



IR-2000 Central Access Panel

User Manual

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A Product of Arjay Engineering Ltd.
Oakville, Ontario, Canada

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Refrigerant Gas Monitor

Flexible monitoring and control for refrigerant gas leaks in chiller rooms of residential, commercial and industrial facilities.

The IR-2000 offers an intelligent solution to gas monitoring for control and ventilation. More than 30 years of gas detection experience has contributed to this highly functional monitor.

- central panel offers display and control functions
- multiple sensor inputs available
- remote audio/visual alarm panels available
- meets CSA and ASHRAE guidelines



IR-2000

The IR-2000 control panel offers a keypad and LCD user interface for easy set-up and operation. This is typically mounted near the main door and inside the chiller room. The Arjay microprocessor monitors the remote sensors mounted adjacent to the chiller units.

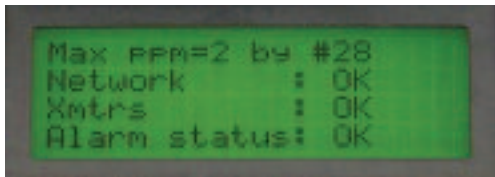
Infrared sensors are used to provide accurate and selective monitoring of both Group A and Group B type refrigerants.

■ Features and Benefits

- bright backlit display and large keypad interface
- analog and relay outputs for control interface
- wall mount heavy duty metal or water tight fiberglass enclosure
- buzzer with silence button
- password protected calibration and control functions
- relay expansion boards provide unlimited relay and output functions

■ Technical Specifications - Control Unit

Operating Temperature	0°C to 40°C, indoor use
Power Input	24 vdc, 110 vac or 220 vac
Standards	UL, CSA
Enclosure	Nema Type 1 or Nema Type 4X



Backlit display offers detailed sensor information



Large keypad, 4-line display, and plug-in connectors are a few of the many features that make this instrument easy to use.

Arjay SS-06



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<u>MODEL</u> IR-2000	<u>DOCUMENT TYPE</u> USER MANUAL	<u>DOCUMENT FILE NAME</u> IR-2000CAPUM12	<u>REV.</u> 1.2
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1.0 INSTRUMENT OVERVIEW

1.1 FEATURES

- Accepts 4-20mA inputs from infrared refrigerant sensors
- Communicates with 1 Auxiliary Board with 8 relays and 4 mA inputs.
- Sensors may be assigned to any of 4 zones
- Each zone may be associated with a different and user selectable gas type
- Optional: 4-20mA output per zone to reflect the zone's max gas reading
- Differential (dual threshold), independent, High-High, High, and Low alarms per zone.
- Optional 4 integral SPDT 10A relays plus 1 Auxiliary Board with up to 8 relays. Each relay is user selectable to be linked to any combination of 12 alarm sources: High-High, High and Low alarms for all 4 zones. Relay 1 of internal relays can be designated for System Fault Alarm.
- Buzzer output linked to common High-High alarm, with Acknowledge input. Auxiliary Board has a buzzer output and acknowledge input.
- Yellow strobe light included
- Independent Delay to On and Off for all installed relays
- Delay to ON for buzzer alarm
- RS-485 Modbus protocol to communicate with Auxiliary Board
- Optional 2nd RS-485 link to Building Monitoring & Control System (BMCS)
- Front panel LCD and membrane keypad user interface.

1.2 DESCRIPTION

The CAP unit is field configured for the number of zones (up to 4).

The CAP unit continuously scans gas concentrations from mA inputs on Auxiliary Board. Up to 4 zones are supported. Each zone is user linked to a single gas type. All sensors in the zone must be for this gas type. For example, a Scanner may be configured for 2 zones to monitor R134A and R123 respectively. Zone 1 may have 2 R134A 4-20MA transmitters, Zone 2 may have 1 R123 4-20MA.

The CAP supports 1 Auxiliary Board with 8 relays. The Auxiliary board is accessed via the Scanner network and is typically located in the scanner enclosure but may be located conveniently to where they are required to reduce electrical wiring.

All sensor values are scanned, and based on the gas concentrations, 3 level alarms are set per zone: low alarm, high alarm, and high high alarm. Any sensor in a zone triggers the zone alarms. There are a total of 8 possible alarms: up to 4 zones, 2 alarms per zone.

Each of the 8 relays may be independently mapped in the field to any of the 24 alarms (Low, High, High-High for up to 4 zones). For example, Relay1 may be mapped to zone 1 Low Alarm as well as the High Alarm for zones all other zones. Relay2 may be mapped to zone 2 Low Alarm as well as the High Alarm for zones all other zones. This scheme will turn on the individual relays 1 and 2 when their respective zones go into Low alarm, and both relays will turn on when any zone goes into High or High-High alarm. This flexibility ensures efficient use of the relays, which can be tailored to unique system requirements.

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Independent Delay to On and Delay to Off can be set for each relay.

For each zone, the maximum ppm value is transmitted on an optional 4-20mA output.

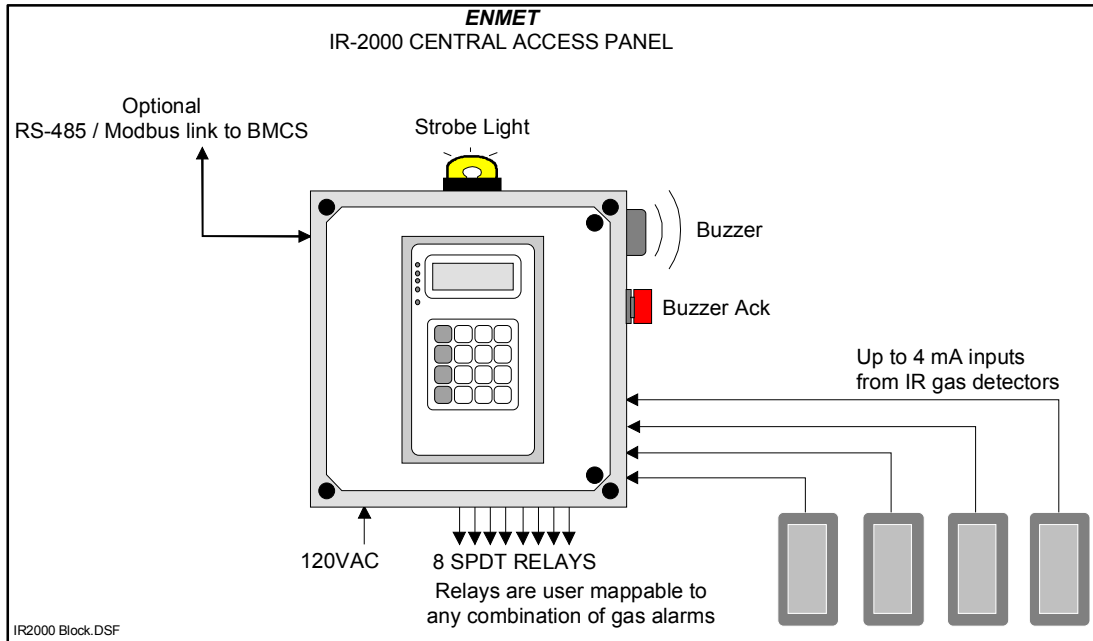


Figure 1.0

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1.3 SPECIFICATIONS

OPERATION

The CAP communicates with an auxiliary board which accepts up to 4 4-20mA outputs assigned to up to 4 zones and sets Sensor Fault, High-High, High, and Low alarms based on ppm values read from the sensors. In addition, the maximum gas reading value is reflected on an optional 4-20mA output per zone.

USER INTERFACE

4 Line x 20 char LCD and 4X4 membrane keypad.

Network RS-485 Modbus protocol connection to Auxiliary Board. Optional additional serial port to link to a Building Automation System.

SENSORS

4-20mA transmitters may be accessed via the Auxiliary board which has up to four 4-20mA inputs.

OUTPUTS

Alarms Differential threshold Low, High, and High-High alarms per zone for up to 4 zones. Each zone is assigned a gas type selectable from a list of about 30 gases. There is a Common Sensor Fault alarm triggered by any sensor in any zone.

Relay Contacts 4 Relays integral relays and up to 16 external relays in banks of 8. Each bank of 8 is accessible via RS-485 and may be located where convenient to save on wiring. Each relay may be field linked to any combination of 24 alarm sources: High-High, High and Low alarms per zone for up to 8 zones. Relay1 may be designated as a System Fault alarm. Contacts are SPDT 10A/120VAC.

Alarm Delay Independent Delay to On and Delay for each relay. Delay range: 0-100 minutes field adjustable.

Strobe Nema 4x Yellow strobe mounted on top of enclosure

Buzzer Activated by any zone's High-High alarm with acknowledge input. Each bank of 8 relays also includes a buzzer and acknowledge input.

4-20mA Outputs Optional. Accessible via RS-485 and may be located where convenient. 2 mA outputs per zone indicating max. ppm and average ppm.

ELECTRICAL SPECIFICATION

Base Scanner Unit

Power 120VAC / 230VAC / 24VDC $\pm 10\%$ (specify at time of order), 2.5 A max.

Fuse T160mA, 250VAC. **Note: For 24VDC power input, the fuse is a 5mm x 20mm, 1/2A, Fast Blow type. This fuse is installed within the unit and must be installed by qualified personnel only.**

The equipment belongs to Pollution Degree2, Installation category II

Sensor Power 12VDC / current depends on number of transmitters.

MECHANICAL SPECIFICATIONS

Enclosure Nema 4X wall mount fiberglass with clear cover to protect keypad / LCD

Dimensions 356mm (14") + (5" for strobe light)H, x 305mm (12") W x 203mm (8") D

Weight 0.3 kg

ENVIRONMENTAL SPECIFICATIONS

Operating Temp. 0 - 55 Deg. C

Relative Humidity 90% max. with no condensation.

2.0 INSTALLATION

See drawings at back of manual.

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3.0 STARTUP AND CONFIGURATION

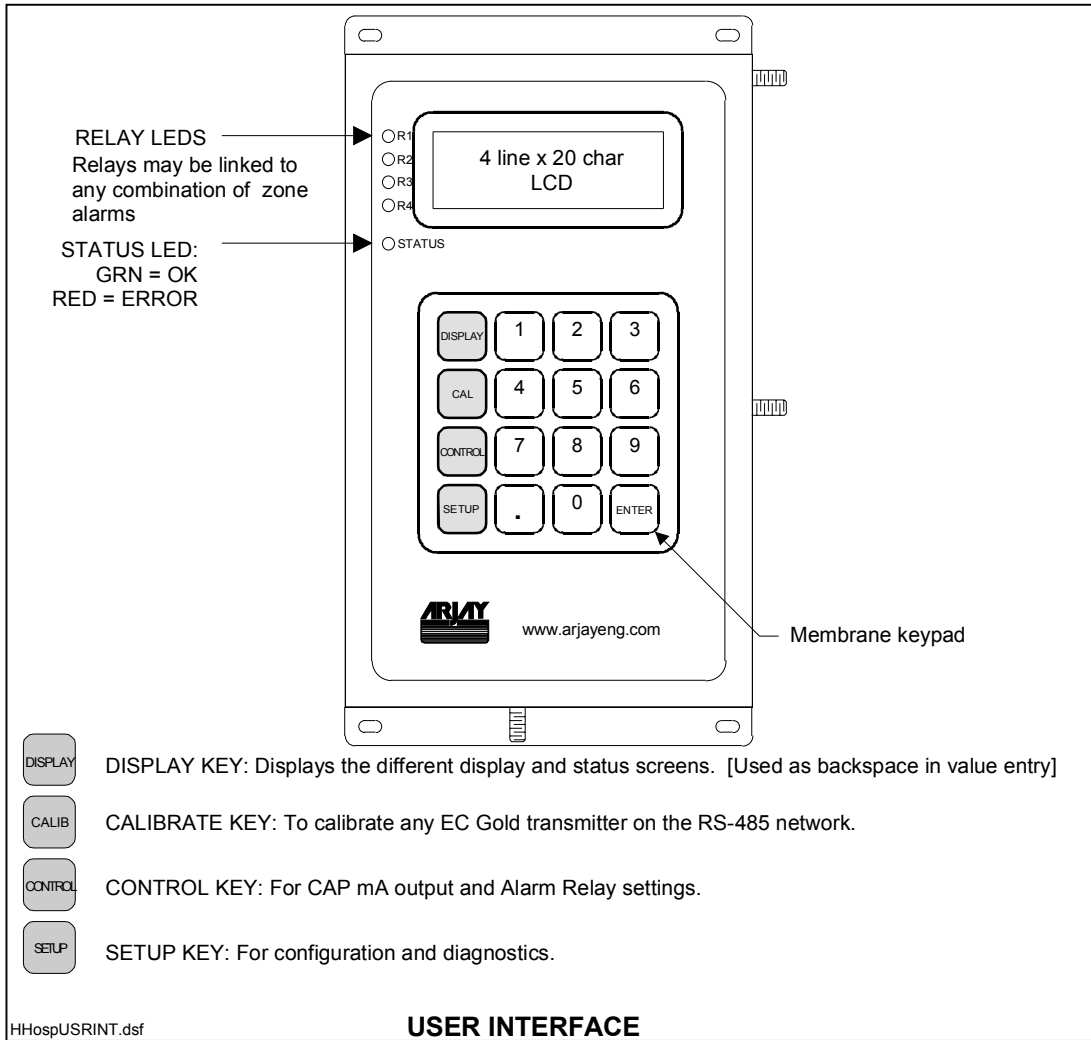


Figure 3.0

3.1 STATUS INDICATIONS

One LED per Relay status. Each relay is triggered by any selectable combination of zone High and Low alarms. The LEDs indicate the condition of the 4 local relays only. Relays on Auxiliary Units have their own LEDs on the Auxiliary Unit.

3.2 PASSWORD PROTECTION

A password must be entered to access any of the 3 value entry menus: CALIB, CONTROL, SETUP. The factory default password is 2000. The password may be changed from the setup menu as described later. The prompt for entering the password is always 9999 regardless of the actual password.

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3.3 DISPLAY SCREENS

After powerup, and the initial startup screen has been displayed for about 3 seconds, the CAP scans all active mA transmitter sensors on the network. This may take several seconds depending on the number. The following screen will now appear:

3.3.1 ZONE ALARM STATUS SCREEN

The following is a typical display:

```
z1: 0 ppm R123
z2: 0 ppm R123
z3: 0 ppm R134A
z4: 0 ppm R134A
```

The above display is for example only. Actual values will vary.

The peak gas concentration is displayed for each zone. The zone display line will toggle between the zone status and the concentration every second if any of the zones are in alarm. **If there are more than 4 zones, then display will toggle between the 2 zone screens every 6 seconds.**

Alarm types:

- Low Alarm At least one sensor in this zone has a ppm level at or above the Low Alarm ppm level for at least the Low Alarm Delay On time.
- High Alarm At least one sensor in this zone has a ppm level at or above the High Alarm ppm level for at least the High Alarm Delay On time.
- Hi Hi Alarm At least one sensor in this zone has a ppm level at or above the High High Alarm ppm level for at least the High High Alarm Delay On time.
- Xmtr error At least one sensor in this zone has a sensor fault or instrument fault.
- No response At least one sensor in this zone is not responding on the network.

3.3.2 OVERALL ALARM STATUS SCREEN

To view this screen, press the DISP key from the Zone Alarm Status Screen (previous screen).

```
Max ppm=25 by #4
Network       : OK
Xmtrs         : OK
Alarm status: Low
```

The above display is for example only. Actual values will vary.

The top line displays the maximum ppm registered by any sensor in any zone, and also the sensor number, which caused it. Sensors are numbered by 4 mA input type sensors for every Auxiliary Unit installed. For example, 1 Auxiliary Unit, the 4-20mA inputs on the Auxiliary Unit are numbered 1-4. If there are 2 Auxiliary Units(OPTIONAL), then its mA inputs are numbered right after the first Auxiliary Unit numbers (5 – 8 in the above example).

The second line displays the network status: either "OK" if all active sensors and networked resources are responding, or "Net no response: x" and the number (quantity) of not responding transmitters or networked resources is displayed. For example if 1 Aux relay board and 1 mA output module are not responding then "Net no response: 2" is displayed.

The third line displays the common sensor status. This includes sensors that have sensor faults or if they are not responding on the network. Sensors for mA inputs are considered in fault if the received mA value is less than 3.5 mA. If all sensors are OK, then "OK" is displayed, else "Xmtr trouble: x" is displayed where "x" is the number (quantity) of sensors with faults or not responding.

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The bottom line displays the common alarm status. Based on the current alarm state, "OK", "Low Alarm", "High Alarm", or "High High Alarm" is displayed. The status reflects the alarm condition including user settable time delays.

3.3.3 AUXILIARY MODULE STATUS SCREEN

To view this screen, press the DISP key from the Overall Alarm Status Screen (previous).

```
Aux1:ok
Relays 1-8: 10000000
Aux2:ok
Relays 1-8: 00000001
```

The above display is for example only. Actual values will vary.

The status of the Auxiliary Relay module(s) is displayed. If only one Aux module is installed, then the bottom 2 lines are blank.

"ok" means the Aux module is responding on the network.

The next line for each Aux module displays the individual status of each relay 1-8 installed on the Aux module. From left to right for relays 1 to 8, a 1 indicates the relay is energized and a 0 indicates it is de-energized.

3.3.4 mA MODULE STATUS SCREEN

To view this screen, press the DISP key from the Auxiliary Status Screen (previous).

```
z1 mA:ok   z5 mA:ok
z2 mA:ok   z6 mA:ok
z3 mA:ok   z7 mA:ok
z4 mA:ok   z8 mA:ok
```

The above display is for example only. Actual values will vary.

The status of the optional mA output units is displayed. **The mA outputs are accessed via the RS-485 / Modbus protocol and the status indicates if they are Ok or not responding. Uninstalled mA units are listed as N/A for Not Applicable.**

The screen is skipped altogether if there are no mA output units installed.

3.3.5 INDIVIDUAL SENSOR STATUS

The status of mA input sensors may be viewed by pressing the following keys on the keypad while in any of the screens described above in sections 3.3.1 – 3.3.4:

Press the zone number to get to the corresponding zone sensor status. For example for zone 1 press "1". The ENTER key does not need to be pressed.

The ppm value and its status is alternately displayed every second beside the sensor number.

The status is displayed followed by a 2 letter code:

NR = no response from

ER = Instrument error

HH = This transmitter has caused a High High Alarm

Hi = This transmitter has caused a High Alarm

Lo = This transmitter has caused a Low Alarm

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Pressing the DISPLAY key when the last transmitter is on screen cycles back to the Main Display.

3.4 NOTES ON THE USER INTERFACE

When entering in numeric values, the cursor can be backspaced to correct mistakes by pressing the DISPLAY key. This is only true if the cursor is not at the beginning of the displayed value, in which case the DISPLAY menu is entered.

Values may be entered with any number of places of decimal.

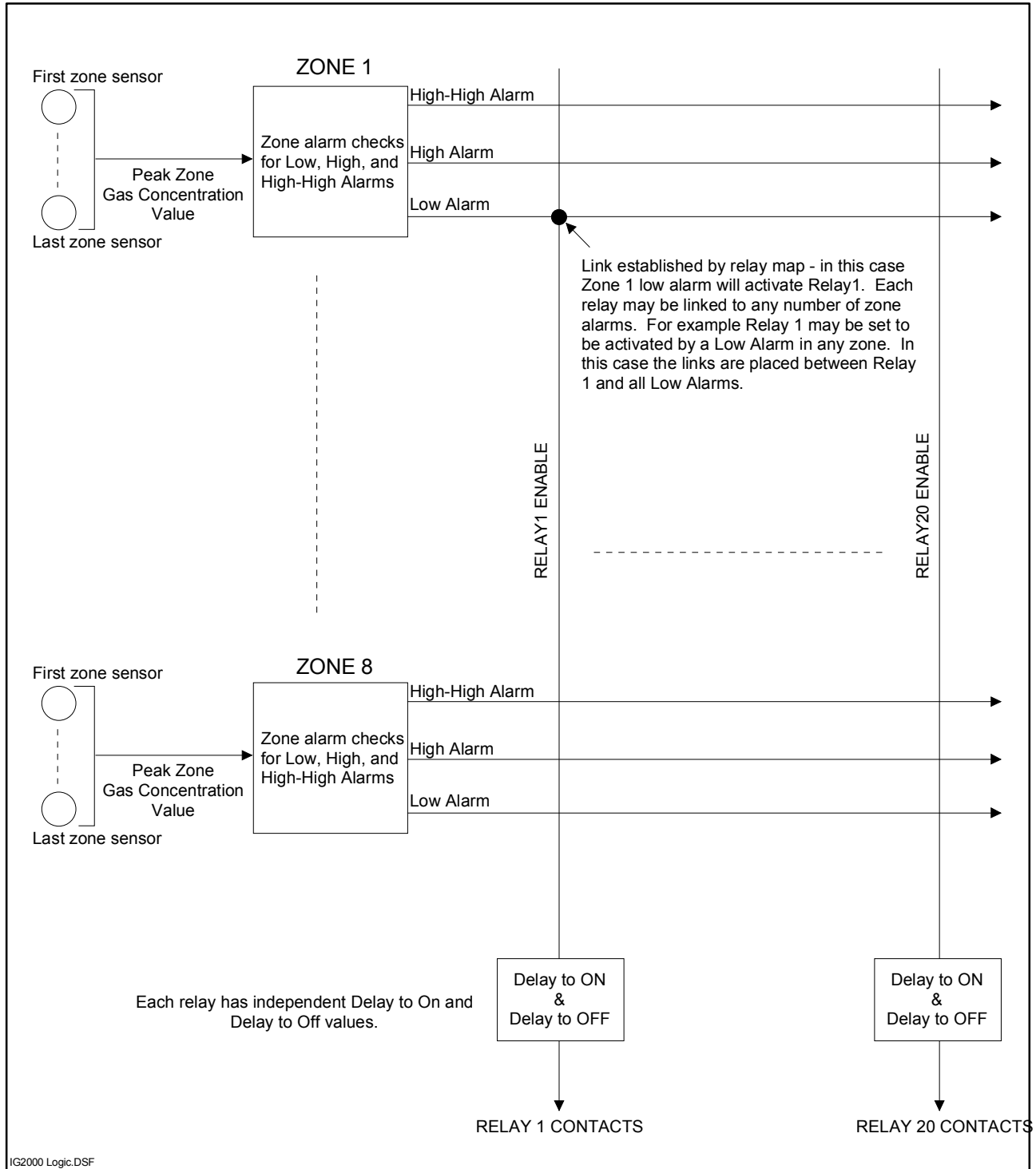
If the entered value is out of the allowed limits, the system displays the limiting value for 2 seconds. For example if a gas concentration Calibration value is entered as 5000.0 then **MAX. 999** is displayed for 2 seconds then entry is allowed again. The current value is not changed unless the entered value is within limits.

**ALL PARAMETERS DESCRIBED BELOW ARE TYPICALLY SET AT THE
FACTORY AS PER THE CUSTOMER ORDER REQUIREMENTS. HOWEVER,
THEY MAY BE VIEWED OR MODIFIED IN THE FIELD.**

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3.5 IR-2000 CONTROL LOGIC DIAGRAM

The diagram below describes the concept of zones as well as the alarm logic of the IR-2000. The system allows for maximum flexibility and utilization of relay resources.



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3.6 SET NUMBER OF EC GOLD TRANSMITTERS ON NETWORK

1. Press the SETUP key, enter the password at the prompt, then 1 for Zone / EC Gold transmitter setup from the SETUP menu screen. The default factory set password is 2000.
2. Enter 0 for the total number of EC Gold transmitters on the network followed by the ENTER key. If there are no EC Golds in the system (only mA input sensors are being used) then enter 0. If there are no EC Golds, then the first mA input on the first Auxiliary Unit is numbered 1.
3. Next, at the prompt, enter the number of zones require (maximum is 8).
4. At the prompt for each zone, enter the start and end sensor network addresses for each zone. Any number of sensors may be selected for a zone as long as they have sequential network addresses. Also, the end address must always be greater than the start address. For example zone 1 addresses 1-2, zone 2 addresses 2-4.
5. After entering the sensor range for a zone, select the gas name to associate with this zone. Follow the prompts to select a gas name. Selecting a name automatically selects appropriate units; for example, selecting CO will automatically select ppm as units. Gas names are selected by a numeric code. The code table showing gases and corresponding codes is shown below:
6. After pressing a Gas number, select the gas type by pressing a 2 digit gas code from 0 to 23 followed by the ENTER key. For each code entered, the corresponding gas is selected, with a prompt to press 1 to keep the selection or 2 to select another gas. The supported gases and their corresponding codes are shown below:

GAS NAME	CODE
Carbon Monoxide: CO (ppm)	00
Nitrogen Dioxide: NO ₂ (ppm)	01
Methane: CH ₄ (%LEL)	02
Propane: C ₂ H ₅ (%LEL)	03
Hydrogen Sulfide: H ₂ S (ppm)	04
Ammonia: NH ₃ (ppm)	05
Chlorine: Cl (ppm)	06
Oxygen: O ₂ (%)	07
Gasoline (%)	08
Hydrogen: H ₂ (ppm)	09
Toxic (ppm) – generic name	10
Combustible (%LEL) – generic name	11
BRH (Broad Range Hydro Carbon) (ppm)	12

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Carbon Dioxide: CO ₂ (ppm)	13
Acetylene (ppm)	14
Sulfur Dioxide: SO ₂ (ppm)	15
ClO ₂ (ppm)	16
Hydrogen Chloride: HCl (ppm)	17
Hydrogen Cyanide: HCN (ppm)	18
Ozone: O ₃ (ppm)	19
Nitric Oxide: NO (ppm)	20
Temperature in deg. C	21
Temperature in deg. F	22
Refrigerant R134A	23
Refrigerant R123	24
Refrigerant R22	25

Table 3.1

3.7 SET ZONE ALARM AND SPAN VALUES

1. Press the CONT key then press 1 for Zone Alarms / mA Span. If coming from the normal display screens, enter the password at the prompt. The default factory set password is 2000.
2. Select a zone by pressing the desired zone number key (1 – 8).
3. Enter the Low Alarm differential values. The low alarm is activated when the peak gas concentration of the zone rises above the high threshold (Diff High), and remains active until the concentration drops below the low threshold (Diff Low).
4. After entering the Low Alarm differential values, the user is prompted for the High, and then High- High differential values.
5. Finally, the user is prompted for the mA span value. This is used to set the mA output reflecting the peak gas concentration for the zone. For example a Span of 1031 ppm for R134A sensing zone, will cause the mA output to be 20 mA (full scale) at gas concentrations of 1031 ppm and higher.
6. After setting the Span as per above, the main control screen is again displayed. Select another zone to setup if desired by pressing the corresponding zone number key.

3.8 ALARM DELAYS

1. From the main Control menu, press 2 to set the Alarm Delays.
2. Press 1 for Buzzer delay. The Buzzer only has a On delay. Enter the Buzzer On delay in minutes followed by the Enter key. The Alarm delay menu is again displayed.
3. Select 2 to set delays for Relays 1-4. These are integral relays that are optional. Select 3 for Auxiliary Unit 1 relays and 4 for Auxiliary Unit 2 relays (if it is present). Next select the relay number (1-4) for Integral relays or 1-8 for Aux relays. Enter the On and Off delays for each relay. The values are in minutes. Fractional minutes are allowed i.e. 1.5 minutes can be

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entered. Note: the relay number is automatically incremented after each relay delay has been set.

3.9 RELAY ALARM MAP

NOTE: The IR-2000 Scanner supports up to 20 relays. There are 4 optional integral relays (contained within the IR2000 Scanner enclosure), as well as 8 relays per Auxiliary Unit. The internal relays (numbered 1-4) are typically not installed unless specifically ordered. The corresponding LEDs on the front panel of the IR2000 Scanner are, however, always installed and the relay map is set so these LEDs indicate common Sensor Fault (R1), Low alarm (R2), High alarm (R3) and High-High alarm (R4).

1. From the main Control menu, press 4 to set the Relay Map. Each of the installed relays (up to 20) may be linked to any combination of up to 24 alarm sources: High-High, High and Low alarms for 8 zones. In addition, Relay1 may be designated as a System Fault alarm.
2. The unit prompts if Relay1 is desired for System Fault alarm:

```

FAULT RELAY
Set Relay1=Sys Fault
Press 1 to toggle
Yes

```

3. The bottom line displays the current setting (Yes means Relay1 is set for System Fault alarm). If necessary, press 1 to change this value, then press the ENTER key.
4. Press the ENTER key after reading the description screen. A screen similar to the following is displayed. The map shown is an example only. The actual values will vary. This screen shows the map for Integral Relays 1 and 2 (R1 and R2). Note: the "Int" on top of the Relay column indicates that the relay is part of the Integral relay group. Aux1 and Aux2 are displayed when setting Aux relays. If the Integral Relay1 has been set for System Fault, then it is excluded from other alarms. The column headings are for the Low (L), High (h), and High-High (H) alarms for each zone (z1 to z4). Enter the mapping as follows:

```

          z1  z2  z3  z4
Int LhH LhH LhH LhH
R1  YNY NNY NNY NNY  (or "Fault Relay")
R2  NNY YNY NNY NNY

```

5. The cursor starts at the Low alarm column for zone 1. To establish a link: press 1, to clear the link: press 0. If there are more than 4 zones then complete the entries for the first 4 zones for each relay and the remaining zones are automatically displayed. Unused zones are not displayed. To advance the cursor to the next column with no change: press the ENTER key. To advance to the next screen: press any other numeric key. Note: changes are made as soon as the '1' or '0' key is pressed. If a mistake is made, you will need to exit the menu, then re-enter to change the value.
6. After completing the maps for relays 1 and 2, the system automatically prompts with the maps for all remaining relays.

THIS CONCLUDES THE CAP SETUP. FOR SETTING UP / CALIBRATING INDIVIDUAL EC GOLD TRANSMITTERS, REFER TO THE NEXT SECTION.

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3.10 CALIBRATION

The 4-20mA transmitters are pre-calibrated at the factory, but field verification with a known concentration of test gas should be performed to ensure proper operation of the system. Field calibrations should be scheduled every 3 or 4 months as part of a regular maintenance program.

The 4-20mA transmitters are calibrated at the sensor itself see (sensor manual for calibration).

3.11 VIEWING TRANSMITTER INFORMATION

1. Press the SETUP key then 2 for Xmtr Information.
2. Press 1 for the Sensor Values / Stat menu, then at the prompt, enter the address of the desired transmitter.
3. The concentration in ppm, the sensor signal in mV and Status for the selected EC Gold transmitter is displayed.

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4.0 SETTINGS SHEET

Checked by	
Model Number	
Serial Number	
Hardware Rev.	
Software Rev.	

The factory settings column below lists the typical default settings. The user may change these values. If changed, please fill in the USER SETTING column for future reference.

4.1 ZONE SETTINGS

PARAMETER	DESCRIPTION	FACTORY SETTING	USER SETTING
Numer of EC Golds	Total number of EC Golds in the system	0	
Numer of Zones	Total number of zones		
Number of Auxiliary Units	Total Auxiliary Units installed (max 2). Each Aux Unit adds 8 relays and 4 mA inputs.		
ZONE 1	Sensor Range (sensor numbers in zone must be contiguous).		
	Gas Code (For example 24=R123)		
	Low Alarm high threshold – concentration of any sensor in the zone must exceed this value for at least the the Low Alarm delay to ON period to activate the Low Alarm.		
	Low Alarm low threshold – concentration of all sensors in the zone must fall below this value for at least the Low Alarm delay to OFF period to deactivate the Low Alarm		
	High Alarm high threshold. As per Low Alarm thresholds description		
	High Alarm low threshold. As per Low Alarm thresholds description.		
	High High Alarm high threshold. As per Low Alarm thresholds description		
	High High Alarm low threshold. As per Low Alarm thresholds description		
SPAN	This is used on the optional Auxillary Board. There are up to 2 per board to reflect the maximum gas concentration in the zone. The full Scale concentration in ppm.		
ZONE 2	Sensor Range (sensor numbers in zone must be contiguous).		
	Gas Code eg. 24=R123		

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	Low Alarm high threshold – concentration of any sensor in the zone must exceed this value for at least the the Low Alarm delay to ON period to activate the Low Alarm.		
	Low Alarm low threshold – concentration of all sensors in the zone must fall below this value for at least the Low Alarm delay to OFF period to deactivate the Low Alarm		
	High Alarm high threshold. As per Low Alarm thresholds description		
	High Alarm low threshold. As per Low Alarm thresholds description.		
	High High Alarm high threshold. As per Low Alarm thresholds description		
	High High Alarm low threshold. As per Low Alarm thresholds description		
SPAN	This is used on the optional Auxillary Board. There are up to 2 per board to reflect the maximum gas concentration in the zone. The full Scale concentration in ppm.		
ZONE 3	Sensor Range (sensor numbers in zone must be contiguous).		
	Gas Code eg. 24=R123		
	Low Alarm high threshold – concentration of any sensor in the zone must exceed this value for at least the the Low Alarm delay to ON period to activate the Low Alarm.		
	Low Alarm low threshold – concentration of all sensors in the zone must fall below this value for at least the Low Alarm delay to OFF period to deactivate the Low Alarm		
	High Alarm high threshold. As per Low Alarm thresholds description		
	High Alarm low threshold. As per Low Alarm thresholds description.		
	High High Alarm high threshold. As per Low Alarm thresholds description		
	High High Alarm low threshold. As per Low Alarm thresholds description		
SPAN	This is used on the optional Auxillary Board. There are up to 2 per board to reflect the maximum gas concentration in the zone. The full Scale concentration in ppm.		
ZONE 4	Sensor Range (sensor numbers in zone must be contiguous).		
	Gas Code eg. 24=R123		

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	Low Alarm high threshold – concentration of any sensor in the zone must exceed this value for at least the the Low Alarm delay to ON period to activate the Low Alarm.		
	Low Alarm low threshold – concentration of all sensors in the zone must fall below this value for at least the Low Alarm delay to OFF period to deactivate the Low Alarm		
	High Alarm high threshold. As per Low Alarm thresholds description		
	High Alarm low threshold. As per Low Alarm thresholds description.		
	High High Alarm high threshold. As per Low Alarm thresholds description		
	High High Alarm low threshold. As per Low Alarm thresholds description		
SPAN	This is used on the optional Auxillary Board. There are up to 2 per board to reflect the maximum gas concentration in the zone. The full Scale concentration in ppm.		
BUZZER ON TIME DELAY	HI/ HI Alarm Time Delay for Buzzer in minutes		
TIME DELAY	Time delay set to 0 at factory. To be set at proper values at <u>START_UP</u> .		
NOTES RELAY DELAYS	Each relay has independent Delay to ON and Delay to OFF values set in minutes. See the Relay Mapping settings sheet on the next page for details.		

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4.2 RELAY / ALARM MAP

Relay Mapping (Circles specifies the factory setting of "YES" as per job specification)

- Relay Mapping is set in #3 of Control Menu;
- Time Delay is set in #2 of Control Menu;
- Internal relays (Relays 1-4) are typically not installed unless specifically ordered. The corresponding LEDs on the front panel of the IR-2000 Scanner are, however, always installed. If internal relays are not ordered then the map below is set so these LEDs indicate common Sensor Fault (R1), Low alarm (R2), High alarm (R3) and High-High alarm (R4).

Relay		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Time Delay on (min)	Time Delay off (min)
INT R1 set for Fault YES / NO	R1	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R2	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R3	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R4	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
AUX1	R1	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R2	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R3	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R4	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R5	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R6	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R7	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R8	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
AUX2	R1	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R2	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R3	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R4	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R5	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R6	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R7	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		
	R8	NNN	NNN	NNN	NNN	NNN	NNN	NNN	NNN		