VEEDER-ROOT
SYSTEM SETUP INSTRUCTIONS

Technical Manual
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ILS-350
UST MONITORING SYSTEM

Manual Number 576013-774

VEEDER-ROOT
Environmental Products

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IMPORTANT

DO NOT APPLY POWER TO THE SYSTEM UNTIL ITS INSTALLATION HAS BEEN CHECKED BY AN AUTHORIZED VEEDER-ROOT DISTRIBUTOR AND FOUND TO BE IN ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THE VEEDER-ROOT "SITE PREPARATION AND INSTALLATION INSTRUCTIONS," MANUAL NO. 576013-773; THE NATIONAL ELECTRICAL CODE; FEDERAL, STATE AND LOCAL CODES; AND OTHER APPLICABLE SAFETY CODES.

SECTION 1. INTRODUCTION

IMPORTANT: This product will be operated near the highly combustible environment of an underground fuel storage tank. Leaking underground tanks can create serious environmental and health hazards. It is your responsibility to setup this product in accordance with the instructions found in this manual.

a. This manual describes the setup procedures for the ILS-350 UST Monitoring System designed and manufactured by the Veeder-Root Company, 125 Powder Forest Drive, Simsbury, CT 06070-2003.

b. When a vertical bar ▌ appears adjacent to text or illustrations, information has been added or revised in this printing.

SECTION 2. PRODUCT DESCRIPTION

The ILS-350 UST Monitoring System features a modular design that allows each system to be configured with monitoring and output capabilities according to the needs of a particular site.

A. MONITOR

1. Monitor Features.

The ILS-350 monitor incorporates the following features (see Figure 1, ILS-350 Front Panel Features''):

- A two-line, 24-character-per-line Liquid Crystal Display.
- A six-button keyboard with control functions for programming, operating and reporting.
- Three front-panel lamps to indicate power-on, warning and alarm conditions.
- An internal audible warning and alarm indicator.

2. Monitoring Functions.

Monitoring functions, such as interstitial leak sensing and vapor sensing, are provided by modules that snap into intrinsically safe expansion slots (see Figure 2, ''ILS-350 Interface Module Area''). Up to four modular boards, two- or three-wire designs, can be snapped into the Intrinsically Safe Area of the monitor. Each module can accommodate four sensors.

3. Output Functions.

Output relays (see Figure 2, ''ILS-350 Interface Module Area'') provide both normally open and normally closed contact for external audible and visual warning devices. They can also control sumps. Five relays, including one timed relay, are available in the power area of the monitor.

B. SENSORS

An ILS-350 system can incorporate sensors that detect liquids in interstitial spaces and piping sumps, as well as sensors that can detect hydrocarbon vapors in dry monitoring wells and hydrocarbons flowing on top of the water table in wet monitoring wells.

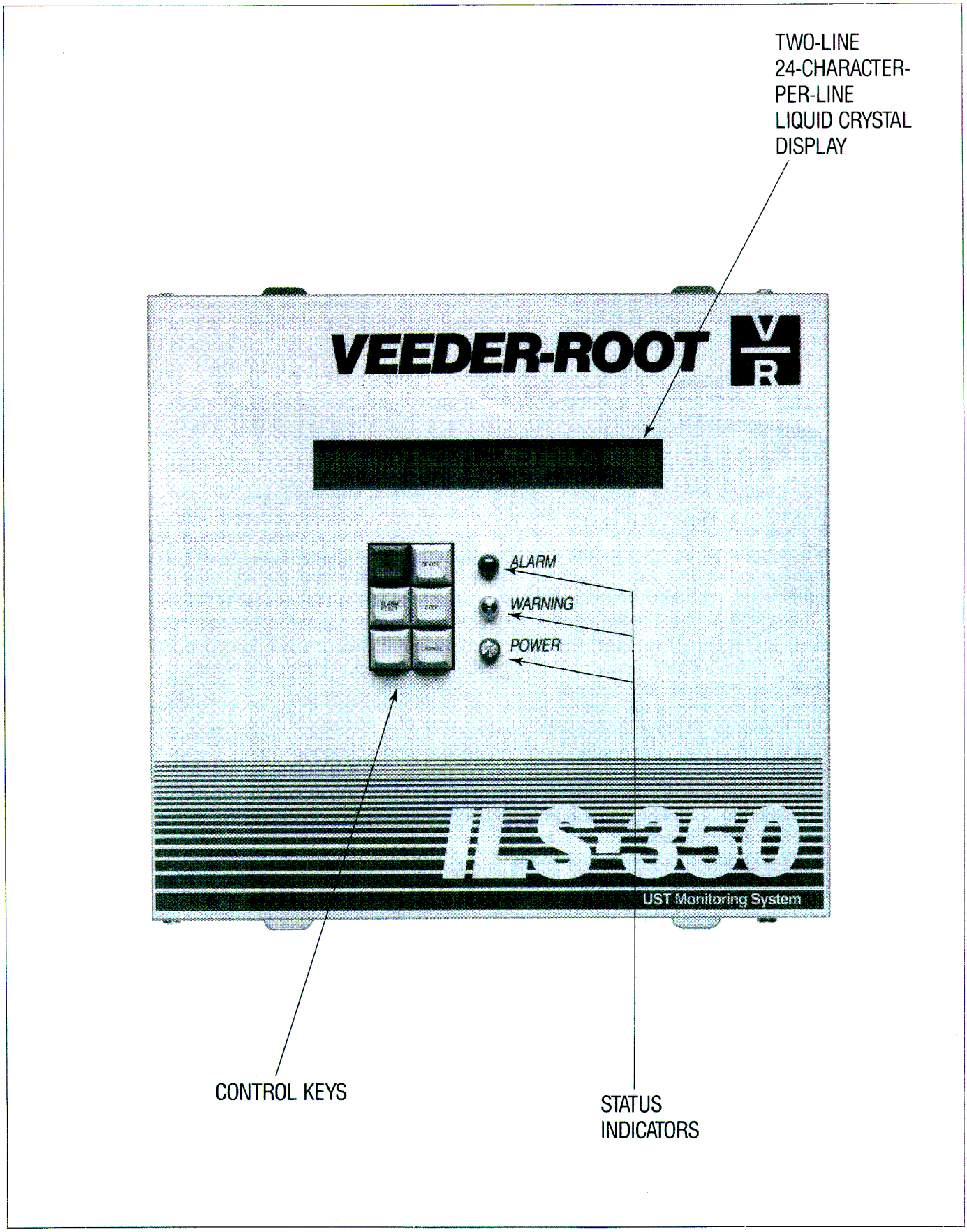


Figure 1. ILS-350 Front Panel Features.

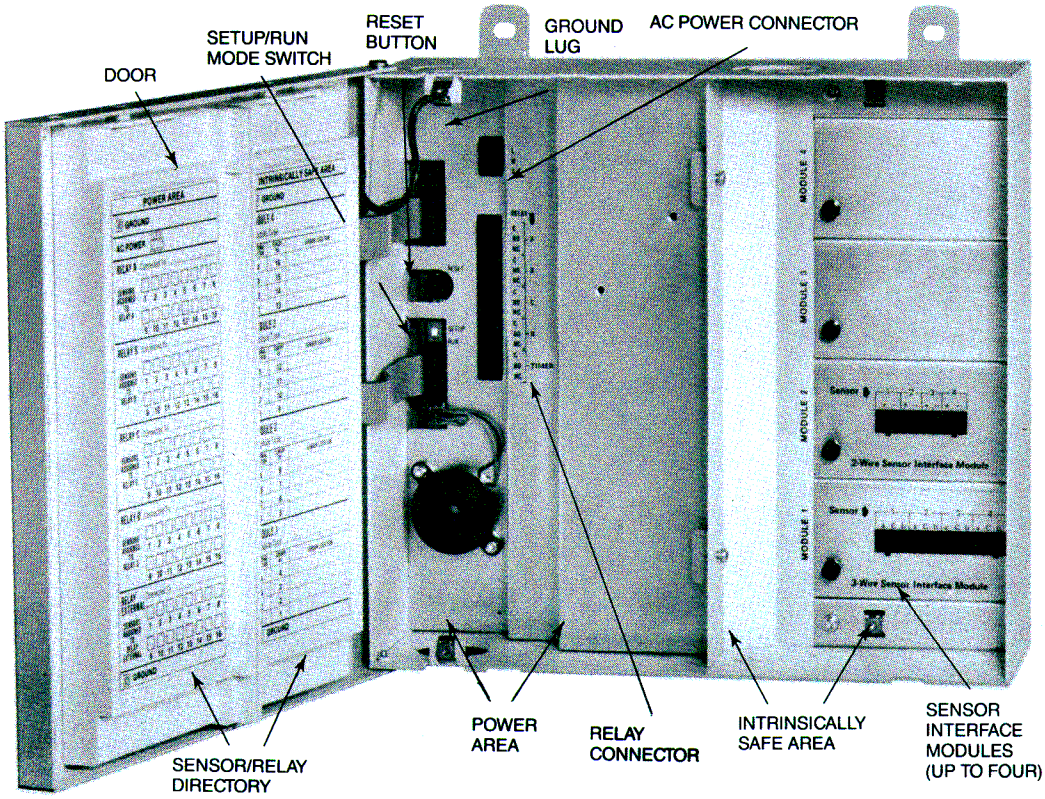


Figure 2. ILS-350 Interface Module Area.

SECTION 3. HOW TO USE THE KEYBOARD

A. GENERAL

The keyboard consists of six buttons. The functions for each button have been established to make movement within the setup mode, entry of setup data and selection of setup choices as simple as possible.

The buttons allow you to access the data, program the system, test system operation and review diagnostic information. (See Section 3B).

B. OPERATING BUTTON FUNCTIONS

BUTTON	RUN MODE	SETUP MODE
TEST TEST	In the Run Mode, TEST activates self-test features. 1. In the Sensor Status Submode, TEST measures the displayed sensor and resets an alarming sensor when the alarm condition has been corrected. 2. In the Relay the Test Submode, TEST initiates and terminates testing of the displayed relay.	In the Setup Mode, only when used in conjunction with ALARM RESET, TEST clears the EEPROM. Both buttons must be held down simultaneously for at least 3 seconds.
DEVICE DEVICE	In the Run Mode, DEVICE allows the operator to enter and view all devices (such as Timed Alarm Relay, Sensor Status, etc.), and return to the normal operating mode display.	In the Setup Mode, DEVICE causes the LCD to display for configuration any system device.
ALARM RESET ALARM RESET	In the Run Mode, ALARM RESET resets one or more existing audible alarm. It will not shut off visual display conditions. Each new alarm condition reactivates the audible alarm.	In the Setup Mode, only when used in conjunction with TEST, ALARM RESET clears the EEPROM. Both buttons must be held down simultaneously for at least 3 seconds.
STEP STEP	In the Run Mode, STEP is active only in submodes. 1. In the Timed Alarm Relay Status Submode, STEP displays the timeout duration period for the timed alarm relay. 2. In the Sensor Status Submode, STEP displays the status of sensors assigned a type during the Setup Mode. Sensors without type assignments will not be displayed. 3. In the Relay Test Submode, STEP displays the next available relay for test and terminates the current relay test.	In the Setup Mode, STEP advances the display to the next setup parameter of a device.
CHANGE CHANGE	Not active in Run Mode.	In the Setup Mode, CHANGE displays and allows the operator to select choices for device parameters. Changes are saved only when the Setup Mode is exited.

SECTION 4. SETUP MODE ORGANIZATION

The ILS-350 has been designed to make its setup simple and logical. In the Setup Mode, you can enter system information and choose operating parameters that tailor the ILS-350 to your particular site and monitoring requirements.

All setup data is entered or setup choices made using the front-panel keyboard. Section 3 describes in detail the functions of each button.

A. DEVICES

DEVICES are general categories of procedures for the ILS-350. Within the Setup Mode there can be two basic DEVICES:

- Timed Alarm Relay
- Sensors

The system will automatically recognize which of these DEVICES has been installed and access only those DEVICES during setup. The others will be skipped.

B. STEPS

Within each DEVICE are STEPS where setup choices are made.

The ILS-350 takes you through setup in the logical paths shown in Figure 3, "Setup Mode Programming Chart".

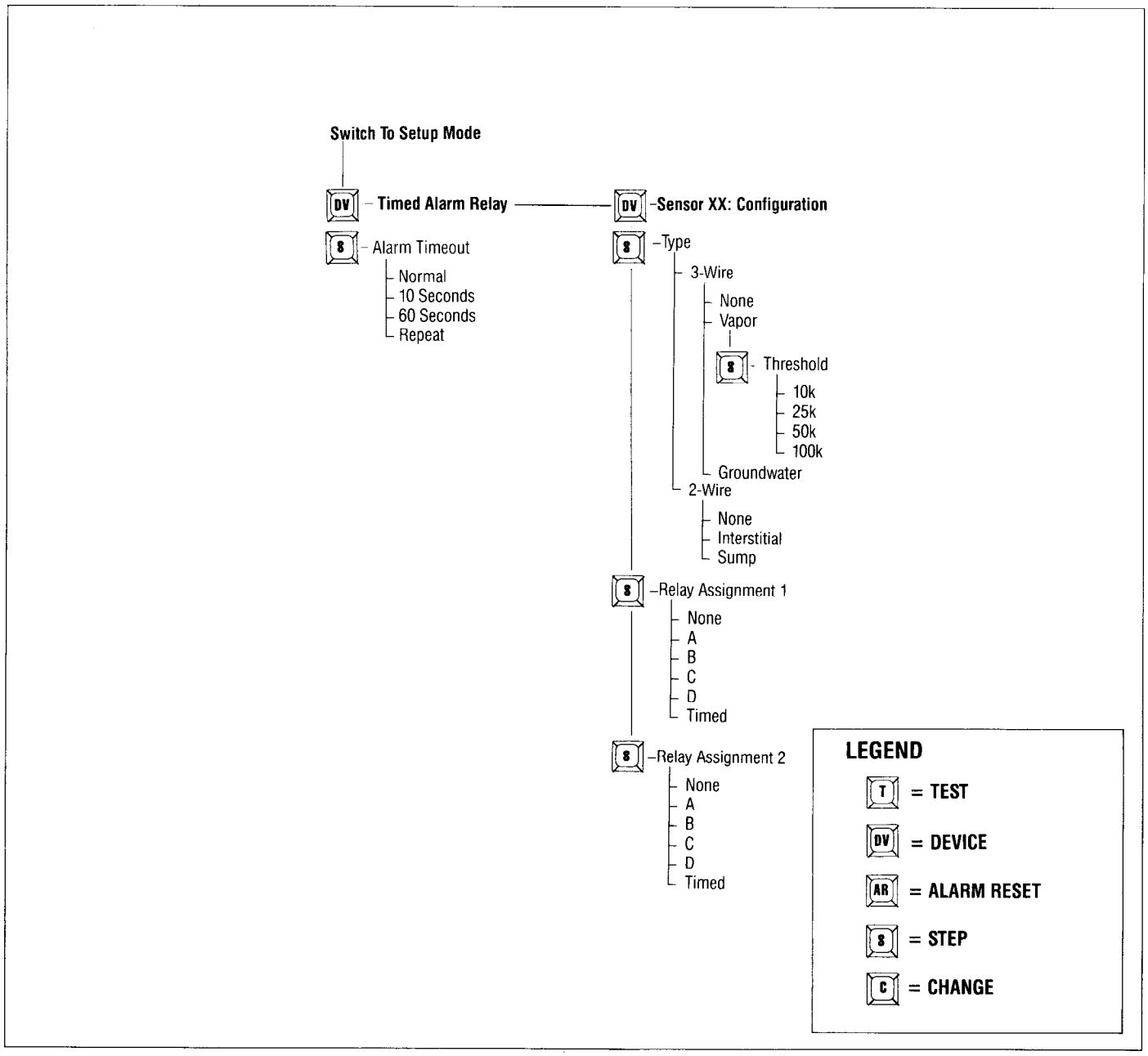


Figure 3. Setup Mode Programming Chart

SECTION 5. SETUP PROGRAMMING GUIDELINES

IMPORTANT!
BEFORE YOU START, READ THIS INFORMATION!

ALL THE PROGRAMMING INSTRUCTIONS IN THIS MANUAL ASSUME THAT THIS IS A FIRST-TIME (COLD-START) SETUP.

The screens that are shown in these setup procedures display factory-set values or choices. Once you have set up the system for your application, your setup values or choices will appear in the display if the Setup Mode is re-entered.

The buttons used to revise any setting are the same as used during initial programming, although the button sequence may change.

For example:

The procedure shown in this manual to select Relay Assignment 1 instructs you to press <STEP> to leave "NONE" as the choice and go on to Relay Assignment 2, <CHANGE> to select relay A, <CHANGE> <CHANGE> to select relay B, and so on to "TIMED."

If relay B has been selected as the Relay Assignment, and you wish to enter the Setup Mode to change the assignment, "B" would show in the display as your first choice. Press <CHANGE> to select relay C, <CHANGE> <CHANGE> to select relay D, and so on through "TIMED," "NONE," and "A."

This will be true for any setup value or choice. Always be sure the value or choice is correct before going on to the next step or device, or switching to the Run Mode.

IMPORTANT

The ILS-350 UST Monitoring System, because of its flexible design, can contain various combinations of sensor, relay output and communication modules to suit particular application requirements.

DURING SETUP the system recognizes the modules installed and takes you through the setup procedures required for those modules only. **It will skip functions not installed in the system.**

A. SETUP REQUIREMENTS

The ILS-350 must have all setup parameters entered to properly collect, interpret and report data at a particular site.

These parameters allow you to utilize the alarm, reporting and communications features of the ILS-350 in ways that best suit the requirements of your operation.

It is important that you prepare for setup in advance so that setup procedures can be conducted smoothly, continuously and with a minimum risk of error.

B. RETURN TO RUN MODE

To return the ILS-350 to the Run Mode. Toggle the Setup/Run Switch in the Power Area of the monitor to the Run position.

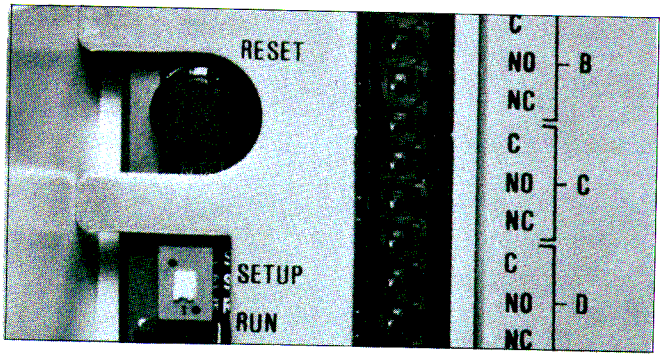


Figure 4. Setup/Run Switch

C. PROGRAMMING SEQUENCE

Since the ILS-350 is a modular system, features and capabilities will vary from system to system according to the needs of particular applications.

As a result, the sequence of DEVICES in the Setup Mode for a particular system will depend on the type of modules (2- or 3-wire) and sensors that have been installed.

Because of this modularity, the instructions for determining and entering setup data are divided by setup DEVICE. Once you switch to the Setup Mode, the ILS-350 will access only those DEVICES that are installed in the system.

D. DETERMINING SETUP DATA

Each section describing a setup function includes "How to Determine Setup Data" information. Review the description of each feature carefully and decide in advance of programming what values or choices you will be entering.

E. ENTERING SETUP DATA

Each section describing a setup function also includes "How to Enter Setup Data" programming diagrams. IT IS IMPORTANT TO UNDERSTAND that these diagrams are based on a first-time (cold-start) setup. The screens depicted show **factory-set** values and choice selections.

They provide a simple guide to the STEP sequences within the DEVICE and the button sequences required to move between STEPS and select data.

Once you become familiar with the setup procedures and button functions, you will find the setup process to be extremely simple and logical.

Abbreviations are used to identify data entry and choice selection sequences. Typically, they are:

- DV — The DEVICE button, used to move from one device to the next.
- S — The STEP button, used to step in a procedure within a particular device.
- C — The CHANGE button, used to scroll through possible choices.
- AR — The ALARM RESET button, used with TEST to clear EEPROM.
- T — The TEST button, used with ALARM RESET to clear EEPROM.

F. SETUP DATA WARNING

A Setup Data Warning will appear in the Status Display and the yellow warning light will flash when you exit the Setup Mode if insufficient or invalid setup data has been entered.

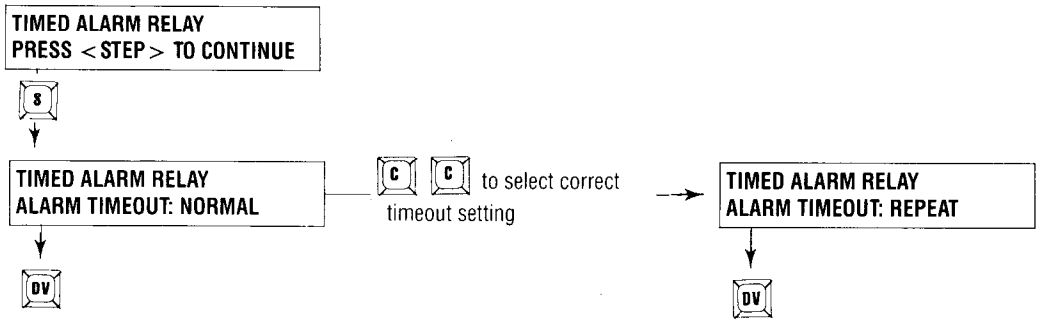
The display will identify the source of the warning (i.e. Sensor 4, etc.), and the warning indicators will remain active until the cause has been corrected.

SECTION 6. EXTERNAL TIMED ALARM RELAY DATA

A. HOW TO DETERMINE EXTERNAL TIMED ALARM RELAY DATA

DEVICE/STEP	DESCRIPTION	SELECTION/ENTRIES
TIMED ALARM RELAY DATA	The timed alarm relay can be used with any compatible external device (i.e., sumps, and audible or visual alarms, etc.). Its response time can be timed or it can be a normal response.	
Alarm Timeout	The length of time the timed alarm relay remains de-energized is programmable. Selections of 10 seconds, 60 seconds, normal, or repeat are possible. If an alarm condition is sensed when a 10- or 60-second selection has been entered, the timed alarm relay cannot be re-triggered by a second alarm condition within that time frame. If repeat has been selected each alarm condition will immediately re-trigger the timed alarm relay. If normal is selected, the timed alarm relay will operate identically to other relays. The visual and audible alarm conditions at the ILS-350 units are not effected by the configuration of the timed alarm relay.	Choices: Normal 10 Seconds 60 Seconds Repeat

B. HOW TO ENTER EXTERNAL TIMED ALARM RELAY DATA

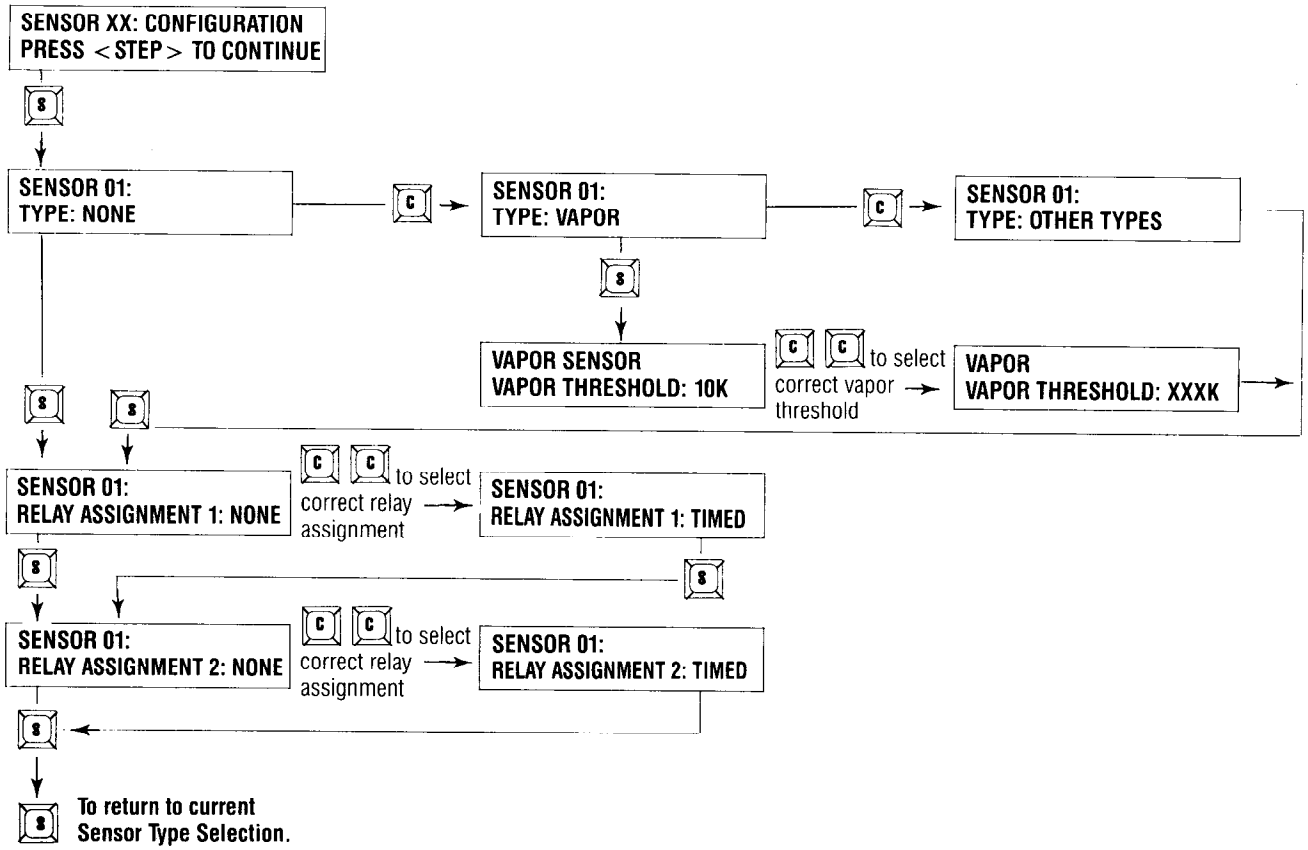


SECTION 7. SENSOR CONFIGURATION DATA

A. HOW TO DETERMINE SENSOR CONFIGURATION DATA

DEVICE/STEP	DESCRIPTION	SELECTION/ENTRIES
SENSOR CONFIGURATION DATA	This information relates to liquid sensors installed in the interstitial space of double-wall tanks and the sumps of double-wall piping systems, vapor sensors installed in dry monitoring wells, and groundwater sensors installed in wet monitoring wells at the site. Data must be entered individually for each Sensor. The parameters you select tell the system the number and types of sensors installed.	
SENSOR TYPE	Where modules are installed, the system will recognize the module type (two- or three-wire), and allows the selection of compatible sensors (interstitial or sump sensors in a two-wire sensor interface module, or vapor or groundwater sensors in a three-wire sensor interface modules). The system establishes a sensor number based on module and sensor connection location. For example, a sensor connected to the first position of the first module would be Sensor No. 1. Ascending to a sensor connected to the last position of the fourth module, the sensor would be recognized as Sensor No. 16. If more than one sensor is installed, pressing DEVICE will advance the system to the next sensor. Up to four modules, each accommodating up to four sensors, may be installed. If a vapor sensor is installed, the system automatically displays Vapor Threshold selections, then the Relay Assignments. For any other sensor type, the system displays Relay Assignments after type selection. **NOTE:** If sensor type is changed after setup procedures are completed, all setup data for that sensor are reset to NONE (default).	Choices: None Vapor Groundwater Interstitial Sump Vapor Sensor Threshold Choices: 10K 25K 50K 100K
SENSOR RELAYS	Two relays are available for each sensor. Step through the selections for Relay Assignment 1 to assign the desired relay to the sensor displayed by the LCD. Once selection is made for Relay Assignment 1, the same choices will be available for Relay Assignment 2. Finally, STEP to return to next sensor type selection, or DEVICE to advance to the next DEVICE. **NOTE:** Any relay assigned to Relay Assignment 1 will de-energize for Alarm conditions only. Any relay assigned to Relay Assignment 2 will de-energize for both Alarm and Warning conditions.	Choices: A B C D TIMED

B. HOW TO ENTER LIQUID SENSOR SETUP DATA



NOTE: If sensor type is changed after setup procedures are completed, all setup data for that sensor are reset to NONE (default).

SECTION 8. WARRANTY CONDITIONS AND LIMITATIONS OF LIABILITY

A. LIMITATIONS OF LIABILITY. We warrant that this product shall be free from defects in material and workmanship for a period of one (1) year from the date of installation or fifteen (15) months from the date of invoice, whichever occurs first. During the first ninety (90) days of this warranty period, we will repair or replace the product, if determined by us to be defective, at the location where the product is in use and at no charge to the purchaser. After the first ninety (90) days of the warranty period, we will repair or replace the product if it is returned to us, transportation prepaid, within the warranty period and is determined by us to be defective. We will not be responsible for any shipping expenses incurred by the user.

This warranty applies only when the product is installed in accordance with Veeder-Root's specifications, and a Warranty Registration and Checkout Form has been filed with Veeder-Root by an authorized Veeder-Root Distributor. This warranty will not apply to any product which has been subjected to misuse, negligence or accident; or misapplied; or used in violation of product manuals, instructions or warnings; or modified or repaired by unauthorized persons; or improperly installed.

B. INSPECTION. You shall inspect the product promptly after receipt and shall notify us at our Simsbury office, in writing, of any claims, including claims of breach of warranty, within thirty days after you discover or should have discovered the facts upon which the claim is based. Your failure to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

C. LIMITATION OF REMEDY AND WARRANTY. The provisions of Paragragh 1 are our sole obligation and exclude all other remedies or warranties, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to you or to any other person for injury to person or damage to or loss of property or value caused by any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions, or warnings; or modified or repaired by unauthorized persons; or improperly installed.

D. LIMITATION OF DAMAGES. Under no circumstances shall we be liable for any incidental, consequential or special damages, losses or expenses arising from this contract or its performance or in connection with the use of, or inability to use, our product for any purpose whatsoever.

E. LIMITATION OF ACTIONS. No action regardless of form arising out of this contract may be commenced more than one year after the cause of action has accrued, except an action for nonpayment.

F. COLLATERAL PROMISES. There are no representations, warranties, or conditions express or implied, statutory or otherwise except those herein contained, and no agreements or waivers collateral hereto shall be binding on either party unless in writing and signed by you and accepted by us at our Simsbury office.

G. INTERPRETATION. Rights and liabilities arising out of any contract with us shall be determined under the Uniform Commercial Code as enacted in Connecticut.

VEEDER-ROOT
Environmental Products

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