INSTRUCTION MANUAL
Datalarm Install & Operation
IM-421-13

Installation & Operating Instructions for Datalarm

Datalarm™

Temperature Monitoring/ Datalogging System

Installation and Operating Instructions

MODULARM CORPORATION
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TABLE OF CONTENTS

PAGE

DATALARM MONITORING/ DATALOGGING SYSTEM INSTALLATION INSTRUCTIONS

GENERAL DESCRIPTION:

The Datalarm Monitoring System consists of two primary components, described as follows:

1) **Datalarm -** The Datalarm is offered in two versions, the Datalarm 1 for single compartment monitoring and the Datalarm 2 for two compartment monitoring. Both versions provide readout of monitored temperature, visual indicators to show compartment status, audible alarm, and dry contact output as well as pulse output for remote notification. In addition to monitoring temperature, the Datalarm also monitors AC power as well as providing a means for integrating a panic (entrapment) alarm and a door ajar alarm into the system. When so configured, the Datalarm constantly monitors compartment temperature, AC power and door status, and provides audible and visual alarms with remote notification capability whenever refrigeration failure, power failure or a "check door alarm" (panic or door ajar) occurs. The Datalarm also contains internal memory (Datalogging) for storing a history of monitored conditions and alarm events. (Datahub and computer or computer network required for data access.)

2) Datahub - The Datahub is a proprietary server. Combined with the Datalarm, the Datahub offers the following capabilities: (Computer with web browser required for access to data and real time alarm conditions.)

- **Dataware™ so**ftware for remote alarm access (for viewing real time alarm conditions and for extracting data from the Datalarm(s)) is pre-installed into the Datahub. (Dataware is accessed with a web browser.)
- Web Enabled. Ethernet port provides access for viewing Real Time Alarm Status and for Logging Data from a single computer, from any computer on a LAN (Local Area Network) or, via the Internet, from any computer anywhere in the world. (Broadband connection at monitored location required for Internet access.)
- Built-in modem for remote access from any computer. (Used when Broadband access is not available.)
- Password protected, with two levels of password security. (Administrator and User)
- Datalarms are completely programmable from a computer via the Datahub. (Or manually on the alarm front panel.)
- Historical Data is presented in graph format, in list format or in CSV (comma delimited) format. CSV format is downloadable into Microsoft Excel, Microsoft Access or any other CSV-compatible application for archiving and data manipulation.
- Time and date stamping of data is generated in the Datahub in 12 or 24 hour format.
- Email Capable. Datahub can generate email when an alarm occurs and notify up to four addresses of the location and type of alarm condition. (Broadband access required for email notification.)
- Up to 125 Datalarms may be connected to a Datahub.

- Battery backup with built-in recharging circuitry to keep Datahub operational in a power failure. (24 hours minimum of operation on battery.)
- Datalarm and Datahub firmware may be upgraded locally or remotely.

SECTION 1 - DATALARM:

(The Datalarm may be used without the Datahub as a stand alone alarm or with the Datahub and a computer or computer network to offer full product capabilities.)

A) CONTROLS, INDICATORS & THEIR FUNCTIONS: (Refer to Figure 1.)

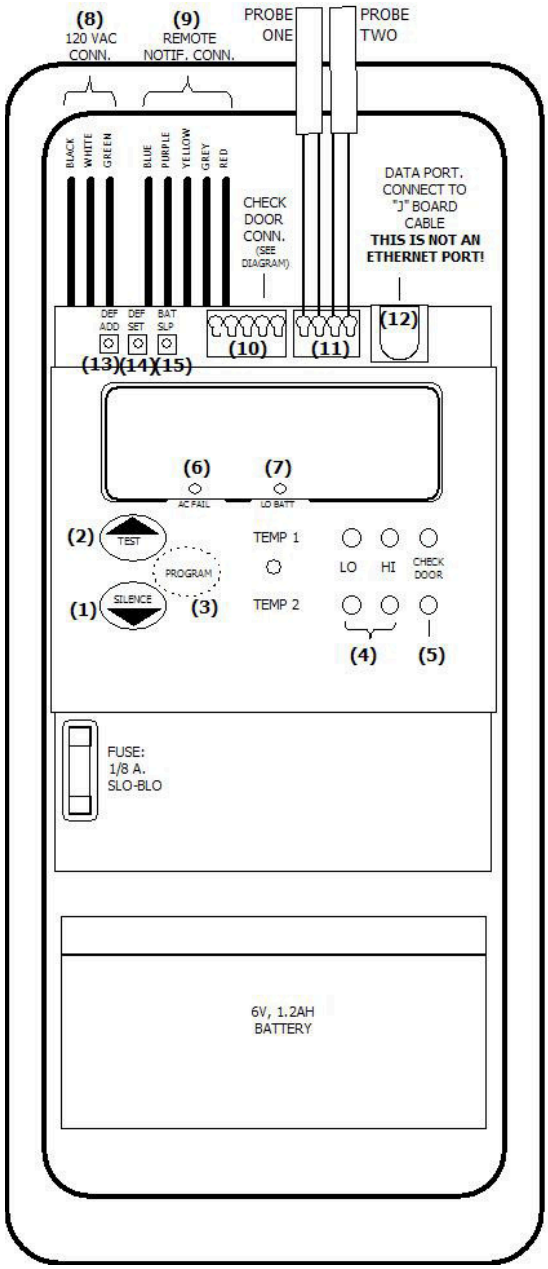

FIGURE 1

REMOTE NOTIFICATION
COLOR CODE:

DRY CONTACTS
- BLUE - N/0
- PURPLE - COM
- YELLOW - N/C

PULSE OUTPUTS
- GREY - GRD
- RED - 6 VDC

USE PULSE OUTPUT TO ACTIVATE AUTO DIALER.

The following are user accessible with the faceplate installed:

1. **Silence button** - In Run mode, (Normal operation) press Silence to acknowledge an alarm condition and silence the audible alarm. In Program mode, press Silence to decrease or change a selected parameter value. (Example: set point, time delay, C or F scale, etc.)
2. **Test button** - In Run mode, press Test to initiate a built-in Test routine. (Alarm parameters are displayed and internal test functions are performed). In Program mode, press Test to increase or change a selected parameter value.
3. **Program button** - (To minimize the possibility of tampering, this button is not indicated on the faceplate. This button can also be disabled completely from the Datahub.) In Run mode, press Program to enter Program mode, which allows for changes to be made to alarm parameters. The program button is also used to advance through the parameters in the program menu and to complete the programming process.
4. **LO & HI Indicator Lights** - Bi-colored LED's to indicate compartment status. Monitored conditions shown are:
   Constant blue = Safe temp.
   Blinking red (HI or LO) = Abnormal temp.
   Constant red (HI or LO) = Temp. alarm. (Temp. abnormal for longer than time delay.)
   The **Datalarm 1** has only "temp 1" indicator lights, which are always lit, and the digital readout constantly displays the single compartment temperature. The **Datalarm 2** has "temp 1" and "temp 2" indicator lights which alternately display at 4 second intervals. The digital readout also alternates with "temp 1" and "temp 2" indicator lights to show respective compartment temperatures.)
5. **CHECK DOOR Indicator Lights** - Red LED's to indicate one of two "Check Door" conditions, depending on the additional optional equipment installed. Options and conditions are:

a) **IP-1 Illuminated Pushbutton** - When installed inside of the walk-in and connected to the Datalarm, the IP-1 provides a Panic (entrapment) Alarm function.

b) **DAC-55 Door Monitor** - When installed on the walk-in and connected to the Datalarm, the DAC-55 provides a Door Ajar Alarm function. (The IP-1 may also be connected to the DAC-55 to combine Door Ajar and Panic Alarm Function.)

6. **AC FAIL Indicator Light** - Blinks on and off when there is no AC power.
7. **LO BATT Indicator Light** - Blinks on and off when the battery is getting weak.

The following are installer accessible with the faceplate removed:

8. **120VAC CONN.** - Line voltage for powering the Datalarm is connected to these wires. (Current draw is less than 50ma.) **Green wire must be connected to earth ground for proper operation.**
9. **REMOTE NOTIF. CONN. -** These wires provide a means for connecting the Datalarm to remote notification devices (Strobe lights, security systems, etc.) Outputs include normally open and normally closed dry contacts, and a pulse voltage output for activation of an automatic telephone dialer. (Wire color code is adjacent to Figure 1.)
10. **CHECK DOOR CONN.** (Check Door Connection) - Used to connect the IP-1(s) or the DAC-55(s) to the Datalarm. (Optional devices for "Check Door" function.) See #5 above and also see connection diagrams (Fig. 2A & 2B on page 8.)

11. **PROBE CONN.** (Probe Connection) **-** Used to connect the provided temperature sensor(s). Connect in accordance with Figure 1. Note: Probes do not have polarity.
12. **DATA PORT** - Used to interconnect the Datalarm(s) to the Datahub. Connection is made with the "J" board and the connecting cable that comes with the "J" board. **IMPORTANT! The Data Port on the Datalarm is not an Ethernet port. It should not be connected directly to a computer or a router. It should only be connected to a "J" board or to the "From Alarms" connection on the Datahub.**
13. **DEF. ADD.** (Default Address Button) - This button is used to restore the address of the Datalarm to the factory default address. (Factory default address is A254.) This button is seldom used, and only has application if the alarms will be connected to a Datahub.
14. **DEF. SET.** (Default Setpoint Button) - The Datalarm contains pre-programmed default values for changeable parameters such as temperature set points, alarm time delay, scale, etc. Press this button if you wish to restore these default values.
15. **BAT. SLP.** (Battery Sleep) – P**atent Pending**. The Datalarm contains a 6 volt rechargeable battery to keep the alarm operational during a power failure. When the alarm is shipped, the battery is **physically connected** to the Datalarm. Providing AC power to the alarm causes the battery to **automatically connect electrically**. With subsequent power outages, the battery will remain electrically connected so as to provide standby power. If desired, press this button with AC power removed to return the battery to the sleep condition. Two significant applications for this feature are:
    A) Bench Testing – If the alarm is tested before it is installed or shipped, this feature provides a means for returning the battery to the sleep state for transporting or shipping.
    B) New Construction Installations – It often happens that alarms are installed, sometimes for months, before line voltage is provided. This feature insures that the battery will be connected once line voltage is supplied.

B) DATALARM OPERATION:

1) **Temperature Monitoring** – If temp is between setpoints, HI & LO alarm lights are both blue. Abnormal Hi or Lo temp activates the alarm delay and causes the respective alarm light to blink red. Abnormal temp that persists for longer than the time delay causes an alarm annunciation: Respective alarm light goes to solid red and the horn sounds. Press Silence to stop the horn from sounding. The light remains red until temp returns to normal. Normal temp automatically resets the alarm and the light returns to blue.

2) **Check Door Alarm** – The Check Door Function can be used to generate a Panic (Entrapment) Alarm, a door ajar alarm or annunciation of both of these conditions. (See "Check Door Indicator lights, page 2&3, for optional equipment required.) If there is no check door alarm, the check door light is off. In a check door alarm the check door light glows red and the horn sounds. Press the Silence button to stop the horn from sounding and to extinguish the check door light. (Note: If the check door alarm is generated by a DAC-55 door monitor, the alarm condition must be cleared on the DAC-55 before it can be cleared on the Datalarm.)

3) **AC FAIL** – The decimal point on the display above "AC FAIL" is used to visually annunciate a power failure. If AC power is on, the AC Fail light is off. The AC Fail light will begin to blink whenever power is interrupted. Power interruptions of less than 1 minute **will not** generate an AC Fail alarm. In power interruptions of less than 1 minute, the AC light will turn off and the alarm will automatically reset when power is restored. Power interruptions of 1 minute or longer **will** generate an AC Fail alarm: The horn begins to beep on and off with the blinking AC Fail light, and all other lights, including the display, will turn off so as to conserve battery power. Press the Silence button to stop the horn from sounding. **Anytime the Silence button is pressed during an AC Fail alarm, the alarm will briefly display the monitored temperature and briefly activate the alarm lights to show compartment temperature and status**.

4) **LO BATT** – The decimal point on the display above "LO BATT" is used to visually annunciate a Low Battery condition. The battery in the Datalarm is rechargeable and the Datalarm contains recharging circuitry. If the battery is sufficiently charged, the LO Batt
light is off. The LO Batt light will begin to blink whenever the battery is getting weak and the horn will beep once every six minutes to draw attention to the Low Battery condition. The Silence button does not affect a low battery condition. **For reliability as a backup power source, it is recommended that the battery be replaced every 3-5 years. (Part #: Datalarm NP1.2-6. Contact: www.modularm.com.**

5) **Dry Contacts** – The dry contacts will operate for alarm conditions 1, 2 and 3 above, as described on page 8, item # 7, "Alarm Relay". There is no relay activation for a low battery condition. Dry contact wire color code is: Blue = N/O, Purple = common, Yellow = N/C.

6) **Pulse Output** – A pulse output (6 VDC for 1 second) is provided for the purpose of activating an automatic telephone dialer, (**Modularm Automatic Telephone Dialer**). Pulse output wire color code is: Grey = ground "-", Red = 6 VDC "+". A pulse output is generated for alarm conditions 1, 2 and 3 above:
   - **a)** One minute after alarm annunciation occurs if the Silence button has not been pressed before the minute passes.
   - **b)** Every 30 minutes after alarm annunciation occurs to repeatedly re-activate the dialer. This continues until the alarm has been acknowledged by pressing the Silence button or until the alarm condition returns to normal.

7) **Test Mode** – Test mode is provided to display alarm parameters and to allow the Datalarm to perform certain testing functions. Press the Test switch to enter Test Mode. The display reads "Test" and the alarm does the following, automatically:
   - **a)** Sequentially illuminates all display segments and LEDs.
   - **b)** Display reads "ArEv" (alarm revision) and then displays the alarm software version number. (Example: 1.12)
   - **c)** Display reads "LrEV" (bootloader revision) and then displays the bootloader software version number. (Example: 0.02) (Bootloader is used for firmware upgrades.)
   - **d)** Display reads "Addr" (Address) and then displays the alarm address (Example: 254). Alarm address is used to identify a particular alarm on a network and is only relevant when the alarm is connected to the Datahub.

e) Display reads "AUtO" (Autoset) and then displays "On" (enabled) or "OFF" (disabled).

f) Display reads "SCLE" (Scale) and then displays "F" (Fahrenheit) or "C" (Centigrade).

g) Display reads "HiAL" (Hi Alarm Setpoint) and then displays selected setpoint value. The respective Hi alarm light is red when this setting displays.

h) Display reads "LoAL" (Lo Alarm Setpoint) and then displays selected setpoint value. The respective Lo alarm light is red when this setting displays.

i) Display reads "dLAy" (Alarm Delay) and then displays selected alarm time delay value in minutes. The respective Hi and Lo alarm lights blink on and off when this setting displays.

j **Note: On the Datalarm 1, single compartment alarm, the display goes to "k",**
below, after "i", above, is completed. On the Datalarm 2, two compartment alarm, "g thru i", above, are repeated to show the settings for the second probe.

k) Display reads "rbAC" (ringback) and then displays selected ringback time delay value in minutes. (See page 10, #6 for Ringback description.)

l) Display reads "rLAY" (relay configuration) and then displays "OFF", "UnLA" or "LACH", depending on the selected mode. (See page 8, item #7, Alarm Relay, for a description of relay operation.)

m) Display lights all segments, all alarm lights turn on and buzzer sounds. Press Silence to turn off the buzzer and put the alarm back into run mode. **Note: If Silence isn't pressed within 30 seconds the buzzer will turn off and the alarm will return to run mode automatically.**

C) DATALARM INSTALLATION:

1. Remove the 3 faceplate screws and remove the faceplate.
2. It is easier to mount the external enclosure if the alarm and the battery are temporarily removed. To remove, grab the alarm/backplate assembly, slide up and then lift out. Reverse to re-install after the enclosure has been mounted.
3. Mount the enclosure in a suitable location:
   A) Surface Mount - Use the 4 mounting holes on the back wall of the enclosure.
   B) Flush Mount - Make a cutout in the mounting surface, 9 3/8" high by 4 3/8" wide. Use the 4 mounting holes on the front flange of the enclosure.
   C) Re-install the alarm into the enclosure.
4. The top of the enclosure has two knockouts for ½" conduit. The left conduit is used to provide power to the alarm. The right conduit is used for connecting the cable from the "J" board to the Datalarm. It may also be used for other low voltage applications such as sensor line routing, connecting to a door monitor, etc.
5. Temperature sensors (1 sensor for the Datalarm 1 and 2 sensors for the Datalarm 2) are not pre-attached to the alarm. Mount the sensor in a location which will typify the average ambient temperature. Recommended location is in front of the evaporator on the ceiling in the center of the room. Make sure that the sensor and sensor wire are positioned so that they will not be damaged by any products or items in the monitored area. Fasten the sensor with the provided ¼" clamp. If desired, sensor wire may be extended up to 200 feet without affecting accuracy of

the displayed temperature. Shielded wire (two conductors inside of the shield) must be used if the sensor line is extended. The sensor line may be shortened as well. When extended, connect the sensor to the two conductors inside of the shield. No connection is made to the shield at the sensor end of the extending wire. If a splice is made inside of the monitored compartment, seal the splice with silicone to prevent moisture from causing erroneous temperature readings. Connect the sensor wire to the terminal block as shown on **Figure 1**. Probes do not have polarity. If the sensor wire has been extended, connect the shield of the extending wire to the leftmost position of the **Check Door Connection** terminal block. (Labeled GRD, Figure 2A & 2B, page 8. Also see #10 on Figure 1.) The shield may also be connected to the grey Remote Notification wire. (Labeled GRD, see #9, Figure 1.) If the probe wire enters the alarm enclosure directly from the monitored compartment, seal the opening to prevent moisture from entering the alarm. **Important! Do not run sensor line in conduit with line voltage. "Bouncing" or erroneous readings will result.**

6. Bring 120VAC through the left conduit to the top chamber of the alarm enclosure and connect to the black and white #18 wires. **The green #18 wire must be connected to earth ground for proper operation.**
7. If the Datalarm is to be connected to other Datalarms or to the Datahub, connect the cable of the "J" Board through the right conduit to the Data Port on the Datalarm. **IMPORTANT! If you are using the right conduit to make other low voltage connections, <u>make the data cable connection first!</u> It will be difficult to impossible to slide the "J" board cable through if there are other wires in the conduit.**
8. If the DAC-55 Door Monitor is to be installed and tied in with the Datalarm, connect according to **Figure 2A**, using the right conduit as a means for making interconnections. 18-22 gauge wire is adequate. (See DAC-55 instructions for complete information on installing this piece of equipment.)
9. If the IP-1 Panic Button is to be installed and tied in with the Datalarm, mount the IP-1 inside of the monitored compartment and connect according to **Figure 2B**, using the right conduit as a means for making connections. (The IP-1 comes with pre-connected interconnecting wire.)

IMPORTANT!! AFTER WIRING HAS BEEN INSTALLED, SEAL CONDUIT OPENINGS AND OTHER OPENINGS (SENSOR INTO COMPARTMENT) WITH SILICONE TO PREVENT MOISTURE FROM ENTERING THE ALARM ENCLOSURE OR DAMAGE MAY RESULT.

WIRING DIAGRAM-CONNECTING DAC-55('S) TO THE DATALARM

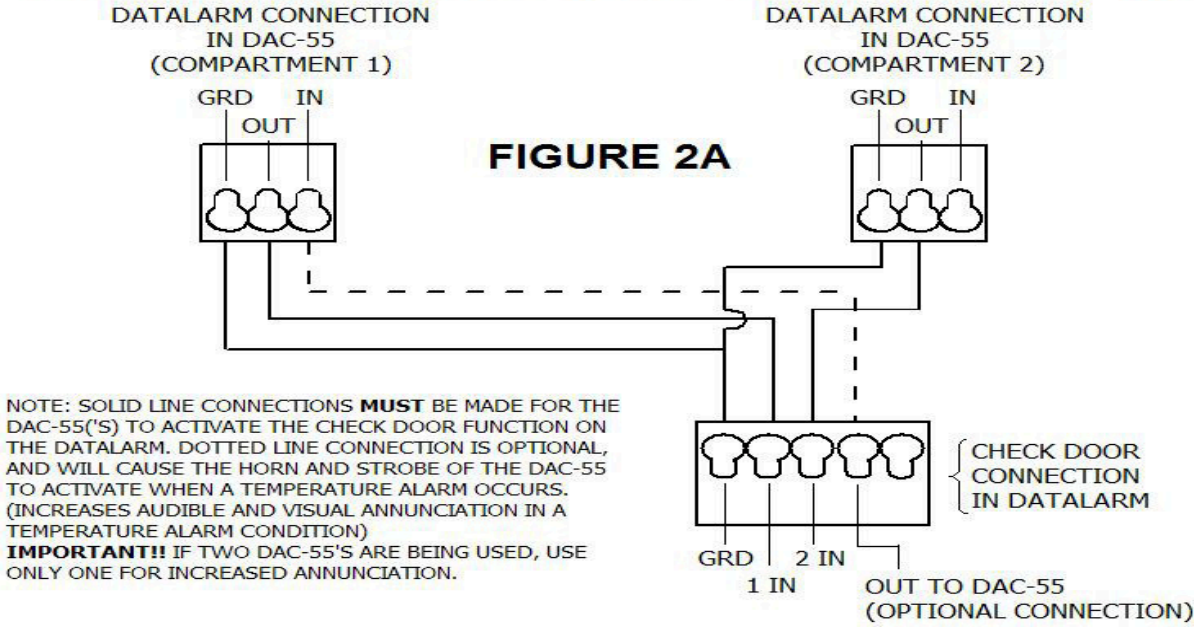

FIGURE 2A

WIRING DIAGRAM-CONNECTING PANIC BUTTON(S) DIRECTLY TO THE DATALARM (PART# IP-1P)

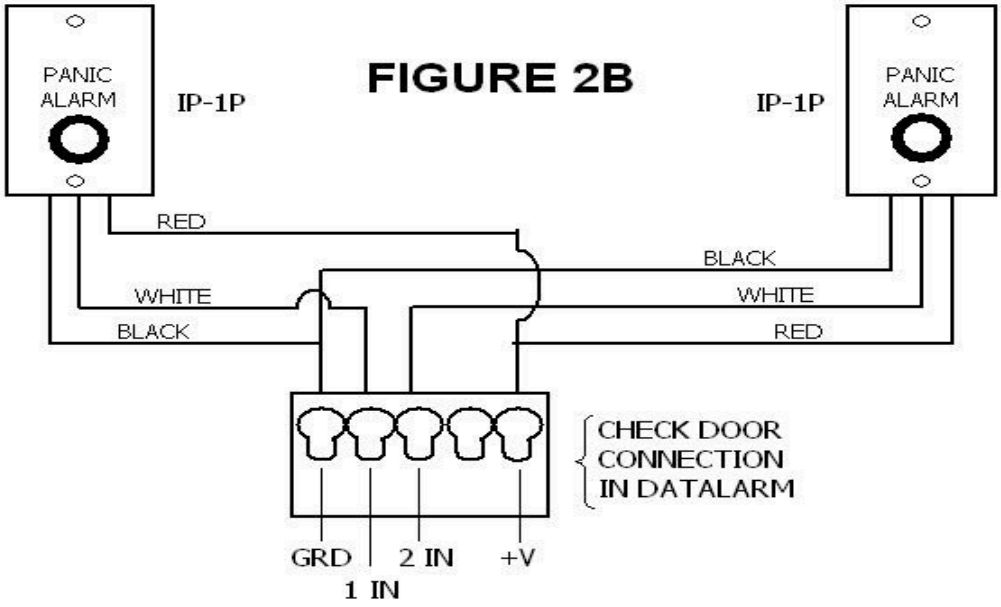

FIGURE 2B

D) <u>DATALARM PROGRAMMING:</u> (The Datalarm may be programmed either manually on the alarm itself or remotely by computer. Remote programming requires the Datahub. Programming via the Datahub is preferable when so connected. This section covers manual programming only.)

IMPORTANT!! It is recommended that you do not enter Program Mode until you have read this section and understand the parameter choices and their intent. The Datalarm contains Autoset ™, a patent pending technology which allows the Datalarm to automatically

program itself for certain common applications. Entering Program Mode and changing temperature setpoints will disable Autoset.

Programming Sequence and Description of Parameters: The program menu contains seven variable parameters. All seven parameters have pre-programmed factory default values. The seven parameters and their factory default values are:

Parameter	Default Value
Autoset	ON
Scale	F
Hi Alarm Temperature Setpoint	45F
Lo Alarm Temperature Setpoint	30F
Alarm Delay	60 Minutes
Ringback Delay	0 Minutes
Alarm Relay	Off

Press the hidden Program button (Page 2, Figure 1, #3) to enter Program Mode. When in Program Mode, the "Silence" and "Test" buttons become means for selecting new parameter values. When a new value has been selected using the Silence or Test buttons, press Program again to move to the next variable parameter. **Note: Once Program Mode is entered, the Program process must be completed for any changes made to be stored as new operating parameters.** There is no provision for moving backwards through the program process and there is no provision for manually exiting without completing the programming process.

When the Program button is pressed, the display reads **"PrOG"**, and then goes to the first parameter:

1. **Autoset ™** (Patent Pending) Display reads **"AUTO"** and then reads the selected choice. Choices are **On** or **OFF**. Default is **ON**. Autoset gives the Datalarm the ability to automatically select from pre-loaded alarm temperature set points by sensing the temperature of the monitored compartment, determining if it a cooler or a freezer, and adjusting itself accordingly. Pre-loaded default set points for a cooler are, HI: 45F, LO: 30F. Pre-loaded default set points for a freezer are, HI: 10F, LO: -20F. All Datalarms are shipped with pre-loaded cooler set points selected. If the monitored compartment is a freezer, the set points will automatically change to the freezer defaults when the compartment temperature drops to the default HI freezer set point. Once changed, the set points will not revert back to the cooler set points regardless of how warm the compartment gets. In the programming menu, changing the Autoset default setting to **OFF** disables the Autoset feature and allows manual adjustment of HI and LO alarm temperature set points. The Autoset function only affects alarm temperature set points. All variable parameters other than alarm temperature set points may still be changed (Scale, Alarm Delay, etc.), without affecting the Autoset function.

   Select **ON** or **OFF** using Silence or Test Buttons and press Program Button to move to next parameter. **Important Note:** If Autoset has been turned **OFF** and Program has been pressed to move to the next parameter, there is no provision in program mode for manually turning Autoset back **On**. (Remember, you can't move backwards through the programming process and you can't manually exit

without completing the programming process.) If this situation has been created and the selection of **OFF** is not the desired choice, there are two ways to correct it: 1) Stop programming and wait for two minutes. The Datalarm is designed so that if programming is interrupted for this period of time it will automatically abort the programming process and return to Run mode, operating at the parameters that existed before programming began. 2) Press the DEF. SET. Button. (Page 2, Fig. 1, #14) This will restore all default values, including "Autoset ON".

2. **Scale** - Display reads **"SCLE"** and then the selected scale. Choices are **F** (Fahrenheit) and **C** (Centigrade). Default is **F**. After selecting **F** or **C** using Silence or Test buttons, press Program button to move to next variable parameter.

3. **HI Alarm Temperature Set point** - (**Note:** If Autoset is **ON**, this parameter selection or any other Alarm Temperature set point parameter selections will **not** display, as set points cannot be changed when Autoset is enabled. These parameters only display when Autoset is **OFF**.) If Autoset is OFF, display reads **"HiAL"** and then the selected setpoint. Setpoint value is changed using "Silence" and "Test" buttons. On the Alarm Status Indicator Lights, the HI Alarm light will glow red to indicate that it is the parameter that has been selected for adjustment. On Datalarms with 2 probe capability, (for 2 compartment monitoring), the HI Alarm light for the selected probe will glow red to indicate the parameter and probe that has been selected for adjustment. (Range is -40F (-40C) to 125F (52C). Select setpoint value & press Program button to move to next variable parameter.

4. **LO Alarm Temperature Set point** - Display reads **"LoAL"** and then the selected setpoint. Operation is the same as #3 above, except LO Alarm light glows red instead of HI Alarm light. Select & press Program button to move to next variable parameter.

5. **Alarm Delay** - Display reads **"dLay"** and then the selected delay time. Default is 60 minutes. HI and LO alarm lights blink on and off to indicate the parameter and probe that has been selected for adjustment. On the Datalarm 2, independent delay time may be selected for each probe. The time delay is provided to override normal rises in compartment temperature caused by defrost cycles or doors being opened. Change using Silence and Test buttons. Range is 000 (no delay) to 150 minutes. Press Program button to move to next variable parameter.

6. **Ringback** - Display reads **"rbAC"** and then the selected ringback time. Default is 000 (no Ringback). The Ringback feature makes the audible alarm re-activate at regular intervals during an alarm condition so as to remind personnel that an alarm condition is ongoing.
   Change using Silence and Test buttons. Range is 000 (no Ringback) to 150 minutes.
   Press Program button to move to next variable parameter.

7. **Alarm Relay** - Display reads **"rLAY"** and then the selected choice. Default is **OFF**. The alarm relay provides normally open and normally closed dry contacts for remote notification purposes. There are 3 selectable relay modes:

a) **0ff** - Display reads **"OFF"**. Choose this mode when the relay is not being used so as to
conserve standby battery life in a power failure.
b) **Unlatched** - Display reads **"UnLA"**. Relay activates when an alarm occurs and de-ctivates when Silence is pressed. Use this mode when the relay is being used to activate a secondary annunciation device such as a horn or a strobe light.
c) **Latched** - Display reads **"LACH"**. Relay activates when an alarm occurs and de-activates when the alarm condition clears. Use this mode when the relay is being used to send a signal to a building management system, where it is desired that an alarm condition continues to be indicated until a condition has been corrected.

Press the Program button again after the desired relay mode has been selected to complete the programming process. The display reads **"doNE"** (Done) and the alarm returns to the Run Mode (normal operation) and begins to perform its monitoring functions. **Note: If the above described programming process is begun and is then interrupted for 2 or more minutes, the Datalarm will automatically abort the Programming mode and will return to Run mode, operating at the parameters that existed before programming began. The programming process must be completed for selected changes to become new stored values.**