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User's Guide

iSeries

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**Temperature & Humidity Monitor
DPiTH-i8DH, -i8DV, -i16D, -i32**

**Temperature & Humidity Limit Alarm
CNiTH-i8DH-AL, -i8DV-AL, -i16D-AL, -i32-AL**



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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.



This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as the guide contains important information relating to safety and EMC.

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NOTES, WARNINGS and CAUTIONS

Information that is especially important to note is identified by following labels:

- **NOTE**
- **WARNING or CAUTION**
- **IMPORTANT**
- **TIP**



Note E3

NOTE: Provides you with information that is important to successfully setup and use the Programmable Digital Meter.



CAUTION or WARNING: Tells you about the risk of electrical shock.



CAUTION, WARNING or IMPORTANT: Tells you of circumstances or practices that can effect the instrument's functionality and must refer to accompanying documents.



Tip E3

TIP: Provides you helpful hints.

PART 1

INTRODUCTION

1.1 Description

The iTH Series instruments monitor and control both temperature and relative humidity.

- Used with an iTH probe the controller comes with dual displays. The top displays relative humidity and the bottom displays temperature. Relative Humidity can be toggled with Temperature readings (by pressing the **⬇** button) or Dewpoint readings (by pressing the **⬆** button). Dewpoint is the temperature at which water vapor from the air begins to form droplets and condenses on surfaces that are colder than the dewpoint of air.
- The temperature and humidity control can be achieved by using on/off or PID heat/cool control strategy. Control can be optimized with an auto tune feature. The instrument offers a ramp to setpoint with timed soak period before switching off the output.

The instruments are simple to configure and use, while providing tremendous versatility and a wealth of powerful features. The iTH Series instruments are available either as monitors or controllers. The monitors are extremely accurate programmable digital panel meters displaying humidity, temperature, or dew point. The controllers also provide dual loop control for both humidity and temperature and are easily programmed for any control or alarming requirement from simple on-off to full autotune PID control.

The iTH family of meters and controllers are available in four true DIN Sizes with NEMA 4 / Type 4, IP65 splash resistant bezels: the ultra compact 1/32 DIN (the world's smallest dual loop Humidity + Temperature controller); the popular midsize 1/16 DIN square bezel with dual display; the 1/8 DIN vertical, and the 1/8 DIN horizontal with the big bright 21mm digits.

The iTH series LED displays can be programmed to change color between Green, Amber, and Red at any set point or alarm point.

The iTH controller models offer a choice of two control or alarm outputs in almost any combination: solid state relays (SSR); Form "C" SPDT (Single Pole Double Throw) relays; pulsed 10 Vdc output for use with an external SSR; or Analog Output selectable for control or retransmission of the process value. Universal power supply accepts 90 to 240 Vac. Low voltage power option accepts 24 Vac or 12 to 36 Vdc.

The Networking and Communications options include direct Ethernet LAN connectivity with an Embedded Web Server, and serial communications. The -C24 serial communications option includes both RS-232 and RS-485. Protocols include both MODBUS and a straightforward ASCII protocol. The -C4EI option includes both Ethernet and RS-485 ASCII/MODBUS on one device.

The iTH Series meters and controllers are designed for easy integration with popular industrial automation, data acquisition and control programs as well as Microsoft Visual Basic and Excel. provides free configuration and data acquisition software and demos which makes it fast and easy to get up and running with many applications.

1.2 Safety Considerations



This device is marked with the international caution symbol. It is important to read this manual before installing or commissioning this device as it contains important information relating to Safety and EMC (Electromagnetic Compatibility).

This instrument is a panel mount device protected in accordance with EN 61010-1:2001, electrical safety requirements for electrical equipment for measurement, control and laboratory. Installation of this instrument should be done by qualified personnel. In order to ensure safe operation, the following instructions should be followed.



This instrument has no power-on switch. An external switch or circuit-breaker shall be included in the building installation as a disconnecting device. It shall be marked to indicate this function, and it shall be in close proximity to the equipment within easy reach of the operator. The switch or circuit-breaker shall meet the relevant requirements of IEC 947-1 and IEC 947-3 (International Electrotechnical Commission). The switch shall not be incorporated in the main supply cord.



Furthermore, to provide protection against excessive energy being drawn from the main supply in case of a fault in the equipment, an overcurrent protection device shall be installed.



- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.
- Unit mounting should allow for adequate ventilation to ensure instrument does not exceed operating temperature rating.
- Use electrical wires with adequate size to handle mechanical strain and power requirements. Install without exposing bare wire outside the connector to minimize electrical shock hazards.

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

Failure to follow all instructions and warnings may result in injury!

1.3 Before You Begin

Inspecting Your Shipment:

Remove the packing slip and verify that you have received everything listed. Inspect the container and equipment for signs of damage as soon as you receive the shipment. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent. The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing the contents, save the packing material and carton in the event reshipment is necessary.

Customer Service:

If you need assistance, please call the nearest Customer Service Department, listed in this manual.

Manuals, Software:

The latest Operation and Communication Manual as well as free configuration software and ActiveX controls are available from **the website listed in this manual or on the CD-ROM enclosed with your shipment.**



For first-time users: Refer to the QuickStart Manual for basic operation and set-up instructions.



If you have the Serial Communications/Ethernet Option you can easily configure the unit on your computer or on-line.

To Reset the Meter:

When the unit is in the "MENU" Mode, **push ▼ once** to direct the unit one step backward of the top menu item.



Push ▼ twice to reset the unit, prior to resuming "Run" Mode except after "Alarms", that will go to the "Run" Mode without resetting the unit.

**PART 2
SETUP
2.1 Front Panel**

Note Refer to the Quick Start Guide for assembly and disassembly instructions.

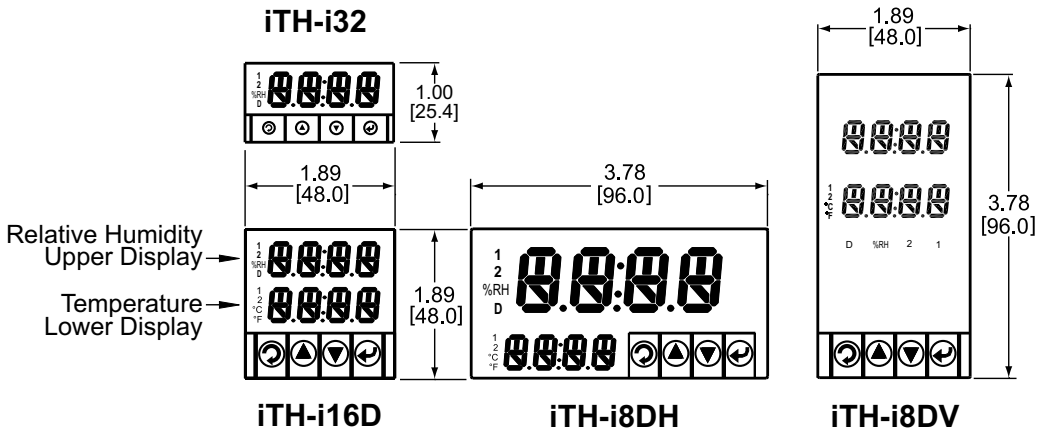


Figure 2.1 Front Panel Display

The upper display may be RH, Temperature or Dewpoint readings depending on your Reading Configuration selections. Factory defaults are shown in **Figure 2.1**. The Dual Display allows the user to observe the Relative Humidity or Dewpoint (upper display) and Temperature Value (lower display), at the same time.

Table 2.1 Front Panel Annunciators

1	Output 1/Setpoint 1/ Alarm 1 indicator
2	Output 2/Setpoint 2/ Alarm 2 indicator
°C	°C unit indicator for Temperature or Dewpoint
°F	°F unit indicator for Temperature or Dewpoint
%RH	Display shows the Percent Relative Humidity
D	Display shows the Dewpoint
	Changes display to Configuration Mode and advances through menu items*
	Used in Program Mode: On Dual Display: swaps the upper and lower displays from RH readings to Temperature readings. Note: this eliminates the small LED ennuicators* On Single Display units: replaces RH readings to Temperature readings*
	Used in Program Mode: On Dual Display: changes upper display from RH readings to Dewpoint readings* On Single Display units: replaces RH readings to Dewpoint readings*
	Accesses submenus in Configuration Mode and stores selected values*

* See Part 3 Operation: Configuration Mode.

2.2 Rear Panel Connections

The rear panel connections are shown in Figures 2.2 and 2.3.

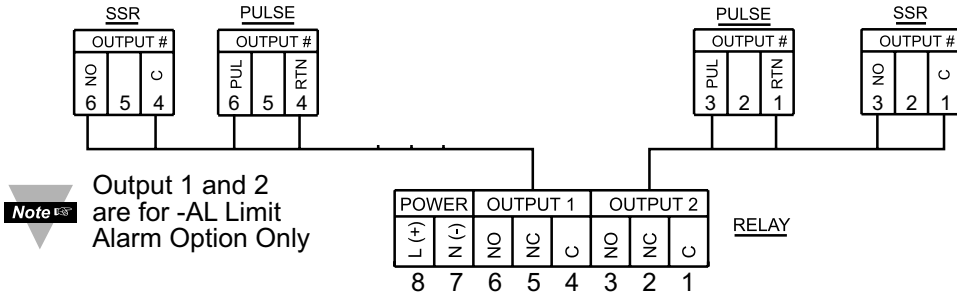


Figure 2.2 Rear Panel Power and Output Connections

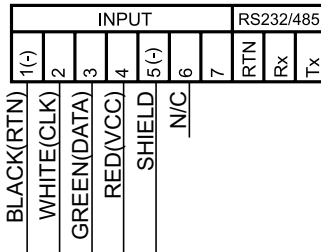


Figure 2.3 Rear Panel Input Connections

Table 2.2 Rear Panel Connector

POWER	AC/DC Power Connector: All models
INPUT	iTH-PROBE
OUTPUT 1	Based on one of the following models: Relay SPDT Solid State Relay Pulse
OUTPUT 2	Based on one of the following models: Relay SPDT Solid State Relay Pulse
OPTION	Based on one of the following models: RS-232C or RS-485 programmable Excitation

Note

Output 1 and 2 are for -AL Limit Alarm Option Only

2.3 Electrical Installation

2.3.1 Power Connections



Caution: Do not connect power to your device until you have completed all input and output connections. Failure to do so may result in injury!

Connect the main power connections as shown in Figure 2.4.

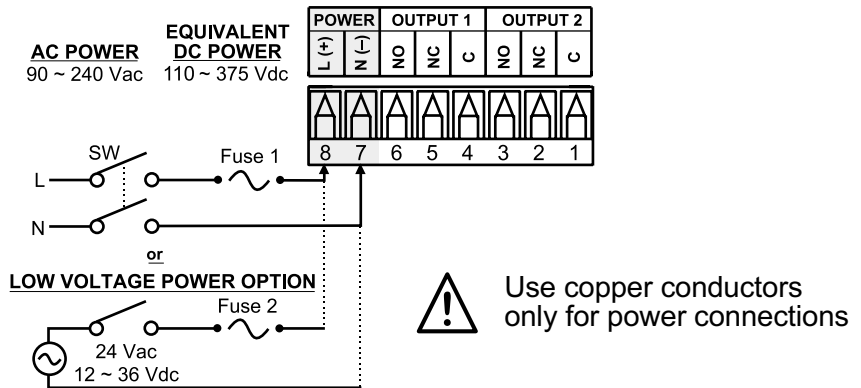


Figure 2.4 Main Power Connections

Table 2.3 Fuse Requirement (see specifications)

FUSE	Connector	Output Type	For 115Vac	For 230Vac	DC
FUSE 1	Power	N/A	100 mA(T)	100 mA(T)	100 mA(T)
FUSE 2	Power	N/A	N/A	N/A	400 mA(T)



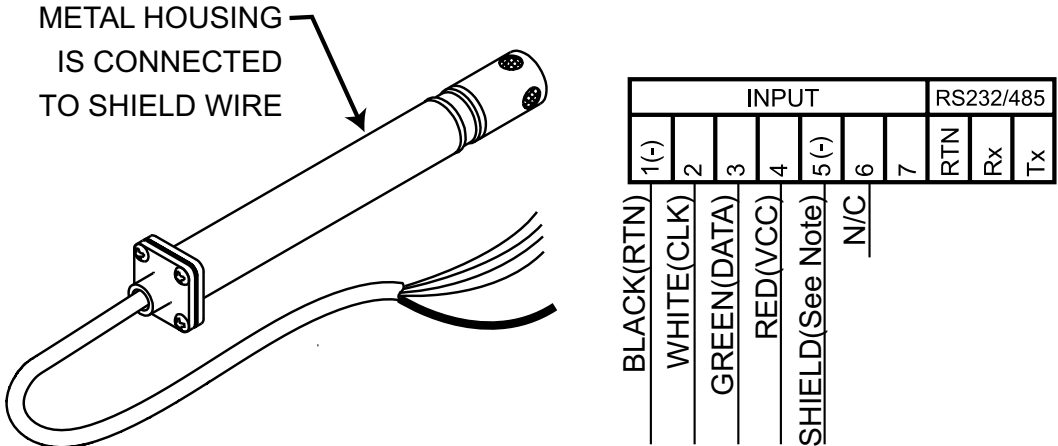
For the low voltage power option, in order to maintain the same degree of protection as the standard high voltage input power units (90 - 240 Vac), always use a Safety Agency Approved DC or AC source with the same Overvoltage Category and pollution degree as the standard AC unit (90 - 240 Vac).



The Safety European Standard EN61010-1 for measurement, control, and laboratory equipment requires that fuses must be specified based on IEC127. This standard specifies for a Time-lag fuse, the letter code "T". The above recommended fuses are of the type IEC127-2-sheet III. Be aware that there are significant differences between the requirements listed in the UL 248-14/CSA 248.14 and the IEC 127 fuse standards. As a result, no single fuse can carry all approval listings. A 1.0 Amp IEC fuse is approximately equivalent to a 1.4 Amp UL/CSA fuse. It is advised to consult the manufacturer's data sheets for a cross-reference.

2.3.2 Humidity and Temperature Probe

The figure below shows the wiring hookup for the temperature and humidity probe.



Choose one which gives the best signal integrity-

1) Connect Probe's Shield to RTN if Probe Housing is not connected to Earth Ground.

OR

2) Connect Probe's Shield to Earth Ground if Probe Housing is not connected to Earth Ground.

Figure 2.5 Probe Wiring Hookup

2.3.3 Wiring Outputs

This meter, if ordered with -AL Limit Alarm option, has two factory installed outputs. The SPDT Mechanical Relay, SPST Solid State Relay, and Pulse Connections are shown below.

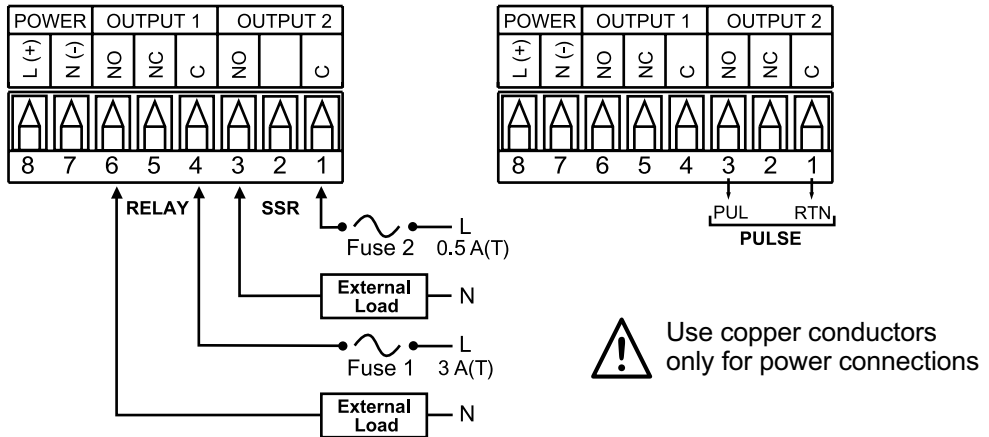


Figure 2.6

a) Mechanical Relay and SSR Outputs Wiring Hookup

b) Pulse Output Wiring Hookup

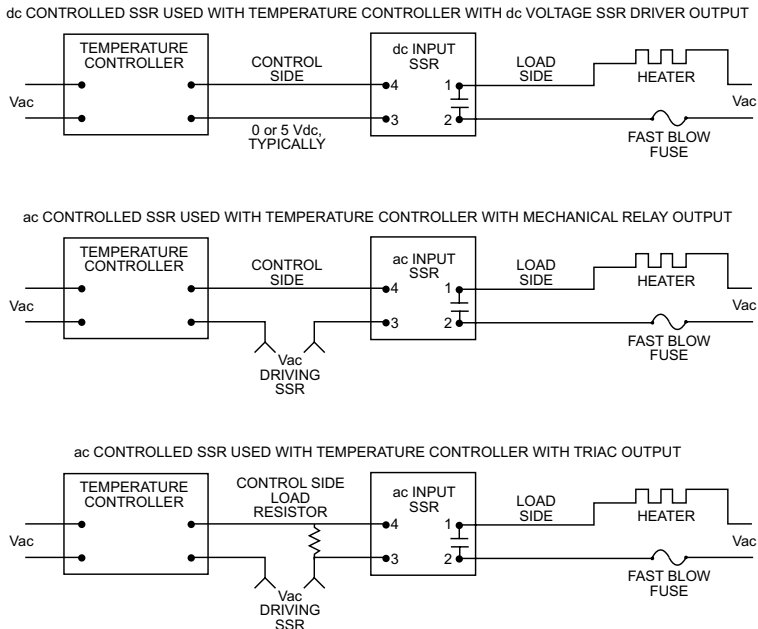


Figure 2.7 Typical Applications

This device has snubber circuits designed to protect the contacts of the mechanical relays when it switches to inductive loads (i.e. solenoids, relays). These snubbers are internally connected between the Common (C) and Normally Open (NO) relay contacts of Output 1 and Output 2.

Note ϵ^{35}

If you have an inductive load connected between Common (C) and Normally Closed (NC) contacts of the mechanical relays and you want to protect them from the rush current during the switching period, you have to connect an external snubber circuit between Common (C) and Normally Closed (NC) contacts as indicated in **Figure 2.8**.

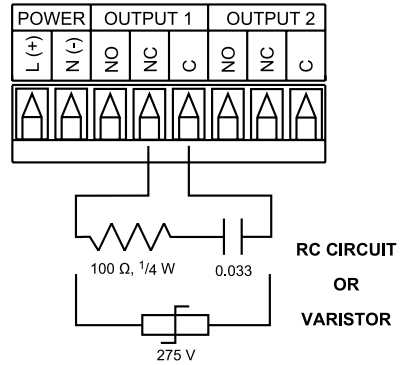


Figure 2.8
Snubber Circuits Wiring Hookup

This device may have a programmable communication output. The RS-232 and RS-485 Output Connection are shown below.

Note ϵ^{35}

External RS-232 connections are not available with -EI or C4EI options.

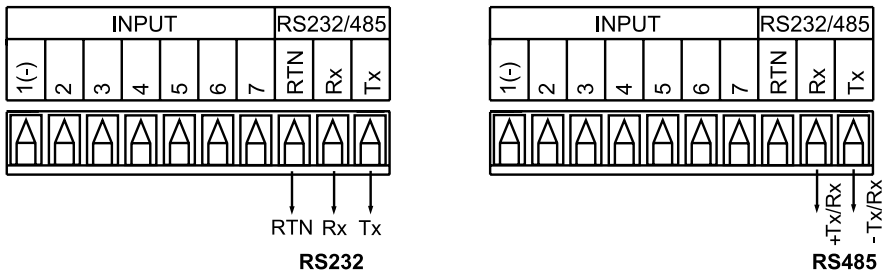


Figure 2.9
a) RS-232 Output Wiring Hookup b) RS-485 Output Wiring Hookup

This device may also have an excitation output.

Note ϵ^{35}

Excitation is not available if Serial Communication (-C24) or Ethernet (-C4EI) or Low Voltage Power Supply (-DC) option is installed.

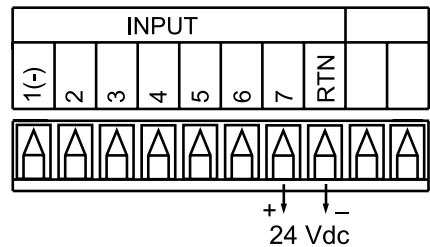


Figure 2.10 **Excitation Output**

2.3.4 Dual Display Color Setup

The dual display option allows the user to change the color of the upper and lower displays.

Note To change the color of the upper display, see **Section 3.2.14** (Display Color section).

To change the color of the lower display follow the instructions below:
The unit should be removed from the panel and opened.

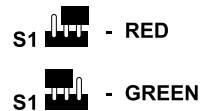
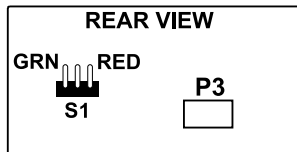
Note Refer to the Quick Start Guide for assembly and disassembly instructions.

The S1 jumper is located on the back side of the display board.
The location of S1 and pin selection jumpers are shown below.



Use a jumper for GREEN or RED, never leave S1 open.

**i/8DH
Dual
Horizontal**



**i/8DV
Dual
Vertical**

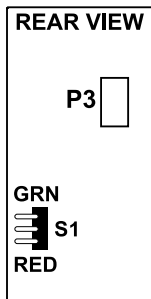


Figure 2.11 i/8 D Location of S1 and Selectable Jumper Positions

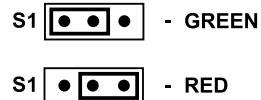
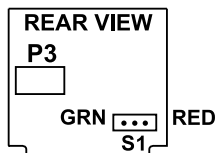


Figure 2.12 i/16D Location of S1 and Selectable Jumper Positions

PART 3

OPERATION: Configuration Mode

3.1 Introduction

The instrument has two different modes of operation. The first, Run Mode, is used to display Temperature and Relative Humidity. The other mode, Menu Configuration Mode, is used to navigate through the menu options and configure the unit. Part 3 of this manual will explain the Menu Configuration Mode. For your instrument to operate properly, the user must first "program" or configure the menu options.

Turning your Unit On for the First Time

The device becomes active as soon as it is connected to a power source. It has no On or Off switch. The device at first momentarily shows the software version number, followed by reset **RES**, and then proceeds to the Run Mode.



















Tip 

For first-time users: Refer to the QuickStart Manual for basic operation and set-up instructions.

Tip 

If you have the Serial Communications/Ethernet Option you can easily configure the unit on your computer or on-line.

Table 3.1 Button Function in Configuration Mode

 MENU	<ul style="list-style-type: none">• To enter the Menu, the user must first press  button.• Use this button to advance/navigate to the next menu item. The user can navigate through all the top level menus by pressing .• While a parameter is being modified, press  to escape without saving the parameter.
 (UP)	<ul style="list-style-type: none">• Press the up  button to scroll through "flashing" selections. When a numerical value is displayed press this key to increase value of a parameter that is currently being modified.• Pressing the  button for approximately 3 seconds will speed up the rate at which the set point value increments.• In the Run Mode, pressing the  button changes display from RH readings to Temperature readings.
 (DOWN)	<ul style="list-style-type: none">• Press the down  button to go back to a previous Top Level Menu item.• Press this button twice to reset the unit to the Run Mode.• When a numerical value is flashing (except set point value) press  to scroll digits from left to right allowing the user to select the desired digit to modify.• When a setpoint value is displayed press  to decrease value of a setpoint that is currently being modified. Pressing the  button for approximately 3 seconds will speed up the rate at which the setpoint value is decremented.• In the Run Mode, pressing the  button changes from RH readings to Dewpoint readings.
 ENTER	<ul style="list-style-type: none">• Press the enter  button to access the submenus from a Top Level Menu item.• Press  to store a submenu selection or after entering a value — the display will flash a SERd message to confirm your selection.• In the Run Mode, press  twice to enable Standby Mode with flashing Stby.

Note 

Reset: Except for Alarms, modifying any settings of the menu configuration will reset the instrument prior to resuming Run Mode.

3.2 Menu Configuration

Note

It is required that you put the unit in the Standby Mode for any configuration change other than Setpoints & Alarms.

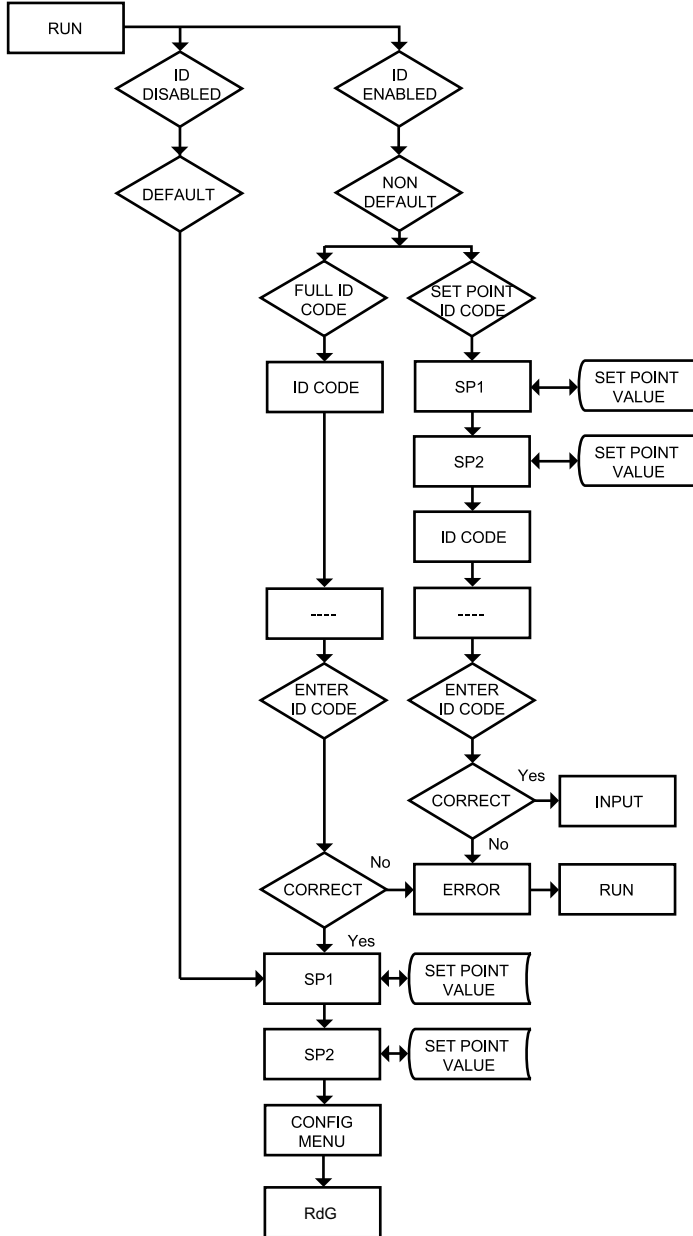


Figure 3.1 Flow Chart for ID and Setpoints

3.2.1 ID Number










TO ENABLE/DISABLE OR CHANGE ID CODE, SEE SECTION 3.2.12.

Note If ID Code is **Disabled** or set as **Default** (0000) the menu will skip ID step to Setpoint Menu.

If ID Code is set to **Full** Security Level and user attempts to enter the Main Menu, they will be prompted for an ID Code.










If ID Code is set to **Setpoint/ID** Security Level and user attempts to enter the Configuration Menu, they will be prompted for an ID Code.

ENTERING YOUR NON-DEFAULT FULL SECURITY ID NUMBER.

- Press  1) Display shows **ID**.
- Press  2) Display advances to **----**.
- Press  &  3) Press  to increase digit 0-9. Press  to activate next digit (flashing). Continue to use  and  to enter your 4-digit ID code.
- Press  4) If the correct ID code is entered, the menu will advance to the Setpoint 1 Menu, otherwise an error message **ERR** will be displayed and the instrument will return to the Run Mode.

Note To change ID Code, see ID Menu in the Configuration section.

ENTERING YOUR NON-DEFAULT SETPOINT/ID SECURITY ID NUMBER.

- Press  5) Display shows **SP1** Setpoint 1 Menu.
- Press  6) Display shows **SP2** Setpoint 2 Menu.
- Press  7) Display shows **ID** ID Code Menu.
- Press  8) Display advances to **----**.
- Press  &  9) Use  and  to change your ID Code.
- Press  10) If correct ID Code is entered, the display will advance to the **INPE** Input Menu, otherwise the error message **ERR** will be displayed and the unit will return to the Run Mode.

To prevent unauthorized tampering with the setup parameters, the instrument provides protection by requiring the user to enter the ID Code before allowing access to subsequent menus. If the ID Code entered does not match the ID Code stored, the unit responds with an error message and access to subsequent menus will be denied.

Note

Tip Use numbers that are easy for you to remember. If the ID Code is forgotten or lost, call customer service with your serial number to access and reset the default to **0000**.

3.2.2 Set Points

SETPOINT 1:

- Press **⏏** 1) Press **⏏**, if necessary until **SP 1** prompt appears.
- Press **⏏** 2) Display shows previous value of "Setpoint 1".
- Press **▲ & ▼** 3) Press **▲** and **▼** to increase or decrease Setpoint 1 respectively.

Note Holding **▲ & ▼** buttons down for approximately 3 seconds will speed up the rate at which the Setpoint value increments or decrements.

- Press **▲ & ▼** 4) Continue to use **▲** and **▼** to enter your 4-digit Setpoint 1 value.
- Press **⏏** 5) Display shows **STRD** stored message momentarily and then advances to **SP 2** only, if a change was made, otherwise press **⏏** to advance to **SP 2** Setpoint 2 Menu.

SETPOINT 2:

- Press **⏏** 6) Display shows previous value of "Setpoint 2".
- Press **▲ & ▼** 7) Press **▲** and **▼** to increase or decrease Setpoint 2 respectively.

Note Holding **▲ & ▼** buttons down for approximately 3 seconds will speed up the rate at which the setpoint value increments or decrements.

- Press **⏏** 8) Display shows **STRD** stored message momentarily and then advances to **ENFG** only, if a change was made, otherwise press **⏏** to advance to **ENFG** Configuration Menu.

3.2.3 Configuration Menu

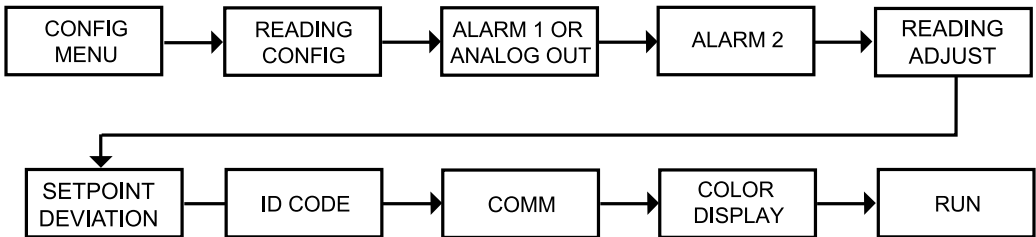


Figure 3.2 Flow Chart for Configuration Menu

3.2.4 Reading Configuration

Note It is required that you put the unit in the Standby Mode for any configuration change other than Set Points & Alarms.

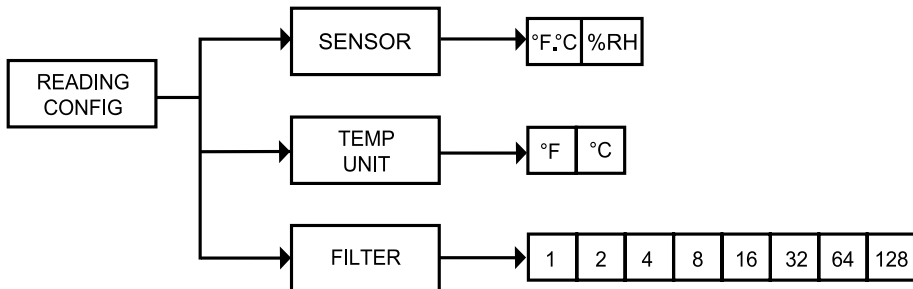


Figure 3.3 Flow Chart for Reading Configuration Menu

ENTER READING CONFIGURATION MENU:

- Press **⏪** 1) Press **⏪**, if necessary, until **ENFC** prompt appears.
- Press **⏩** 2) Display advances to **RdC** Reading Configuration Menu.
- Press **⏩** 3) Display advances to **SENSOR** Sensor.

SENSOR SUBMENU:

- Press **⏩** 4) Sensor selection for Autotune, Loop (Reading Offset Adjust), or Ramp and Soak **°F, °C** is for temperature and **°RH** is for Humidity.

TEMPERATURE UNIT SUBMENU:

- Press **⏩** 5) Display flashes previous Temperature Unit selection.
- Press **⏴** 6) Scroll through the available selections to the Temperature Unit of your choice: **°F** or **°C**.
- Press **⏩** 7) Display shows **SETRd** stored message momentarily and then advances to **FILTER** Filter Constant.

FILTER CONSTANT SUBMENU:

- Press **⏩** 8) Display flashes previous selection for Filter Constant.
- Press **⏴** 9) Scroll through the available selections:
0001, 0002, 0004, 0008, 0016, 0032, 0064, 0128
- Press **⏩** 10) Display shows **SETRd** stored message momentarily only, if change was made, otherwise press **⏩** to advance to the next menu.
The Filter Constant Submenu allows the user to specify the number of readings stored in the Digital Averaging Filter.

3.2.5 Alarm 1

This unit is equipped with two physical outputs that can only be configured as follows: **Alarm 1 & Alarm 2**. Alarm1 will only work for Humidity, not Temperature.



Alarm 1 is designed to monitor the humidity value around Setpoint 1 and Alarm 2 is designed to monitor the temperature value around Setpoint 2.

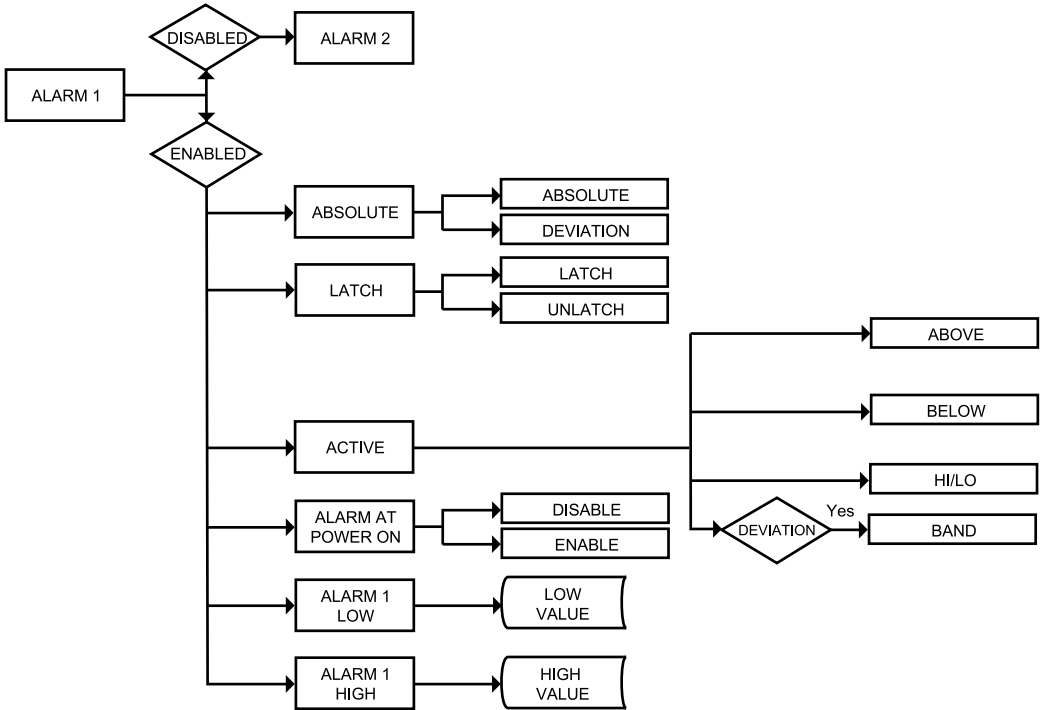


Figure 3.4 Flow Chart for Alarm 1

ENTER ALARM 1 MENU:

- Press 1) Press , if necessary, until **ENFG** prompt appears.
- Press 2) Display advances to **RdG** Reading Configuration Menu.
- Press 3) Press , until Display advances to **ALR 1** Alarm 1 Menu.
- Press 4) Display advances to Alarm 1 **ENBL** Enable or **DSBL** Disable Submenu and flashes the previous selection.

ALARM 1 ENABLE/DISABLE SUBMENU:

- Press ▲ 5) Scroll through the available selection until **ENBL** displays to use Alarm 1.
- Press ⏻ 6) Display shows **STRD** stored message momentarily and then advances to **ABS0** only if it was changed, otherwise press ⏻ to advance to **ABS0** Alarm 1 Absolute/Deviation Submenu.



If **DSBL** Alarm 1 **Disabled** was selected, all submenus of Alarm 1 Menu will be skipped and meter advances to **ALR2** Alarm 2 Menu. If **ENBL** Alarm 1 **Enabled** was selected, Output 1 would be automatically Disabled.

ALARM 1 ABSOLUTE/DEVIATION SUBMENU:

- Press ⏻ 7) Display flashes previous selection. Press ▲ to **ABS0** Absolute or **DEV** Deviation.
- Press ⏻ 8) Display shows **STRD** stored message momentarily (only if it was changed) and then advances to **LECH**.

Absolute Mode allows Alarm 1 to function independently from Setpoint 1. If the process being monitored does not change often, then "Absolute" Mode is recommended. The absolute Setpoint values are placed in the Alarm 1 Low and Hi values.

Deviation Mode allows Alarm 1 trigger at the Setpoint 1 value, as long as the Alarm 1 Low and Hi values equal 0. Deviation mode is typically the ideal mode if the process temperature changes often.

ALARM 1 LATCH/UNLATCH SUBMENU:

- Press ⏻ 9) Display flashes previous selection. Press ▲ to **LECH** Latched or **UNLE** Unlatched.
- Press ⏻ 10) Display shows **STRD** stored message momentarily (only if it was changed) and then advances to **ACTV**.

Latched Mode: Relay remains "latched" until reset. To reset already latched alarm, select Alarm Latch and press Max twice (i.e. Unlatch and then back to Latch) or from a Run Mode, push ⏻ twice to put the unit in Standby Mode and then push ⏻ one more time to return to the Run Mode.

Unlatched Mode: Relay remains latched only as long as the alarm condition is true.

ACTIVE SUBMENU:

- Press **⏪** 11) Display flashes previous selection. Press **⏩** to scroll through the available selections: **AbOv** Above, **bELo** Below, **Hi.Lo** HI/Low and **bAND** Band. (Band is active if **DEV** Deviation was selected).
- Press **⏪** 12) Display shows **SEtP** stored message momentarily (only if it was changed) and then advances to **A.P.ON**.

Above: In Absolute Mode, Alarm 1 is triggered when the process variable is greater than the Alarm Hi Value (Low value ignored). In Deviation Mode, Alarm 1 is triggered at the Setpoint plus any offset placed in the Alarm Hi value.

Below: In Absolute Mode, Alarm 1 is triggered when the process variable is less than the Alarm Low Value (Hi value ignored). In Deviation Mode, Alarm 1 is triggered at the Setpoint plus any offset placed in the Alarm Low value.

Hi/Low: In Absolute Mode, Alarm 1 is triggered when the process variable is less than the Alarm Low Value or above the Hi Value. In Deviation Mode, Alarm 1 is triggered when the process variable is less than the Setpoint minus any offset in the Alarm Low or greater than the Setpoint plus any offset in the Alarm Hi value.

Band: Alarm 1 is triggered when the process variable is above or below the "band" set around Setpoint 1. Band equals Hi Value (Low Value ignored). A "band" is set around the Setpoint by the instrument only in the "Deviation" Mode.

The Band for the AL 1 would be following the Setpoint 1 value

The Band for the AL 2 would be following the Setpoint 2 value.

The Band or the Deviation Value should be entered under:

AL1 High (if they want Alarm 1)

AL2 High (if they want Alarm 2)

AL Low value is ignored in the Band mode.

Example: if customer requires a Deviation Value of ± 10 degrees around a setpoint (using Output 2 as alarm)

Alarm 2: - Deviation

Contact Closure type: Deviation---Band

AL2 High: 10 (Band they want around Setpoint 2)

Then the Band Value is to be entered under AL2 HI: 10 not $80 + 10 = 90$

ALARM ENABLE/DISABLE AT POWER ON:

- Press **↻** 13) Display flashes previous selection. Press **▲** to **ENBL** enable or **DSBL** disable.
- Press **↻** 14) Display shows **SEPRd** stored message momentarily (only if it was changed) and then advances to **ALRL**.

Note

If Alarm at Power On is enabled, the alarm will be active when an alarm condition occurs.

If Alarm at Power On is disabled, the alarm will not be active (even if an alarm condition exists) *unless* the process value moves into a non-alarm condition and back into an alarm condition.

ALARM 1 LOW VALUE SUBMENU:

- Press **↻** 15) Display flashes 1st digit of previous value. Use **▲** and **▼** to enter new value.
- Press **▲** & **▼** 16) Use **▲** and **▼** to enter Alarm 1 Low Value.
- Press **↻** 17) Display shows **SEPRd** storage message momentarily (only if it was changed) and then advances to **ALRH**.

ALARM 1 HI VALUE SUBMENU:

- Press **↻** 18) Display flashes 1st digit of previous value. Use **▲** and **▼** to enter new value.
- Press **▲** & **▼** 19) Use **▲** and **▼** to enter Alarm1 Hi Value.
- Press **↻** 20) Display shows **SEPRd** stored message momentarily (only if it was changed) and then advances to the next menu.

3.2.6 Alarm 2

This unit is equipped with two physical outputs that can only be configured as follows: **Alarm 1 & Alarm 2**. Alarm 2 only works for Temperature, not Humidity.

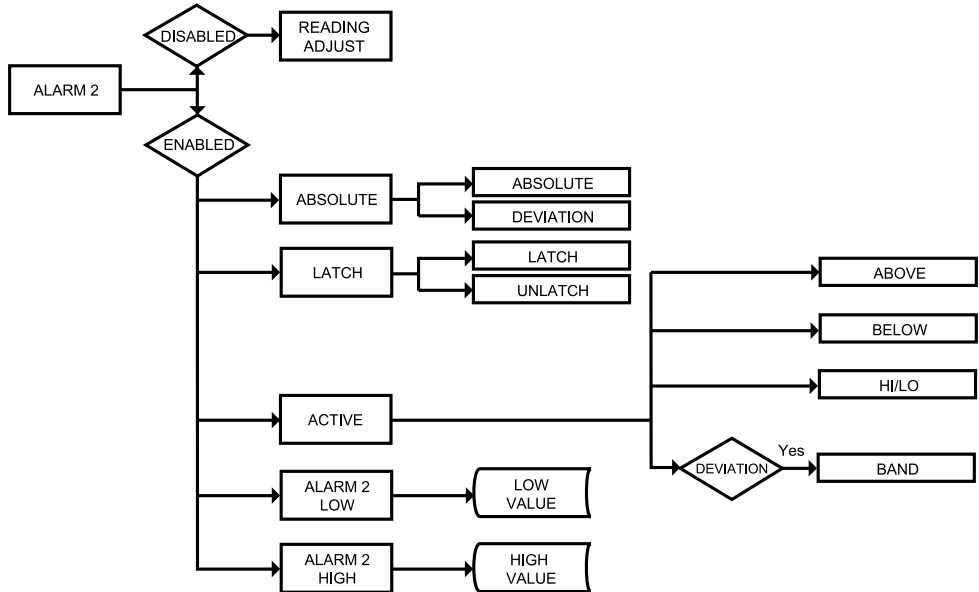


Figure 3.5 Flow Chart for Alarm 2

ENTER ALARM 2 MENU:

- Press **⏪** 1) Press **⏪**, if necessary, until **ENFG** prompt appears.
- Press **⏩** 2) Display advances to **RdG** Reading Configuration Menu.
- Press **⏪** 3) Press **⏪**, if necessary, until Display advances to **ALR2** Alarm 2 Menu.
- Press **⏩** 4) Display advances to Alarm 2 **ENBL** Enable or **DSBL** Disable Submenu.

ALARM 2 ENABLE/DISABLE SUBMENU:

- 5) Display flashes previous selection. Press **⏩** until **ENBL** displays to use Alarm 2.
- Press **⏩** 6) Display shows **STPRd** stored message momentarily and then advances to **ABSD** only if it was changed, otherwise press **⏪** to advance to **ABSD** Absolute/Deviation Submenu.

If **DSBL** Alarm 2 **Disabled** was selected, all submenus of Alarm 2 will be skipped and meter advances to **R.ADJ** Reading Adjust Menu.



The remaining Alarm 2 menu items are identical to Alarm 1 Menu. Modifying Alarm Settings will not reset the instrument.

3.2.7 Reading Adjust Menu

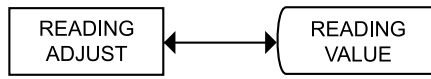


Figure 3.6 Flow Chart for Reading Adjust Menu

ENTER READING ADJUST MENU:

- Press **⏻** 1) Press **⏻**, if necessary, until **ENFG** prompt appears.
- Press **⏻** 2) Display advances to **INPE** Input Menu.
- Press **⏻** 3) Press **⏻**, if necessary, until Display advances to **R.ADJ** Reading Adjust Menu.

READING ADJUST VALUE SUBMENU:

- Press **⏻** 4) Display flashes 1st digit of previous Reading Adjust value.
- Press **▲** & **▼** 5) Press **▲** and **▼** buttons to enter a new Reading Adjust value (-19.99 to 99.99).
- Press **⏻** 6) Display shows **SErD** stored message momentarily and then advances to **SP.dN** Setpoint Deviation Menu.

Reading Offset Adjust

For Relative Humidity, the unit allows the user to fine tune a minor error of the transducer, however some applications may require a large offset adjust.

(Displayed Process Value = Measured Process Value ± R.ADJ).

R.ADJ is adjustable between -19.99 to 99.99

Note This will adjust humidity or temperature depending on Sensor selection, in Reading Configuration (see **Section 3.2.4**).

3.2.8 SETPOINT DEVIATION ENABLE/DISABLE SUBMENU:

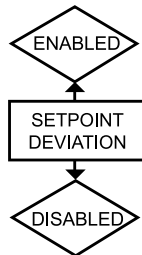


Figure 3.7 Flow Chart for Setpoint Deviation Menu

- Press **⏻** 1) Display advances to Setpoint Deviation **ENbL** Enable or **dSbL** Disable Submenu and flashes the previous selection.
- Press **▲** 2) Scroll through the available selections: **ENbL** or **dSbL**.
- Press **⏻** 3) Display shows **SErD** stored message momentarily and then advances to **Id** ID Code Menu.

Setpoint Deviation Submenu, if “enabled”, allows changes to Setpoint 1 to be made automatically to Setpoint 2. This mode is very helpful if the Process Value changes often. In Setpoint Deviation Mode, set SP2 a certain number of degrees or counts away from SP1 - this relation remains fixed when SP1 is changed. For instance: Setting SP1=200 and SP2=20 and enabling **SP.dN** means that the absolute value of SP2=220. Moving SP1 to 300, the absolute value of SP2 becomes 320.

3.2.9 ID CODE

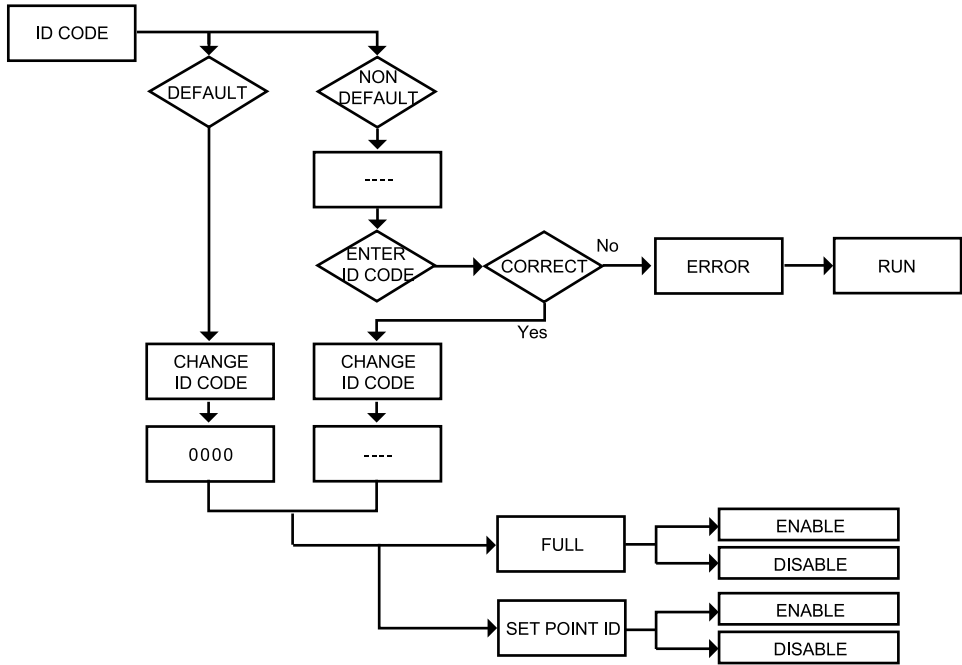


Figure 3.8 Flow Chart for ID Code

ENTER ID CODE MENU:

- Press **⏪** 1) Press **⏪**, if necessary, until **CONF** prompt appears.
- Press **⏩** 2) Display advances to **RdC** Reading Configuration Menu.
- Press **⏪** 3) Press **⏪**, if necessary, until Display advances to **Id** ID Code Menu.

ENTERING OR CHANGING YOUR (NON-DEFAULT) ID CODE:

- Press **⏩** 4) Display advances to **----** with 1st under score flashing.
- Press **▲** & **▼** 5) Press **▲** and **▼** to enter your 4-digit "ID Code" number.
- Press **⏩** 6) Display advances to **Ch. Id** Change ID Code Submenu.

Note

If entered "ID Code" is incorrect display shows **ERRd** Error message momentarily and then skips to the Run Mode.

- Press **⏩** 7) Display flashes the first digit of previous entered "ID Code" number.
- Press **▲** & **▼** 8) Press **▲** and **▼** buttons to enter your new "ID Code" number.
- Press **⏩** 9) Display shows **SEEd** stored message momentarily and then advances to the **FULL** Full Security Submenu.

ENTERING OR CHANGING YOUR (DEFAULT) ID CODE:

- Enter **ID** menu (Repeat steps from 1 to 3).
- Press **↻** 10) Display advances to **CH.ID** Change ID Code Submenu.
Press **↻** 11) Display shows **0000** message with flashing 1st digit.

Note ⓘ

If you want to change your default "ID Code" you can do it now, otherwise press **↻** and menu will skip to **FULL** Full Security Submenu.

- Press **▲** & **▼** 12) Press **▲** and **▼** buttons to enter your new "ID Code" number.
Press **↻** 13) Display shows **SErD** stored message momentarily and then advances to the **FULL** Full Security Submenu.

FULL SECURITY LEVEL SUBMENU:

- Press **↻** 14) Display flashes **ENbL** Enable or **dSbL** Disable.
Press **▲** 15) Scroll through the available selections: "Enable" or "Disable".
Press **↻** 16) Display shows **SErD** stored message momentarily and then advances to **SP.ID** Setpoint/ID Submenu.

Note ⓘ

If "Full" Security Level is "Enabled" and the user attempts to enter the Main Menu, they will be prompted for an ID Code. The ID Code should be correct to enter the instrument Menu item.

SETPOINT/ID SECURITY LEVEL SUBMENU:

This Security Level can be functional only if **FULL** Security Level is Disabled.

- Press **↻** 17) Display flashes **ENbL** Enable or **dSbL** Disable.
Press **▲** 18) Scroll through the available selections: "Enable" or "Disable".
Press **↻** 19) Display shows **SErD** stored message momentarily and then advances to **COMM** Communication Submenu.

Note ⓘ

If "**Setpoint/ID**" Security Level is "**Enabled**" and the user attempts to advance into the **CONF** Configuration Menu, he will be prompted for ID Code number. The ID Code should be correct to proceed into the Configuration Menu, otherwise display will show an Error and skip to the Run Mode.

Note ⓘ

If "**Full**" and "**Setpoint/ID**" Security Levels are "**Disabled**", the ID code will be "Disabled" and user will not be asked for ID Code to enter the Menu items ("ID" Submenu will not show up in "ID/Setpoint" Menu).

3.2.10 COMMUNICATION OPTION

Purchasing this instrument with Serial Communications permits an instrument to be configured or monitored from an IBM PC compatible computer using software available from **the website or on the CD-ROM enclosed with your shipment**. For complete instructions on the use of the Communications Option, refer to the Serial Communications Reference Manual.

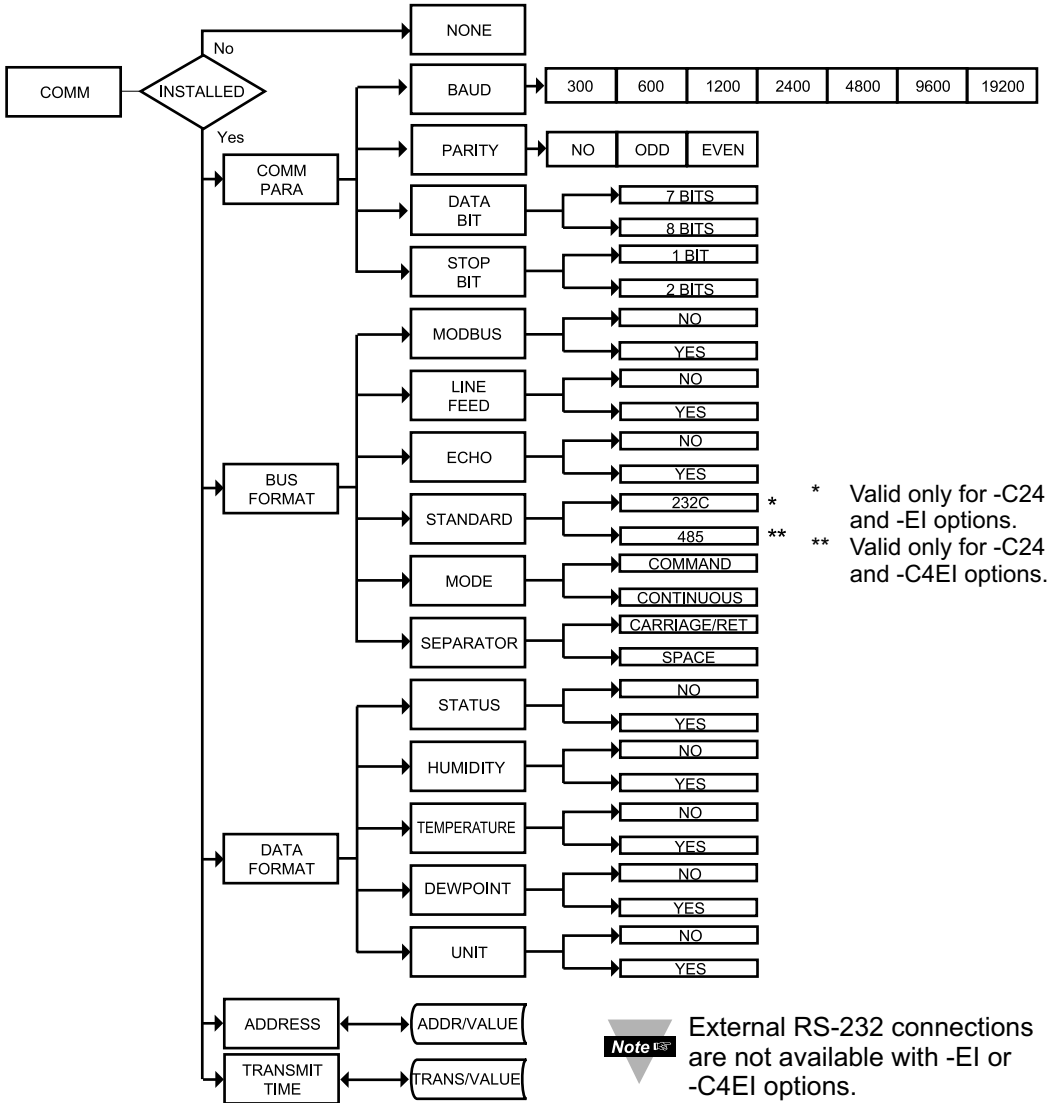


Figure 3.9 Flow Chart for Communication Option







Note With the exception of DATA FORMAT Sub Menu, all other command formats are the same in the **Serial Communications Manual**.

The following table are the exceptions to the Serial Communication Manual's Table 5.3

Command	Command Index	Function	Command Bytes	# Of Characters	Default Value
X	01	Send RH Reading	0	0	-
X	02	Send Temperature Reading	0	0	-
X	03	Send Dewpoint Reading	0	0	-

Table 3.2 Command Letters and Suffix for iTH

ENTER COMMUNICATION OPTION MENU:

- Press  1) Press , if necessary, until **ENFC** prompt appears.
- Press  2) Display advances to **RDC** Reading Configuration Menu.
- Press  3) Press , if necessary, until Display advances to **COMM** Communication Options Menu.
- Press  4) Display advances to **CPAR** Communication Parameters Submenu.







If Communication Option is not installed, the display shows **NONE** and skips to the Color Display Menu.

COMMUNICATION PARAMETERS SUBMENU:





Allows the user to adjust Serial Communications Settings of the instrument. When connecting an instrument to a computer or other device, the Communications Parameters must match. Generally the default settings (as shown in **Section 5**) should be utilized.

- Press  5) Display advances to **BAUD** Baud Submenu.





BAUD SUBMENU:

- Press  6) Display flashes previous selection for **BAUD** value.
- Press  7) Scroll through the available selections: **300**, **600**, **1200**, **2400**, **4800**, **9600**, **19.2K**.
- Press  8) Display shows **SEED** stored message momentarily and then advances to **PREY** only, if it was changed, otherwise press  to advance to **PREY** Parity Submenu.





PARITY SUBMENU:

- Press  9) Display flashes previous selection for "Parity".
- Press  10) Scroll through the available selections: NO, ODD, EVEN.
- Press  11) Display shows **SEED** stored message momentarily and then advances to **DATA** only, if it was changed, otherwise press  to advance to **DATA** Data Bit Submenu.

DATA BIT SUBMENU:

- Press  12) Display flashes previous selection for "Data Bit".
- Press  13) Scroll through the available selections: 7-BIT, 8-BIT.
- Press  14) Display shows **SEED** stored message and then advances to **SEOP** only, if it was changed, otherwise press  to advance to **SEOP** Stop Bit Submenu.

STOP BIT SUBMENU:





- Press  15) Display flashes previous selection for “Stop Bit”.
- Press  16) Scroll through the available selections: 1-BIT, 2-BIT.
- Press  17) Display shows **SERd** stored message momentarily and then advances to **BUS.F** only, if it was changed, otherwise press  to advance to **BUS.F** Bus Format Submenu.


BUS FORMAT SUBMENU:


Determines Communications Standards and Command/Data Formats for transferring information into and out of the unit via the Serial Communications Bus. Bus Format submenus essentially determine how and when data can be accessed via the Serial Communications of the device.

- Press  18) Display advances to **M.BUS** Modbus Submenu.

MODBUS PROTOCOL SUBMENU:





- Press  19) Display flashes previous selection for **M.BUS**.
- Press  20) Scroll through the available selections: NO, YES.
- Press  21) Display shows **SERd** stored message momentarily and then advances to **LF** only, if it was changed, otherwise press  to advance to **LF** Line Feed submenu.

 **Note** To select iSeries Protocol, set Modbus submenu to “No”.
To select Modbus Protocol, set Modbus submenu to “Yes”.

 **Note** If Modbus Protocol was selected, the following Communications Parameters must be set as: No Parity, 8-bit Data Bit, 1-Stop Bit. Do not attempt to change these parameters.





LINE FEED SUBMENU:

Determines if data sent from the instrument will have a Line Feed appended to the end - useful for viewing or logging results on separate lines when displayed on communications software at a computer.

- Press  22) Display flashes previous selection for “Line Feed”.
- Press  23) Scroll through the available selections: NO, YES.
- Press  24) Display shows **SERd** stored message momentarily and then advances to **ECHO** only, if it was changed, otherwise press  to advance to **ECHO** Echo Submenu.

ECHO SUBMENU:

When valid commands are sent to the instrument, this determines whether the command will be echoed to the Serial Bus. Use of echo is recommended in most situations, especially to help verify that data was received and recognized by the unit.

- Press  25) Display flashes previous selection for “Echo”.
- Press  26) Scroll through the available selections: NO, YES.
- Press  27) Display flashes **SERd** stored message momentarily and then advances to **SEND** only if it was changed, otherwise press  to advance to **SEND** Communication Standard Submenu.

COMMUNICATION INTERFACE STANDARD SUBMENU:

Determines whether device should be connected to an RS-232C serial port (as is commonly used on IBM PC-compatible computers) or via an RS-485 bus connected through appropriate RS-232/485 converter. When used in RS-485 Mode, the device must be accessed with an appropriate Address Value as selected in the Address Submenu described later.

- Press **↻** 28) Display flashes previous selection for “Standard”.
- Press **▲** 29) Scroll through the available selections: 232C, 485.
- Press **↻** 30) Display shows **SERRd** stored message momentarily and then advances to **ModE** only, if it was changed, otherwise press **↻** to advance to **ModE** Data Flow Mode Submenu.

DATA FLOW MODE SUBMENU:

Determines whether the instrument will wait for commands and data requests from the Serial Bus or whether the instrument will send data automatically and continuously to the Serial Bus. Devices configured for the RS-485 Communications Standard operate properly only under Command Mode.

- Press **↻** 31) Display flashes previous selection for “Mode”.
- Press **▲** 32) Scroll through the available selections: **Cmd** “Command”, **ContE** “Continuous”.
- Press **↻** 33) Display shows **SERRd** stored message momentarily and then advances to **SEPR** only, if it was changed, otherwise press **↻** to advance to **SEPR** Data Separation Submenu.

DATA SEPARATION CHARACTER SUBMENU:

Determines whether data sent from the device in Continuous Data Flow Mode will be separated by spaces or by Carriage Returns.

- Press **↻** 34) Display flashes previous selection for “Separation” Submenu.
- Press **▲** 35) Scroll through the available selections: **SPCE** “Space” or **CR** “Carriage Return”.
- Press **↻** 36) Display shows **SERRd** stored message momentarily and then advances to **DATE.F** only, if it was changed, otherwise press **↻** to advance to **DATE.F** Data Format Submenu.

DATA FORMAT SUBMENU:

Preformatted data can be sent automatically or upon request from the unit. Use the Data Format Submenus to determine what data will be sent in this preformatted data string. Refer to the iSeries Communications Manual for more information about the data format. At least one of the following suboptions must be enabled and hence output data to the Serial Bus.

Note This menu is applicable for Continuous Mode of RS-232 communication.

Press **⏪** 37) Display advances to **SETE** Alarm Status Submenu.

ALARM STATUS SUBMENU:

Includes Alarm Status bytes in the data string.

- Press **⏪** 38) Display flashes previous selection for “Status” (alarm status).
- Press **⏩** 39) Scroll through the available selections: NO, YES.
- Press **⏪** 40) Display shows **SETR** stored message momentarily and then advances to **HUMd** only, if it was changed, otherwise press **⏪** to advance to **HUMd** Humidity Submenu.

HUMIDITY READING SUBMENU:

Includes Humidity Reading in the data string.

- Press **⏪** 41) Display flashes **HUMd**.
- Press **⏩** 42) Scroll through the available selections: NO, YES.
- Press **⏪** 43) Display shows **SETR** stored message momentarily and then advances to **TEMP** only, if it was changed, otherwise press **⏪** to advance to **TEMP** Temperature Submenu.

TEMPERATURE READING SUBMENU:

Includes Temperature Reading in the data string.

- Press **⏪** 44) Display flashes **TEMP**.
- Press **⏩** 45) Scroll through the available selections: NO, YES.
- Press **⏪** 46) Display shows **SETR** stored message momentarily and then advances to **DEW** only, if it was changed, otherwise press **⏪** to advance to **DEW** Dewpoint Submenu.





DEWPOINT READING SUBMENU:

Includes Dewpoint Reading in the data string.


- Press **⏪** 47) Display flashes **DEW**.
- Press **⏩** 48) Scroll through the available selections: NO, YES.
- Press **⏪** 49) Display shows **SETR** stored message momentarily and then advances to **UNIT** only, if it was changed, otherwise press **⏪** to advance to **UNIT** Temperature Unit Submenu.


TEMPERATURE UNIT SUBMENU:

Includes a byte in the data string to indicate whether reading is in Celsius or Fahrenheit.








- Press  50) Display flashes previous selection for **UNIT**.
- Press  51) Scroll through the available selections: NO, YES.
- Press  52) Display shows **SEEd** stored message momentarily and then advances to **Addr** only, if it was changed, otherwise press  to advance to **Addr** Address Setup Submenu.

ADDRESS SETUP SUBMENU:


 This menu is applicable to the RS-485 Option only.

- Press  53) Display advances to “Address Value” (0000 to 0199) Submenu.

ADDRESS VALUE SUBMENU:

- Press  54) Display flashes 1st digit of previously stored Address Value.
- Press  &  55) Press  and  to enter new “Address Value”.
- Press  56) Display shows **SEEd** stored message momentarily and then advances to **EREM** only, if it was changed, otherwise press  to advance to **EREM** Transmit Time Interval Submenu.








TRANSMIT TIME INTERVAL SUBMENU:

 This menu is applicable if “Continuous” Mode was selected in the “Data Flow Mode” Submenu and the device is configured as an RS-232C Standard device. Also, one or more options under the Data Format Submenu must be enabled.

- Press  57) Display advances to “Transmit Time Value” Submenu.

TRANSMIT TIME INTERVAL VALUE SUBMENU:

Determines the interval at which data will be emitted to the RS-232 Serial Bus when the instrument is in Continuous Data Flow Mode.

- Press  58) Display flashes 1st digit of previous “Transmit Time Value” in seconds.
- Press  &  59) Press  and  to enter new “Transmit Time Value”, e.g. 0030 will send the data every 30 seconds in Continuous Mode.
- Press  60) Display shows **SEEd** stored message momentarily and then advances to **COLR** only, if it was changed, otherwise press  to advance to **COLR** Color Display Selection Menu.

 For more details, refer to the Serial Communication Manual available at the website listed in the cover page of this manual.

3.2.11 DISPLAY COLOR SELECTION

This submenu allows the user to select the color of the upper display.

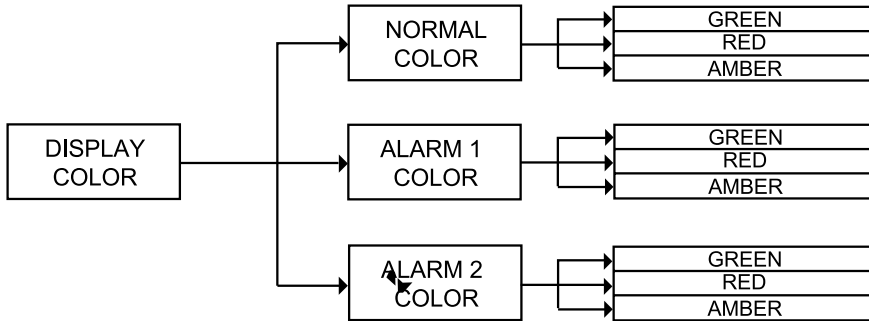


Figure 3.10 Flow Chart for Display Color Selection

ENTER DISPLAY COLOR SELECTION MENU:

- Press **⏪** 1) Press **⏪**, if necessary, until **C.N.F.G** prompt appears.
- Press **⏩** 2) Display advances to **R.D.G** Reading Configuration Menu.
- Press **⏪** 3) Press **⏪**, if necessary, until Display advances to **C.O.L.R** Display Color Selection Menu.
- Press **⏩** 4) Display advances to **N.C.L.R** Normal Color Submenu.

NORMAL COLOR DISPLAY SUBMENU:

- Press **⏩** 5) Display flashes the previous selection for “Normal Color”.
- Press **⏮** 6) Scroll through the available selections: **GRN**, **RED** or **AMBR**.
- Press **⏩** 7) Display shows **S.E.R.d** stored message momentarily and then advances to **I.C.L.R** only, if it was changed, otherwise press **⏩** to advance to **A.1.C.L.R** Alarm 1 Display Color Submenu.




The menu below allows the user to change the color of the upper display when Alarm 1 is triggered.

ALARM 1 DISPLAY COLOR SUBMENU:

- Press **⏩** 8) Display flashes previous selection for “Alarm 1 Color Display”.
- Press **⏮** 9) Scroll through the available selections: **GRN**, **RED** or **AMBR**.
- Press **⏩** 10) Display shows **S.E.R.d** stored message momentarily and then advances to **A.2.C.L.R** only, if it was changed, otherwise press **⏩** to advance to **A.2.C.L.R** Alarm 2 Display Color Submenu.

Note A color change is based on the Relative Humidity value only. If this value causes an alarm condition, the upper display will change to the selected Alarm 1 Color. A color change will occur whether Alarm 1 is enabled or disabled.

ALARM 2 DISPLAY COLOR SUBMENU:

- Press  11) Display flashes previous selection for "Alarm 2 Color Display".
- Press  12) Scroll through the available selections: **GRN**, **RED** or **AMBR**.
- Press  13) Display shows **SEt** stored message momentarily and then momentarily shows the software version number, followed by **RSE** Reset, and then proceeds to the Run Mode.

Tip IN ORDER TO DISPLAY ONE COLOR, SET THE SAME DISPLAY COLOR ON ALL THREE SUBMENUS ABOVE

Note If user wants the display to change color every time that both Alarm 1 and Alarm 2 are triggered, the Alarm values should be set in such a way that Alarm 1 value is always on the top of Alarm 2 value, otherwise value of Alarm 1 will overwrite value of Alarm 2 and Display Color would not change when Alarm 2 is triggered.

Example 1:

Alarm Setup: Absolute, Above, Alarm 2 HI Value "ALR.H" = 200, Alarm 1 HI Value "ALR.H" = 400

"Color Display" Setup: Normal Color "N.CLR" = Green, Alarm 1 Color "1.CLR" = Amber, Alarm 2 Color "2.CLR" = Red

Display Colors change sequences:

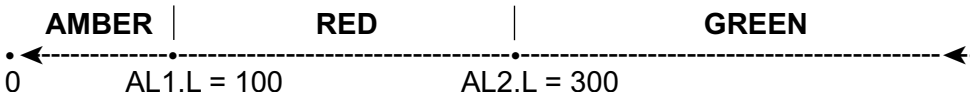


Example 2:

Alarm Setup: Absolute, Below, Alarm 2 Low Value "ALR.L" = 300, Alarm 1 Low Value "ALR.L" = 100

Color Display Setup: "N.CLR" = Green, "1.CLR" = Amber, "2.CLR" = Red

Display Colors change sequences:



Example 3:

Setpoint 1 = 300,

Setpoint 2 = 200

Alarm 1 & 2 Setup: Deviation, Band, "ALR.H" = 10

Color Display Setup: "N.CLR" = Green, "1.CLR" = Amber, "2.CLR" = Red

Display Colors change sequences:



Alarm 1 is designed to monitor the Process Value around the Setpoint 1.
Alarm 2 is designed to monitor the Process Value around the Setpoint 2.

Example 4:

Setpoint 1 = 200

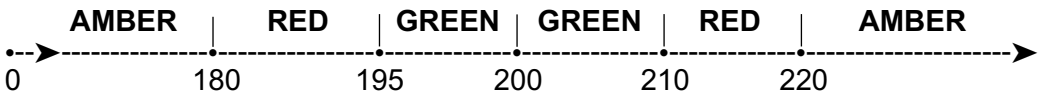
Setpoint 2 = 200

Alarm 1 Setup: Deviation, Band, "ALR.H" = 20

Alarm 2 Setup: Deviation, Hi/Low, "ALR.H" = 10, "ALR.L" = 5

Color Display Setup: "N.CLR" = Green, "1.CLR" = Amber, "2.CLR" = Red

Display colors change sequences:



Reset: The instrument automatically resets after the last menu of the Configuration Mode has been entered. After the instrument resets, it advances to the Run Mode.

PART 4 SPECIFICATIONS

SENSOR SPECIFICATIONS

Relative Humidity (RH)

Accuracy/Range: $\pm 2\%$ for 10 to 90% RH
 $\pm 3\%$ for 0 to 10%RH and 90 to 100%RH

Non-linearity: $\pm 3\%$

Hysteresis: $\pm 1\%$ RH

Response Time:

4 sec (63% slowly moving air)

Repeatability: $\pm 0.1\%$

Resolution: 0.03%, 12bit

NOTE: Reconditioning of the probe may be necessary if the probe is stored for a period of time in a harsh environment (e.g. high humidity or exposure to chemicals). To recondition the probe: heat probe for 1 day at 100°C to return it to calibration conditions.

Temperature (T)

Accuracy/Range*:

$\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$) for

-40 to 0°C and 80 to 123.8°C

(-40 to 32°F and 176 to 254°F)

$\pm 0.5^\circ\text{C}$ ($\pm 1^\circ\text{F}$) for 0 to 80°C (32 to 176°F)

***NOTE:** extended temperature range is for Probe only, the Controller's operating temperature is 0-50°C

Response Time:

5 sec (63% slowly moving air)

Repeatability: $\pm 0.1^\circ\text{C}$

Resolution: 0.01°C, 14 bit

METER SPECIFICATIONS

NMRR: 60 dB

CMRR: 120 dB

A/D Conversion:

12 bit RH and 14 bit Temperature

Reading Rate:

2 samples per seconds max.

Digital Filter: Programmable

Decimal Selection:

None, 0.1 for temp and humidity

Warm up to Rated Accuracy: 30 min.

Display: 4-digit, 9-segment LED

• 10.2 mm (0.40"): i32, i16D, i8DV

• 10.2 mm (0.40") & 21 mm (0.83"):i8DH
red, green and amber programmable colors for process variable, set point and temperature units

ALARM 1 & 2: (programmable to display color change)

Relay*: 250 Vac or 30 Vdc @ 3 A (Resistive Load); configurable for on/off, PID and Ramp and Soak

Output 1*: SPDT type, can be configured as Alarm 1 output

Output 2*: SPDT type, can be configured as Alarm 2 output

SSR*: 20-265 Vac @ 0.05-0.5 A (Resistive Load); continuous

DC Pulse*: Non-Isolated;
10 Vdc @ 20 mA

Operation: high/low, above/below, band, latch/unlatch, normally open/normally closed and process/deviation; front panel configurations

* Only with -AL Limit Alarm Option

NETWORK AND COMMUNICATIONS (Optional -C24, -C4EI, -EI)

Ethernet: Standards Compliance IEEE 802.3 10Base-T

Supported Protocols: TCP/IP, ARP, HTTPGET

RS-232/RS-422/RS-485/MODBUS:

Selectable from menu; both ASCII and modbus protocol selectable from menu.

Programmable 300 to 19.2 K baud; complete programmable setup capability; program to transmit current display, alarm status, min/max, actual measured input value and status.

RS-485: Addressable from 0 to 199

Connection: Screw terminals

EXCITATION (optional in place of Communication)

24 Vdc @ 25 mA

Not available for Low Power Option

INSULATION

Power to Input/Output

2300 Vac per 1 min. test

1500 Vac per 1 min. test
(Low Voltage/Power Option)

Power to Relays/SSR Outputs

2300 Vac per 1 min. test

Relays/SSR to Relay/SSR Outputs

2300 Vac per 1 min. test

RS-232/485 to Inputs/Outputs

500 Vac per 1 min. test

APPROVALS

UL, C-UL, and see CE Approval Section

GENERAL

Line Voltage/Power

90-240 Vac +/-10%, 50-400 Hz*

110-375 Vdc, equivalent voltage

4 W, power for i32 Models

5 W, power for i8DV, i8DH, i16D Models

* *No CE compliance above 60 Hz*

Low Voltage/Power Option

12-36 Vdc or 24 Vac** +/-10%, **3 W**

External power source must meet
Safety Agency Approvals.

** *Units can be powered safely with 24 Vac power but, no Certification for CE/UL are claimed.*

External Fuse Required

Time-Delay, UL 248-14 listed:

100 mA/250 V

400 mA/250 V (Low Voltage/Power Option)

Time-Lag, IEC 127-3 recognized:

100 mA/250 V

400 mA/250 V (Low Voltage/Power Option)

Environmental Conditions

• **i32:** 0 to 55°C (32 to 131°F),
90% RH non-condensing

• **i8DV, i8DH, i16D:**
0 to 50°C (32 to 122°F),
90% RH non-condensing

• **Cable:** operating temperature
0-105°C (32 to 221°F)

Protection

NEMA-4x/Type 4/IP65 front bezel:
i32, i16D

NEMA-1/Type 1 front bezel:
i8DH, i8DV

Dimensions

i/8 Series:

48 H x 96 W x 127 mm D
(1.89 x 3.78 x 5")

i/16 Series:

48 H x 48 W x 127 mm D
(1.89 x 1.89 x 5")

i/32 Series:

25.4 H x 48 W x 127 mm D
(1.0 x 1.89 x 5")

Industrial Probe iTHP-2:

16mm Dia. x 51mm Long (0.63" x 2")

Industrial Probe iTHP-5:

16mm Dia. x 137mm Long (0.63" x 5")

Probe Housing Material: SS316

Panel Cutout

i/8 Series:

45 H x 92 mm W (1.772" x 3.622 "),
1/8 DIN

i/16 Series:

45 mm (1.772") square, 1/16 DIN

i/32 Series:

22.5 H x 45 mm W (0.886" x 1.772"),
1/32 DIN

Weight

i/8 Series: 295 g (0.65 lb)

i/16 Series: 159 g (0.35 lb)

i/32 Series: 127 g (0.28 lb)

PART 5 FACTORY PRESET VALUES

Table 5.1 Factory preset value

MENU ITEMS	PRESET VALUES	NOTES
Set Point 1 (SP1)	000.0	
Set Point 2 (SP2)	000.0	
Reading Configuration (RDG):		
Sensor (SENS)	%RH	
Decimal Point	FFF.F	not menu selectable
Temperature unit (tEMP)	°F	
Filter value (FLtR)	0004	
Alarm 1 & 2:		
Alarm 1 (ALR1), Alarm 2 (ALR2)	Disable (dSbL)	
Absolute/Deviation (AbSO/dEV)	Absolute (AbSO)	
Latch/Unlatch (LtCH/UNLt)	Unlatch (UNLt)	
Contact Closure (Ct.CL)	Normally Open (N.O.)	
Active (ACTV)	Above (AbOV)	
Alarm At Power On (A.P.ON)	Disable (dSbL)	Alarm 1 only
Alarm Low (ALR.L)	000.0	
Alarm High (ALR.H)	80.0	
Reading Adjust Value (R.AdJ)	000.0	
Setpoint Deviation (SP.dV)	Disabled (dSbL)	
ID:		
ID Value	0000	
Full ID (FULL)	Disable (dSbL)	
Set Point ID (Id.SP)	Disable (dSbL)	
Communication Parameters:		
Baud Rate (BAUd)	9600	
Parity (PRtY)	Odd	
Data bit (DAtA)	7 bit	
Stop Bit (StOP)	1 bit	
Modbus Protocol (M.bUS)	No	
Line Feed (LF)	No	
Echo (ECHO)	Yes	
Standard Interface (StNd)	RS-232 (232C)	
Command Mode (MOdE)	Command (CMd)	
Separation (SEPR)	Space (SPCE)	
Alarm Status (StAt)	No	
Humidity (HUMd)	Yes	
Temperature (TEMP)	No	
Dewpoint (dEU)	No	
Units (UNIt)	No	
Multipoint Address (AddR)	0001	
Transmit Time (tR.tM)	0016	
Display Color (COLR):		
Normal Color (N.CLR)	Green (GRN)	
Alarm 1 Color (1.CLR)	Red (RED)	
Alarm 2 Color (2.CLR)	Amber (AMbR)	

PART 6 CE APPROVALS INFORMATION

 This product conforms to the EMC directive 89/336/EEC amended by 93/68/EEC, and with the European Low Voltage Directive 72/23/EEC.

Electrical Safety EN61010-1:2001

Safety requirements for electrical equipment for measurement, control and laboratory.

Double Insulation

Pollution Degree 2

Dielectric withstand Test per 1 min

- Power to Input/Output: 2300Vac (3250Vdc)
- Power to Input/Output: 1500Vac (2120Vdc)
(Low Voltage dc Power Option*)
- Power to Relays/SSR Output: 2300Vac (3250Vdc)
- Ethernet to Inputs: 1500Vac (2120Vdc)
- Isolated RS232 to Inputs: 500Vac (720Vdc)
- Pulse to Inputs: No Isolation

Measurement Category I

Category I are measurements performed on circuits not directly connected to the Mains Supply (power). Maximum Line-to-Neutral working voltage is 50Vac/dc. This unit should not be used in Measurement Categories II, III, IV.

Transients Overvoltage Surge (1.2 / 50uS pulse)

- Input Power: 2500V
- Input Power: 1500V
(Low Voltage dc Power Option*)
- Ethernet: 1500V
- Input/Output Signals: 500V

Note: *Units configured for external low power dc voltage, 12-36Vdc

EMC EN61326:1997 + and A1:1998 + A2:2001

Immunity and Emissions requirements for electrical equipment for measurement, control and laboratory.

- EMC Emissions Table 4, Class B of EN61326
- EMC Immunity** Table 1 of EN61326

Note: **I/O signal and control lines require shielded cables and these cables must be located on conductive cable trays or in conduits. Furthermore, the length of these cables should not exceed 30 meters



Refer to the EMC and Safety installation considerations (Guidelines) of this manual for additional information.



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **one (1) year** from the date of purchase. In addition to OMEGA's standard warranty period, OMEGA Engineering will extend the warranty period for **four (4) additional years** if the warranty card enclosed with each instrument is returned to OMEGA.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available **BEFORE** contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available **BEFORE** contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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