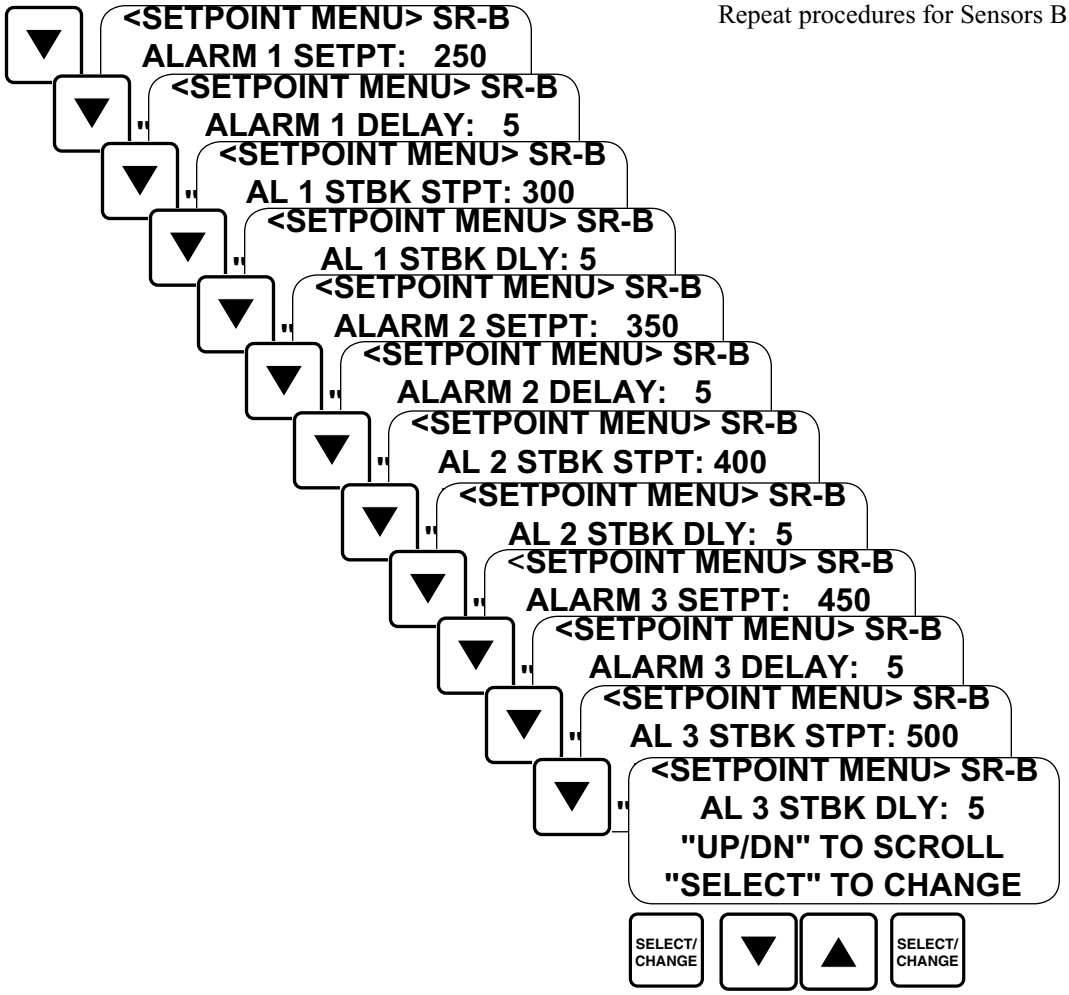
CHANGE SENSOR A ALARM 1 SETPOINT (0-1000)
Press the **SELECT** key. The displayed setpoint value should begin to blink. Press the UP/DOWN arrows to change the value to the desired value.

CHANGE SENSOR A ALARM 1 DELAY (1-120 MINS)
Press the **SELECT** key. The displayed setpoint value should begin to blink. Press the UP/DOWN arrows to change the value to the desired value.

CHANGE SNR A ALM 1 SETBACK SETPOINT (0-1000)
Press the **SELECT** key. The displayed setpoint value should begin to blink. Press the UP/DOWN arrows to change the value to the desired value.

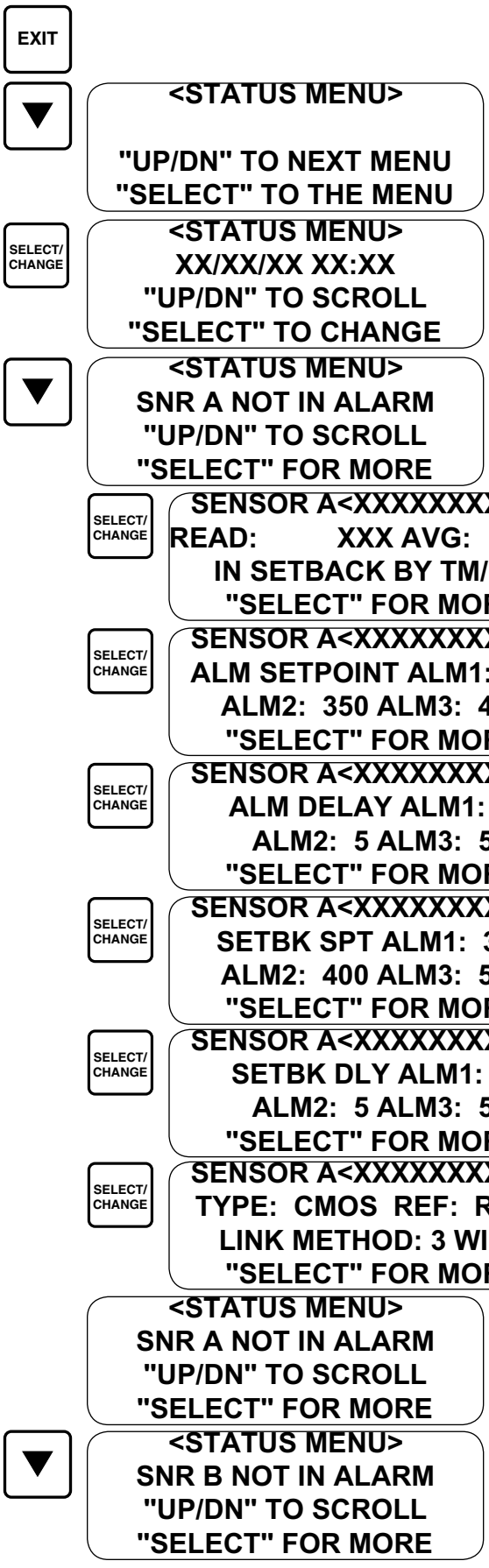
CHANGE SNR A ALM 1 SETBACK DELAY (1-120MINS)
Press the **SELECT** key. The displayed setpoint value should begin to blink. Press the UP/DOWN arrows to change the value to the desired value.

Repeat procedures for the remaining alarm levels for Sensor A



Repeat procedures for Sensors B through H

STATUS



This menu allows the user to veiw -- but not change -- the various controller parameters. This menu displays the status of the system. Screen entries in “STATUS MENU” will only be shown if their respective control options are installed in the “CONFIGURATION MENU”

PLACE CONTROL INTO THE "SETPOINT MENU"
Press the **EXIT** key. Press the **DOWN** arrow until the <SYSTEM MENU> screen appears.

Press the **SELECT** key to enter the <STATUS> menu. The control should be in the "VIEW ONLY" mode.

VIEW SENSOR A STATUS
Sensor A's status can be viewed by pressing the **SELECT** key. The control will go into the Sensor A submenu. Each successive screen can be viewed by pressing the "SELECT" key.

SENSOR A CURRENT READING AND TWA

SENSOR A SETPOINTS

SENSOR A ALARM DELAYS

SENSOR A SETBACK SETPOINTS

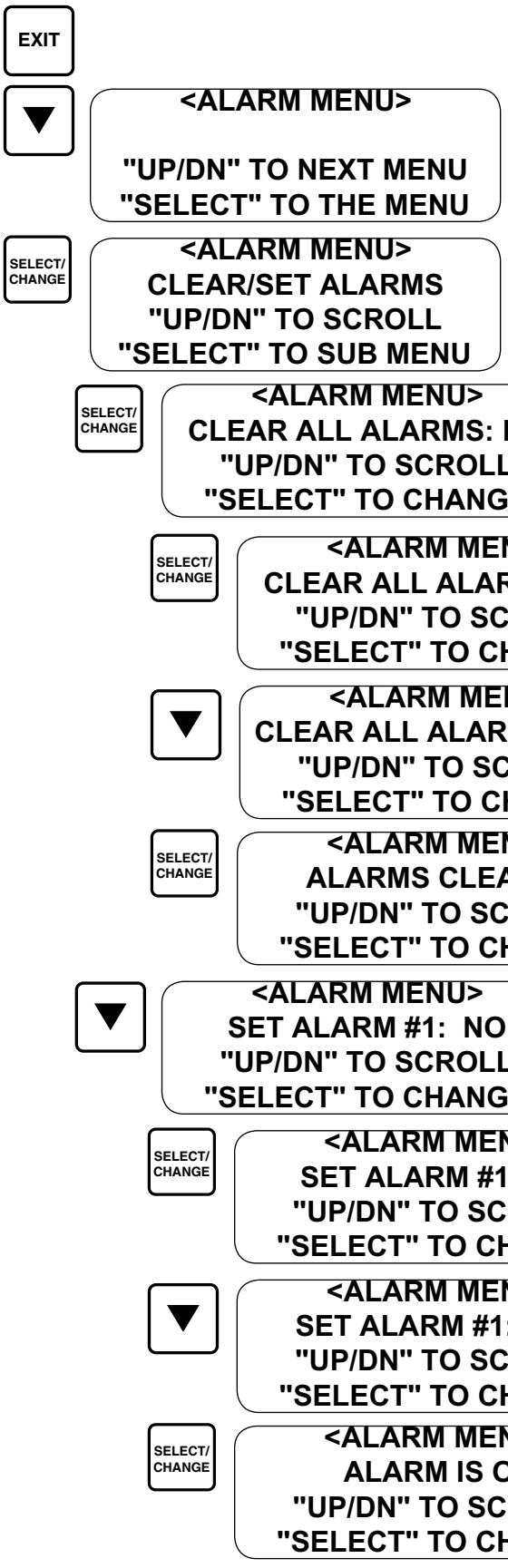
SENSOR A ALARM DELAYS

SENSOR A TYPE, REFRIGERANT, AND CONNECTION

REPEAT PROCEDURES FOR SENSOR B


<STATUS MENU>
SNR C NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR C
<STATUS MENU>
SNR D NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR D
<STATUS MENU>
SNR E NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR E
<STATUS MENU>
SNR F NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR F
<STATUS MENU>
SNR G NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR G
<STATUS MENU>
SNR H NOT IN ALARM
"UP/DN" TO SCROLL
"SELECT" FOR MORE
REPEAT PROCEDURES FOR SENSOR H
<STATUS MENU>
SETBACK TIME BETWEEN
XX:XX TO XX:XX
"UP/DN" TO SCROLL
SETBACK TIMER SETTINGS
<STATUS MENU>
ALM STAGE AL1: N.O.
AL2: N.O. AL3: N.O.
"UP/DN" TO SCROLL
ALARM RELAY SETUP
<STATUS MENU>
ALM LATCH AL1: NO
AL2: NO AL3: NO
"UP/DN" TO SCROLL
ALARM RELAY LATCH STATUS
<STATUS MENU>
COMM STATION #: XX
COMM BAUD RATE: 9600
"UP/DN" TO SCROLL
COMMUNICATIONS PARAMETERS
<STATUS MENU>
EPROM CHKSUM: XXXX
FIRMWARE VER: 1.5
"UP/DN" TO SCROLL
SOFTWARE VERSION

ALARM



This menu allows the user to clear active alarms, activate alarm relays to test alarming devices, and to view the controllers alarm log.

In order to clear an alarm or to activate an alarm relay, the controller must be in either the DATA ACCESS MODE or the ALL ACCESS MODE.

PLACE CONTROL INTO THE "SETPOINT MENU"

Press the **EXIT** key. Press the **DOWN** arrow until the <ALARM MENU> screen appears.

Press the **SELECT** key to enter the <ALARM> menu.

CLEAR AN ALARM OR ACTIVATE AN ALARM RELAY

Press the **DOWN** arrow the display "**CLEAR/SET ALARMS**". Press the SELECT key. If the controller is currently in an active alarm condition, the "**CLEAR ALL ALARMS**" message will be displayed

CLEAR ALL ALARMS

Press the **SELECT** key to activate the "**CLEAR ALL ALARMS**" routine. The entry "***NO***" will begin to flash, indicating that the controller is in the change mode.

While the "**NO**" is blinking, press the **DOWN** arrow. The blinking "**NO**" should change to a blinking"**YES**".

Press the **SELECT** key to enter your change.

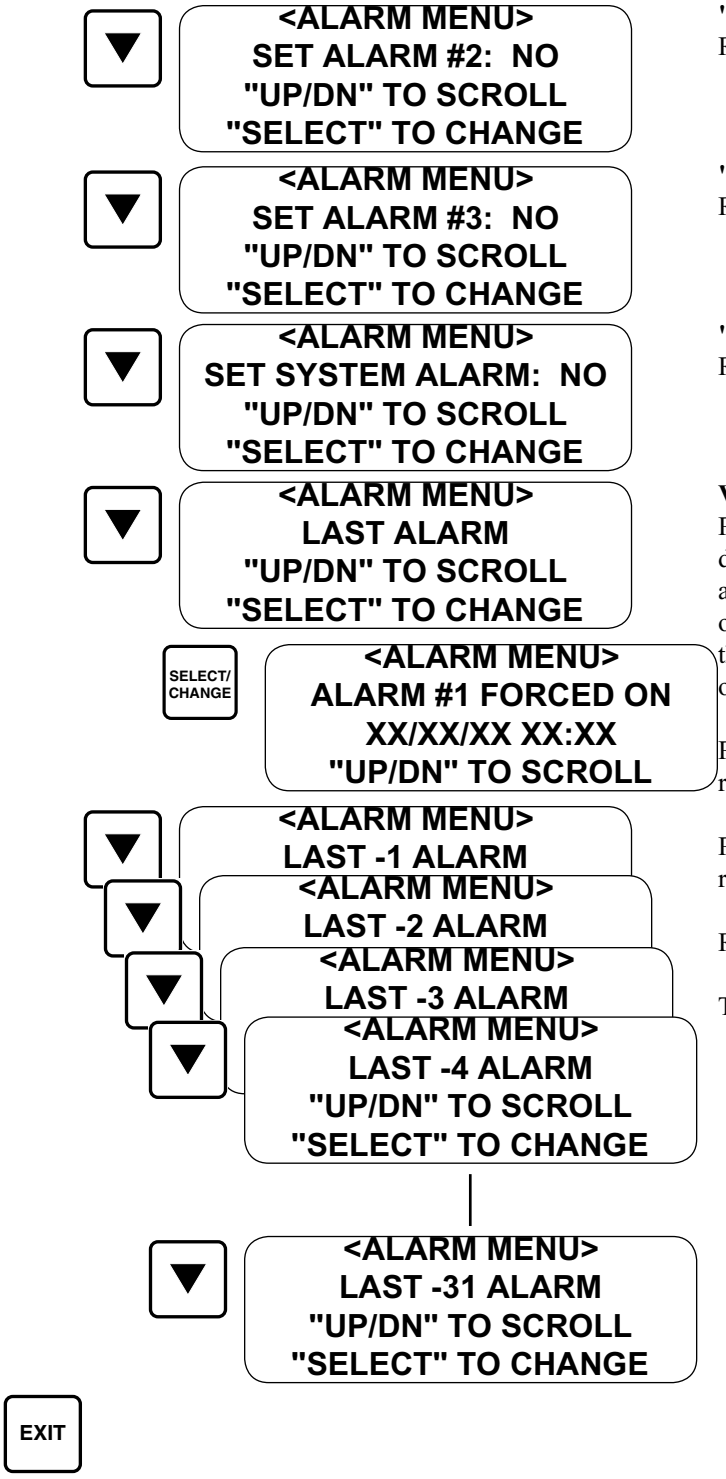
"SET" ALARM #1

To activate the alarm relays for alarm level #1, press the DOWN arrow until the "SET ALARM #1" screen is displayed.

Press the **SELECT** key to activate the "**SET ALARM #1**" routine. The entry "***NO***" will begin to flash, indicating that the controller is in the change mode.

While the "**NO**" is blinking, press the **DOWN** arrow. The blinking "**NO**" should change to a blinking"**YES**".

Press the **SELECT** key to enter your change. The alarm relays for Alarm Level #1 will go into their alarm mode.



"SET" ALARM #1
Repeat procedures for Alarm Level #2

"SET" ALARM #3
Repeat procedures for Alarm Level #3

"SET" SYSTEM ALARM
Repeat procedures for System Alarm.

VIEW THE ALARM LOG
Press the **DOWN** arrow until the "**LAST ALARM**" screen is displayed. The Sherlock Control System will log the last 32 alarm conditions in chronological order starting with the "last" or most recent alarm condition. To view this log entry, press the **SELECT** key. The alarm condition and the time and date of the condition will be displayed.

Press the **DOWN** arrow to move to the LAST -1, or 2nd most recent alarm condition.

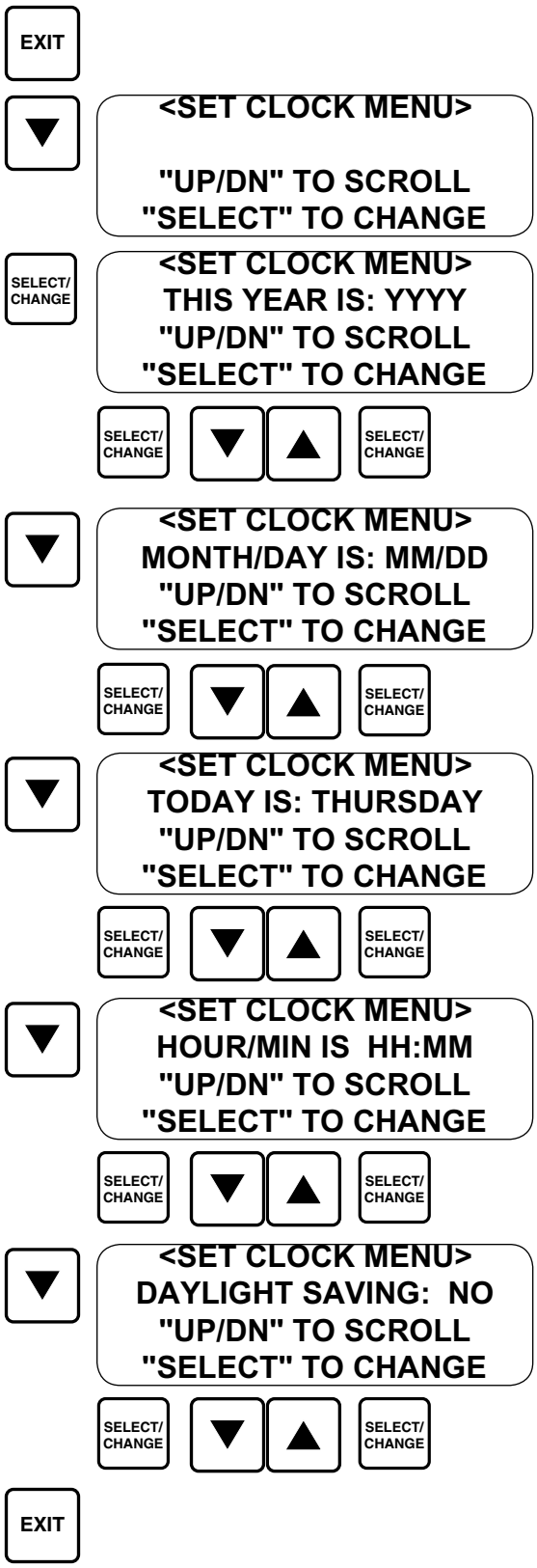
Press the **DOWN** arrow to move to the LAST -2, or 3rd most recent alarm condition

Repeat procedures for the remaining 29 entries.

The definitions of each alarm message are on the next page.

ALARM

ALARM MESSAGE	DESCRIPTION
NONE	There is no alarm condition for this entry in the alarm log. The Alarm Log has probable been cleared recently.
ALARM #X IS SILENCED	Alarm Level "X" was silenced by pressing the Alarm Silence button on the front panel.
SENSOR X OPEN ALARM	Sensor X is not operating properly. Problem can either be a wiring problem, an incorrect style of sensor
ALL ALARMS CLEAR	The Sherlock Monitoring System had previously been in alarm. All alarm conditions have cleared. The Sherlock is no longer in alarm.
SNR X ALARM Y STBK ALM	Sensor X is currently in Setback and is currently in alarm at Alarm Level Y.
SNR X ALM Y ALRM END	Sensor X was previoudly in Alarm Level Y. The alarm condition has cleared.
SNR X ALM Y HIGH ALARM	Sensor X is currently in alarm at Alarm Level Y.
SNR X ALM Y OXGN LOW	Sensor X is an Oxygen Depletion Sensor and is currently in a low alarm at Alarm Level Y.
ALARM #Y IS FORCED ON	Alarm Level Y was forced on by a user.
SYST ALARM FORCED ON	System Alarm was forced on by a user
ALM SILENT BY SWITCH	All active alarms were silenced by a user closing a contact across Digital Inpu #3.
ALM CLEAR BY SWITCH	All active and latched alarms were cleared by a user closing a contact across Digital Input #4.
LINK COMM. ERR.	The communications link between the Sherlock Control Module and the Sherlock IO board has been interupted. The Control Module will initiate an alarm, activating the attached strobe light and the IO board will activate the System Alarm relay after 1 minute.
LINK COM. O.K.	The Sherlock had previously been in communication error alarm and the alarm condition has cleared
4-20 MA BRD COMM. ERR.	The communications link between the Sherlock Control Module and the Sherlock AO board has been interupted. The Control Module will initiate an alarm, activating the attached strobe light and the IO board will activate the System Alarm relay after 1 minute.
4-20 MA BRD COMM. OK	The Sherlock had previously been in communication error alarm and the alarm condition has cleared



This menu allows the user to change the controller's time and date. The controller must be in the "DATA ACCESS" mode to make any changes.

PLACE CONTROL INTO THE "SET CLOCK MENU"
Press the **EXIT** key. Press the **DOWN** arrow until the <SET CLOCK MENU> screen appears.Press the **SELECT** key to enter the <SET CLOCK> menu.

SET THE YEAR
The year can be set by pressing the **SELECT** key to activate the edit fucntion. The Year should begin to blink. Press the **UP** and **DOWN** arrows to change the year to the desired value. Press the **SELECT** key to set.

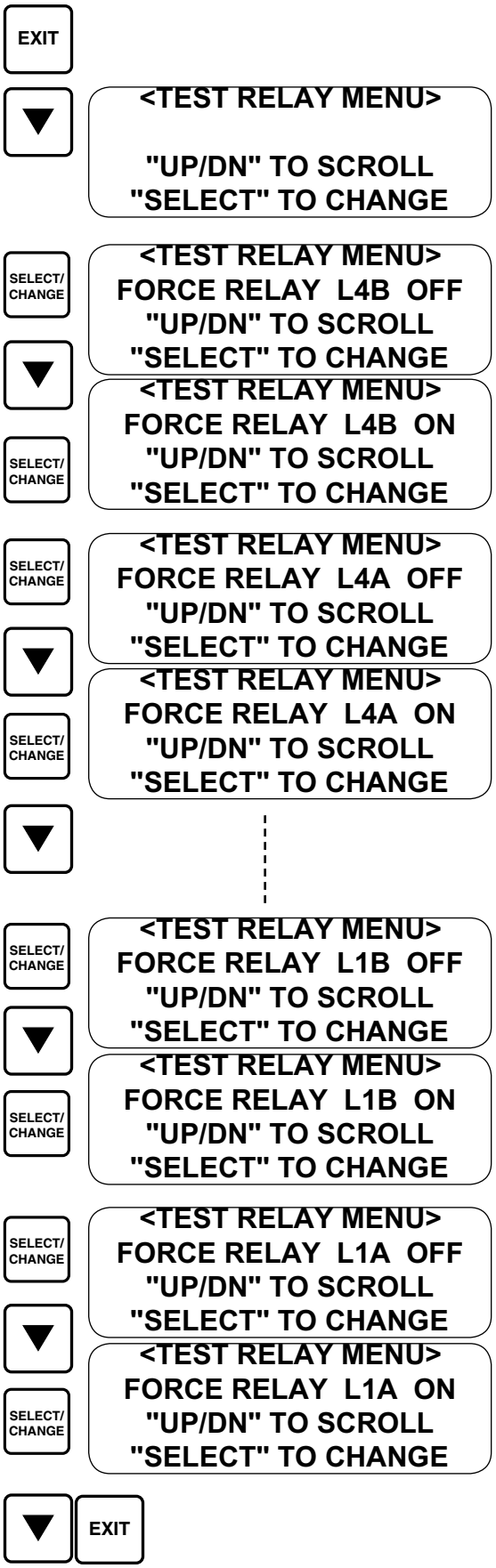
SET THE MONTH/DAY
The month/day can be set by pressing the **SELECT** key to activate the edit fucntion. The month/day should begin to blink. Press the **UP** and **DOWN** arrows to change to the desired value. Press the **SELECT** key to set.

SET THE DAY OF WEEK
The day of week can be set by pressing the **SELECT** key to activate the edit fucntion. The day should begin to blink. Press the **UP** and **DOWN** arrows to change to the desired value. Press the **SELECT** key to set.

SET THE CLOCK
The clock can be set by pressing the **SELECT** key to activate the edit fucntion. The clock should begin to blink. Press the **UP** and **DOWN** arrows to change to the desired value. Press the **SELECT** key to set.

SET THE DAYLIGHT SAVINGS OPTION
The Daylight Savings option will cause the control to automatically adjust the clock on the standard "Spring Forward" and Fall Back" days. The option can be set by pressing the **SELECT** key to activate the edit fucntion. The *YES/NO* should begin to blink. Press the **UP** and **DOWN** arrows to change to the desired value. Press the **SELECT** key to set.

TEST RELAY



The ouput relays are connected to different alarming equipment. This menu is provided to facilitate the wiring check, When entering and exiting this menu, the relays retain their original operating states. Each entry operates one relay. This relay can then be turned ON(Energized) or OFF(De-Energized) by the user. The N.O. or N.C. settings on alarm relays have no effect on the test. When exiting from this menu, the operating states of all relays prior to entering this menu will be resumed.

TEST RELAY L4B (LEVEL 4 RELAY B)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

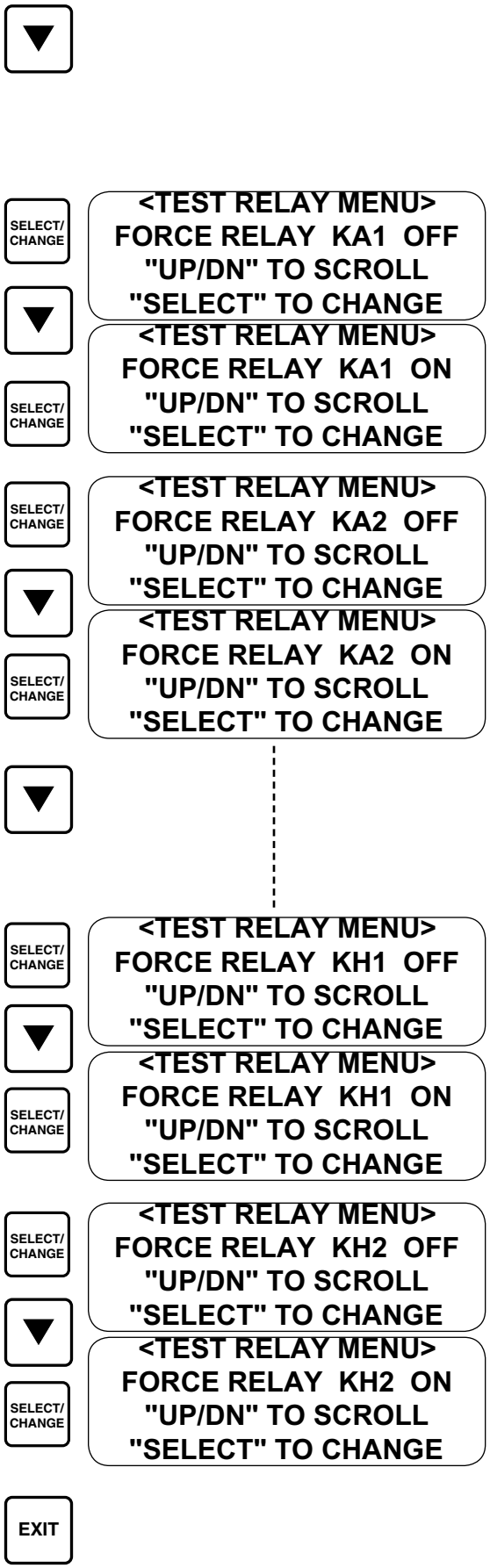
TEST RELAY L4A (LEVEL 4 RELAY A)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

TEST RELAY L3B (LEVEL 3 RELAY B)
TEST RELAY L3A (LEVEL 3 RELAY A)
TEST RELAY L2B (LEVEL 2 RELAY B)
TEST RELAY L2A (LEVEL 2 RELAY A)

TEST RELAY L1B (LEVEL 1 RELAY B)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

TEST RELAY L1A (LEVEL 1 RELAY A)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF). This is the last of the standard alrm level relays.

EXIT THIS MENU OR DOWN ARROW TO CONTINUE IN THIS MENU WITH ZONE ISOLATION RELAY TEST



The zone isolation relays are an option and not found in all Sherlock 4-Series controls. Each sensor labeled from sensor "A" to "H" has 2 relays for each sensor. The number of zone isolation relays are as follows:

Sherlock 204 has 4. (Sensor "A" & "B")
Sherlock 404 has 8. (Sensors "A", "B", "C", "D")
Sherlock 804 has 16. (Sensors "A" through "H")

TEST ZONE ISOLATION RELAY KA1
(SENSOR A RELAY 1)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

TEST ZONE ISOLATION RELAY KA2
(SENSOR A RELAY 2)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

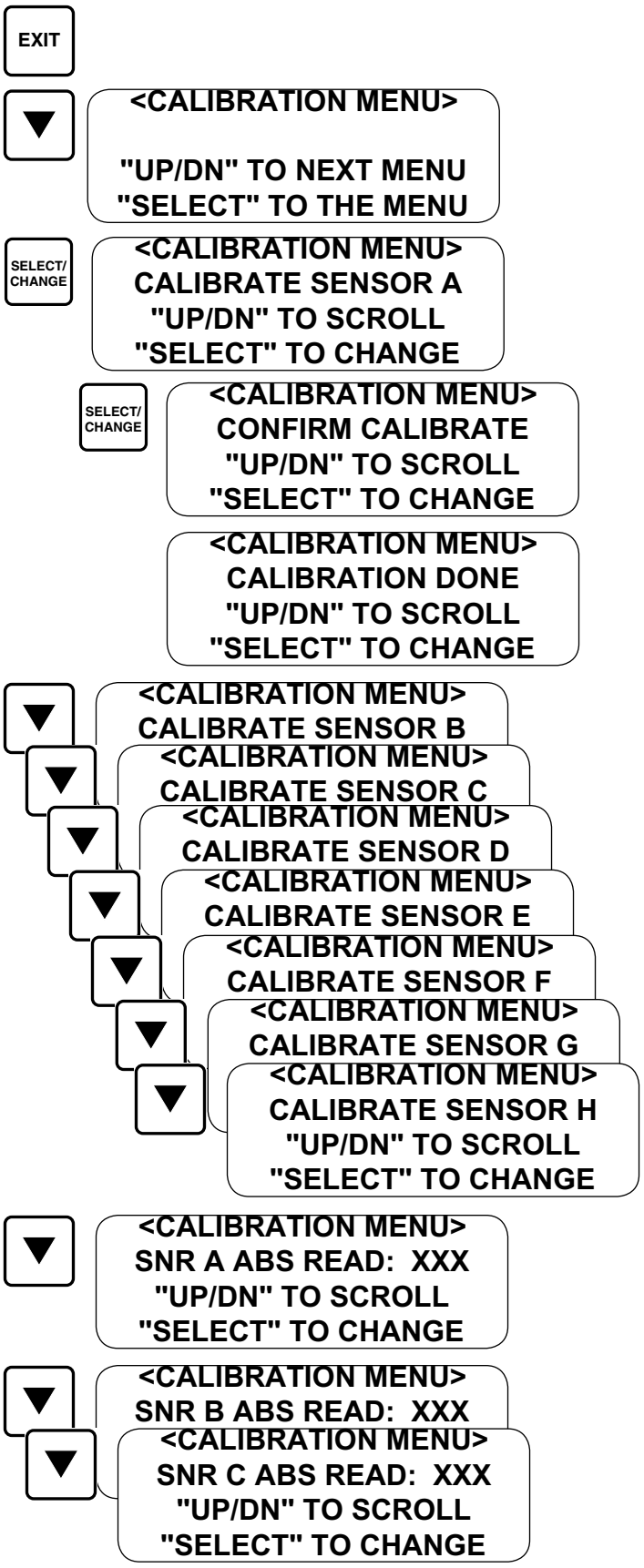
TEST ZONE ISOLATION RELAY KB1, KB2
TEST ZONE ISOLATION RELAY KC1, KC2
TEST ZONE ISOLATION RELAY KD1, KD2
TEST ZONE ISOLATION RELAY KE1, KE2
TEST ZONE ISOLATION RELAY KF1, KF2
TEST ZONE ISOLATION RELAY KG1, KG2

TEST ZONE ISOLATION RELAY KH1
(SENSOR H RELAY 1)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

TEST ZONE ISOLATION RELAY KA2
(SENSOR H RELAY 2)
Press **SELECT** button. The "OFF" message start to blink Press **UP/DOWN** arrow button to change to "ON". Press **SELECT** button to execute the forcing (ON or OFF).

Exit this menu and return to DEFAULT SCREEN. All relays return to their operating states prior to entering relay test menu.

CALIBRATION



This page and the next contain a brief overview of the "CALIBRATION MENU" of the Sherlock Control System. The pages after these two contain specific instruction on calibrating the Sherlock Monitoring System and its sensors.

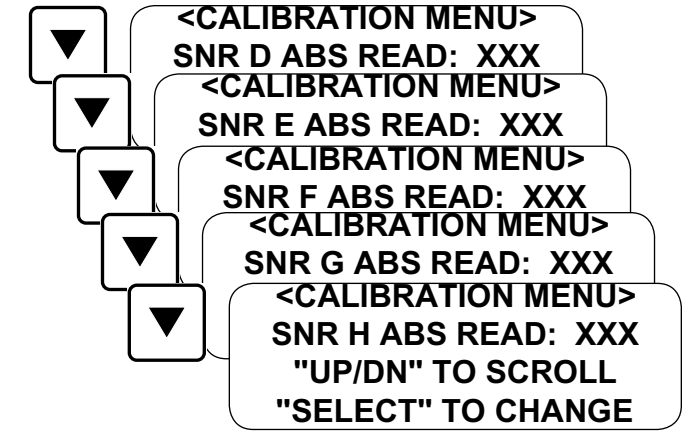
The CALIBRATION MENU contains three basic functions:

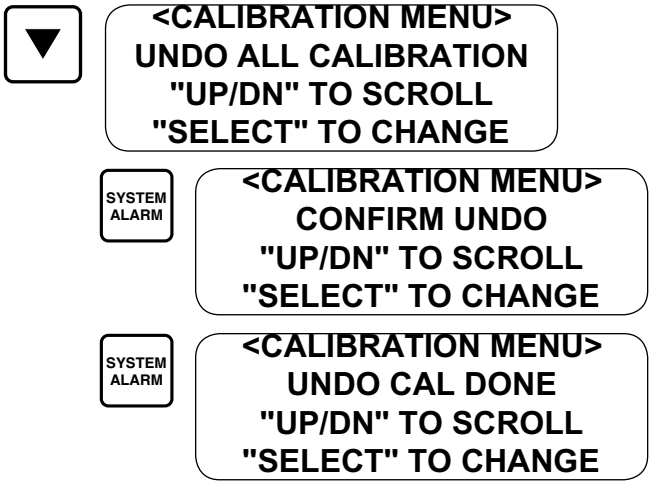
1) ZERO CALIBRATION (ZERO OFFSET)
These instructions are not applicable to the Oxygen sensor.

This function will allow the user to factor out the senosr's designed "rasied zero" and any ambient effects on the sensor by reseting the currently displayed reading to zero.

Each sensor is designed to produce a minimum value when zero ppm of gas is detected. CMOS - 6, IR - 20

2) SENSOR ABSOLUTE READING
This reading is the actual reading produced by the sensor without the zero offset.





3) UNDO (RESET) ZERO CALIBRATION
This function will clear the zero offset for all sensors.

CALIBRATION

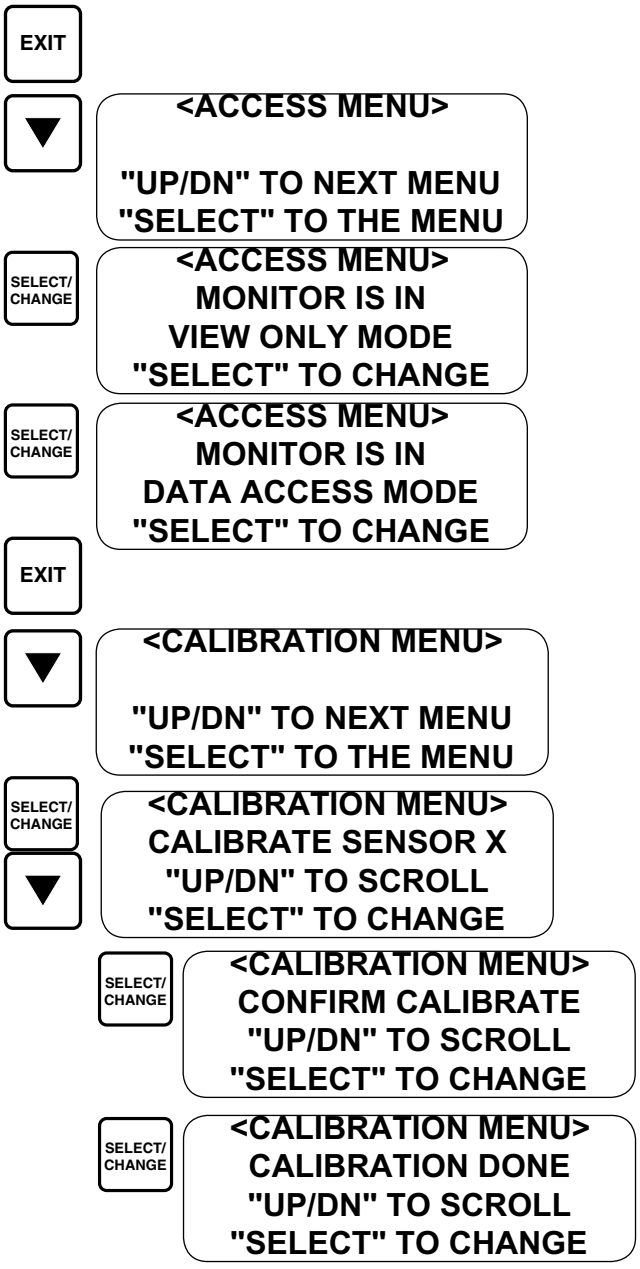
Prior to shipment, all sensors manufactured by Genesis International, Inc. are factory calibrated. The calibration method will set the base level (or Zero Level) and the gain (or Slope). As the sensor gets older or the ambient conditions change drastically, the Zero Level may drift upward or downward. The Gain (Slope) will not normally change.

Periodic adjustment (no more than six months) of the Zero Level is necessary to ensure that the Sherlock Sensor is reading accurately. This function can be performed in a number of different ways. The first and most expeditious method is to "offset" the Zero Level by programming an offset or by conducting a Zero Calibration within the Sherlock control systems. If calibration is beyond the offset limit (> 80) then the second method is to adjust the zero offset on the sensor itself. More complex method involving exposing the sensor to pre-measured gas concentrations, mimicking one of the factory calibration procedures. A Sherlock Refrigerant Sensor Calibration and Test Kit is required for this method.

For CMOS sensor, turning the potentiometers CCW will lower the readings, CW will raise the readings. After turning a potentiometer, you must wait at least 30 seconds for the readings to stabilize before making any other adjustments or continuing to the next step.

For IR sensor, zeroing function is accomplished by pushing a push button on the sensor for six seconds. Refer to the OPERATIONS section of this manual.

Zero Calibration - Sherlock 4-Series, CMOS and IR Sensors



Prior to continuing, ensure that the sensors are properly connected to the SHERLOCK 4-Series Monitor and that the sensor has been energized for over 3 hours.

1. Place the Sherlock into the Calibrate Sensor Mode

Press the EXIT Key.

Using the UP/DOWN Arrows, place the Sherlock into the "Access" Menu.

Press Select. If the control display shows <DATA ACCESS MODE>, then press the EXIT Key.

If not, press the **SELECT** Key, changing the control from <VIEW ONLY MODE> to <DATA ACCESS MODE>.

Press the EXIT Key.

Using the UP/DOWN Arrows, place the Sherlock into the "Calibration" Menu.

Press Select.

Using the UP/DOWN Arrows, locate the function <CALIBRATE SENSOR X> where "X" is the sensor being calibrated.

Press the SELECT Key. The display should state <CONFIRM CALIBRATE>.

Press the SELECT Key. The display should show <CALIBRATION DONE>.

CALIBRATION KIT.

The Calibration Kit contains the following items:

Carrying Case
Calibration Chamber
Calibration Gas - Zero Level
Calibration Gas - Span Gas.
Flow Regulating Valve
2.5 ft Vinyl Tubing

Flow Regulating Valve. The Flow Regulating Valve permits the sensor chamber or the IR Sensor chamber to be filled at a constant rate.

Calibration Chamber. The Calibration Chamber allows the CMOS and Oxygen sensors to be sealed into a controlled environment.

2.5 ft Vinyl Tubing. To connect the valve to either the Calibration Chamber or to the IR Sensor Chamber.

Calibration Gas - Zero Level. 79.1% Nitrogen/20.9% Oxygen, 34 L gas, compressed.

Calibration Gas - Span Gas.

Refrigerant Sensor-Measured concentration of refrigerant gas and N2/O2.

Oxygen Sensor - 23% Nitrogen/17% Oxygen, 34 L gas, compressed.

Measured Gas Calibration - Sherlock IR Sensor (See manual 44-0221 IR Sensor for more)

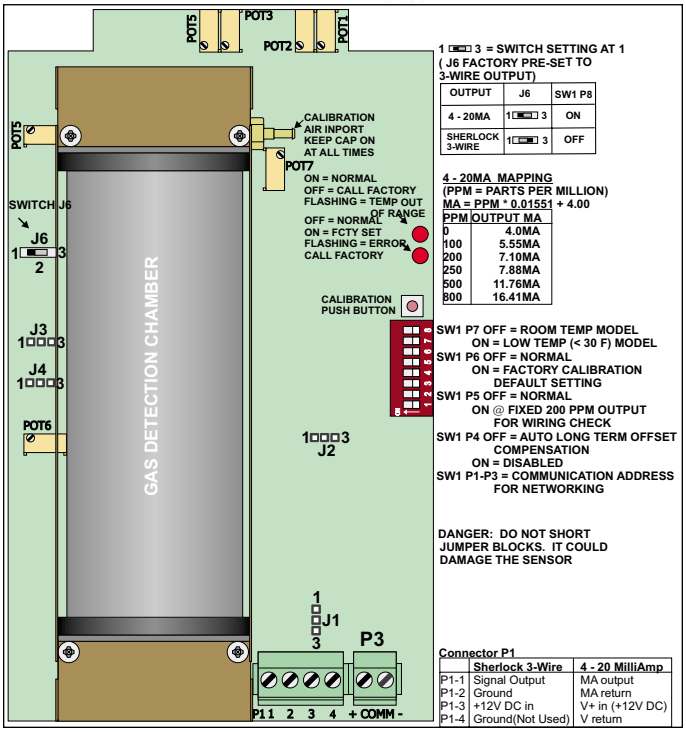
Equipment Required.

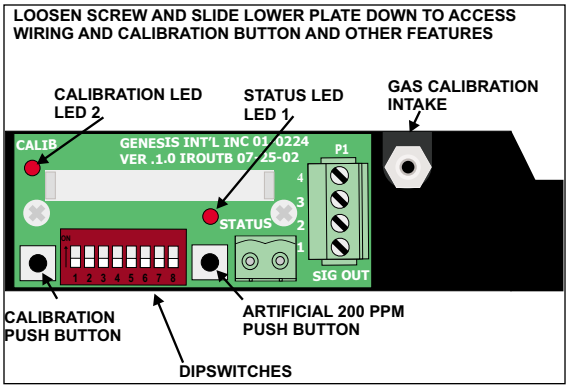
1. Sherlock Refrigerant Sensor Calibration and Test Kit.
   a. Flow Regulating Valve - 1 Liter per minute
   b. Calibration Gas Canister - 79.1% Nitrogen/20.9% Oxygen (Zero Gas)
   c. Calibration Gas Canister - Nitrogen Balance/Measured quantity of Refrigerant Gas (Span Gas)
   d. Vinyl Tubing for IR Sensor.
   e. Potentiometer Screwdriver.
2. Digital Multi-meter-DC Volts/Amps

The measured gas calibration procedure may be used as a double check of sensor accuracy and only needs to be done if there are questions of whether or not the sensor is working. It is not necessary to use measured gas to calibrate the infrared sensor. This procedure involves changing the air currents drastically inside the sensing chamber, so please use the procedure listed below only as a test. Since the gas is forced into the sensor the reading will not be as accurate as a normal reading.

At the factory we allow for normal airflow that would occur in a real leak when we calibrate the sensor and set the zero level. So there will be an artificial reading between the zero gas and measured gas because of the unusual air currents involved.

1) Place the Plastic tubing that comes with the calibration kit over the inlet valve on the top right of the sensing tube and connect the other end to the calibration gas canister regulator.





2) Run the 20.9% O2 gas into the sensor for about 5 minutes and wait for the reading to settle. Press the push button on the sensor right above the dipswitch for 10 seconds. This will be the artificial zero level.

3) Next run the measured refrigerant gas into the sensor for about 5 minutes. The difference between the artificial measured gas reading and the artificial zero level reading should be close to the measured gas concentration however the way the gas is pumped in will create errors in the accuracy of the reading.

4) Once the measured gas testing is complete and no gas is present and the sensor is mounted in normal conditions, do the push button calibration once again to remove any artificial readings that were introduced during measured gas calibration.

Measured Gas Calibration - Sherlock CMOS Sensor

To accurately calibrate the Sherlock CMOS Sensor, the Refrigerant Gas Sensor Calibration Kit for the particular sensor must be used.

Kit Setup Instructions

1. Insert the tube into the fitting at the end of the chamber, tighten the fitting until the tube is snug.
2. Remove the sensor from the wall or mounting point. Take the front face cover off of the sensor.
3. Mounting the Sensor
   a. Place the chamber on its side so that the tube comes out from the left or right side.
   b. Mount the sensor module in the chamber using the supplied mouniting screw, making sure that the cable fits into the notch at one end of the chamber.
   c. Seal the chamber.
4. Take the free end of the tube and mount it onto the barbed end of the flow regulating valve**.**

Calibration Procedures.

1. Filling the Chamber
   a. Mount the valve onto the 20.9% Oxygen tank. Open the valve for 2 minutes.
   b. Wait 5 minutes.
   c. Open the valve again for 2 minutes.
   d. Wait 5 minutes.
2. Place the controller into the Sensor Absolute Screen.
   a. Press EXIT.
   b. Press the DOWN arrow until the "CALIBRATION MENU" is displayed. Press SELECT.
   c. Press the DOWN arrow until you reach the "SNR X ABS READ: YYY" screen where X is the sensor being calibrated.
3. With the supplied Potentiometer Screwdriver, adjust the potentiometer until the displayed reading is 40. If the reading is too high or too low and the potentiometer has no effect on the reading, open the chamber and change the position of the set pin jumper one position lower if the reading is too high, or one position higher if the reading is too low.
4. Conduct the Zero Calibration procedure for this partular sensor.

SENSOR MOUNTED IN CALIBRATION CHAMBER

Calibration - Sherlock Oxygen Sensor

To accurately calibrate the Sherlock O2 Depletion Sensor, the O2 Sensor Calibration Kit must be used.

Kit Setup Instructions

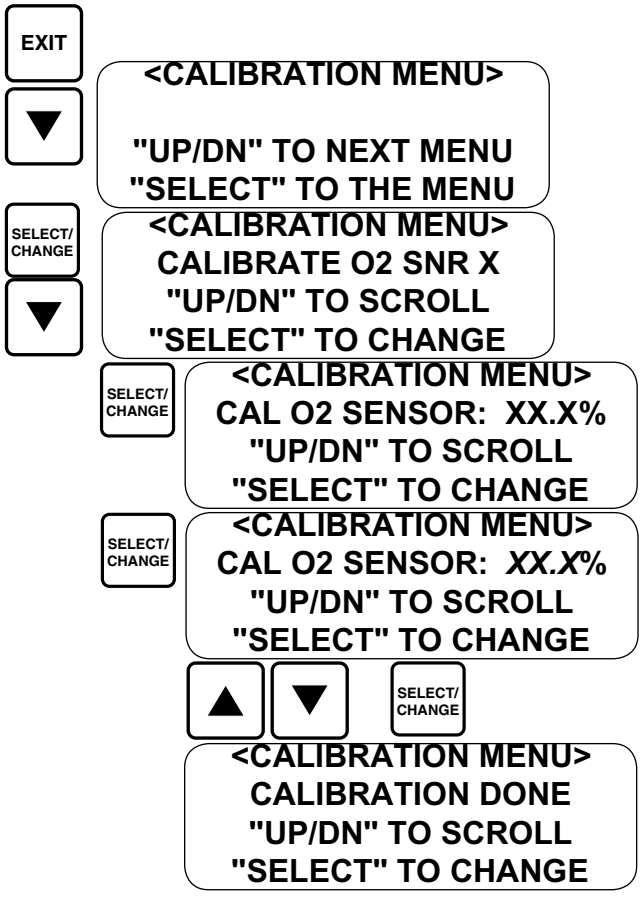
1. Insert the tube into the fitting at the end of the chamber, tighten the fitting until the tube is snug.
2. Remove the sensor from the wall or mounting point. Take the front face cover off of the sensor.
3. Mounting the Sensor
   a. Place the chamber on its side so that the tube comes out from the left or right side.
   b. Mount the sensor module in the chamber using the supplied mouniting screw, making sure that the cable fits into the notch at one end of the chamber.
   c. Seal the chamber.

NOTE: Sensor module must be mounted so that the sensor (spool-like object) is sitting straight up and down with the wires at the top.

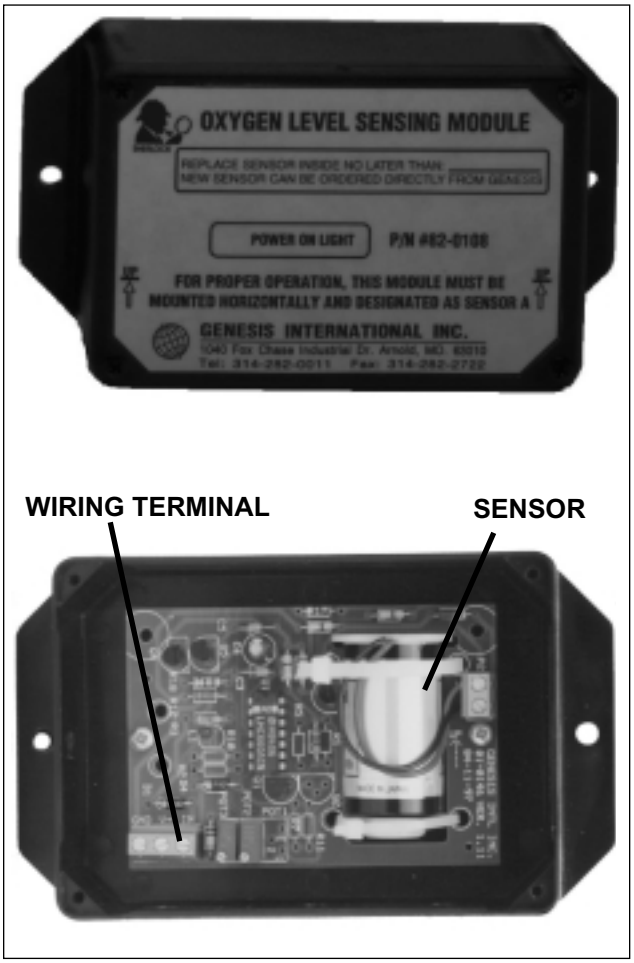
4. Take the free end of the tube and mount it onto the barbed end of the flow regulating valve**.**

Calibration Procedures.

1. Filling the Chamber
   a. Mount the valve onto the 20.9% Oxygen tank. Open the valve for 2 minutes.
   b. Wait 5 minutes.
   c. Open the valve again for 2 minutes.
   d. Wait 5 minutes.



PROPER MOUNTING OF THE ELECTROCHEMICAL SENSOR



2) Follow these programming procedures.:
Ensure that the control access in the "Data Access" or the "All Access" mode.

Press the **EXIT** key.

Using the **UP/DOWN** Arrows, place the Sherlock into the “Calibration” Menu.

Press **SELECT**.
Using the **UP/DOWN** Arrows, locate the function <CALIBRATE O2 SNR X> where “X” is the sensor being calibrated.

Press the **SELECT** Key. The screen should display <CAL O2 SENSOR: XX.X%> .

Press the **SELECT** Key. The values XX.X% should blink.

Use the UP/DOWN arrows to change the values to 20.9%. Press the SELECT key to set the value.

The screen will flash <CALIBRATION DONE>.

TROUBLESHOOTING

SHERLOCK CMOS (SOLID STATE) REFRIGERANT GAS SENSOR

LED L1 - LED L1 will indicate whether the sensor is powered up and if the internal circuitry is operating properly. The LED is color coded. Red is for CFC/HCFC gases. Green is for HFC gases. Amber is for Ammonia (NH3).

LED Status	**Solution**
Off	Sensor is not powered up Check power. Ensure that the sensor is being powered by 12V AC or DC. Call Genesis Customer Service if LED is still off.
ON Steady	Sensor is powered up. Sensor is operating properly.

Sensor Reading	**Solution**
Sensor reading shows the presence of gas	Check space with a hand held leak detector for a leak. If no leak, follow the zero calibration instructions. Next move the sensor to another location or swap positions with another sensor. If readings "move" with the sensor, call Genesis Service.
Sensor output indicates a full scale reading	If readings "stay" at original location, check for wiring problems or the presence of gas. Double check signal wire connection.
Sensor output indicates an "open circuit"	Check for wiring problems, jumpers not properly set.
Sensor output indicates a "short circuit"	Check wiring. Sensor Element may have malfunctioned. Call Genesis Customer Service
	Check for continuity wiring problems.

RECOMMENDED MAINTENANCE SCHEDULE

These sensors can last up to 5 years if properly installed. To insure a reading as accurate as possible, these sensors need to be zero calibrated every 6 months. It is strongly recommended to follow the zero calibration instructions in the calibration menu of this manual to rezero the sensors. Measured gas calibration testing should only be necessary for double checking and for testing the sensor.

SHERLOCK INFRARED (IR) REFRIGERANT GAS SENSOR

LED L1 - LED L1 will indicate if the sensor microprocessor is operating and if the sensor is operating in the correct temperature environment. When the microprocessor goes through start-up, it will turn on L1 and keep it on unless the microprocessor detects a failure of any of the sensor components or detects an incorrect temperature range.

LED L2 - LED L2 is used for calibration of the sensor and is normally off. When the Push Button Calibration is done, L2 will turn on in about 4 seconds then turn off when Push button is released.

LED Status	Condition	Solution
L1 Off	Sensor is not powered up.	Check power connector. Ensure that the sensor is being powered by 12 Volts DC. Ensure that wire connections are secure and are correct polarity.
		Microprocessor detects an error in the sensor hardware or Microprocessor Failure. Call Genesis Customer Service
L1 On Steady	Sensor is operating properly. Sensor is operating in correct temperature range.	
L1 On Flashing	Temperature range is incorrect. Sensor is set for Room Temp and the inside chamber temperature is below 32 °F or the sensor is set for Cold Temp and the ambient temperature is above 32 °F.	Switch Dip Switch SW7 to other position.
	Microprocessor detects error in the sensor signal.	If switching SW7 does not work, call Genesis Customer Service
L2 Off	Sensor is operating properly.	
L2 On Flashing	Microprocessor Failure	Call Genesis Customer Service. Check start up date on the sensor cover
L2 On Steady	Sensor is on factory calibration setting	Turn Dip Switch 6 off and wait at least 1 minute for L2 to turn off and do Push Button calibration again.
Sensor Reading		
	Sensor reading shows the presence of gas	Was the calibration procedure followed. First attempt Push button procedure. Check area around sensor with a hand held leak detector for a leak. If no leak, move sensor to another location or swap positions with another sensor. If readings "move" with the sensor, call Genesis Service, if readings "stay" at original location, check for wiring problems or the presence of gas. Make sure Dip Switches are set to off position and Switch J6 is set to the 2,3 position. How old is the sensor? Check start up date on the sensor cover.
	Sensor output indicates a full scale reading	Check for wiring problems. Turn DipSwitch 5 to on. If the control reads about 200 there could be a sensor problem and contact Genesis customer service. If it still reads full scale double check for proper wiring. How old is the sensor? Check start up date on the sensor cover.

GLOSSARY

ABS This is the "absolute value" for the sensor also known as the "raw reading" for the sensor.

ACGIH "American Conference of Governmental Industrial Hygienists" This organization sets guidelines for occupational exposure for various gases.

ALL ACCESS MODE - The user has complete access to the menus of the monitor.

AL, ALM "Alarm".

ALARM DELAY - This feature is designed to minimize false alarms. It means the sensor must see gas levels at or above the setpoint for this period of time.

CFC "Chloro Flouro Carbon" This is a class of refrigerants.

COMM BAUD RATE - This identifies the speed of the port used in the communications.

COMMUNICATION STATION - The monitor has remote communication capabilities. The monitors can be linked together. Each monitor in the net work must have its own identification that distinguishes itself from other monitors and controls.

CMOS "Ceramic Metal Oxide Sensor" also referred to as Solid State Sensors.

DATA ACCESS MODE - The user can view as well as change the settings, however the critical settings in the system setup cannot be changed.

DI1 / DI2 Setback dry contact input (1 or 2).

DLAY “Delay”.

DPDT Relay "Double Pole Double Throw" This is a type of relay with two independent poles. Each pole (common) can be switched from normally closed contact to normally open contact.

HCFC "Hydro Chloro Flouro Carbon" This is a class of refrigerants.

HFC "Hydro Flouro Carbon" This is a class of refrigerants.

K1A "K" denotes alarm, "1" refers to the alarm level (1, 2 or 3) and "A" refers to the relay pole for that alarm level (A or B),

LATCH This feature allows the user to choose whether they would like an alarm condition to be manually reset (latched) or reset automatically (unlatched) when the alarm condition clears.

NDIR "Non-Dispersive Infrared" Sensors also referred to as IR Sensors.

OXGN Oxygen Deprivation Sensor.

SETBACK, STBK - This feature allows the sensors to operate under alternate setting under certain circumstances.

SETPT “Setpoint”.

SNR “Sensor”.

SPDT "Single Pole Double Throw" This is a type of relay with one pole. The pole (common) can be switched between normally open contact and normally closed.

T/D1 Setback feature based on the setback time or input 1.

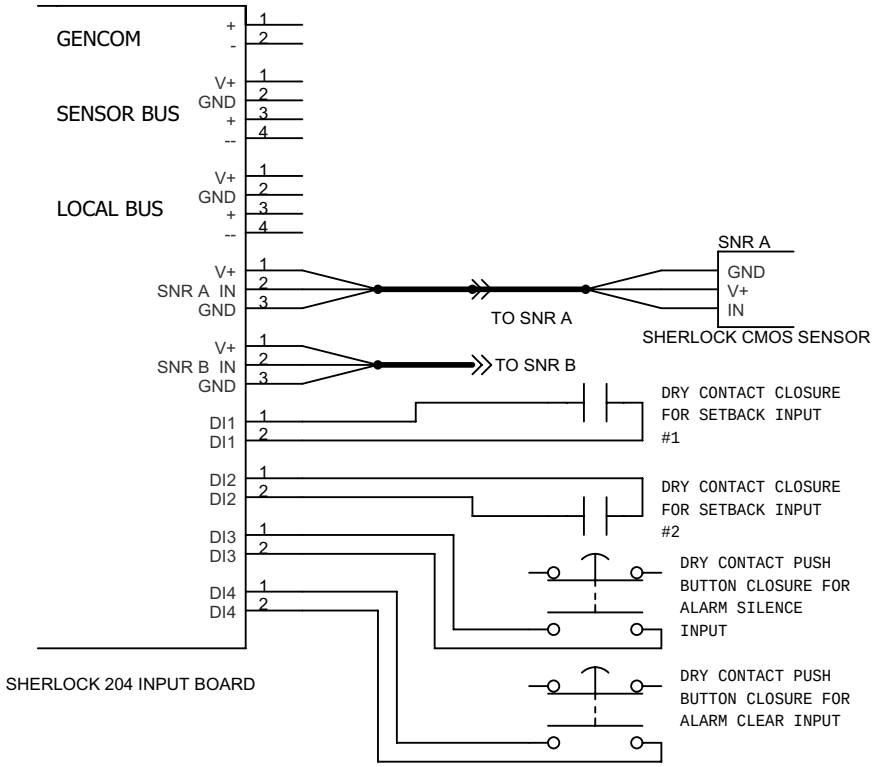
TMCK Setback feature based on the build-in setback time clock.

TWA, AVG "Time Weighted Average" This is the average reading of the sensor over a period of time.

VIEW ONLY MODE - The user can view the settings in the menu but cannot make any changes.

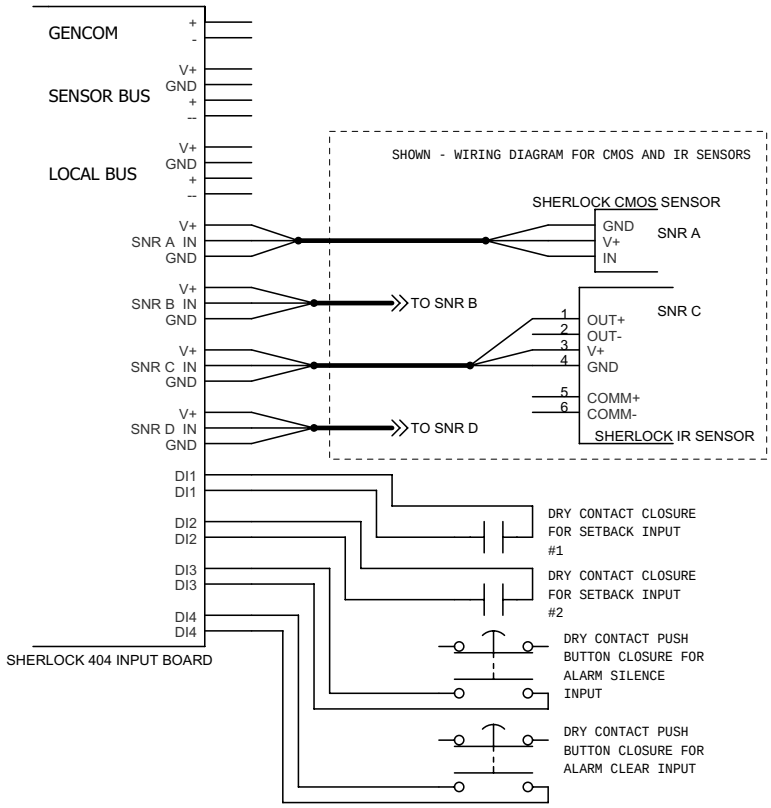
ITEM	PART#
Sherlock 204 Control Assembly	60-0035
Sherlock 204: Mounted in NEMA 4X Enclosure	60-0035
Sherlock 404 Control Assembly	60-0036
Sherlock 404: Mounted in NEMA 4X Enclosure	60-0036
Sherlock 804 Control Assembly	60-0037
Sherlock 804: Mounted in NEMA 4X Enclosure	60-0037
Sherlock 204 Auxiliary Relay Kit:	88-0313
Sherlock 404 Auxiliary Relay Kit:	88-0314
Sherlock 804 Auxiliary Relay Kit:	88-0166
Analog Output Board for Sherlock 204/404	88-0167
Analog Output Board for Sherlock 804	88-0168
Solid State CMOS CFC/HCFC Sensor	82-0100
Solid State CMOS HFC Sensor	82-0101
Solid State CMOS Ammonia (NH_3) Sensor	82-0102
Solid State CMOS CFC/HCFC Ventline Sensor	60-0018
Solid State CMOS HFC Ventline Sensor	60-0028
Solid State CMOS Ammonia (NH_3) Ventline Sensor	60-0027
Electrochemical Oxygen Deprivation Sensor	82-0108
R-11 Infrared Sensor NEMA 1 45F to 120F	82-0232
R-12 Infrared Sensor NEMA 1 45F to 120F	82-0239
R-22 Infrared Sensor NEMA 1 45F to 120F	82-0200
R-123 Infrared Sensor NEMA 1 45F to 120F	82-0201
R-134a Infrared Sensor NEMA 1 45F to 120F	82-0202
R-402a Infrared Sensor NEMA 1 45F to 120F	82-0249
R-404a Infrared Sensor NEMA 1 45F to 120F	82-0241
R-11 Infrared Sensor NEMA 3R 45F to 120F	60-0057
R-22 Infrared Sensor NEMA 3R 45F to 120F	60-0053
R-123 Infrared Sensor NEMA 3R 45F to 120F	60-0055
R-134a Infrared Sensor NEMA 3R 45F to 120F	60-0054
R-404a Infrared Sensor NEMA 3R 45F to 120F	60-0052
R-408a Infrared Sensor NEMA 3R 45F to 120F	60-0065
R-409a Infrared Sensor NEMA 3R 45F to 120F	60-0066
R-502 Infrared Sensor NEMA 3R 45F to 120F	60-0059
R-507a Infrared Sensor NEMA 3R 45F to 120F	60-0061
R-717(NH_3) Infrared Sensor NEMA 3R 45F to 120F	60-0056
R-11 Infrared Sensor NEMA 3R -30F to 45F	60-0058
R-22 Infrared Sensor NEMA 3R -30F to 45F	60-0047
R-123 Infrared Sensor NEMA 3R -30F to 45F	60-0049
R-134a Infrared Sensor NEMA 3R -30F to 45F	60-0054
R-404a Infrared Sensor NEMA 3R -30F to 45F	60-0051
R-502 Infrared Sensor NEMA 3R -30F to 45F	60-0060
R-507a Infrared Sensor NEMA 3R -30F to 45F	60-0062
R-717 (NH3) Infrared Sensor NEMA 3R -30Fto 45F	60-0050
Gas Canister, 250 ppm R22, Air Balance, 34L	46-0004
Gas Canister, 1000 ppm R22, Air Balance, 34L	46-0024
Gas Canister, 250 ppm R22, Air Balance, 104L	46-0029
Gas Canister, 250 ppm R134a, Air Balance, 34L	46-0005
Gas Canister, 250 ppm R123, Air Balance, 34L	46-0006
Gas Canister, 50 ppm R123, Air Balance,34L	46-0030
Gas Canister, 250 ppm R-404A, Air Balance, 34L	46-0022
Gas Canister, 250 ppm R11, Air Balance, 34L	46-0011
Gas Canister, 250 ppm R12, Air Balance, 34L	46-0023
Gas Canister, 17% Oxygen, Nitrogen Balance, 34L	46-0007
Gas Canister, 20.9% Oxygen, Nitrogen Balance, 34L	46-0008
Gas Canister, 20.9% Oxygen, Nitrogen Balance, 104L	46-0013

ITEM	PART#
Gas Canister, 50 ppm Ammonia, Air Balance, 75L	46-0027
Gas Canister, 250 ppm Ammonia, Air Balance, 75L	46-0026
Gas Canister, 500 ppm Ammonia, Air Balance, 75L	46-0009
Regulating Valve, Standard Calibration Kit	46-0003
Regulating Valve, Ammonia Calibration Kit	46-0010
Calibration Kit For HFC Sensors (R-134A)	88-0153
Calibration Kit For R-123 Sensors Only	88-0154
Calibration Kit For Oxygen Deprivation Sensors	88-0155
Calibration Kit For R-717 (NH3) Sensors	88-0156
Calibration Kit For R-11CFC/HCFC Sensors	88-0221
Remote Alarm:	82-0127
Auto Alarm Dialer Model 1104:	87-0001
Auto Alarm Dialer Model 1108:	87-0008
Remote Alarm And Strobe:	88-0109
Horn	87-0030
Horn/Strobe	87-0005
1 Horn/Strobe w/Power Kit:	88-0227
2 Horn/Strobes w/Power Kit:	88-0228
3 Horn/Strobes w/Power Kit:	88-0229
1 Horn/Strobe w/Power Kit:	88-0230
2 Horn/Strobes w/Power Kit:	88-0231
3 Horn/Strobes w/Power Kit:	88-0232
1 Horn/Strobe:	88-0233
Strobe Light w/Power Kit:	88-0234
2 Stacked Beacons with Horn (Red, Amber)	88-0292
3 Stacked Beacons with Horn (Red, Amber, Blue)	88-0252
Break Glass Pull Station w/Back Box (Blue)	88-0268
Break Glass Pull Station w/Back Box (Yellow)	88-0271
GenCom Communications Installation Manual	44-0025
Gencom Interface Board to Modem	80-0010
Gencom Interface Wire Harness	80-0145
Gencom to Modem Ribbon Cable – 8”	80-0202
“The Stick” FAX Phone Switch	87-0002
GenCom Communication:	88-0190
GenCom Communication (w/ 33.6 KB Modem)	88-0191
Inline Filter	30-0026
Transformer, Wall Plug, 12V DC 250ma	33-0008
Transformer, Wall Plug, 12V DC 250ma	33-0032
Fuse, 6.3 Amp	33-0038
Transformer, Wall Plug, 12V DC 1.5a	33-0051
Fuse, 3.15 Amp, Time Lag	33-0054
Sherlock 102 Control Power Supply 24 VAC	33-0025
Power Supply, Switching, 12V DC 3a	33-0068
Power Supply, Switching, 12V DC 6.2a	33-0072
Housing, Horn Strobe Power Supply w/ Knockouts	35-0075
Optional 24 VAC to 12 VDC Power Supply	84-0236
Belden #8443 Triad Twisted Sensor Cable 22 AWG	27-0063
Belden #8770 Triad Twisted Shielded Sensor Cable 18 AWG	27-0094
Belden #9364 Triad Twisted Shielded Sensor Cable 20 AWG	27-0082
3.15 Amp Fuse Sherlock 4-Series Control	33-0054
Testing Fluid, Sherlock CFC/HCFC and HFC Sensors	45-0008
Testing Fluid, Sherlock Ammonia Sensors	45-0019
Manual Sherlock 4 SERIES	44-0219



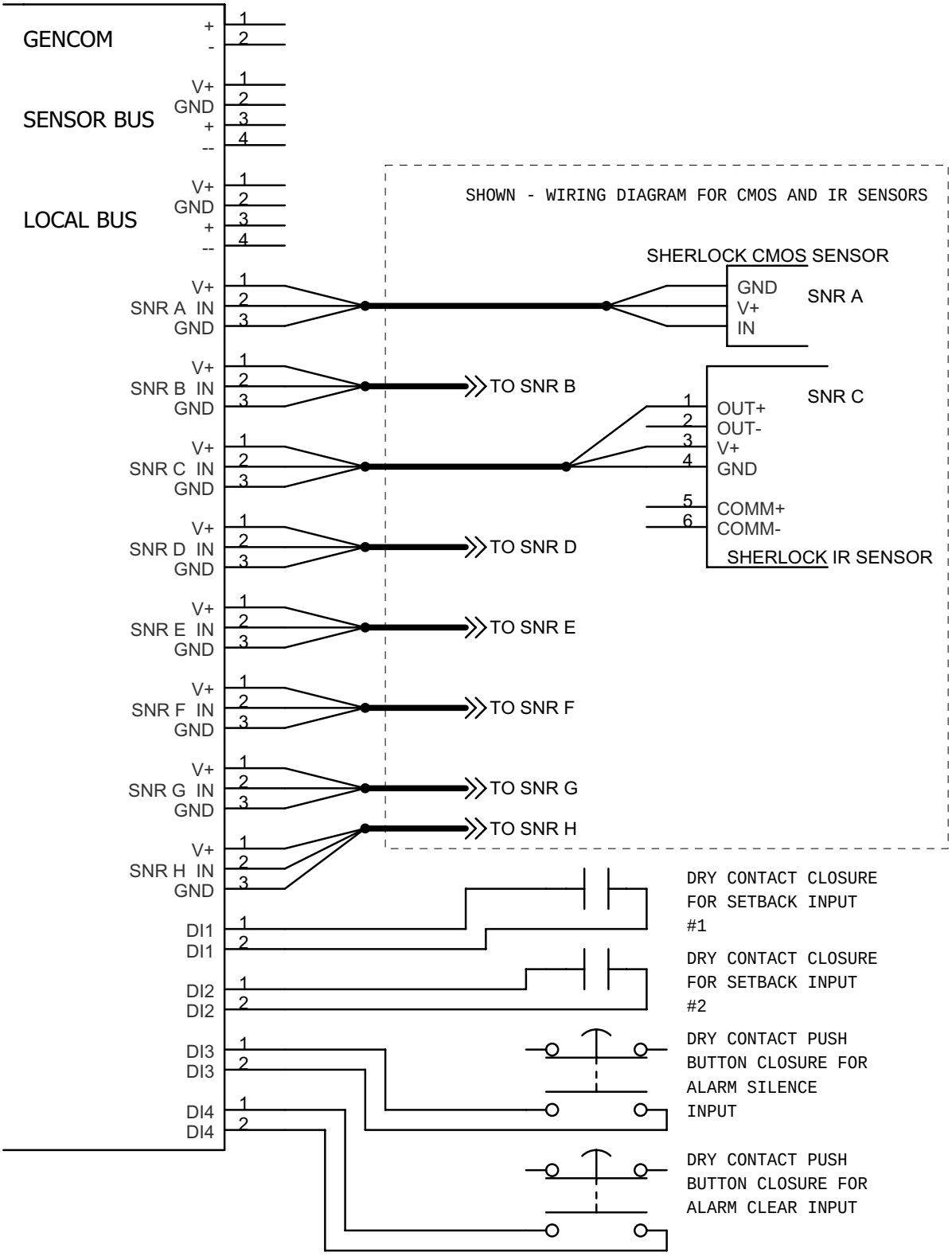
1) SENSOR WIRE - 0-100FT RUN, BELDEN 8443 3-22AWG, TWISTED
SENSOR WIRE - 100-1000FT RUN, BELDEN 8770 3-18AWG, TWISTED, SHIELDED

2) DIGITAL INPUT WIRE - 2-18AWG



1) SENSOR WIRE - 0-100FT RUN, BELDEN 8443 3-22AWG, TWISTED
SENSOR WIRE - 100-1000FT RUN, BELDEN 8770 3-18AWG, TWISTED, SHIELDED

2) DIGITAL INPUT WIRE - 2-18AWG

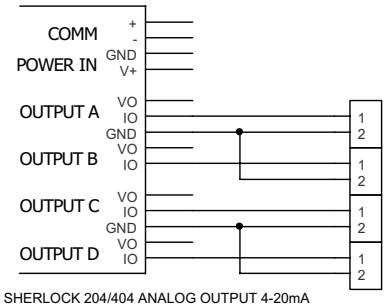


1) SENSOR WIRE - 0-100FT RUN, BELDEN 8443 3-22AWG, TWISTED
SENSOR WIRE - 100-1000FT RUN, BELDEN 8770 3-18AWG, TWISTED, SHIELDED

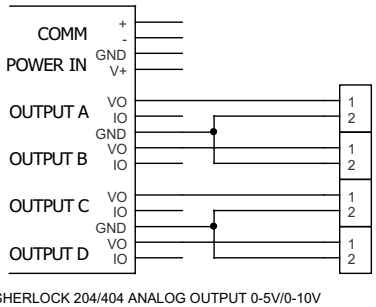
2) DIGITAL INPUT WIRE - 2-18AWG

WIRING DIAGRAMS

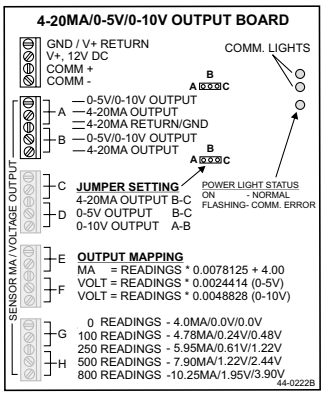
ANALOG OUTPUT BOARD WIRING DIAGRAMS

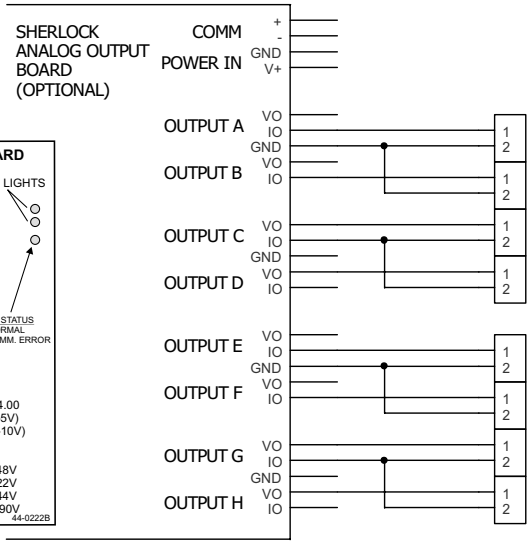


SHERLOCK 204/404 ANALOG OUTPUT 4-20mA

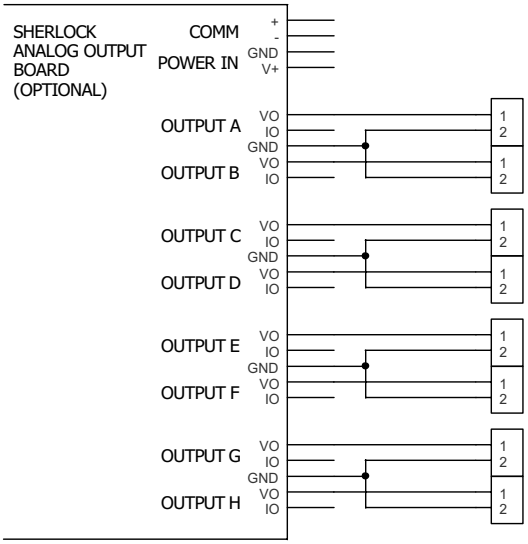


SHERLOCK 204/404 ANALOG OUTPUT 0-5V/0-10V



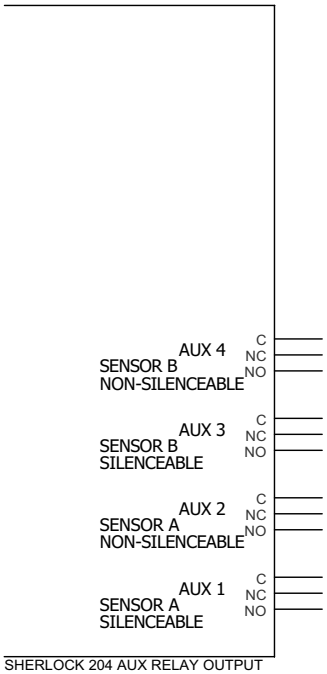


SHERLOCK 804 ANALOG OUTPUT 4-20mA

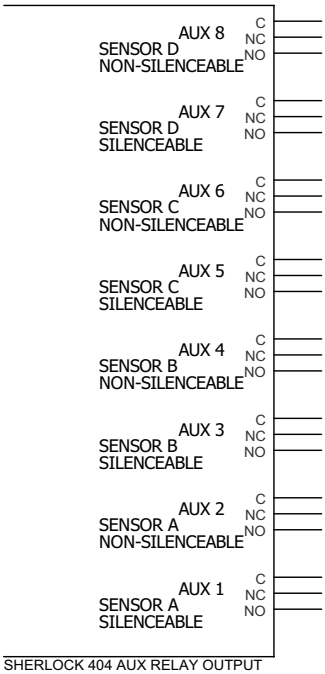


SHERLOCK 804 ANALOG OUTPUT 0-5V/0-10V

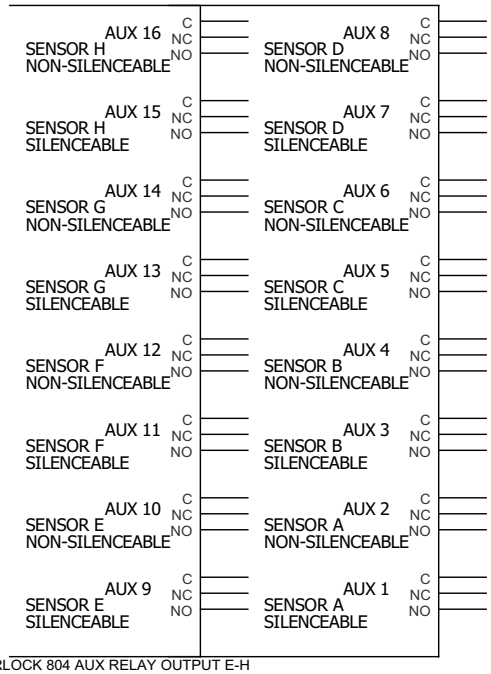
AUXILIARY RELAY BOARD WIRING DIAGRAMS



SHERLOCK 204 AUX RELAY OUTPUT



SHERLOCK 404 AUX RELAY OUTPUT



SHERLOCK 804 AUX RELAY OUTPUT E-H

SHERLOCK 804 AUX RELAY OUTPUT A-D

NOTES

(1) WIRING DIAGRAM ONLY INDICATES EQUIPMENT KNOWN TO GENESIS OR WHAT COULD POSSIBLY BE CONNECTED TO UNIT.

(2) USE BELDEN 8443 22-3 AWG, STRANDED TWISTED TRIAD

(3) OPTIONAL HORN/STROBE KIT CONNECTED TO 1B SILENCEABLE RELAY.FOR REMOTE ALARMING

(4) MATCH V+ TO V+, OUT+ TO IN, GND TO GND

(5) USE BELDEN 8451 22-2 AWG, STRANDED TWISTED PAIR FOR RUNS UNDER 250 FT. USE 18-2 AWG OVER 250 FT

(6) 4-20 MA OUTPUT SHOWN. OUTPUT NAMES CORRESPOND TO SAME SENSOR. (OUTPUT A = SENSOR A)

(7) USE BELDEN #8770 18-3 AWG SHIELDED, STRANDED, TWISTED TRIAD

(8) OPTIONAL STROBE LIGHT KIT CONNECTED TO NON-SILENCEABLE 3A RELAY

(9) STANDARD FACTORY MOUNTED STROBE LIGHT

(10) OPTIONAL AUXILLIARY RELAY BOARD FOR ZONE CUT-OFF. RELAYS TIED TO INDIVIDUAL SENSORS. CAN BE SET TO ALARM AT LEVEL 3 OR MULTIPLE LEVELS. EACH SENSOR HAS 1 SILENCEABLE AND 1 NON-SILENCEABLE RELAY. THE SHERLOCK 804 HAS 2 BOARDS STACKED. A THRU D RELAYS ARE ON THE BOTTOM BOARD AND E THRU H ARE ON THE TOP.

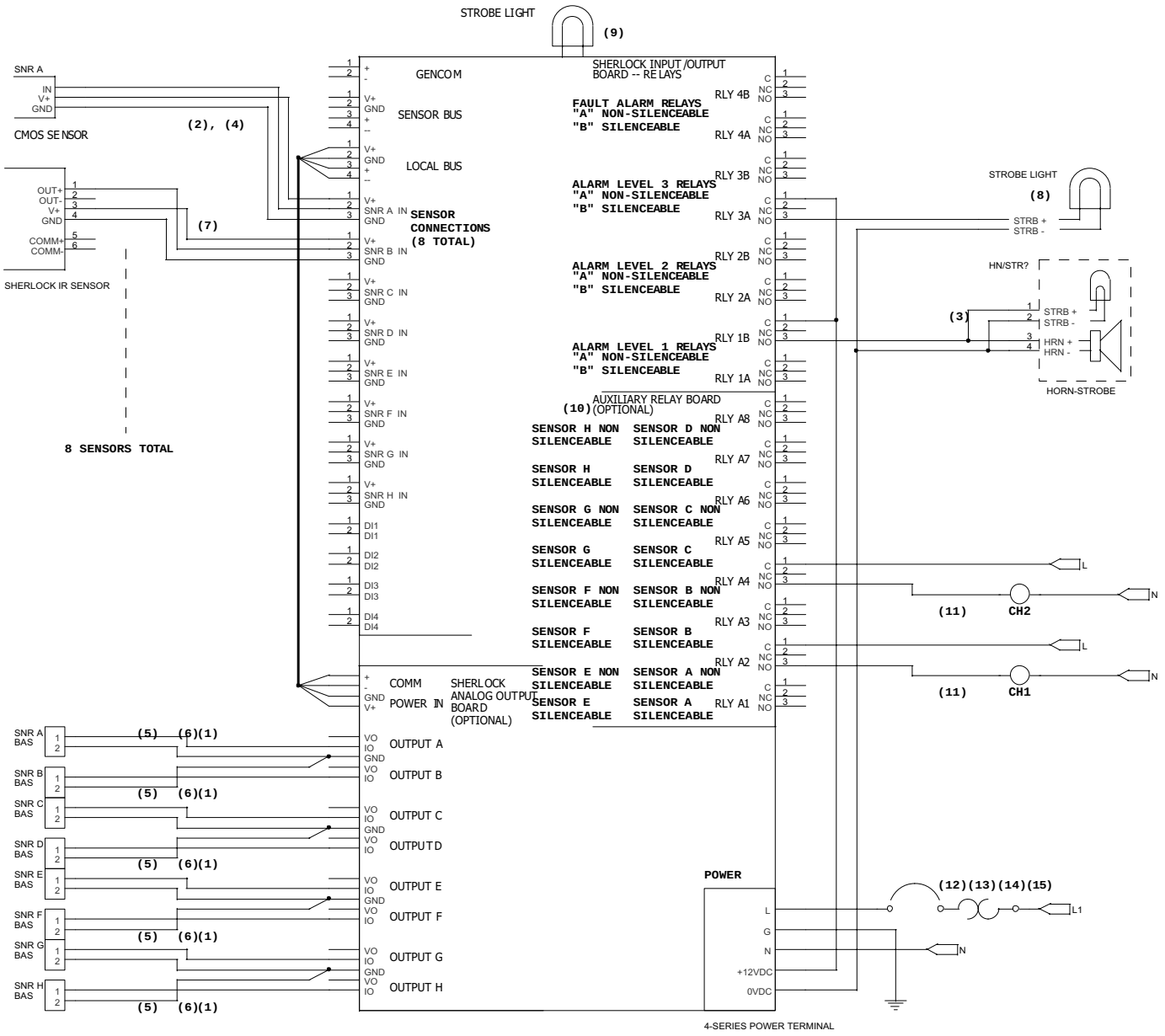
(11) CHILLERS IN SEPARATE MACHINE ROOMS. SENSOR A ALARM CONTROLS CHILLER 1 (CH1) SHUTDOWN. SENSOR B CONTROLS CHILLER 2 (CH2) SHUTDOWN.

(12) INPUT POWER CAN BE 120VAC OR 208/240VAC,3 AMP

(13) 100 TO 240 VAC, 2.5 AMPS 50/60 HZ

(14) GROUNDED NEUTRAL

(15) THE 4-SERIES CONTROL SYSTEM IS A PERMANENTLY CONNECTED DEVICE. ENSURE THAT THE CONTROL POWER SOURCE IS WIRED THROUGH AN EXTERNAL ELECTRICAL CUT-OFF SWITCH OR THROUGH A 15AMP CIRCUIT BREAKER. LOCATE THE CUT-OFF SWITCH OR CIRCUIT BREAKER NEAR THE CONTROL UNIT AND MARK AS THE DISCONNECTING DEVICE FOR THE UNIT.



THIS IS A GENERAL WIRING DIAGRAM SHOWING THE MANY FEATURES AND OPTIONS OF THE SHERLOCK 4-SERIES. ACTUAL WIRING DIAGRAM MAY VARY SIGNIFICANTLY

WIRING DIAGRAMS

THIS PAGE IS FOR FIELD WIRING OR CUSTOM WIRING DIAGRAMS

Before using the table below of "Suggested Setpoints", different municipalities use different standards. Several Universal codes have published recommended alarm levels

- ASHRAE 15-1994
- Uniform Mechanical Code
- International Mechanical Code
- Standard Mechanical Code

When calculating the setpoints for the Sherlock control, the local code jurisdictions need to be consulted. Some jurisdictions have modified the Universal codes for their specific use. It is also a good idea to consult the refrigerant manufacturers Material Safety Data Sheet for Permissible Exposure Limits (PEL) and Immediate Danger to Life and Health (IDLH) limits.

Alarm levels can also vary depending upon which refrigerant is used. If your refrigerant is not listed, check the manufacturers material safety data sheet for PEL (also Allowable Exposure Limit) (AEL)) and IDLH limits.

The Uniform Mechanical Code from which this table was constructed, which is recognized in most municipalities in part or in whole states alarm levels should be at no more than 50% and 25% of the PEL.

If you have questions or concerns, contact Genesis International technical support and we can guide you further.

Suggested Setpoints

	Uniform Mechanical Code Levels			Sherlock 4-Series		
Refrigerant	**PEL (ppm)**	**IDLH (ppm)**	**25% LFL (ppm)**	**Alarm Level 1**	**Alarm Level 2**	**Alarm Level 3**
R-11	1000	5000	na	250	500	850
R-12	1000	50000	na	250	500	850
R-22	1000	50000	na	250	500	850
R-113	1000	4500	na	250	500	850
R-114	1000	50000	na	250	500	850
R-123	30	4000	na	30	200	850
R-134A	1000	50000	na	250	500	850
R-500	1000	50000	na	250	500	850
R-502	1000	50000	na	250	500	850
R-717 (NH_3)	50	500	40000	50	250	850

***Levels taken from Uniform Mechanical Code**

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GENESIS INTERNATIONAL INC.

1040 Fox Chase Industrial Dr. Arnold, MO 63010 **Web: www.Genesis-International.com**
Tel: 636-282-0011 **Fax: 636-282-2722** **E-Mail: Mail@Genesis-International.com**

ONE YEAR LIMITED WARRANTY

GENESIS INTERNATIONAL INC. (GENESIS) warrants each new Electronic Control System and component part thereof to be free from defects in material and workmanship at the time of purchase. GENESIS' obligation under this warranty shall be limited to repairing or exchanging any part or component parts thereof, without charge, F.O.B. factory or nearest authorized parts depot, which may prove defective within one (1) year from date of original installation (not to exceed fifteen (15) months from the date of shipment from the GENESIS factory) and which is proven to the satisfaction of GENESIS to be defective. GENESIS may at its option ship a replacement part prior to receipt of the customer's defective part and proof of the date of original installation upon receipt of a purchase order from the customer. Upon receipt by GENESIS of a defective part proven to GENESIS' satisfaction to be defective, the customer will be credited the exchange price of the part. If not within the coverage of this limited warranty, the part or parts will be returned to the customer C.O.D. and a charge may be imposed for a repair cost estimate. The warranties to repair or replace above recited are the only warranties, express, implied or statutory, made by GENESIS with respect to the Electronic Control System or component parts thereof, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, and GENESIS neither assumes nor authorizes any person to assume for it, any other obligation or liability in connection with any product which utilizes a GENESIS Electronic Control System. Shipping charges for warranted items may also apply.

Within 30 days of the date of shipping Genesis will take back any unused equipment and refund the customer in full minus a 15% restocking fee and any damage charges or testing charges. If the unit is returned within 90 days an in house credit will be given minus a 15% restocking fee. Returns for credit will not be given after 90 days from the ship date.

THIS WARRANTY SHALL NOT APPLY TO LOSS OF FOOD OR REFRIGERANT GAS, OR INCREASED POWER CONSUMPTION OR INCREASED UTILITY CHARGES DUE TO FAILURE FOR ANY REASON.

GENESIS **SHALL NOT BE LIABLE** for any loss, claim, injury or damage to any person or property, or lost profits or other similar loss, or damage, which may arise, directly or indirectly, result or be claimed to have resulted from a defect in the workmanship or materials of any product which utilizes the GENESIS Electronic Control System or any component part thereof.

GENESIS **SHALL NOT BE LIABLE** for any losses or damages 1) resulting from any repairs or replacements made by the customer to the GENESIS Electronic Control System or any component part thereof without the written consent of GENESIS, or 2) when the Electronic System is installed or operated in a manner contrary to the printed instructions covering installation and service which accompanied the System. Furthermore, GENESIS shall not be liable for payment of any removal or installation charges of warranted parts.

GENESIS **SHALL NOT BE LIABLE** for any damages, delays, or losses caused by defects, nor for damages caused by short or reduced supply of materials, fire, flood, strikes, acts of God, or circumstances beyond its control or when the failure or defect of any part or component parts of the System is incident to ordinary wear, accident, abuse or misuse, or when the serial number of the System or component part has been removed, defaced, altered, or tampered with.

This warranty **SHALL BE VOID** when this Electronic Control System or any component part thereof is operated on high, low, improper voltage or amperage, put to a use other than normally recommended by GENESIS, moved to a different address other than the original installation, or transferred to a second owner.

The warranty of items resold by GENESIS and warranted by the original manufacturer shall be transferred to the original owner and will be the only warranty recognized by GENESIS.

GENESIS INTERNATIONAL, INC.

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