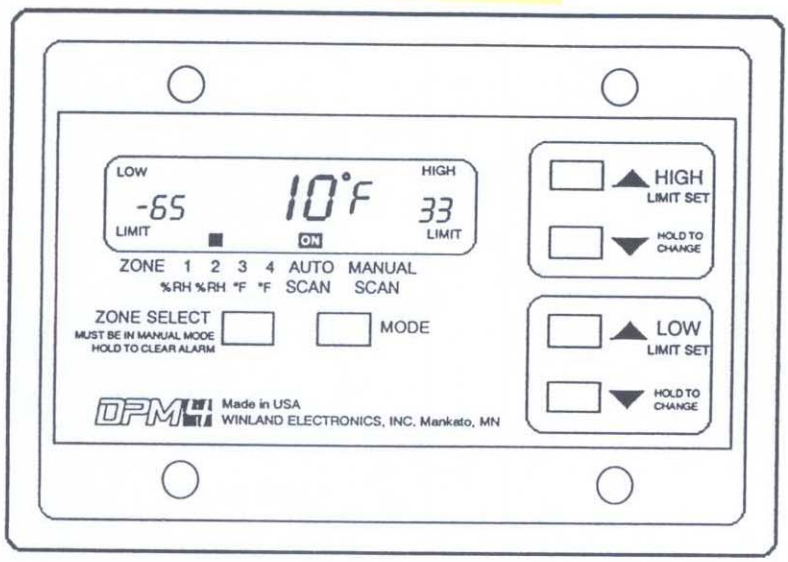
DPM4

DIGITAL PANEL METER



INSTALLATION / OPERATION INSTRUCTIONS

Winland Electronics, Inc.
Mankato, Minnesota, U.S.A.
PN Z1889 REV B
March, 1995

ONE YEAR LIMITED WARRANTY

Winland Electronics, Inc. warrants that each product of its manufacture is free from defects in material and factory workmanship, when properly installed and operated under normal conditions according to the manufacturer's instruction.

Manufacturer's obligation under this warranty is limited to correcting, without charge, at its factory any part or parts thereof which shall be returned to the factory, by the original retail purchaser, transportation charges prepaid, within one year after purchase and which upon examination shall disclose to the manufacturer's satisfaction to have been originally defective. Correction of such defects by repair to, or supplying of replacements for defective parts shall constitute fulfillment of all obligations to purchaser. Repair service performed by the manufacturer after one year from date of purchase will be for a reasonable service charge.

This warranty shall not apply to any of the manufacturer's products which have been subject to misuse, negligence or accident or which shall have been repaired or altered outside of the manufacturer's factory. Warranty is void if housing or cover is removed.

Manufacturer shall not be liable for loss, damage, or expense directly or indirectly from the use of its product or from any other cause.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE EXCLUDED, AS ARE ALL OTHER REPRESENTATIONS TO THE USER — PURCHASER, AND ALL OTHER OBLIGATIONS OR LIABILITIES, INCLUDING LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, ON THE PART OF THE MANUFACTURER OR THE SELLER.

No person, agent or dealer is authorized to give any warranties on behalf of the manufacturer nor to assume for the manufacturer any other liability in connection with any of its products.

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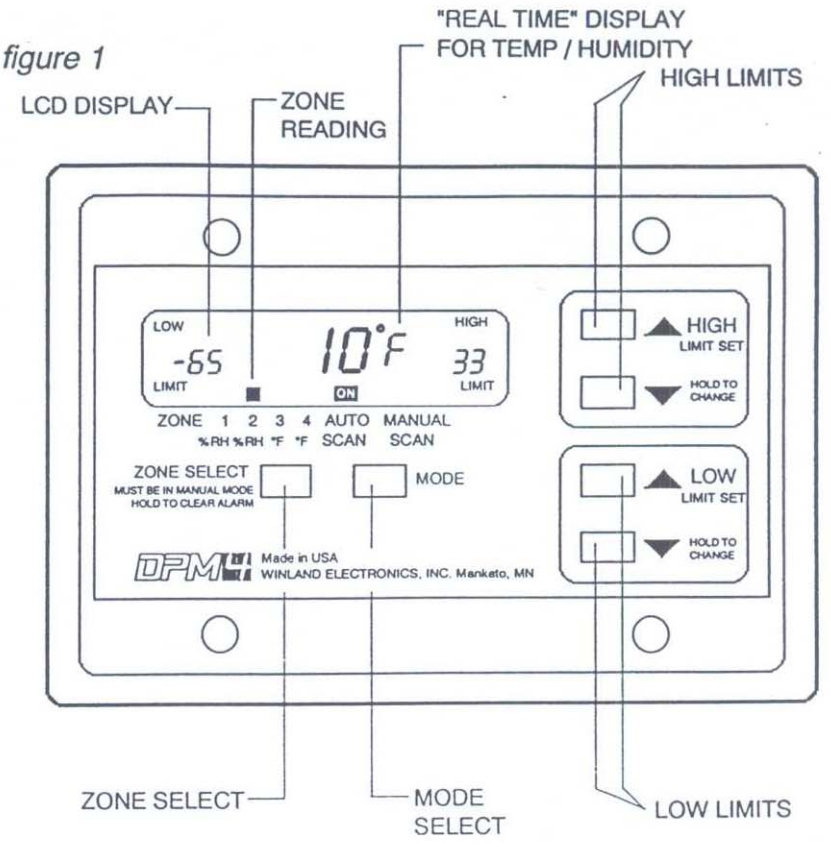
SYSTEM OVERVIEW

Thank you for purchasing a Winland Digital Panel Meter (DPM-4). Your new DPM-4 is capable of automatically monitoring humidity and temperature in up to two separate locations. It has separate high and low alarm limits for each individual zone. The microprocessor controlled console scans and updates each zone 15 times per minute to watch for potentially damaging humidity and temperature changes. The DPM-4 is capable of monitoring humidity from 10-90%RH and any temperature from -67°F to +300°F with the proper sensor. If humidity or temperature in any of the monitored areas rises or falls outside your preset limits, the unit will provide a relay contact change which can activate an alarm panel, telephone dialer, process controller, wireless security system, etc.

A Zone Reading is displayed with large easy to see digits in the center of the display. *(See figure 1).*

figure 1



The high and low limit for each zone is also displayed. Indicators above the numbers 1 2 3 4 show which zone is being displayed.

Alarms are indicated by a flashing zone indicator or by flashing the word high or low if the displayed zone is exceeding its high or low limit respectively.

To make the DPM-4 more tamper proof, a DIP switch accessible only from the rear of the console can be set to LOCK the eight high and low temperature limits.

The DPM-4 also features an automatic or manual alarm reset capability. Normally the automatic mode is used. In this mode the DPM-4 will automatically reset or clear an alarm when the temperature or humidity returns to normal (within limits). In the manual mode, the operator must clear all alarms. This feature is useful to latch or capture a short momentary alarm so the operator will know which zone went into alarm.

INSTALLATION

STEP 1

Select a site for the DPM-4 console. Sensor cable lengths and power source locations should be considered. Maximum cable length for the sensors is 500 feet.

Option #1 Surface Mounting Without Mounting Box

It is possible to install the console on a soft wall (sheet rock, paneling, etc.) without the use of a mounting box. This is the fastest mounting method and it gives the control console a nice looking low profile. In selecting a site to mount the console keep in mind that it must be placed in a secure, dry location with an ambient temperature of +32° to 130° F. For this option, drill a 1/2" diameter hole in the wall which will be opposite the wiring terminal strip on the console. This hole will provide access for all wiring. Next, carefully mark the location of the four corner screw holes on the console. Then drive four wall anchors into the proper locations and complete by attaching the console to the wall.

Option #2 Surface Mounting

In areas where no hollow interior walls are available, the surface mounting box (part #1110) can be used. The surface mounting box (3 gang electric box) can be secured to any wall. The installed profile of the DPM-4 with this option is about 2 1/2" out from the wall.

If you select mounting option #2 you must order a 3 gang electric box (part #1110) from Winland.

Note: To Insure Proper Operation Test Unit Weekly

STEP 2

POWER CONNECTIONS

Important: The DPM-4 requires an uninterrupted power supply of 12-14 VDC (- 200 mA) to function properly. (Don't use AC power, it will damage the unit). Most alarm panels include terminals which provide +12 VDC to power accessories, etc. If this is unavailable call Winland for other options. This is important because if power is interrupted to the DPM-4 the high and low limits for each zone will be lost and the unit will automatically go into alarm condition. Once power is restored it will be necessary to reprogram the high and low temperature limits.

Find the 16 pin connector/cable assembly and connect to the power source using one red wire from the +12V position and one black wire from the ground position. Both of these wires are located toward the bottom of the 16 wire connector. *(See figure 2).*

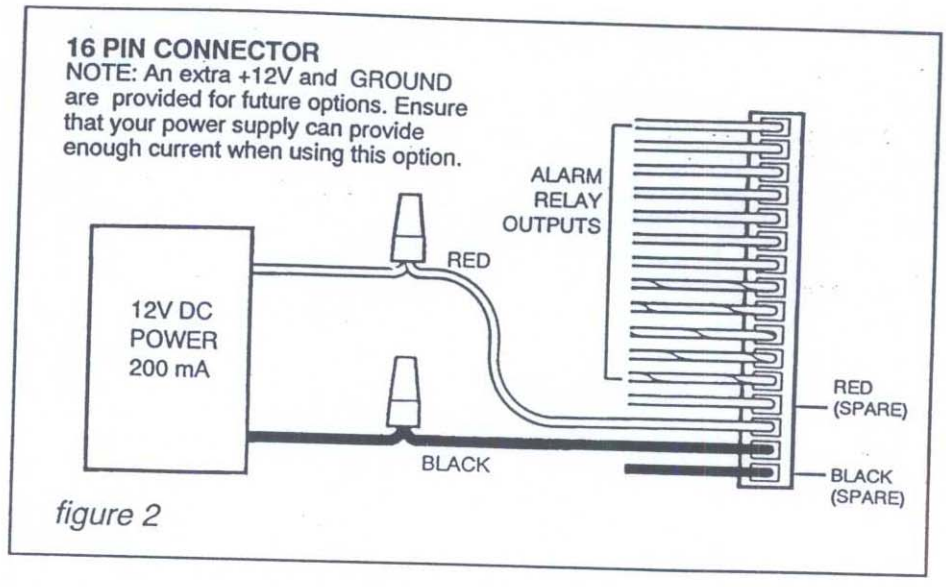


figure 2

NOTE: IT IS ESSENTIAL THAT THE POWER SUPPLY BE WELL FILTERED AND REGULATED TO ENSURE PROPER OPERATION. DO NOT OVERLOAD THE POWER SUPPLY.

STEP 3

ALARM RELAY CONNECTIONS

a) Locate the 16 pin wire connector cable assembly used to connect power.

b) Depending on the type of relay output desired (N/O or N/C) connect with the normally open and common wires or the normally closed and common wires to an open zone on your alarm panel. *(See figure 3)*

IMPORTANT: Figure 3 shows the relay contacts in a NON-ALARM state (with power applied). For example a contact labeled NC (Normally Closed) will make contact (be closed) with the COM (Common) contact when the DPM-4 is NOT in an alarm condition. Be sure to select the correct contacts, NO or NC.

Note: To Insure Proper Operation Test Unit Weekly

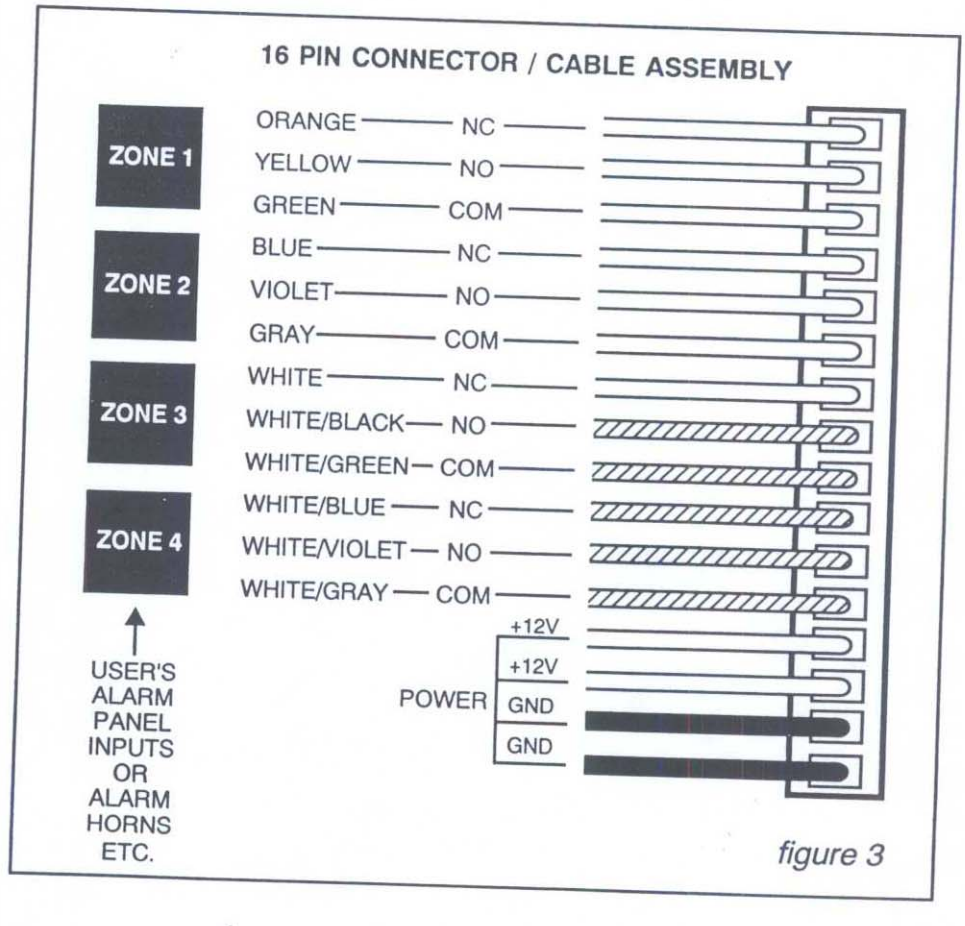


figure 3

STEP 4

OPTIONAL OPEN COLLECTOR ALARM OUTPUT CONNECTIONS

This is an optional solid state switch output. Follow the instructions supplied with the cable/connector assembly. (Cable/connector assembly must be ordered separately.)

STEP 5

SENSOR CONNECTIONS

Locate the eight wire cable assembly and connect sensor lines to it as shown in *figure 4*.
(Humidity and Temperature sensors must be ordered separately).

To connect the sensor lines use a splice connector or solder to join the colored wire from the connector to the colored wire of the sensor wire. Then connect the black wire from the connector to the black wire from the sensor wire. Repeat this process for each of the remaining zones you intend to use.

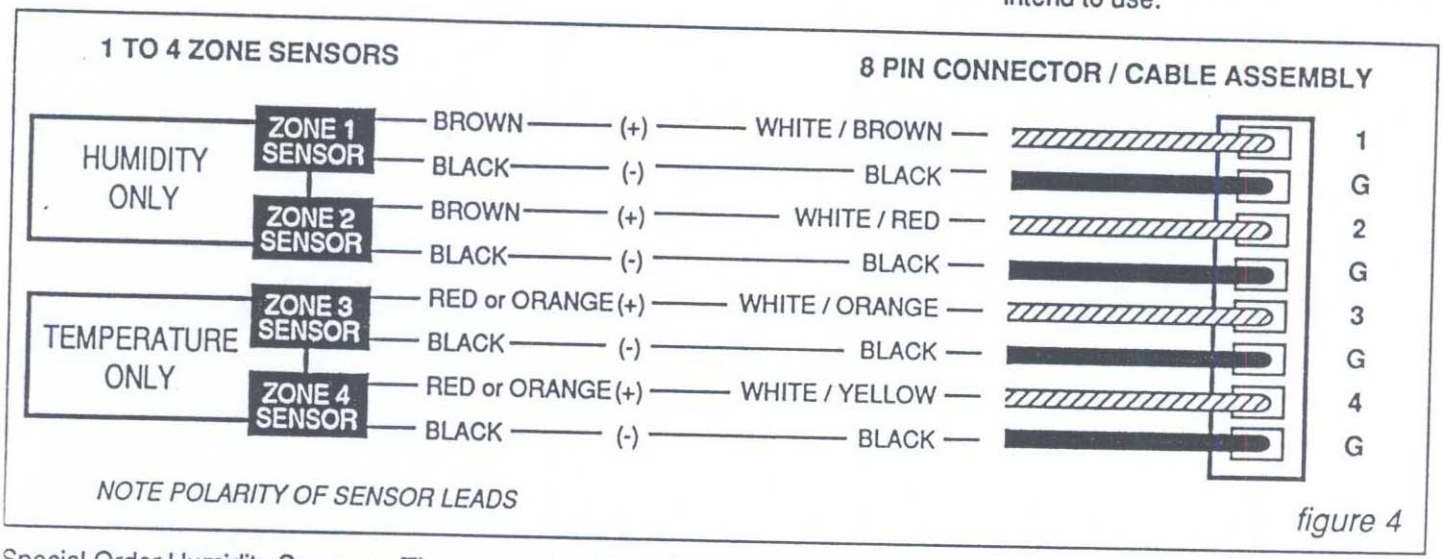


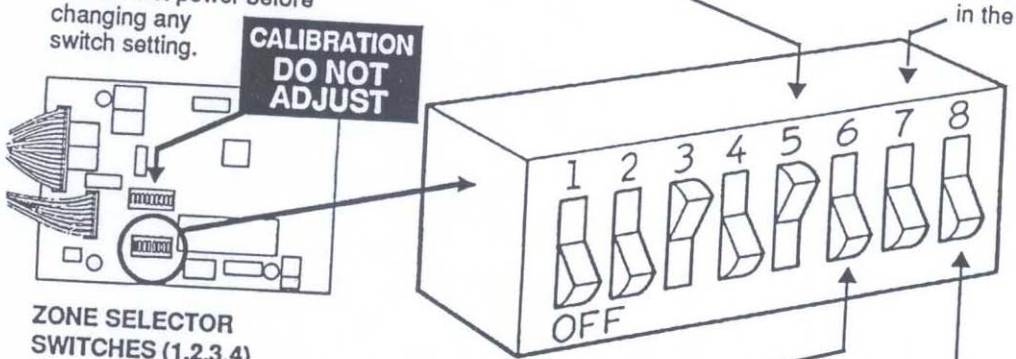
figure 4

Special Order Humidity Sensor or Thermocouple Option: Follow instructions supplied with the sensor.

STEP 6

PROGRAMMING DPM-4

The following figure illustrates how to set each of the 8 programming DIP switches. Disconnect power before changing any switch setting.



SCALING SWITCH (5)
Important: The DIP switch labeled X2 (fifth from the left) must be kept in the "OFF" or down position.

ALARM SWITCH (7)
The Alarm DIP switch (labeled ALR, seventh from the left) is used to select Automatic or Manual resetting of an alarm condition. All units are shipped from Winland with the Alarm switch in the "UP" or automatic position. In this position the DPM-4 will automatically reset or clear an alarm when the humidity or temperature returns to normal (within limits).

In the MANUAL position (Alarm switch down) an alarm will have to be cleared manually by the operator. See page 9 for clearing instructions.

figure 5

ZONE SELECTOR SWITCHES (1,2,3,4)
For each zone used, the corresponding DIP switch must be in the UP position. The example shows zones 1,2 and 4 being used. If none of the zone DIP switches are turned on, the unit's display will read *"ALL OFF"*. Be sure to activate only the switches which correspond to zones you will be using. Note: Any order or sequence of zones can be used.

°F/°C SWITCH (6)
All units shipped from the factory will display temperatures in degrees Fahrenheit. °C cannot be read on the DPM-4.

LIMITS LOCK SWITCH (8)
The DPM-4 is shipped from Winland with the Limits Lock DIP switch (labeled LMT, eighth from the left) in the "UP" position. In this position the High and Low Limits can be changed as often as desired. A short time delay helps prevent accidential limit changes. If you wish to lock your high and low limits in order to make them more tamper proof, then move the Limits Lock switch to the "DOWN" position. Important: Once this DIP switch is moved to the "DOWN" position the "High Limit Set" and "Low Limit Set" buttons on the front of the DPM-4 will become inoperable. Trying to use them will cause the display to show the words, *"turn Loc OFF"*. To change the High or Low limits for any zone the Limits Lock switch must first be moved back to the "UP" position.

STEP 7

OPTIONAL AUDIO ALERT - (Must be ordered separately) Follow the instructions supplied with the optional buzzer (Part #1183).

STEP 8

Connect the sensor cable connector (8 wire) and the alarm relay cable connector (16 wire) into the DPM-4. **Note: At this point all zones used should be in alarm and the DPM-4 should display *"SEt"* to remind the operator to set his limits. (In case of difficulty see page 10 for other display messages.)**

STEP 9

Mount the DPM-4 to the previously installed mounting box using the four screws provided. See GENERAL OPERATION for operating instructions.

GENERAL OPERATION

To use the DPM-4 the operator must become familiar with the display. The following *(figure 6)* describes all of the key features of the display and how they are used.

The following is an important general rule: WITH ALL CONDITIONS NORMAL, (NO ALARMS) NOTHING SHOULD BE FLASHING IN THE DISPLAY).

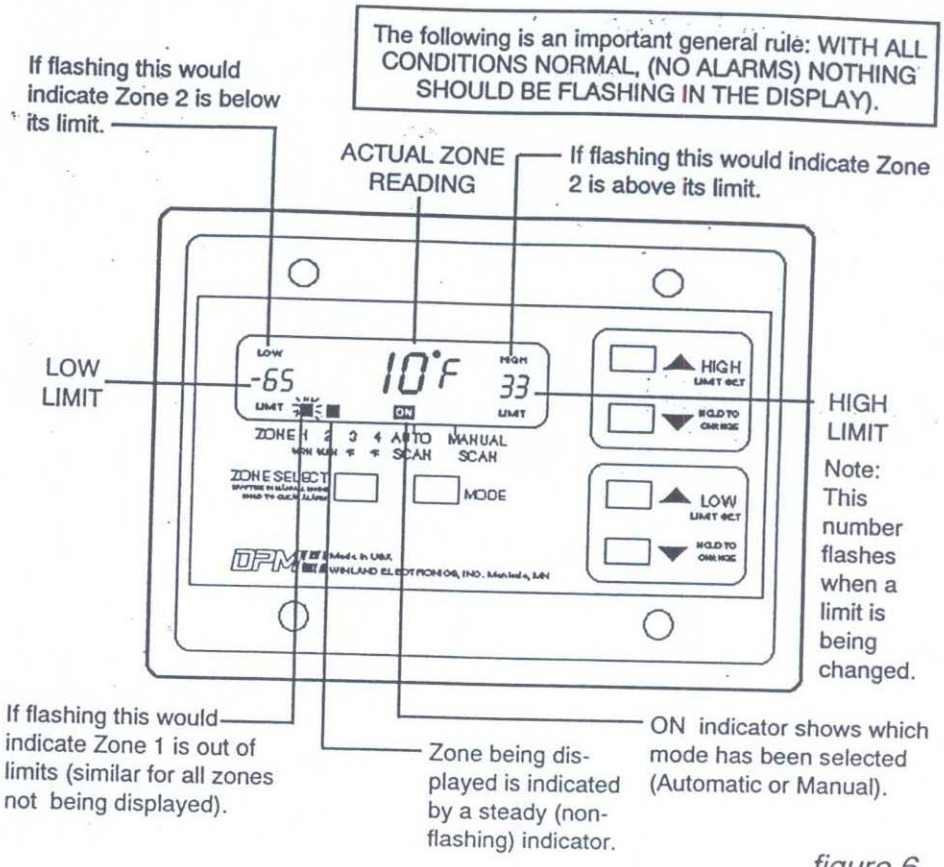


figure 6

1) HOW TO SET /CHANGE A LIMIT —

Follow steps

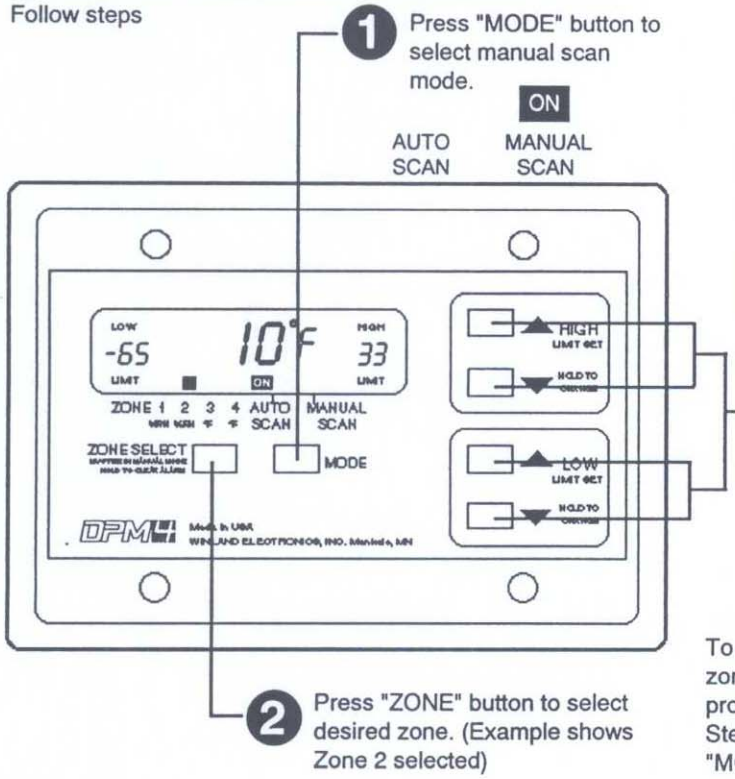


figure 7

2) AUTOMATIC / MANUAL SCAN MODE

Auto Scan Feature

To select the AUTO or MANUAL SCAN mode simply depress the "MODE" button so that the ON character on the display appears directly above the words "Auto Scan" or "Manual Scan".

When you select *AUTO SCAN* mode, the DPM-4 will automatically display the reading of each zone for approximately 5 seconds and then moves on to the next zone. Unused zones will automatically be skipped. An indication of the zone being displayed is provided by a solid square character (■) located above the zone numbers 1 to 4 as shown in figure 7.

When the *MANUAL* mode is selected the display will show the reading of a single zone. The display will continue showing this zone's reading until the "zone" button is pressed, which will cause it to move onto the next zone.

IMPORTANT: While in the *MANUAL* mode the DPM-4 will still continue to scan all of the zones for an alarm condition. However, only the zone selected will be displayed.

3) CLEARING ALARMS

If you have selected the Automatic Alarm Reset Mode *(See page 6)* simply correct the problem which caused the alarm condition and the alarm relays will reset automatically once the monitored humidity or temperature moves back into the proper range. If the monitored function cannot be corrected and you wish to cancel the alarm, you may choose to raise or lower one or more limits as required to clear the alarm.

If you have selected the Manual Alarm Reset Mode *(See page 6)* then use the following procedure to manually clear the alarm. First, correct the problem which caused the alarm condition. Second, select the zone that is in the alarm condition (select MANUAL SCAN mode and press Zone button to select the zone in alarm). Third, press and hold the Zone select button four seconds or until "high" or "low" words stop flashing. If more than one zone goes into alarm this procedure must be repeated to clear each alarm separately.

Note: To Insure Proper Operation Test Unit Weekly

DISPLAY MESSAGES

`ALL OFF` **ALL OFF**
All four zone select DIP switches are off. At least one zone must be used. See page 6 for setting these switches.

`FAIL OPEn` **FAIL OPEN**
The selected zone has an open (broken) sensor or the sensor is disconnected.

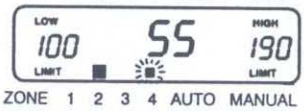
`FAIL Shrt` **FAIL SHORT**
The selected zone has a sensor that is shorted or the extension cable is shorted.

`turn Loc OFF` **TURN LOCK OFF**
The operator is trying to change a high or low limit while the limits are locked. The limits lock DIP switch must be put in the UP position before changing a limit. See page 6, section(8).

`SEt` **SET**
The high or low limit for the selected zone has not been programmed (or memory was lost due to power failure). See Step #1 page 8 to re-program the limits.

"HIGH" flashing indicates the reading in Zone 3 is above the high limit. (Note 197°F is above the 190°F limit in the example).

"LOW" flashing indicates the temperature in Zone 3 is below the low limit.



Zone indicator flashing indicates Zone 4 is in an alarm condition while Zone 2 is being displayed. Note if all 4 zones would go into an alarm condition, then all three zones indicators (1,3,4) would flash.
Zone 2 indicator would remain on (non-flashing) to indicate Zone is still being displayed.

NOTE: If Zone 2 is also in alarm condition then "HIGH" or "LOW" would also be flashing as described previously.

DISPLAY MESSAGES

High Limit Flashing indicates that the High Limit Set button (increase or decrease) has been held for more that 4 seconds and the limit can be changed.

Low Limit Flashing — same as above only the Low Limit Set buttons were activated.

NOTE: If both the High and Low Limit Set buttons are used then both limits will be flashing allowing quick and easy adjustment without going through repeated time delays. (Time delays are used to help prevent accidental limit changes.)

Note: To Insure Proper Operation Test Unit Weekly

APPLICATIONS

Freezer Defrost Cycles

Sometimes it is desired to monitor a freezer temperature without going into alarm when the freezer goes through a defrost cycle. This may be accomplished by immersing the special Winland moisture resistant sensor probe (Winland part #1107) into a container of nonconductive liquid such as glycerin, vegetable oil, or actually placing it into a sample of the medium being frozen.

Another option is delaying the output response of the DPM-4 using the model TDL-120 time delay. Adjustable from 0-150 minutes after alarm the module resets if the alarm clears before the selected time expires. The automatic reset option on page 6 item 7 must be chosen to allow the DPM-4 contact to clear automatically.

FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

SPECIFICATIONS

DIMENSIONS	6.55" x 4.70" x 1.0" *(166mm x 119mm x 25mm)*
WEIGHT	8 oz. *(.23Kg)*
MOUNTING	Can be flush mounted without a mounting box. Optional box available for mounting.
CASE MATERIAL	ABS Plastic
INPUT VOLTAGE REQUIRED (including alarm conditions)	12 to 14 VDC 200 mA
TEMPERATURE SENSOR(S)	Electronic Transducer
CONSOLE CALIBRATION ERROR	- 0.2% (does not include sensor error)
MINIMUM READING BETWEEN HIGH & LOW LIMITS	1 Digit
RANGE OF CONSOLE ALARM SET POINTS	-67° to +300°F in 1 digit steps – Range is Sensor Dependent

RFI & NOISE IMMUNITY	If a zone fails, it is resampled (4) times to help prevent false alarms.
NUMBER OF SENSOR INPUTS	2 Humidity / 2 Temperature
SCAN RATE WITH ALL 4 ZONES ACTIVE	Each zone sampled 15 times per minute. (minimum)
CONSOLE TEMPERATURE OPERATING RANGE	+32° to +130°F *(0° to +54°C)*
CONSOLE HUMIDITY OPERATING RANGE	0 to 85% RH
ENVIRONMENT	Non-Corrosive
CONSOLE DISPLAY	12 Digit Liquid Crystal (No backlighting)
ALARM OUTPUTS (ONE SET PER ZONE) a) RELAY OUTPUTS b) SOLID STATE	SPDT Relay 1 Amp @ 30 VDC Open Collector - 100 mA less than or equal to DPM-4 Input Voltage (12 to 14VDC)
WARRANTY	1 Year Limited